

TAP3.12 Format Specification
Version 37.0
22 September 2026

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Table of Contents

1 Introduction 5
1.1 Overview 5
1.2 Scope 5
1.3 Abbreviations 5
1.4 References 6
Billing Identifier (BID) Notification and Synchronization Process 7
1.5 Conventions 7
2 Differences from the Commercial Requirement 7
2.1 Transfer Frequency 7
2.2 File Creation Timestamp 8
2.3 File Available Timestamp 8
2.4 Version Control 8
2.5 Reference Tables 8
2.6 Supplementary Services 8
2.7 Location Information 9
2.8 Dates and Times 9
2.9 File Size Limitations 9
2.10 Support for Interstandard Number Portability 9
2.11 Calculated Exchange Rate for Currencies Not Published by GSER 9
2.12 Exchange Rate for Currencies Published by GSER 9
2.13 Exchange Rate higher than expected 10
2.14 Partial Type Indicator 10
2.15 TAP Versions Supported 10
2.16 Aggregated Usage Record Date(s) 10
2.17 Aggregated Usage Record Implementation Date 10
3 Logical Structure 11
3.1 Data Interchange 12
3.2 Transfer Batch 13
3.3 Batch Control Information 14
3.4 Accounting Information 15
3.5 Network Information 16
3.6 Aggregated Usage Record 17
3.7 Mobile Originated call 18
3.8 MO Basic Call Information 19
3.9 Location Information 20
3.10 Basic Service Used 21
3.11 Charge Information 22
3.12 CAMEL Service Used 23
3.13 Mobile Terminated Call 24
3.14 MT Basic Call Information 25
3.15 Mobile Session 26
3.16 Session Charge Information 27
3.17 Messaging Event 28

3.18 Supplementary Service Event 29
3.19 Supplementary Service Used 30
3.20 Service Centre Usage 31
3.21 GPRS Call 32
3.22 GPRS Basic Call Information 33
3.23 GPRS Service Used 34
3.24 Content Transaction 35
3.25 Content Transaction Basic Info 36
3.26 Charged Party Information 37
3.27 Content Service Used 38
3.28 Advised Charge Information 39
3.29 Location Service 40
3.30 Tracking Customer Information 41
3.31 Tracked Customer Information 42
3.32 Location Service Usage 43
3.33 Audit Control Information 44
4 Data Dictionary 45
4.1 A 47
4.2 B 70
4.3 C 76
4.4 D 146
4.5 E 158
4.6 F 167
4.7 G 173
4.8 H 182
4.9 I 187
4.10 L 192
4.11 M 203
4.12 N 221
4.13 O 232
4.14 P 238
4.15 R 244
4.16 S 260
4.17 T 281
4.18 U 314
4.19 V 319
4.20 Context Abbreviations 322
5 Classification of Errors 322
5.1 Known Issues Impact 322
5.2 Severity Levels 322
5.3 Naming and Numbering of Error Codes 323
5.3.1 Bilaterally Agreed Validation Errors 324
5.4 Other General Errors Not Listed in the Data Dictionary 325
5.5 Validation Rules Not Described in the Data Dictionary 327

5.6 Text Representation of IP Addresses 330
5.7 Validation of ASCII String Type elements 331
5.8 Identification of Emergency Calls 331
5.9 TAP Record Charge Validation Procedure 332
5.9 Provision of TAP Events on VoLTE handover scenarios 334
5.10 Provision of TAP Events on SMS Messaging 336
5.11 Provision of TAP Events on VoLTE S8 Home Routed (S8HR) Scenarios 337
5.12 Provision of TAP Events on VoLTE LBO HR, like for S8HR (new option) 339
6 Physical Structure 339
6.1 Abstract Syntax 340
6.2 Transfer Syntax 382
6.3 File Naming Conventions 382
6.3.1 Chargeable TAP Data 382
6.3.2 Test TAP Data 382
7 Migration to a New Release 382
Annex A Supplementary Services 384
Annex B Changes from Previous Specification Version Number 387
Annex C Description of 3GPP Releases and Specifications 395
C.1 Charging Specifications 395
C.2 Cause for Termination 395
C.3 Service Codes 396
Annex D Document Management 400
D.1 Document History 400
D.2 Other Information 411

1 Introduction

1.1 Overview

This document defines the logical and physical data that must be transferred between PMNs under the Transferred Account Procedure (TAP). It additionally contains all the validation rules that can be applied to a TAP3 file.

The transfer mechanism for TAP files is discussed in TD.28 [32].

The primary commercial requirement for data to be transferred is defined in permanent reference document BA.12 [12].

Note: Because there are many standards and documents relating to the Transferred Account Procedure, terminology can become confused, not least because each standard may have its own term for any particular item of data. For the purposes of this document BA.12 [12] is considered the prime input document in terms of the commercial requirement and items are named accordingly.

The other major input documents are the 3GPP specifications listed in Annex C.

1.2 Scope

The version of TAP supported by this document is Specification Version Number 3, Release Version Number 12. The implementation timetable for this version of TAP is such that all TAP files created on or after 01 July 2017 must conform to this standard (see TD.34 [15] for further information on implementation of new TAP standards).

1.3 Abbreviations

Term	Description
ASN	Abstract Syntax Notation
BER	Binary Encoding Rules
PMN	Public Mobile Network
HPMN	Home PMN
IMF	International Monetary Fund
TAP	Transferred Account Procedure
VPMN	Visited PMN
ATCF	Access Transfer Control Function
CDR	Call Detail Record
CS	Circuit Switched
CSFB	Circuit Switched Fall Back
eSRVCC	Enhanced Single Radio Voice Call Continuity
GSER	GSMA Standardised Exchange Rates
MSC	Mobile Switching Centre
MSU	Message Signal Unit
P-CSCF	Proxy Call Session Control Function

PMN	Public Mobile Network
REVOLVER	Re-Evaluation of VoLTE: Verification of Roaming Models
TRF	Transit and Roaming Function
VoIMS	Voice over IP Multimedia Subsystem
VoLTE	Voice over Long Term Evolution

1.4 References

	Document Number	Title
[1]	3GPP TS 22.004	General on Supplementary Services
[2]	3GPP TS 22.030	Man-Machine Interface (MMI) of the User Equipment (UE)
[3]	3GPP TS 29.002	Mobile Application Part (MAP) specification
[4]	3GPP TS 32.005	3G call and event data for the Circuit Switched (CS) domain
[5]	3GPP TS 32.015	GSM Call Event Data for the Packet Switched (PS) domain
[6]	3GPP TS 32.205	Charging data description for the Circuit Switched (CS) domain
[7]	3GPP TS 32.215	Charging data description for the Packet Switched (PS) domain
[8]	3GPP TS 32.298	Charging Data Record (CDR) Parameter Description
[9]	CIBER Manual v2.0	CIBER Manual v2.0
[10]	GSMA PRD BA.08	Timescales For Data Transfer
[11]	GSMA PRD BA.11	Billing and Accounting Information – Treatment of Exchange rates
[12]	GSMA PRD BA.12	Transferred Account Procedure and Billing Information
[13]	GSMA PRD BA.27	Charging and Accounting Principles
[14]	GSMA PRD TD.13	TADIG Code Naming Conventions (GSM Infocentre database)
[15]	GSMA PRD TD.34	TAP Release Management Process
[16]	GSMA PRD BA.62	BA.62 Roaming Hubbing Business Requirements Commercial Model
[17]	GSM TS 12.05	Event and call data
[18]	GSM TS 12.15	GPRS Charging
[19]	<ref not in use>	
[20]	<ref not in use>	
[21]	<ref not in use>	
[22]	IETF RFC 2866	RADIUS Accounting
[23]	IETF RFC 2869	RADIUS Extensions
[24]	<ref not in use>	
[25]	<ref not in use>	
[26]	ISO 4217	Codes for the representation of currencies and funds
[27]	ISO 646	Information Processing – ISO 7-bit coded character set for information interchange

[28]	ITU E.164	Principles, criteria and procedures for the assignment and reclamation of E.164 country codes and associated identification codes for groups of countries
[29]	<ref not in use>	
[30]	3GPP TS 22.004	General on Supplementary Services
[31]	IETF RFC 2119	Key words for use in RFCs to Indicate Requirement Levels
[32]	GSMA PRD TD.28	File Transfer Methods
[33]	GSMA PRD TD.58	TAP3.12 Implementation Handbook
[34]	IETF RFC 4282	The Network Access Identifier
[35]	GSMA PRD TD.38	Billing Identifier (BID) Notification and Synchronization Process
[36]	3GPP TS 23.032	Universal Geographical Area Description (GAD)
[37]	ITU REC X.680	Abstract Syntax Notation One (ASN.1)
[38]	ITU REC X.690	ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)
[39]	GSMA PRD BA.29	RAEX Op Data Business Requirements
[40]	GSMA PRD TD.77	RAEX Op Data Format Specification
[41]	3GPP TS 32.225	Charging data description for the IP Multimedia Subsystem (IMS)
[42]	3GPP TS 32.274	Short Message Service (SMS) charging
[43]	3GPP TS 09.02	Mobile Application Part (MAP) Specification
[44]	3GPP TS 29.002	Mobile Application Part (MAP) specification
[45]	RFC 2119	“Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997. Available at http://www.ietf.org/rfc/rfc2119.txt
[46]	RFC 8174	Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words https://www.rfc-editor.org/info/rfc8174

1.5 Conventions

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in RFC 2119[45] and clarified by RFC8174[46], when, and only when, they appear in all capitals, as shown here.

2 Differences from the Commercial Requirement

The IDS TAP file specification differs from the commercial requirement.

These differences are due to a number of factors including implementation considerations. The detailed differences are itemised below.

2.1 Transfer Frequency

BA.12 [12] sets a maximum limit to the number of TAP files that a Recipient is obliged to accept from a given Sender per day.

If the volume of traffic per day for a given Roaming Agreement is such that it cannot be transferred within the number of files specified by BA.12 [12], without violating the file size and/or number of records limit specified within this document, then this 'files per day' limit may be exceeded. No Fatal, Severe or Warning errors can be raised by the Recipient in this case.

2.2 File Creation Timestamp

The date and time of the file creation is included.

2.3 File Available Timestamp

Due to constraints in the physical file transfer environment where PMNs push data to HPMNs it is not possible to identify the actual date and time when the file is fully available on the HPMN's system. In these cases the File Available Timestamp is set to the date and time when the 'push' started.

The difference between this time and the actual time the transfer has completed is considered to be insignificant under normal circumstances and any major differences noted are expected to be handled by negotiation between the PMNs concerned.

2.4 Version Control

The TAP Specification Version and Release Version numbers are included in order to allow HPMNs to be able to identify the standard being used on the interface.

2.5 Reference Tables

In order to minimise the amount of data transferred and to avoid the repetition of frequently identical information at the call/event level a series of reference tables have been incorporated:

- Message Description Information; each table row comprises a code with its description.
- Taxation; each table row comprises a code with its tax type and rate.
- Discounting; each table row comprises a code with its discount applied, either the fixed discount amount or a discount rate.
- Currency Conversion; each table row comprises a code with its exchange rate and an indication of how many decimal places are represented.
- UTC Time Offset Information; each table row comprises a code with its offset value.
- Recording Entity Information; each table row comprises a code with its entity type, for example MSC, and entity identifier.

The codes are used within the calls/events as required.

2.6 Supplementary Services

Unlike 3GPP TS 32.005 [4], GSM Association PRD BA.12 [12] has no concept of events. BA.12 [12] assumes that supplementary services, when not used in conjunction with a call action, for example activation, are treated in a similar manner to mobile originated calls. There will be no called party but some supplementary services have additional information which may be useful for example the number involved in call forward activation.

These non call related Supplementary Services are treated as separate events within the TAP.

2.7 Location Information

The Location Area Code (LAC), Cell Identity and SGSN Address are maintained in TAP for all applicable services for technical and operational reasons.

2.8 Dates and Times

All date/time items cater for millennium compliance and have the format CCYYMMDDHHMMSS.

All timestamps are provided in the sending PMN's local time further qualified by an offset from Universal Time (UTC). This enables the HPMN to easily calculate its (HPMN) local time, especially useful when computing charges for forwarding calls to roamed subscribers.

2.9 File Size Limitations

Due to the high system resource consumption of tools used for ASN.1 processing, as used for TAP3, a file size limit has been set (see 'Validation Rules Not Described In Data Dictionary').

2.10 Support for Interstandard Number Portability

Inclusion of elements ESN (Electronic Serial Number), MIN (Mobile Identification Number) and MDN (Mobile Directory Number) are required to support mobile number portability within markets supporting various technology standards, for example USA.

2.11 Calculated Exchange Rate for Currencies Not Published by GSER

The GSMA offers a GSER (GSMA Standardised Exchange Rates) tool as per the details defined in BA.11 [11]. Most exchange rates use in the industry are published by GSER. The full list of GSER currencies is available in BA.11 [11].

A tolerance of two units on the 5th significant digit of the calculated Exchange Rate for currencies that are not published by GSER is required to avoid operational problems when validating the Exchange Rate on different systems.

Note: This is needed due to inaccurate values of calculated exchange rates used in the industry.

2.12 Exchange Rate for Currencies Published by GSER

Like IMF, GSER publishes exchange rates to 6 significant digits. Historically, some operator systems have been developed to support only 5 decimal places for exchange rates and a tolerance has therefore been introduced to allow operators who cannot support the full number of significant digits published by GSER to round either up or down from the more accurate GSER exchange rate.

Note: This is needed as not all operators are able to support more than 5 significant digits. Operators who can support all digits as published by GSER must, of course, not round the exchange rate in TAP and must populate TAP with the full GSER published exchange rate.

2.13 Exchange Rate higher than expected

A validation rule has been added for operational reasons to enable TAP files to be rejected when Exchange Rates are higher than expected.

2.14 Partial Type Indicator

BA.12 [12] states that this element is mandatory to populate where the TAP record represents part of a context, whereas there is no validation rule currently applied on Partial Type Indicator existence and validity in TAP.

Practically, and due to implementation concerns, adding such validation rules would create a number of operational issues, therefore such rules are not defined.

2.15 TAP Versions Supported

BA.12 [12] states rules governing liabilities for conversion between TAP versions. The implicit requirement is for no restrictions on the TAP versions used.

Practically, this is technically no longer tenable and the technical constraint is that the public interface will only support the latest two versions. At the time of writing, November 2013, this means that the current TAP version v3.12 and the preceding one v3.11 are allowed on the public interface. However, the party at the lower TAP version (v3.11) is responsible financially and operationally for conversion to/from the higher version (v3.12) of the TAP format. Use of any other TAP version must be bilaterally agreed.

The BA.12 [12] conversion requirements remain unaffected.

2.16 Aggregated Usage Record Date(s)

The business requirement as stated in BA.12 [12] requires only a single date, that is, the record allows only aggregation of usage related to a single date.

In order to provide flexibility of usage there is an additional date included to enable definition of a period that the aggregated usage represents.

2.17 Aggregated Usage Record Implementation Date

The business requirement as stated in BA.12 [12] refers to an effective date of 01 May 2017, however, due to technical considerations, the effective date of the specification is 01 July 2017.

3 Logical Structure

The following conventions have been used in the logical structure diagrams:

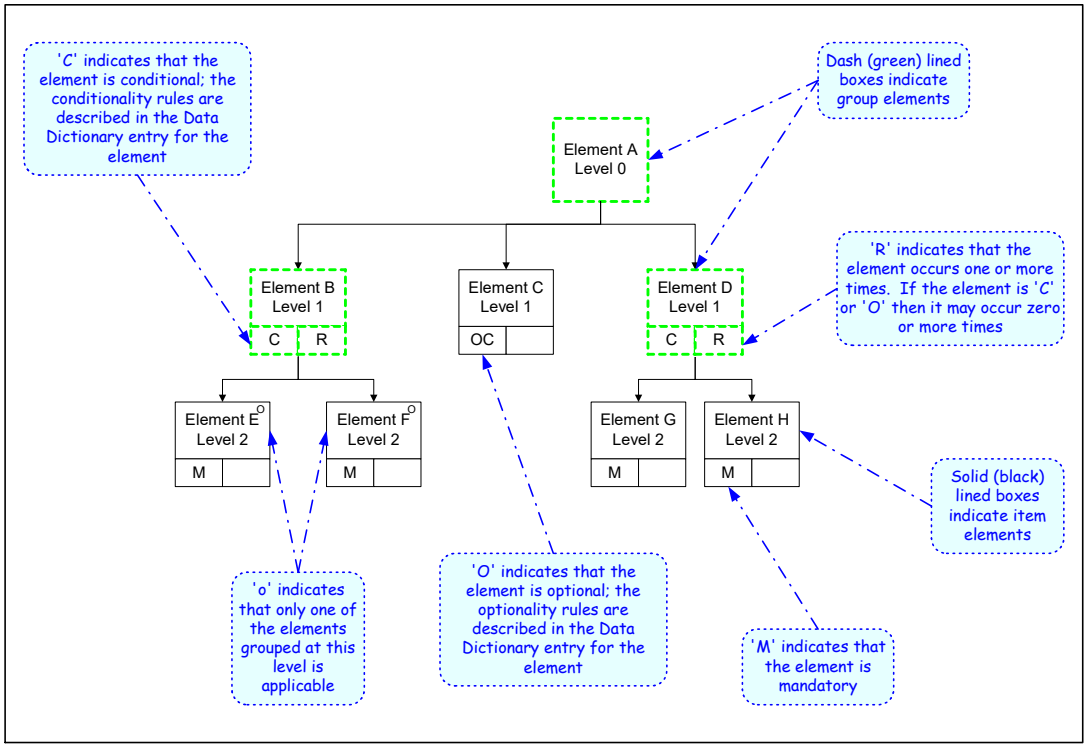

Figure 1: Conventions used within Logical Structure Diagrams

In the following sections the logical structure is broken down diagrammatically to show the logical record formats. Each item is clarified to show whether it is:

Mandatory	Must be present.
Conditional	In general, must be present. However in certain circumstances the element may not occur because the particular circumstance is not relevant or the information is not available (for example from the network).
Optional	Does not need to be present. Inclusion/exclusion of optional elements is at the discretion of the Sender PMN, no specific agreements need to be in place to allow the PMN to include these elements.
Repeating	Occurs more than once for a given situation (may also be conditional or optional).

The rules for conditionality and optionality are given in the data dictionary.

Where items are repeating items this is also documented. Again, fuller descriptions are given in the data dictionary.

If an item is conditional and does not exist due to conditionality rules then, obviously, those items below it in the hierarchy cannot exist either, even if denoted as mandatory. However, if it does exist then any mandatory item directly below it in the hierarchy must also exist.

Note that the notation does not imply any particular “level” of data within the structure by virtue of its position within the diagram. The only “levels” which exist are the hierarchic levels denoted by the box which contains the data item name.

3.1 Data Interchange

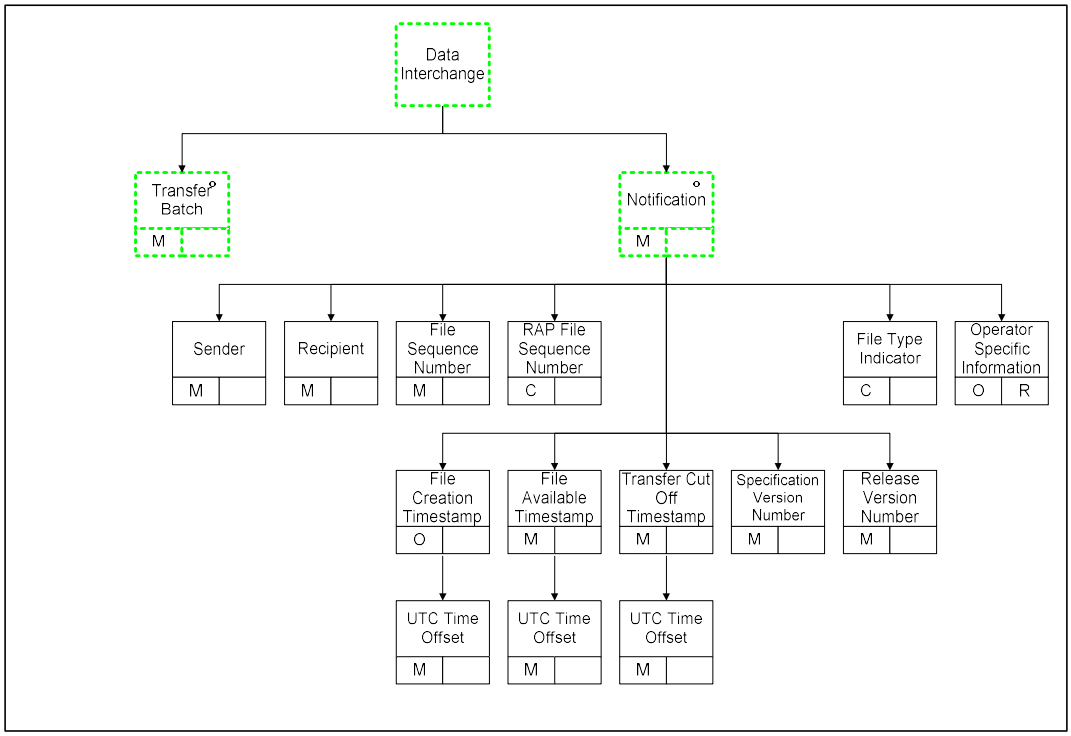

Figure 2: Data Interchange Logical Structure

Data Interchange		
Transfer Batch		Figure 3
Notification		

Table 1: Data Interchange Element Cross References

3.2 Transfer Batch

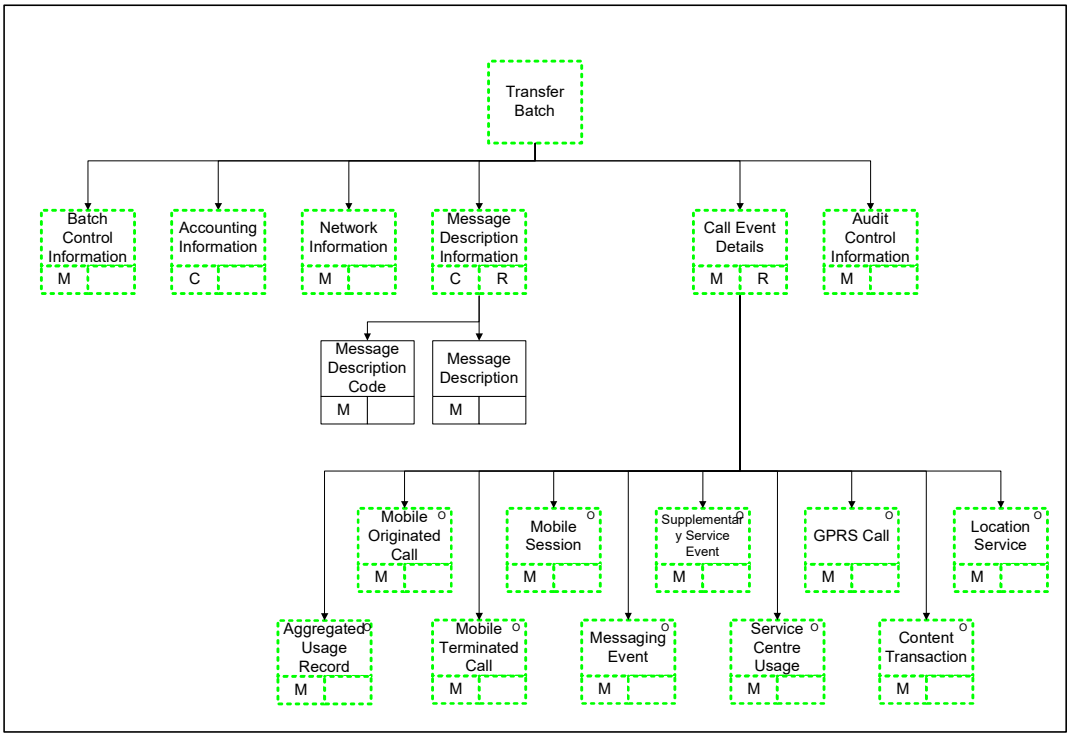

Figure 3: Transfer Batch Logical Structure

Transfer Batch	Figure 2	
Batch Control Information		Figure 4
Accounting Information		Figure 5
Network Information		Figure 6
Message Description Information		
Call Event Details		
Aggregated Usage Record		Figure 2
Mobile Originated Call		Figure 8
Mobile Terminated Call		Figure 13
Mobile Session		Figure 15
Messaging Event		Figure 17
Supplementary Service Event		Figure 18
Service Centre Usage		Figure 20
GPRS Call		Figure 21
Content Transaction		Figure 24
Location Service		Figure 29
Audit Control Information		Figure 33

Table 2: Transfer Batch Element Cross References

3.3 Batch Control Information

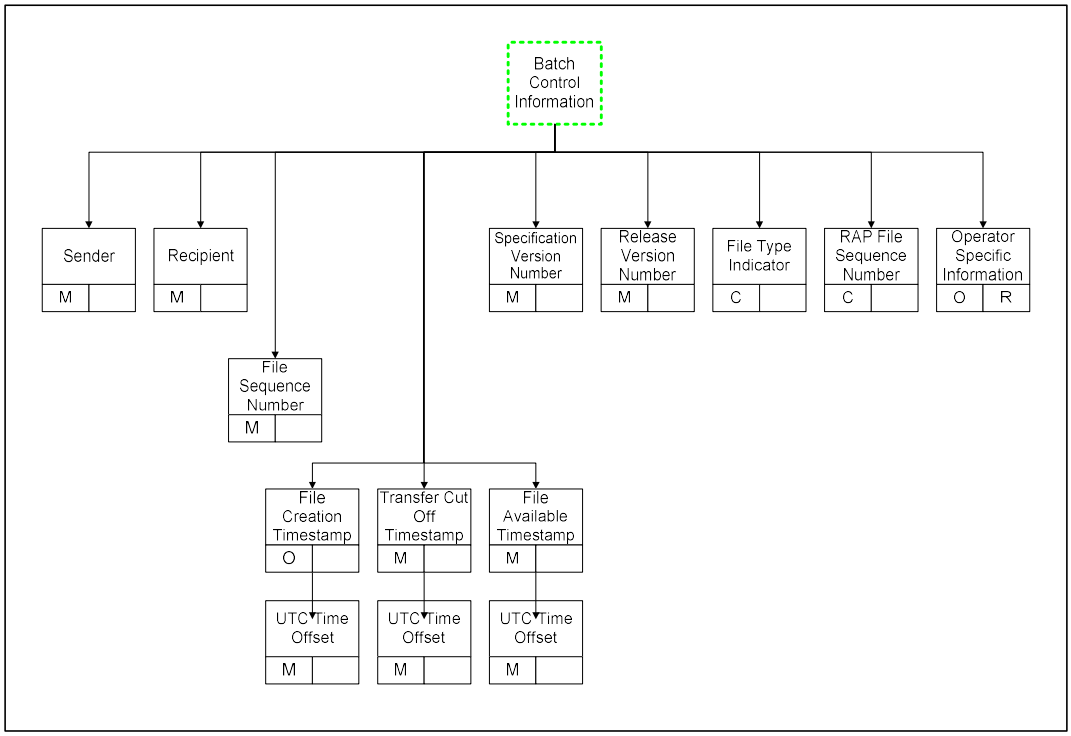

Figure 4: Batch Control Information Logical Structure

Batch Control Information	Figure 3	

Table 3: Batch Control Information Element Cross References

3.4 Accounting Information

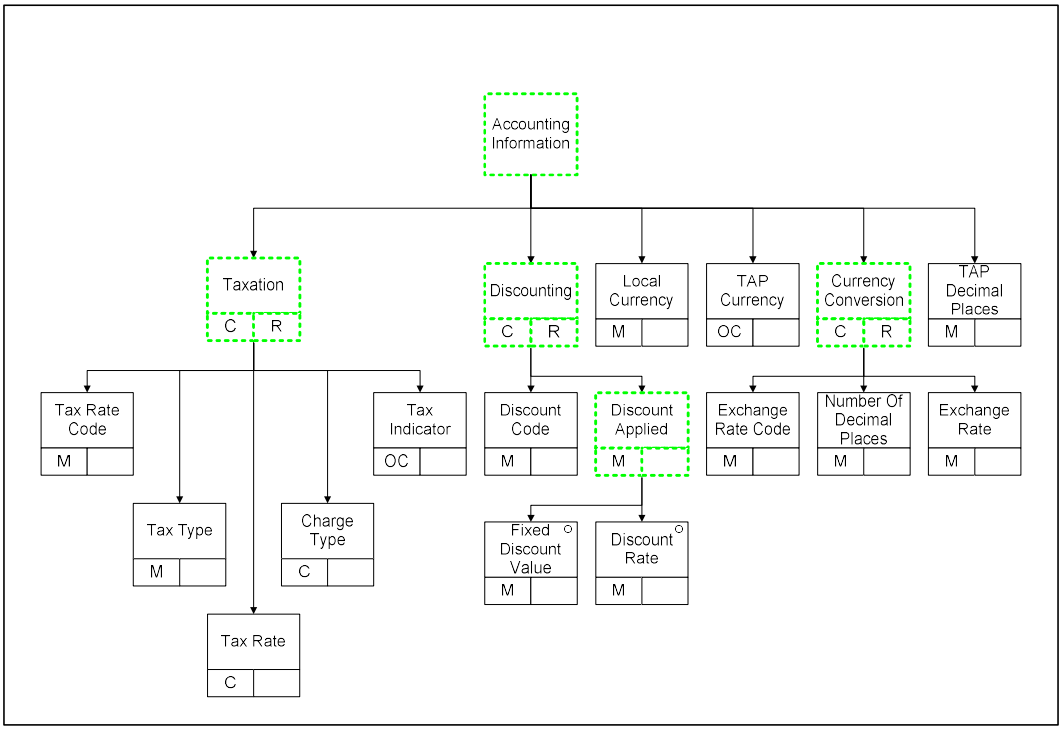

Figure 5: Accounting Information Logical Structure

Accounting Information	Figure 3	
Taxation		
Discounting		
Discount Applied		
Currency Conversion		

Table 4: Accounting Information Element Cross References

3.5 Network Information

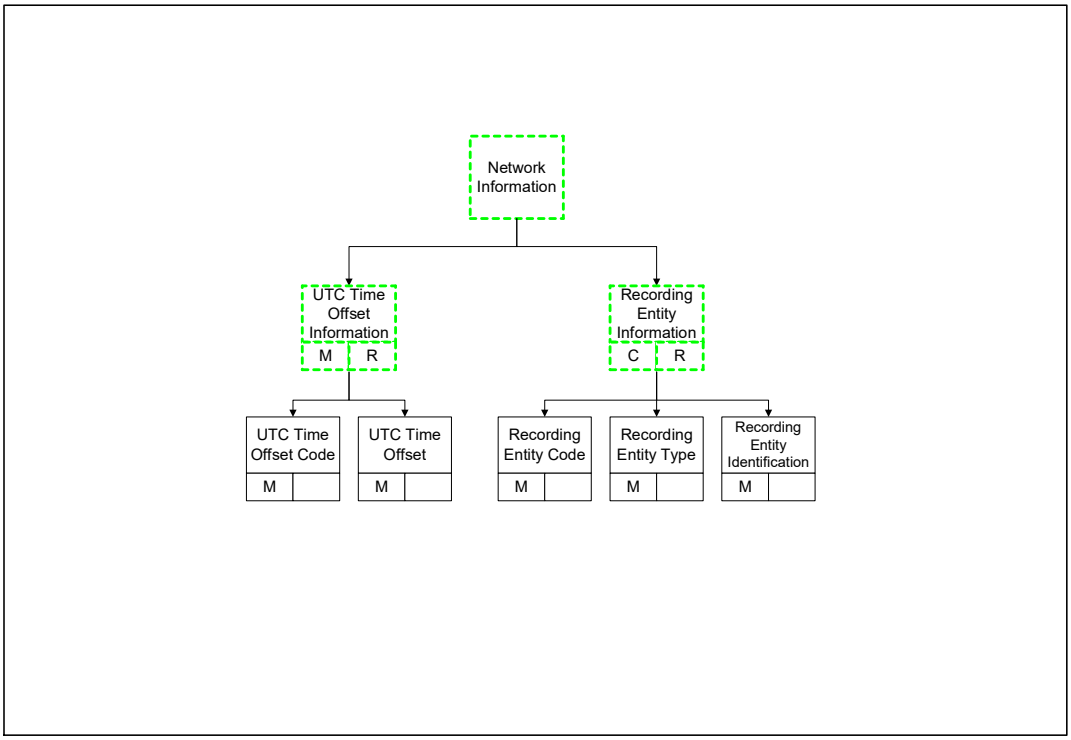

Figure 6: Network Information Logical Structure

Network Information	Figure 3	
UTC Time Offset Information		
Recording Entity Information		

Table 5: Network Information Element Cross References

3.6 Aggregated Usage Record

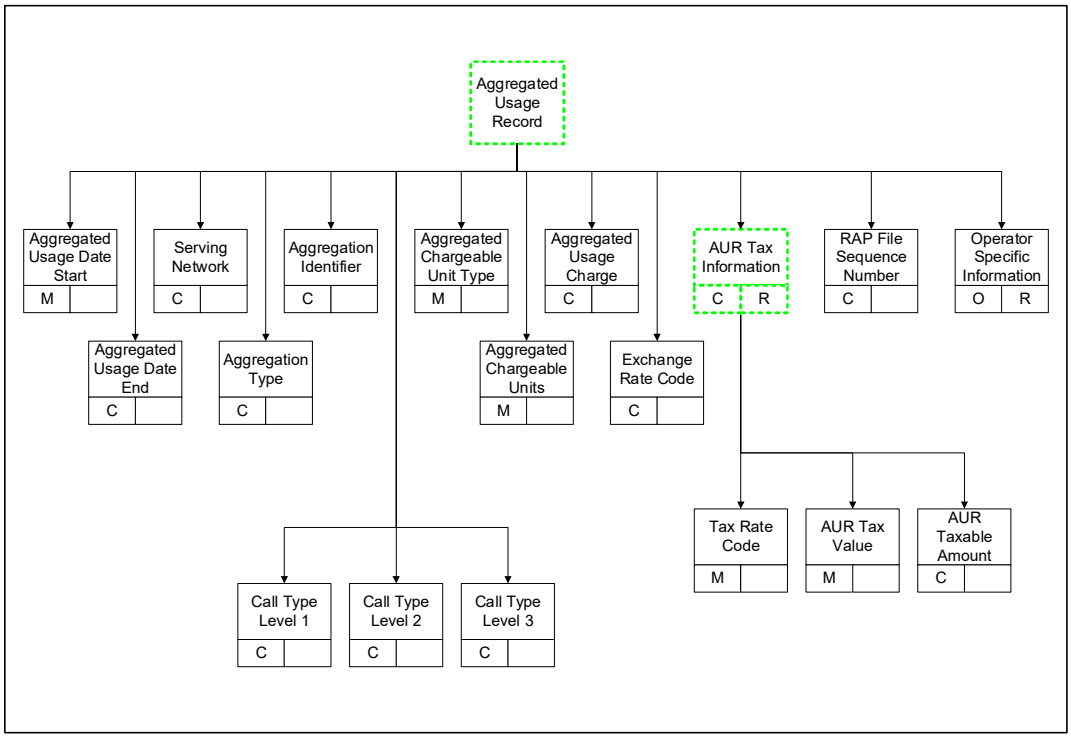

Figure 7: Aggregated Usage Record Logical Structure

AUR Tax Information		

: Aggregated Usage Record Element Cross References

3.7 Mobile Originated call

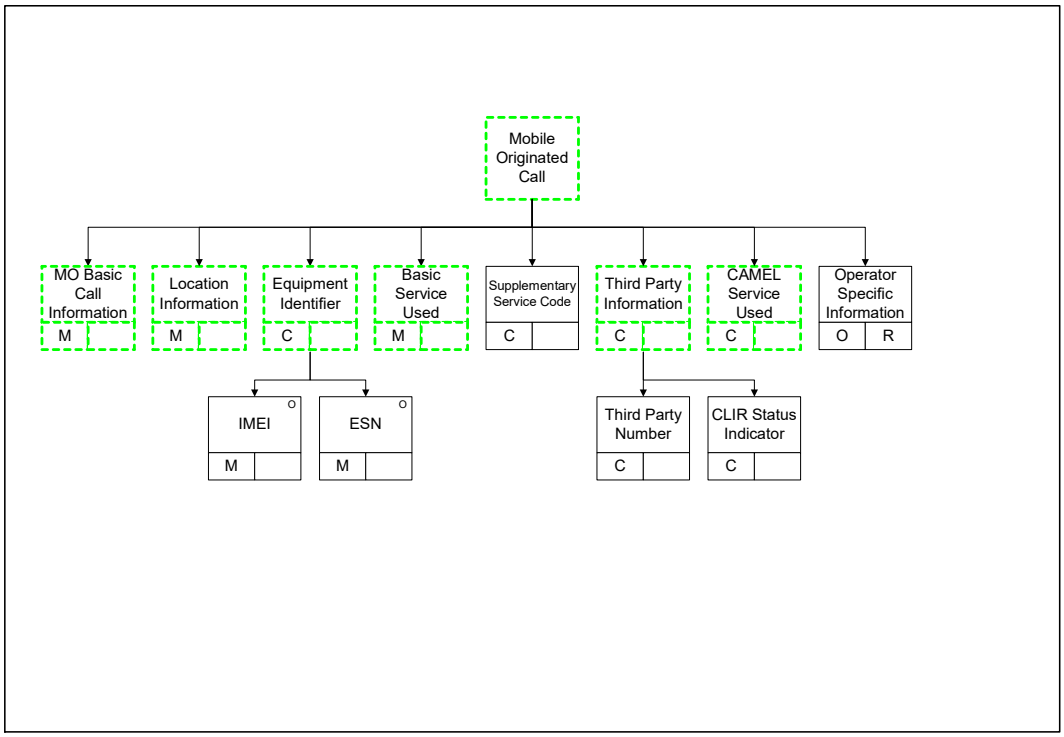

Figure 8: Mobile Originated Call Logical Structure

Mobile Originated Call	Figure 3	
MO Basic Call Information		0
Location Information	Figure 13 Figure 18	Figure 9
Equipment Identifier	Figure 13 Figure 18 Figure 21	
Basic Service Used	Figure 13	Figure 10
Third Party Information		
CAMEL Service Used	Figure 13 Figure 21	Figure 12

Table 6: Mobile Originated Call Element Cross References

3.8 MO Basic Call Information

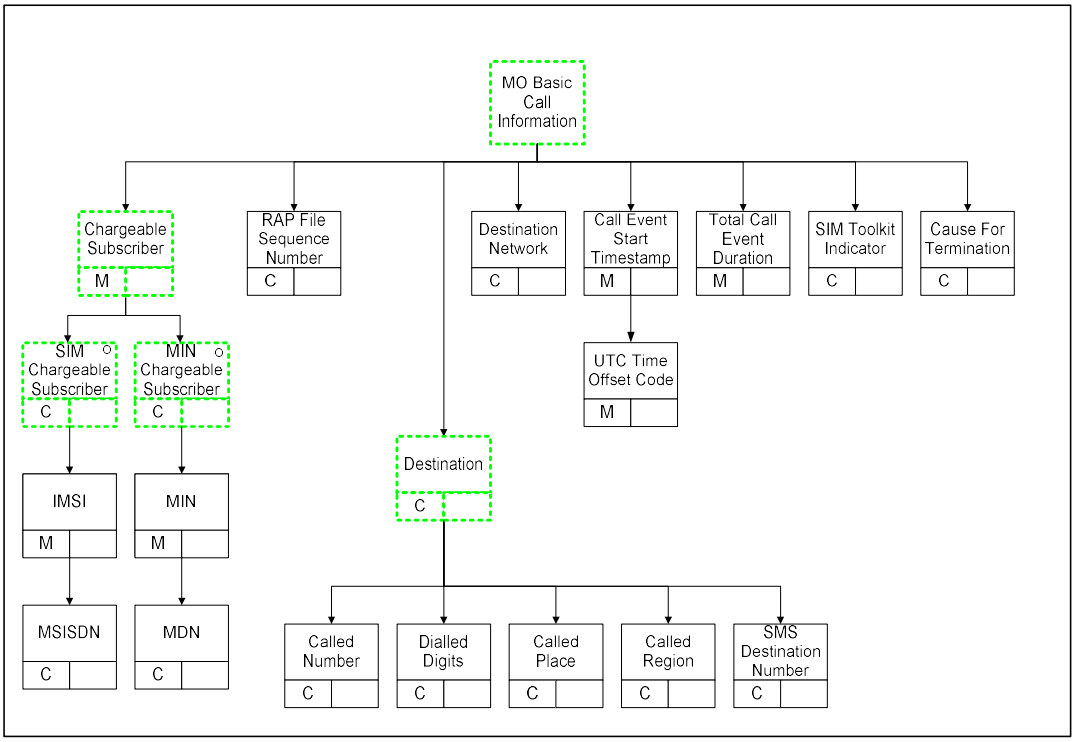

Figure 8: MO Basic Call Information Logical Structure

MO Basic Call Information	Figure 8	
Chargeable Subscriber	Figure 14 Figure 18 Figure 22	
Destination		
SIM Chargeable Subscriber		
MIN Chargeable Subscriber		

Table 7: MO Basic Call Information Element Cross References

3.9 Location Information

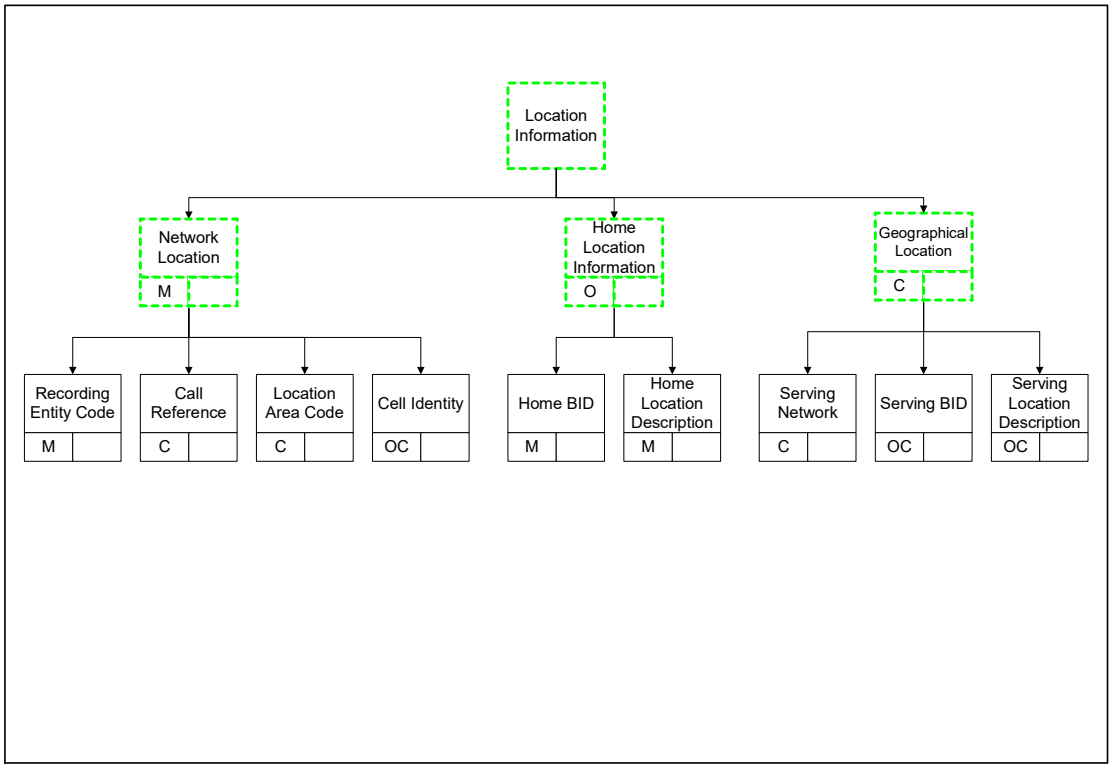

Figure 9: Location Information Logical Structure

Location Information	Figure 8 Figure 13 Figure 18	
Network Location		
Home Location Information	Figure 21	
Geographical Location	Figure 21 Figure 15 Figure 17	

Table 8: Location Information Element Cross References

3.10 Basic Service Used

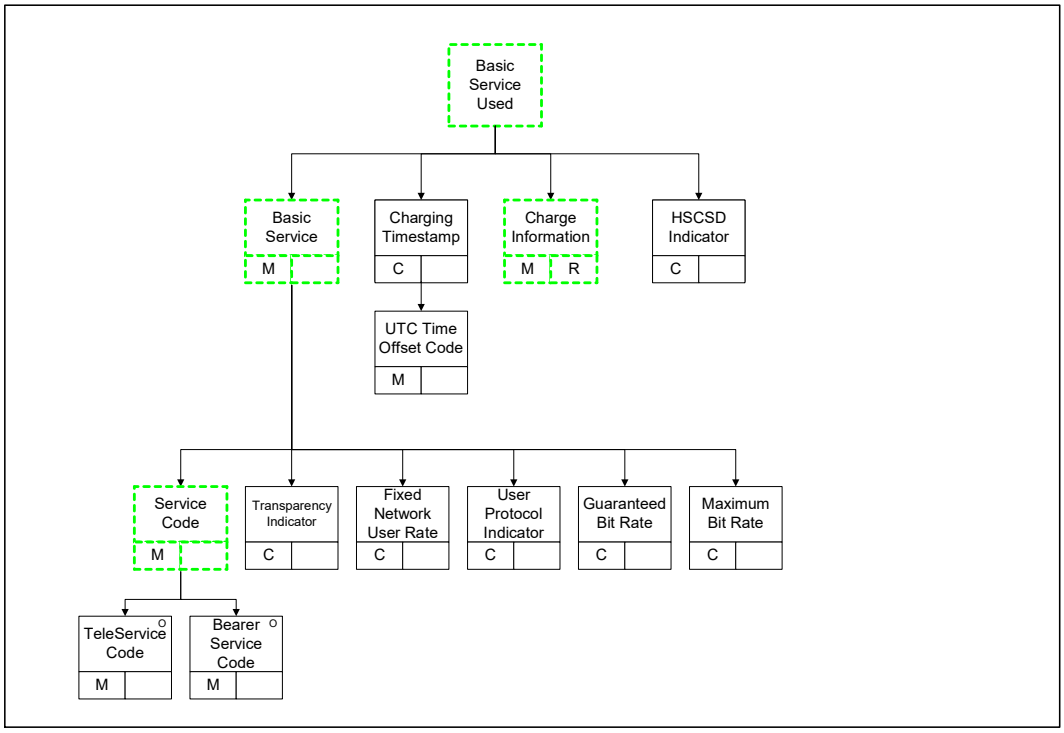

Figure 10: Basic Service Used Logical Structure

Basic Service Used	Figure 8 Figure 13	
Basic Service		
Service Code	Figure 19	
Charge Information	Figure 19 Figure 20 Figure 23 Figure 27 Figure 32	Figure 11

Table 9: Basic Service Used Element Cross References

3.11 Charge Information

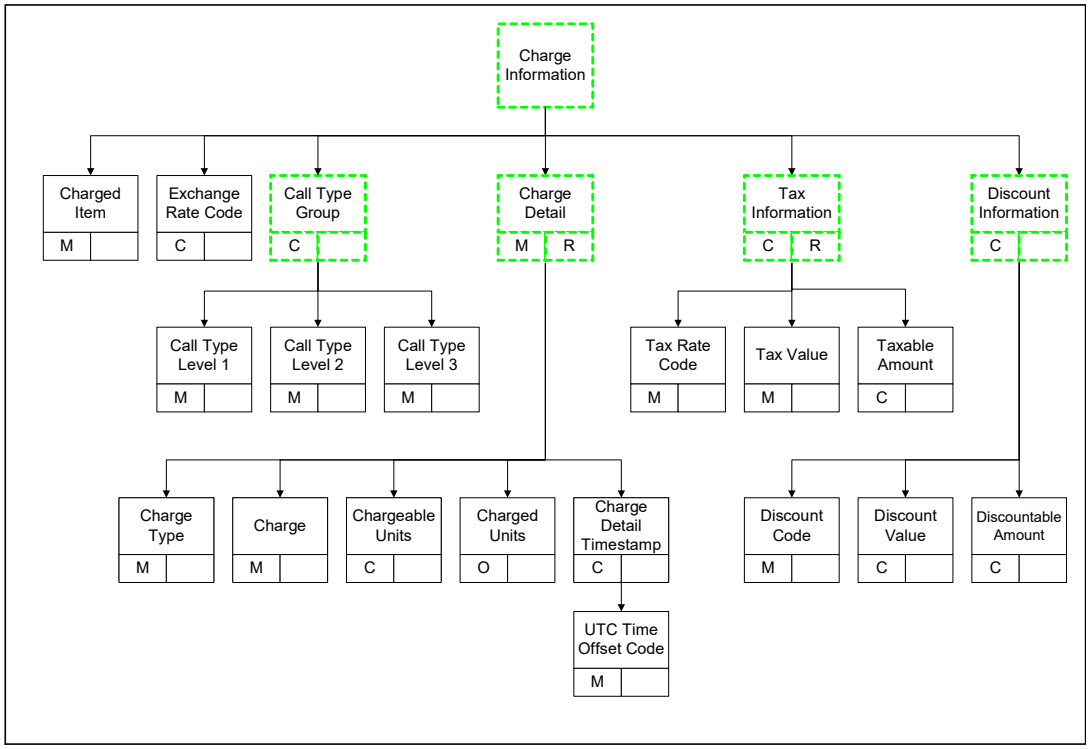

Figure 11: Charge Information Logical Structure

Charge Information	Figure 10 Figure 19 Figure 20 Figure 23 Figure 27 Figure 32	
Charge Detail	Figure 16	
Tax Information	Figure 12 Figure 16 Figure 17	
Discount Information	Figure 12	
Call Type Group	Figure 16 Figure 17	

Table 10: Charge Information Element Cross References

3.12 CAMEL Service Used

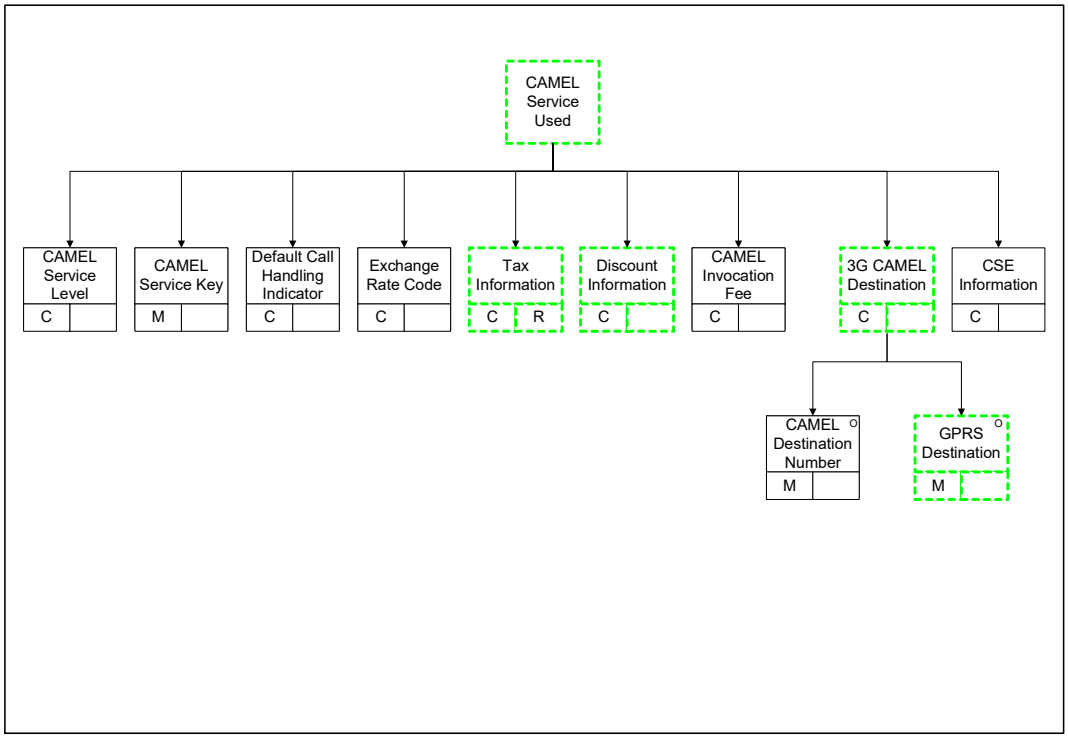

Figure 12: CAMEL Service Used Logical Structure

CAMEL Service Used	Figure 8 Figure 13 Figure 21	
3G CAMEL Description		
GPRS Destination		Figure 22
Tax Information	Figure 16 Figure 17	Figure 11
Discount Information		Figure 11

Table 11: CAMEL Service Used Element Cross References

3.13 Mobile Terminated Call

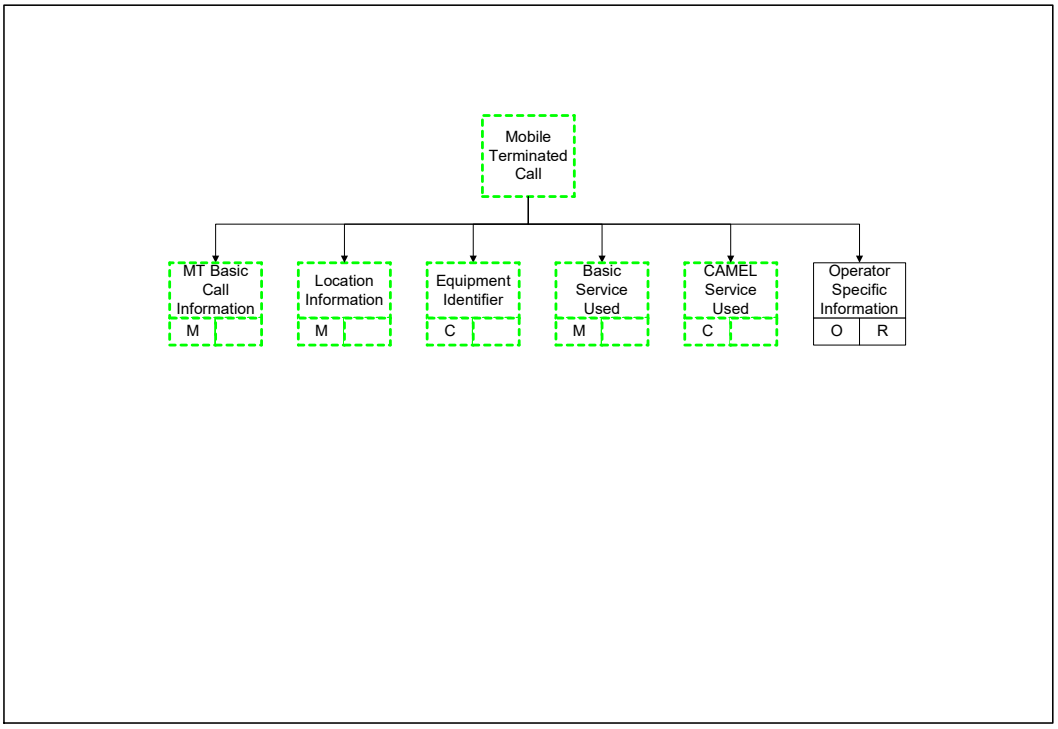

Figure 13: Mobile Terminated Call Logical Structure

Mobile Terminated Call	Figure 3	
MT Basic Call Information		Figure 14
Location Information	Figure 8 Figure 18	Figure 9
Equipment Information	Figure 18 Figure 21	Figure 8
Basic Service Used	Figure 8	Figure 10
CAMEL Service Used	Figure 8 Figure 21	Figure 12

Table 12: Mobile Terminated Call Element Cross References

3.14 MT Basic Call Information

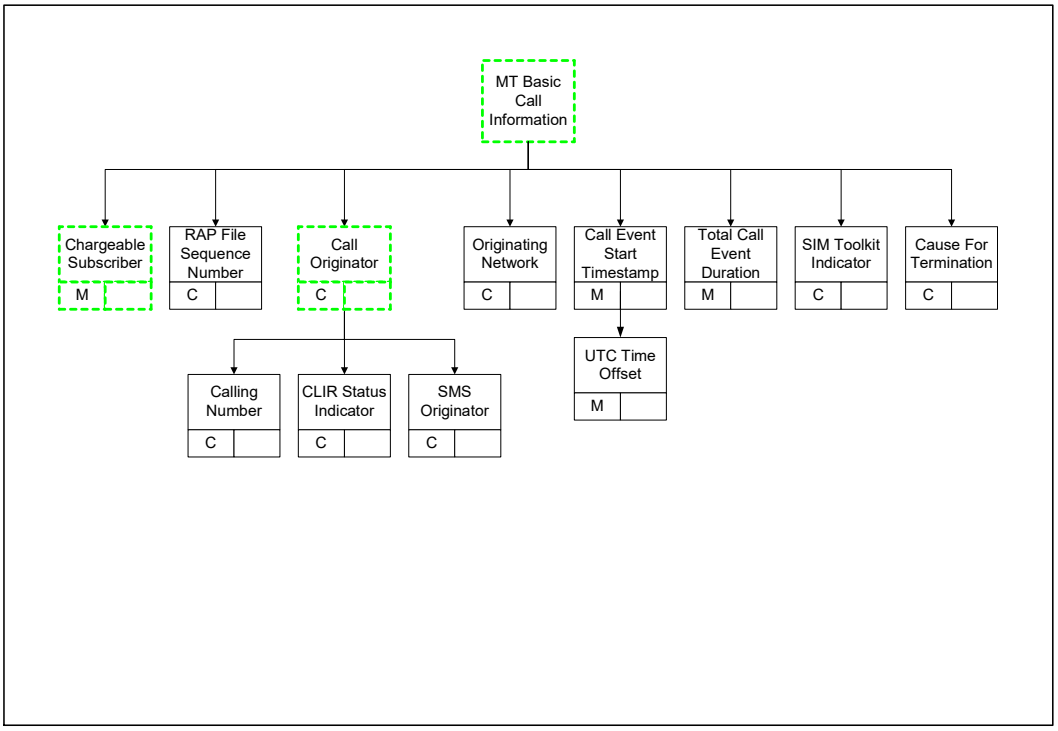

Figure 14: MT Basic Call Information Logical Structure

MT Basic Call Information	Figure 13	
Chargeable Subscriber	Figure 18 Figure 22	0
Call Originator		

Table 13: MT Basic Call Information Element Cross References

3.15 Mobile Session

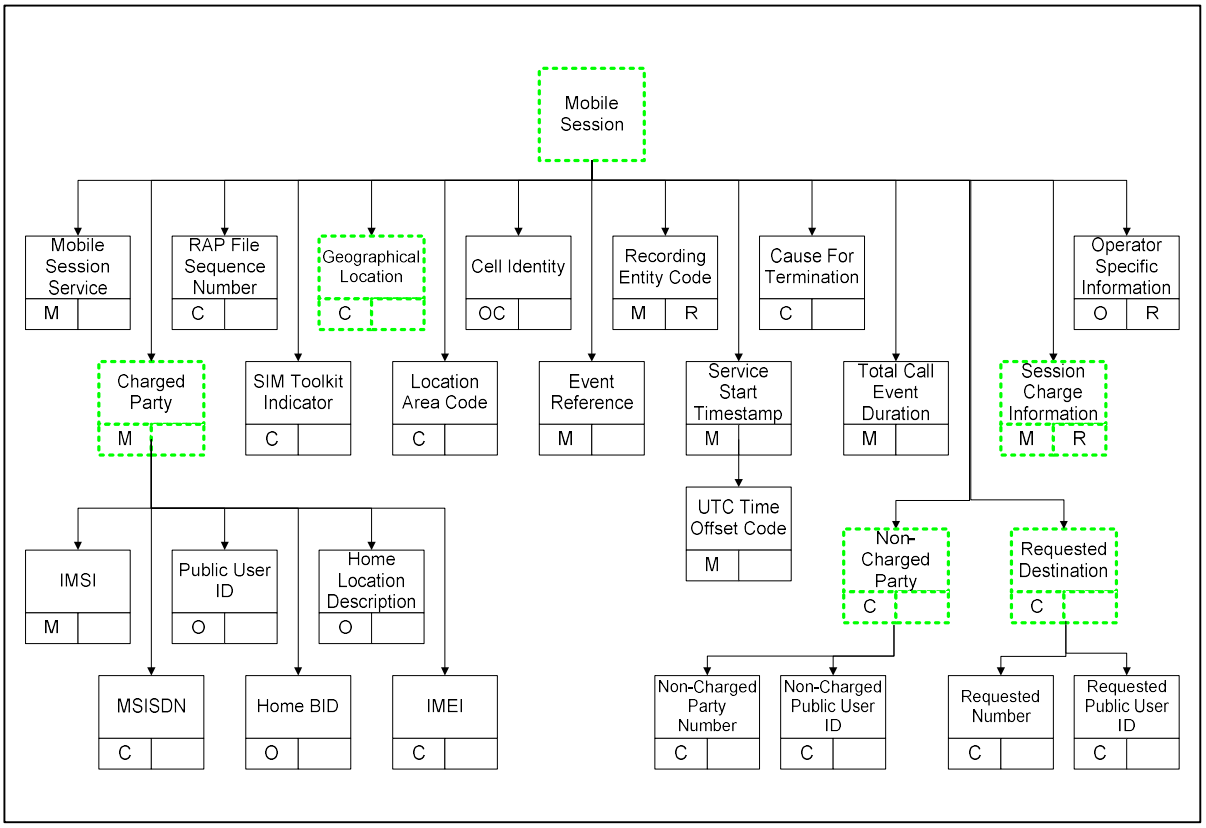

Figure 15: Mobile Session Logical Structure

Mobile Session	Figure 3	
Charged Party	Figure 17	
Geographical Location	Figure 17 Figure 21	Figure 9
Non-Charged Party	Figure 17	
Requested Destination		
Session Charge Information		Figure 16

Table 14: Mobile Session Element Cross References

3.16 Session Charge Information

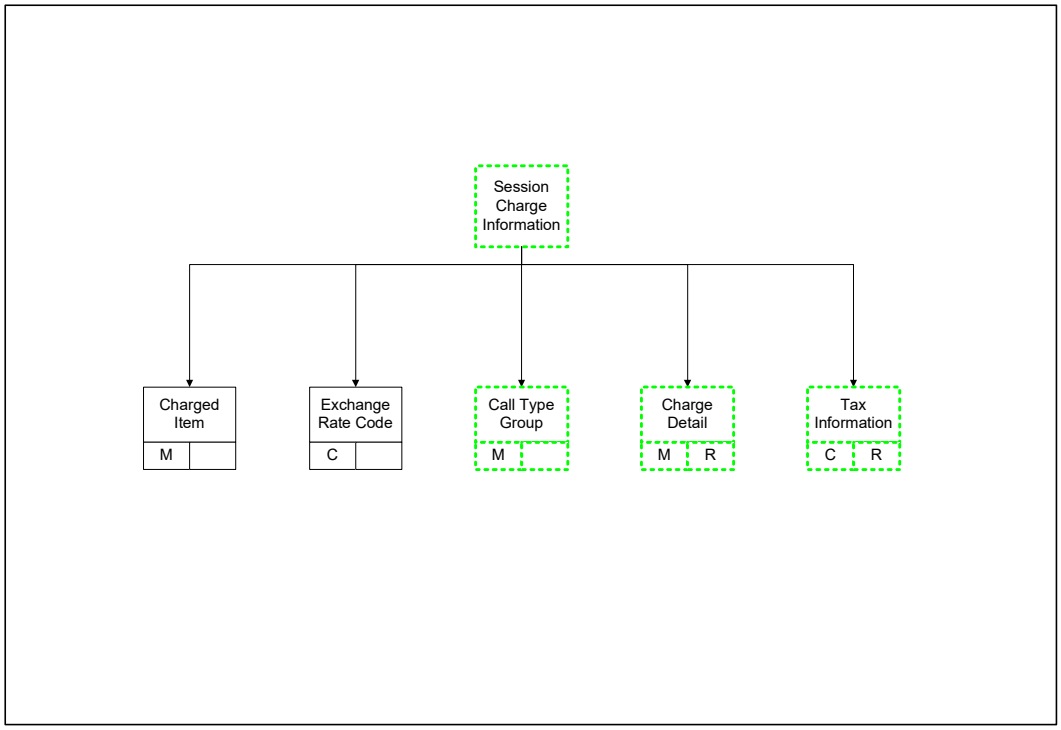

Figure 16: Session Charge Information Logical Structure

Session Charge Information	Figure 15	
Call Type Group	Figure 17	Figure 11
Charge Detail		Figure 11
Tax Information	Figure 12	Figure 11

Table 15: Session Charge Information Element Cross References

3.17 Messaging Event

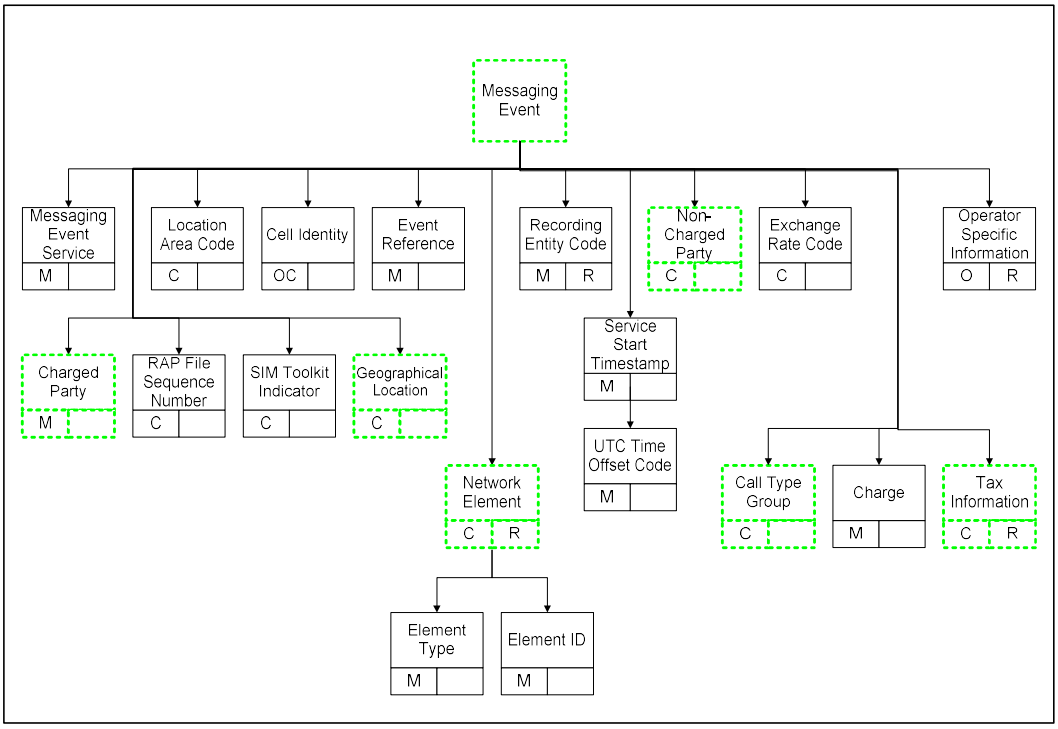

Figure 17: Messaging Event Logical Structure

Messaging Event	Figure 3	
Charged Party	Figure 15	
Geographical Location	Figure 15 Figure 21	Figure 9
Network Element		
Non-Charged Party	Figure 15	
Call Type Group	Figure 16	Figure 11
Tax Informatiom	Figure 12	Figure 11

Table 16: Messaging Event Element Cross References

3.18 Supplementary Service Event

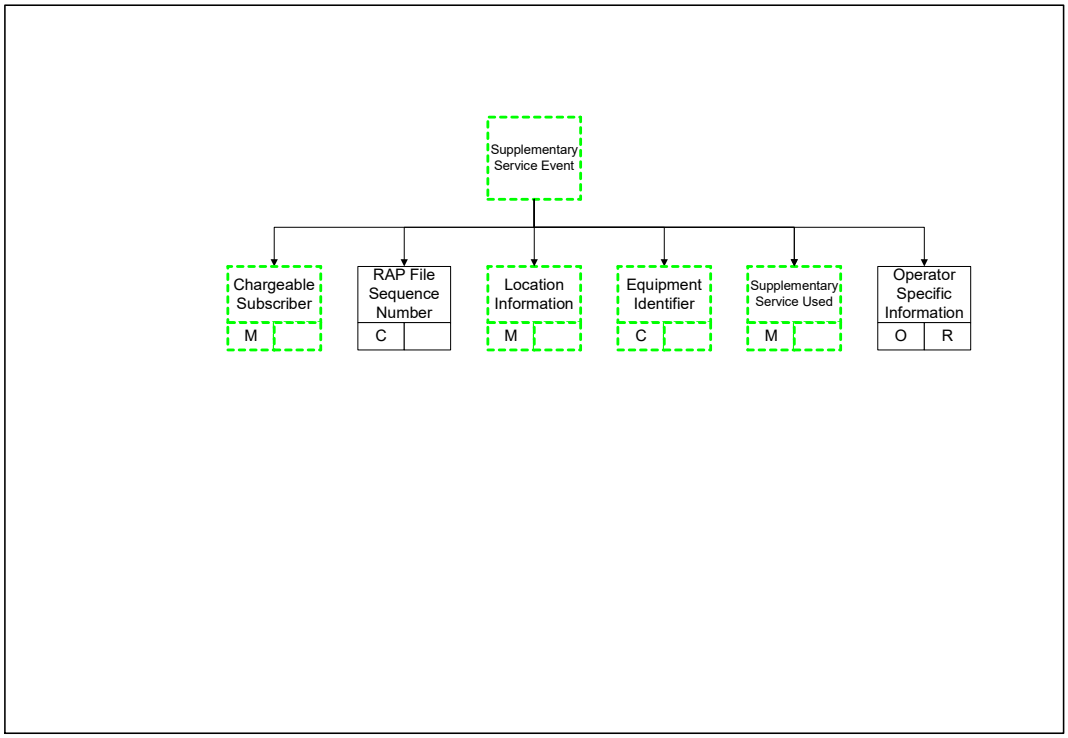

Figure 18: Supplementary Service Event Logical Structure

Supplementary Service Event	Figure 3	
Chargeable Subscriber	Figure 14 Figure 22	0
Location Information	Figure 8 Figure 13	Figure 9
Equipment Identifier		Figure 8
Supplementary Service Used		Figure 19

Table 17: Supplementary Service Event Element Cross References

3.19 Supplementary Service Used

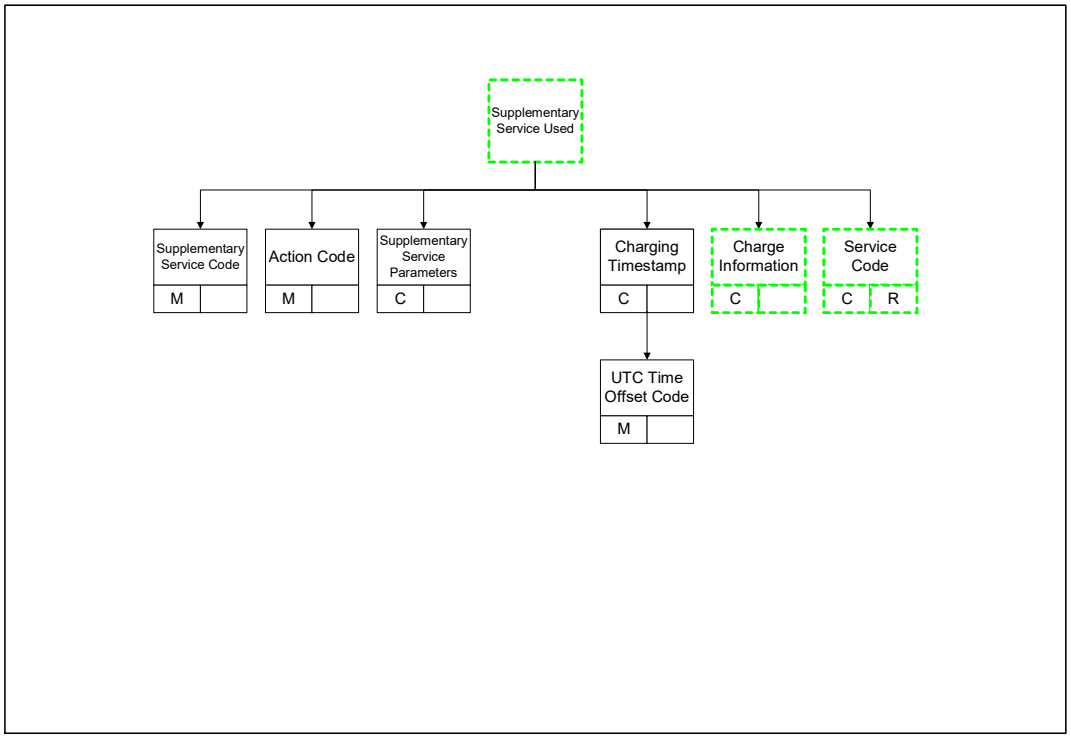

Figure 19: Supplementary Service Used Logical Structure

Supplementary Service Used	Figure 18	
Charge Information	Figure 10 Figure 20 Figure 23 Figure 27 Figure 32	Figure 11
Service Code		Figure 10

Table 18: Supplementary Service Used Element Cross References

3.20 Service Centre Usage

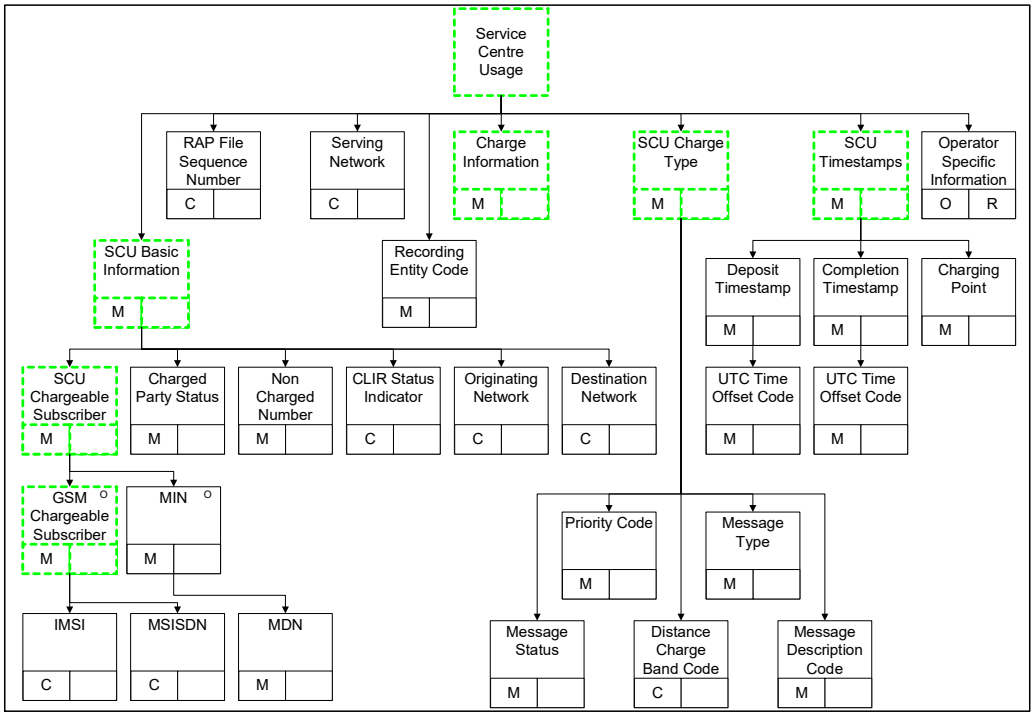

Figure 20: Service Centre Usage Logical Structure

Service Centre Usage	Figure 3	
SCU Basic Information		
SCU Chargeable Subscriber		
Charge Information	Figure 10 Figure 19 Figure 23 Figure 27 Figure 32	Figure 11
SCU Charge Type		
SCU Timestamps		

Table 19: Service Centre Usage Element Cross References

3.21 GPRS Call

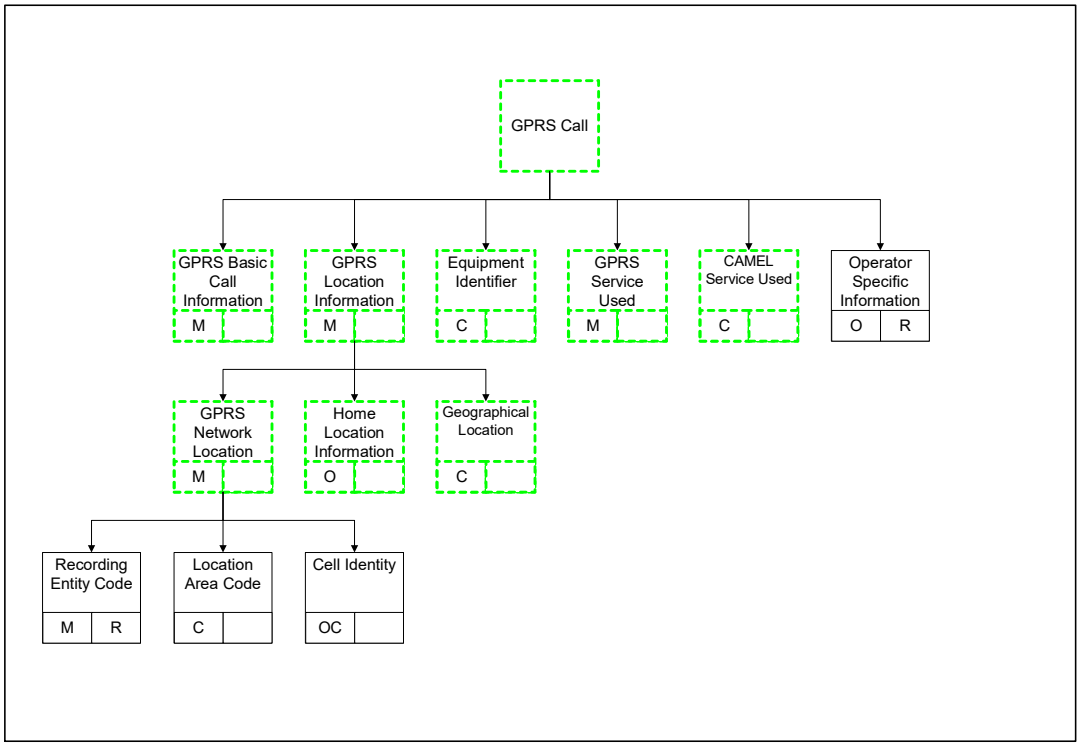

Figure 21: GPRS Call Logical Structure

GPRS Call	Figure 3	
GPRS Basic Call Information		Figure 22
GPRS Location Information		
GPRS Network Location		
Home Location Information		Figure 9
Geographical Location	Figure 15 Figure 17	Figure 9
Equipment Identifier	Figure 13 Figure 18	Figure 8
GPRS Service Used		Figure 23
CAMEL Service Used		Figure 12

Table 20: GPRS Call Element Cross References

3.22 GPRS Basic Call Information

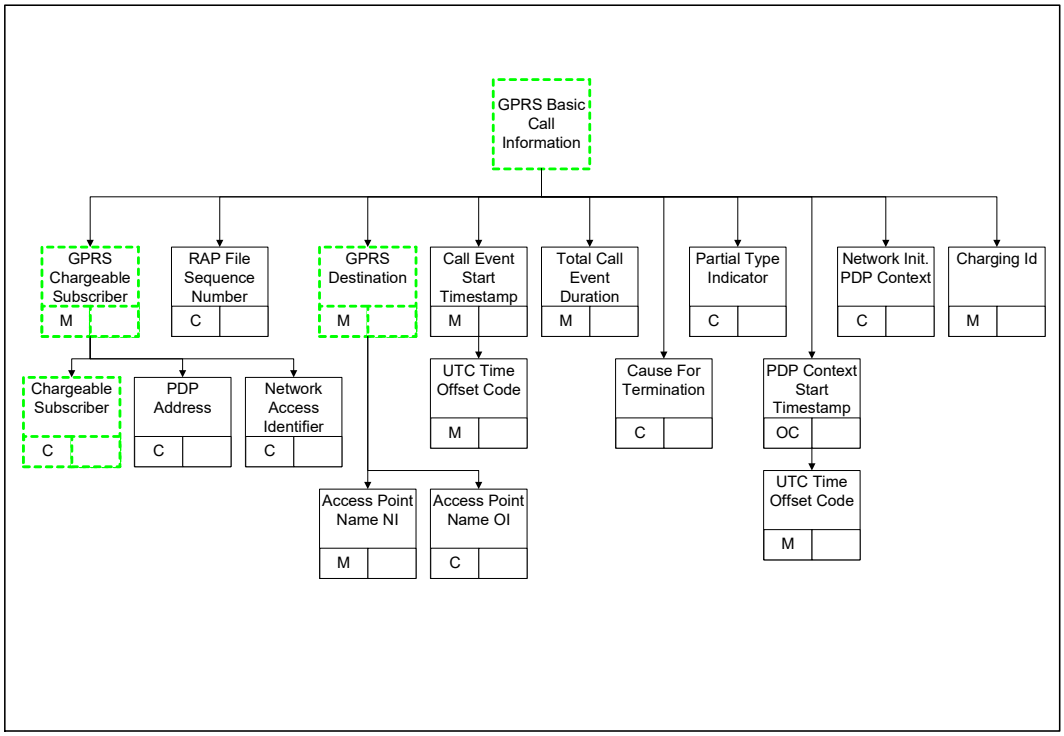

Figure 22: GPRS Basic Call Information Logical Structure

GPRS Basic Call Information	Figure 21	
GPRS Chargeable Subscriber		
GPRS Destination	Figure 12	
Chargeable Subscriber	Figure 14 Figure 18	0

Table 21: GPRS Basic Call Information Element Cross References

3.23 GPRS Service Used

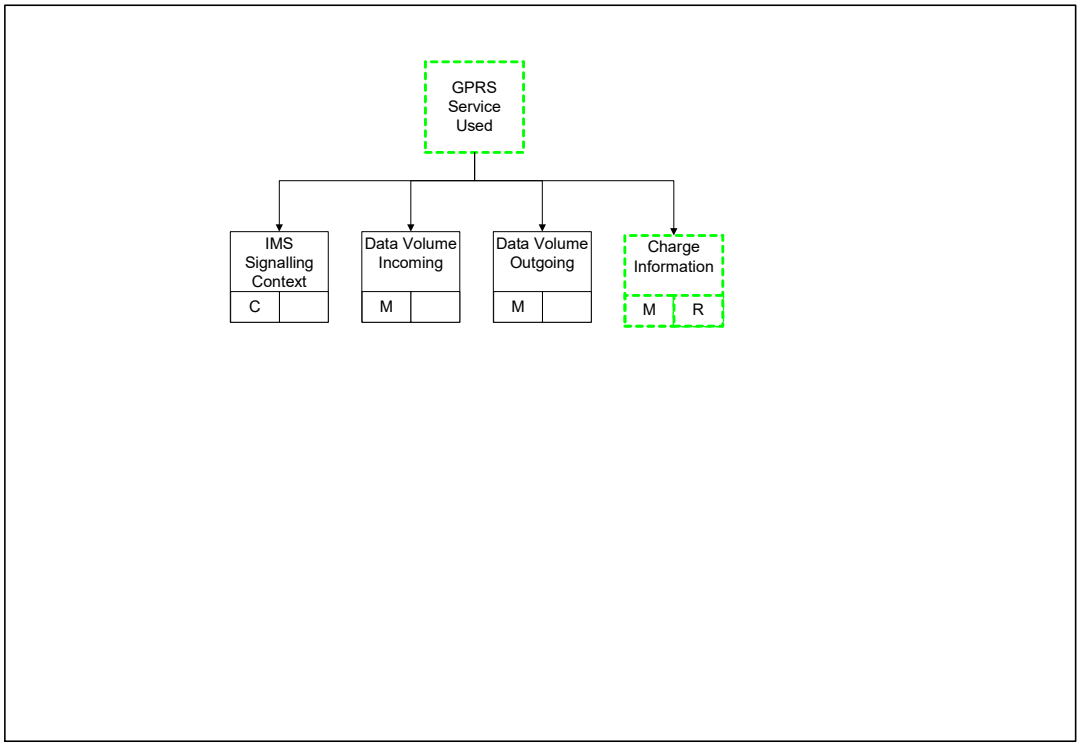

Figure 23: GPRS Service Used Logical Structure

GPRS Service Used	Figure 21	
Charge Information	Figure 10 Figure 19 Figure 20 Figure 27 Figure 32	Figure 11

Table 22: GPRS Service Used Element Cross References

3.24 Content Transaction

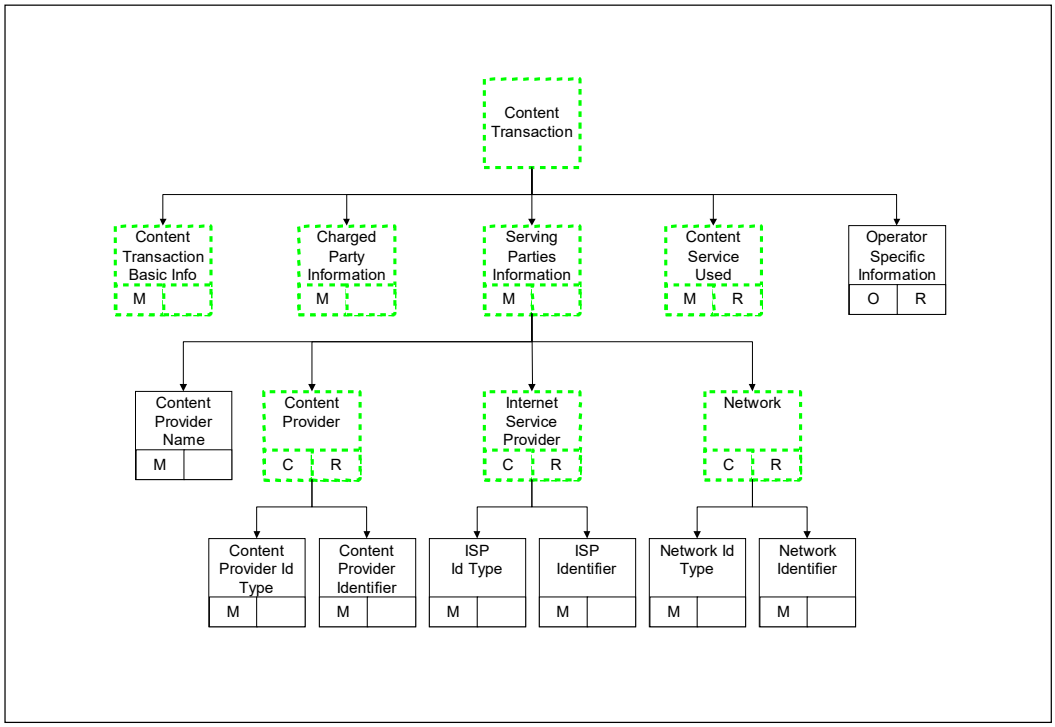

Figure 24: Content Transaction Logical Structure

Content Transaction	Figure 3	
Content Transaction Basic Information		Figure 25
Charged Party Information		Figure 26
Content Service Used		Figure 27
Serving Parties Information		
Content Provider		
Internet Service Provider	Figure 29	
Network	Figure 29	

Table 23: Content Transaction Element Cross References

3.25 Content Transaction Basic Info

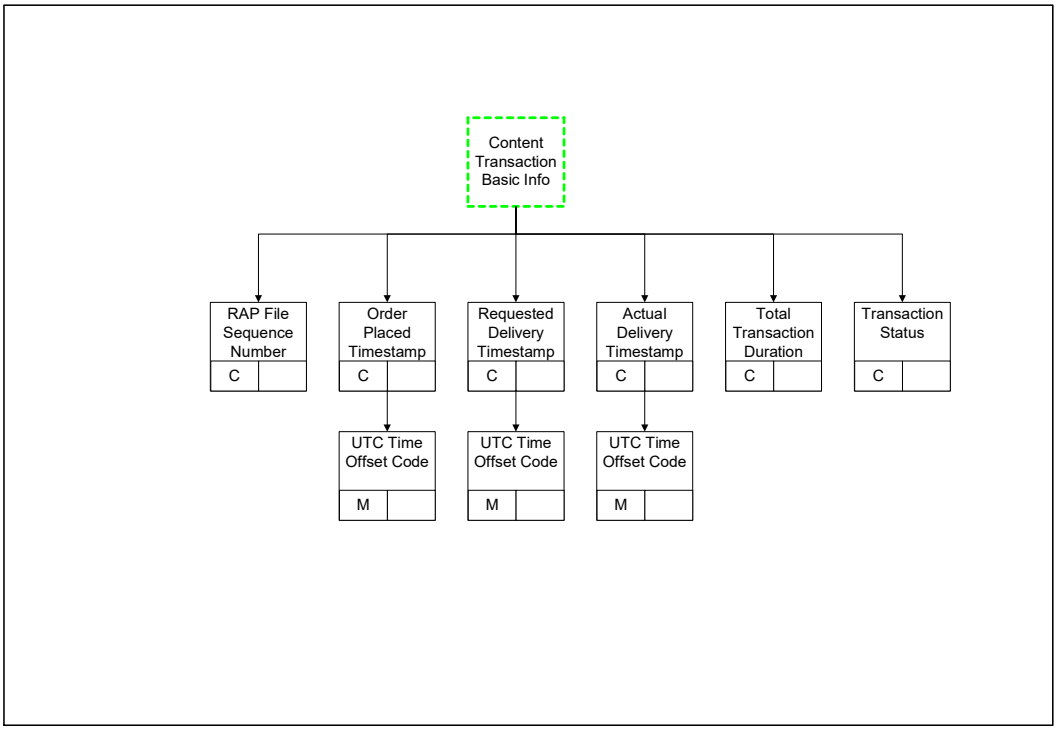

Figure 25: Content Transaction Basic Info Logical structure

Content Transaction Basic Information	Figure 24	

Table 24: Content Transaction Basic Info Element Cross References

3.26 Charged Party Information

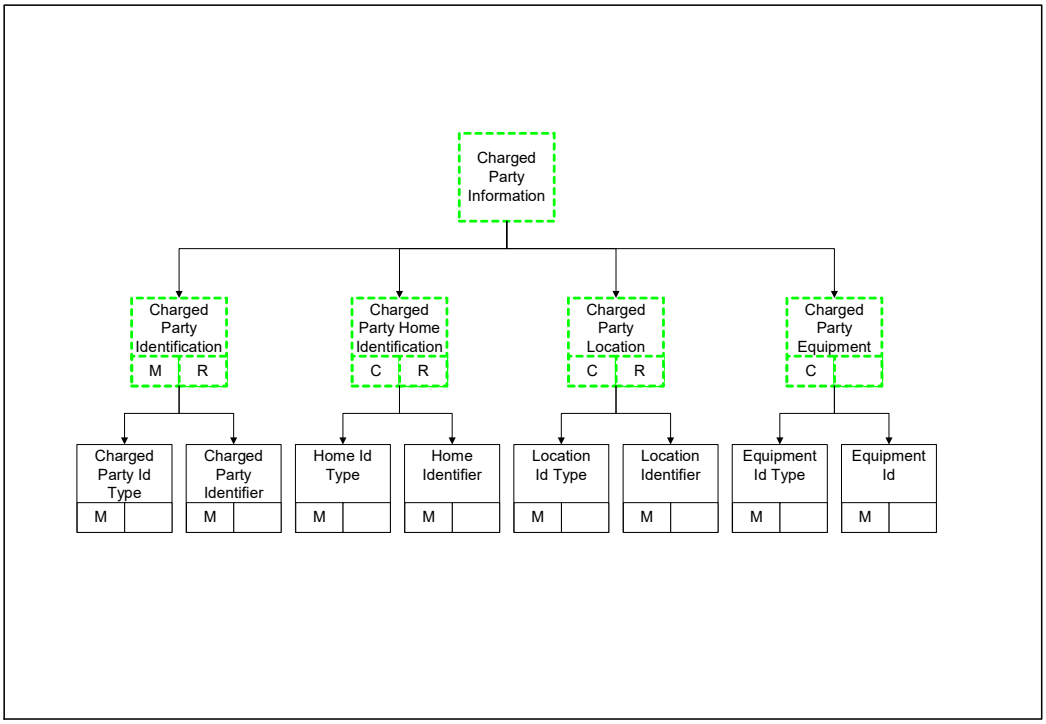

Figure 26: Charged Party Information Logical Structure

Charged Party Information	Figure 24	
Charged Party Identification		
Charged Party Home Identification		
Charged Party Location		
Charged Party Equipment		

Table 25: Charged Party Information Element Cross References

3.27 Content Service Used

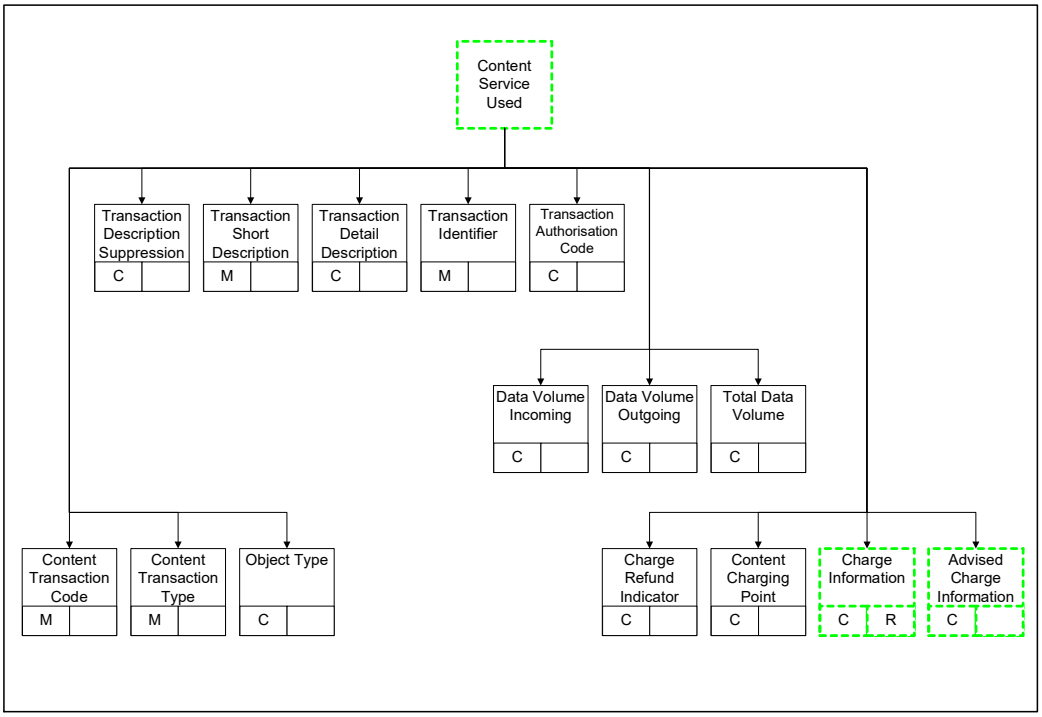

Figure 27: Content Service Used Logical Structure

Content Service Used	Figure 24	
Charge Information	Figure 10 Figure 19 Figure 20 Figure 23 Figure 32	Figure 11
Advised Charge Information		Figure 28

Table 26: Content Service Used Element Cross References

3.28 Advised Charge Information

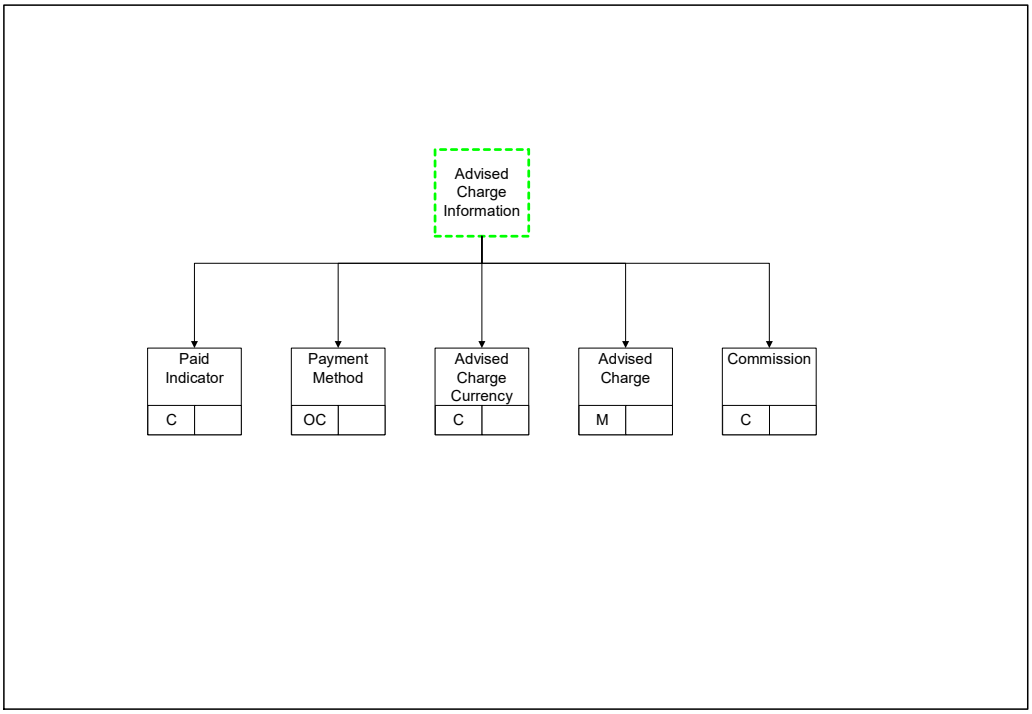

Figure 28: Advised Charge Information Logical Structure

Advised Charge Information	Figure 27	

Table 27: Advised Charge Information Element Cross References

3.29 Location Service

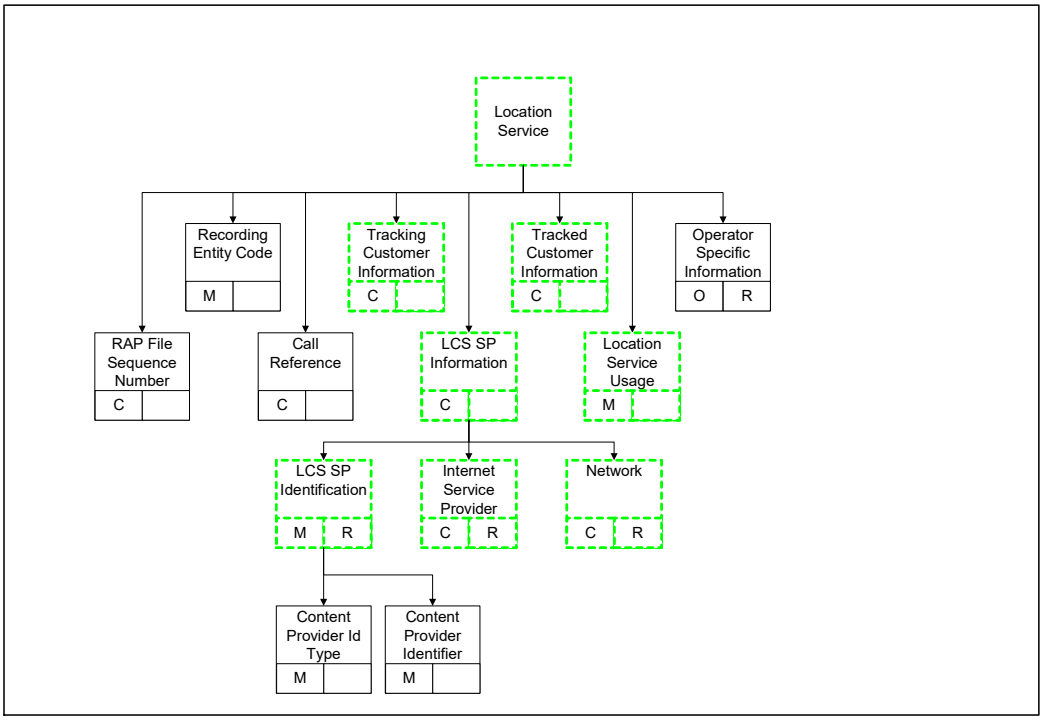

Figure 29: Location Service Logical Structure

Location Service	Figure 3	
Tracking Customer Information		Figure 30
Tracked Customer Information		Figure 31
Location Service Usage		Figure 32
LCS SP Information		
LCS SP Identification		
Internet Service Provider		Figure 24
Network		Figure 24

Table 28: Location Service Element Cross References

3.30 Tracking Customer Information

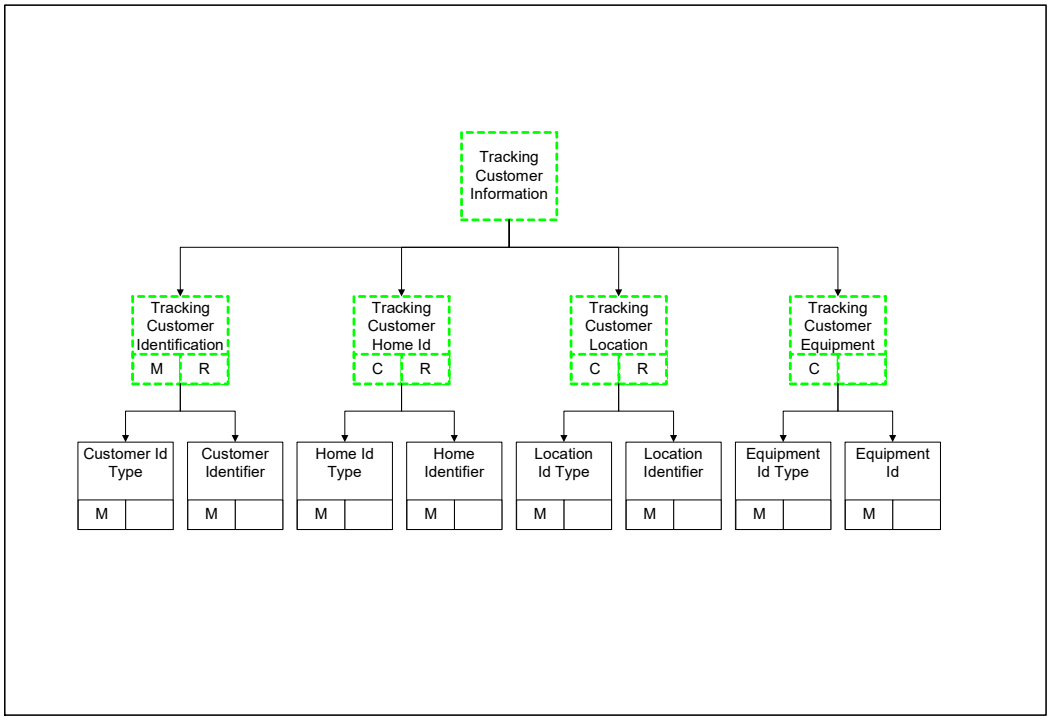

Figure 30: Tracking Customer Information Logical Structure

Tracking Customer Information	Figure 29	
Tracking Customer Identification		
Tracking Customer Home Id		
Tracking Customer Location		
Tracking Customer Equipment		

Table 29: Tracking Customer Information Element Cross References

3.31 Tracked Customer Information

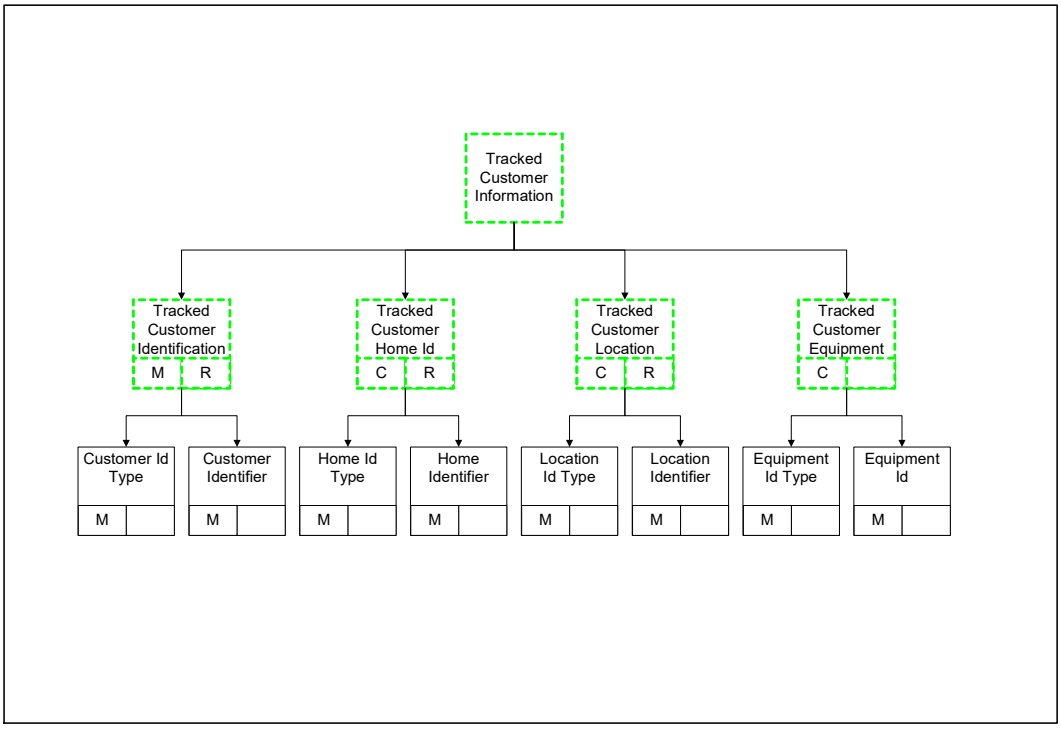

Figure 31: Tracked Customer Information Logical Structure

Tracked Customer Information	Figure 29	
Tracked Customer Identification		
Tracked Customer Home Id		
Tracked Customer Location		
Tracked Customer Equipment		

Table 30: Tracked Customer Information Element Cross References

3.32 Location Service Usage

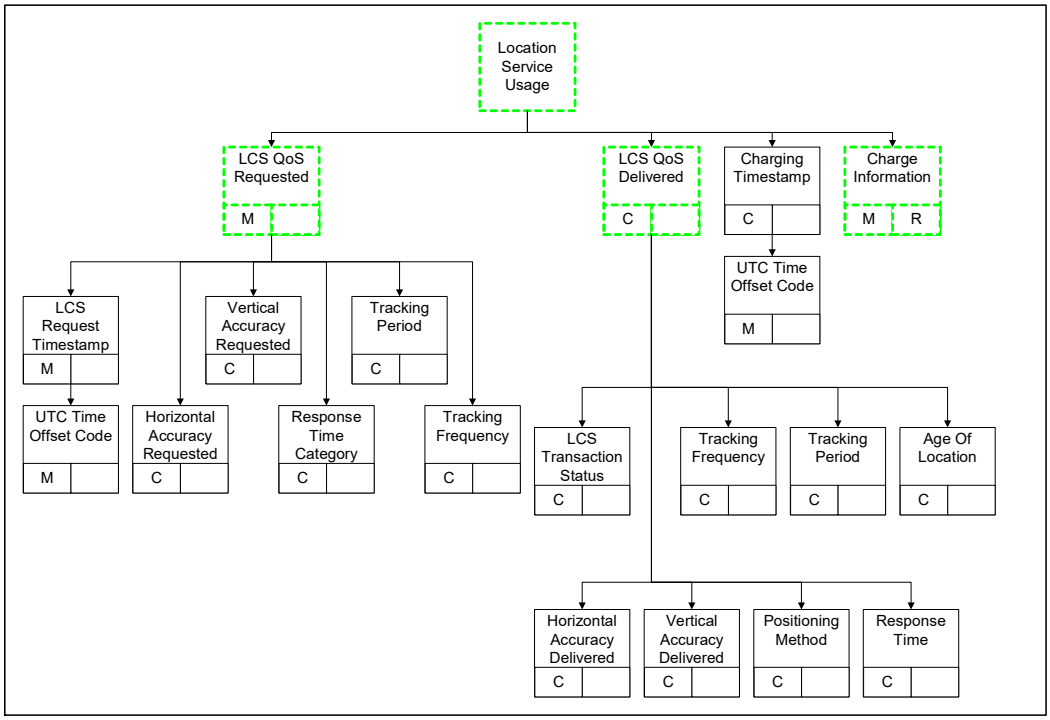

Figure 32: Location Service Usage Logical Structure

Location Service Usage	Figure 29	
Charge Information	Figure 10 Figure 19 Figure 20 Figure 23 Figure 27	Figure 11
LCS QoS Requested		
LCS QoS Delivered		

Table 31: Location Service Usage Element Cross References

3.33 Audit Control Information

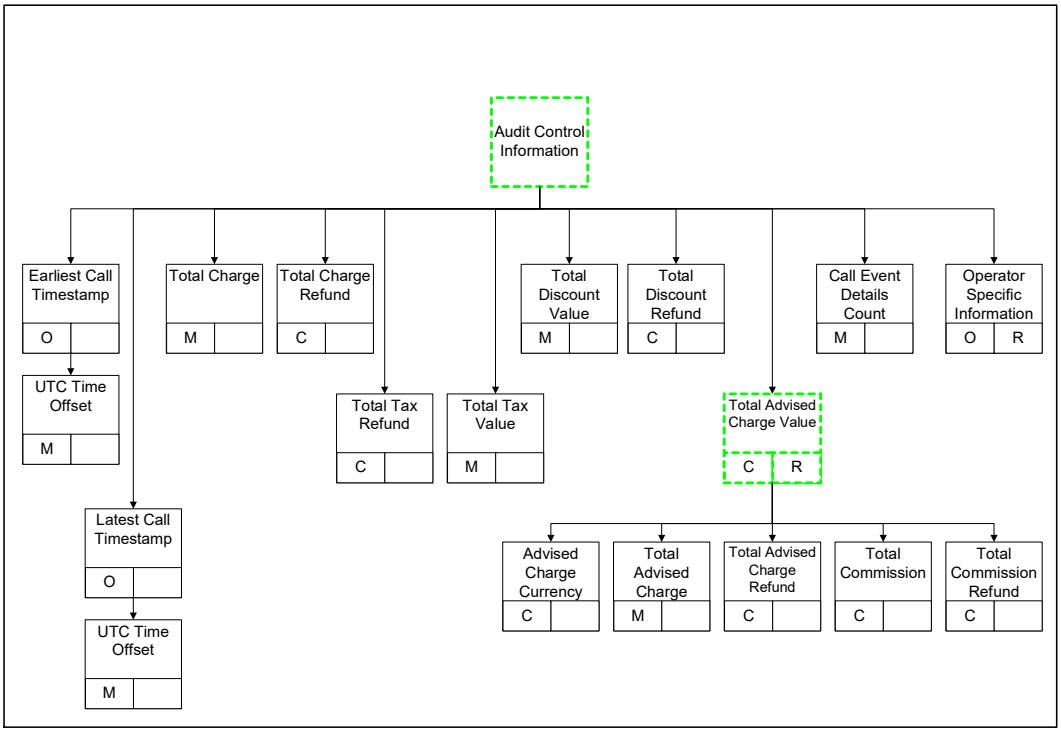

Figure 33: Audit Control Information Logical Structure

Audit Control Information	Figure 3	
Total Advised Charge Value		

Table 32: Audit Control Information Element Cross References

4 Data Dictionary

The data dictionary gives a full listing of all data items within the Transferred Account Procedure (TAP).

In addition to providing descriptions, derivations and values where appropriate for all groups and items, it describes conditionality and validation in detail.

The following table explains how to interpret the information in the data dictionary:

Element	Description	Error Code	Context	Severity Level	Validation Description
This column contains the name of the Data Element or Group	This column contains a description of the meaning of the Data Element. It instructs the TAP Sender how to create and populate TAP, but does not provide any instructions to the TAP Recipient. The Derivation section explains how the value of the Data Element is derived. In most cases this contains references to 3GPP standards documents. The Conditionality section explains if the element is mandatory, conditional (mandatory under certain conditions that are listed here) or optional.	This column contains the error codes that must be used for the errors raised. Additional error codes can only be used by bilateral agreement.	This column contains an abbreviation of the call event types for which the specific error can be raised. The abbreviations within the	This column contains the severity level applicable to each error. If the error is raised, it must follow the error severity.	This column contains the exact description of each error, and provides the maximum validation that can be applied by the TAP Recipient. Except for the specific errors listed in section 5, other errors not listed in this column can only be raised by bilateral agreement.

Element	Description	Error Code	Context	Severity Level	Validation Description
	Note: Mandatory item missing errors cannot be raised due to information in this section, but only be raised if there is an explicit error defined in the Validation Description column. The Value or Range sections explain the list of valid values or ranges, for those Data Elements where a list of values or ranges is applicable. Where there is an explicit list of values or ranges, then those values or ranges are used for the value out of range error, unless the Validation Description column specifies additional value criteria. **Note:** Value out of range errors cannot be raised due to information in this section, but only be raised if there is an explicit error defined in the Validation Description column. The Format section explains the valid format in case it is not easily explained by the Value or Range sections.		'Context' column are detailed in the **Error! Reference source not found.** at the end of the dictionary.		

Table 33: Explanations of the Data Dictionary Columns

4.1 A

3G CAMEL Destination	A group identifying the destination as returned by the CAMEL server. It may consist either of CAMEL Destination Number or GPRS Destination depending on service used. *Conditionality:* Must be present within group CAMEL Service Used where the destination has been modified by the CAMEL server. **Note:** The "3G CAMEL Destination" name has been historically inherited in TD.57 from the wireless standards upon the introduction of "GPRS relevant to CAMEL usage" as it has represented part of the 3G developments. In TAP, CS & PS CAMEL Information generated from both 2G & 3G networks are valid to be populated below the "3G CAMEL Destination" Group.				
Access Point Name NI	The Network Identifier part of the Access Point Name (APN) in dot notation. *Derivation:* In the case of GPRS usage without CAMEL invocation: The actual connected APN NI as defined in PS Domain Charging – see Annex C. Pre GSM Release '98 from the	10 11	GPRS GPRS	Severe Severe	Syntax error where group GPRS Destination occurs within group GPRS Basic Call Information. Syntax error where group GPRS Destination occurs within group 3G CAMEL Destination.

	GSM item AccessPointName (see *conditionality* note below). In case of GPRS usage with CAMEL invocation: Within GPRS Basic Call Information, the actual connected APN NI as modified by the CSE in APN NI field as defined in PS Domain Charging – see Annex C. Within 3G CAMEL Destination, the original APN NI before modification by the CSE in CAMEL APN NI field available within CAMEL Information as defined in PS Domain Charging – see Annex C. In the case of Wi-Fi usage this element must contain the Venue Class where available, otherwise defaults to 0 (zero). *Conditionality:* Mandatory within group GPRS Destination. Networks which have not yet upgraded to at least GSM Release ’98 do not yet support the separation of the APN into the Network Identifier and Operator Identifier parts and, therefore, must populate a concatenation of both parts within this item.	200	GPRS	Severe	Until 30 April 2015: APN NI is EUInternet and data session is not home routed. From 01 May 2015: EU (or EEA) VPMN where local breakout (LBO) is made available as per EU Roaming Regulation III and APN NI is EUInternet. Note (applies both before and after 01 May 2015): When, within the same call record, there is an APN NI within CAMEL Service Used then this error can only be raised on that APN NI and not on the APN NI within GPRS Basic Call Information.

	Values: This field is encoded as a string comprising of up to 63 characters. The actual contents are for further study.				
Access Point Name OI	The Operator Identifier part of the Access Point Name (APN) in dot notation. *Derivation:* In the case of GPRS usage without CAMEL invocation: The actual connected APN OI as defined in PS Domain Charging – see Annex C. Pre GSM Release '98 from the GSM item AccessPointName (see *conditionality* note below). From GSM Release '98 to 3GPP Release 7 from the GSM item AccessPointNameOI (see *conditionality* note below). From 3GPP Release 8 from the GSM item P-GW PLMN Identifier (see *conditionality* note below). In the case of GPRS usage with CAMEL invocation: Within GPRS Basic Call Information, the actual connected APN OI as modified by CSE in APN OI field as defined in PS Domain Charging – see Annex C.	10 11	GPRS GPRS	Severe Warning	Syntax error where group GPRS Destination occurs within group GPRS Basic Call Information. Syntax error where group GPRS Destination occurs within group 3G CAMEL Destination.

	Within 3G CAMEL Destination, the original APN OI field available within CAMEL Information as defined in PS Domain Charging – see Annex C. *Conditionality:* Mandatory within group GPRS Destination where the GPRS Call represents an SGSN or S-GW ticket or an assembled SGSN/GGSN or S-GW/P-GW ticket. This item is only available within networks which have upgraded to at least GSM Release '98 and not available for Wi-Fi usage. *Values:* This field is encoded as a string comprising of up to 37 characters. The actual contents are for further study.				
Accounting Information	A grouping of accounting related information. The group must contain a Local Currency and Currency Conversion table. The group may conditionally include Taxation and Discounting tables and, optionally, TAP Currency. *Conditionality:*	30 31 32	Tf Batch Tf Batch Tf Batch	Fatal Fatal Fatal	No Taxation group present and batch contains taxes. No Discounting group present and batch contains discounts. Mandatory item Local Currency missing within group.

	Must be present within group Transfer Batch where any Call Event Details contains a charge.	33	Tf Batch	Fatal	Item TAP Currency not present and currency other than SDR specified in roaming agreement.
		34	Tf Batch	Fatal	Group Currency Conversion missing within group and the transfer includes one or more Charge greater than zero.
		35	Tf Batch	Fatal	Mandatory item TAP Decimal Places missing within group.
Action Code	The Action Code qualifies the way in which the supplementary service is used. *Derivation for Supplementary Services:* GSM item SS ActionType (See Annex C – CS Domain Charging). *Conditionality:* Mandatory within group Supplementary Service Used. *Values:* 0 Registration SS only 1 Erasure SS only	10	SS	Severe	Syntax error.
		20	SS	Severe	Value out of range for supplementary service where associated Supplementary Service Code is for a supplementary service.
		22	SS	Severe	Value out of range for USSD message where associated Supplementary Service Code is for USSD message. **Note:** Error Codes 11 & 21 removed in TAP release 3.11 (01 May 2005).

	2 Activation SS only 3 Deactivation SS only 4 Interrogation SS only 5 Invocation SS only 6 Registration of Password SS only 7 USSD Invocation USSD only				
Actual Delivery Timestamp	The timestamp representing the actual time at which the start of the Content Transaction was commenced. This is given in the time of the serving Content Provider. There must be a UTC Time Offset Code associated with the item. *Example:* The Charged Party may request to download all messages at 2200hrs in order to take advantage of off-peak rates while placing the order at an earlier time but the actual content download may have commenced at 0030hrs. *Conditionality:* Must be present within group • Content Transaction Basic Info when no other timestamp present within group or when item referenced as the Charging Point. *Format:*	10 11 20 21 30 31	Content Content Content Content Content Content	Severe Warning Severe Warning Severe Warning	Syntax error and timestamp referenced as Charging Point. Syntax error and timestamp not referenced as Charging Point. Value out of range and timestamp referenced as Charging Point. Value out of range and timestamp not referenced as Charging Point. Mandatory associated UTC Time Offset Code missing and timestamp referenced as Charging Point.

	CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 to 235959	100 101 200	Content Content Content	Severe Warning Severe	Mandatory associated UTC Time Offset Code missing and timestamp not referenced as Charging Point. Actual Delivery Timestamp after associated Charge Detail timestamp and timestamp referenced as Charging Point. Actual Delivery Timestamp after associated Charge Detail timestamp and timestamp not referenced as Charging Point. Actual Delivery Timestamp before the commercial roaming start date (in VPMN local time if no other time zone explicitly agreed) for the specific service and the TAP file is not a test file and the timestamp is referenced as the Charging Point.
Advised Charge	The charge advised to the Charged Party.	10 20	Content Content	Severe Severe	Syntax error. Value out of range.

	The charge must not contain a negative value. Note that where there is an associated Charge Refund Indicator present then this is an implicit negative value. The charge should always match the complete amount quoted to the customer. Where the amount 'advised' (quoted) to the customer included taxes then this charge should include taxes, otherwise, there should be no taxes included. The charge is in the Advised Charge Currency, or TAP Currency where no associated Advised Charge Currency is present, or SDRs where neither is present. The number of decimal places is defined by item TAP Decimal Places. *Conditionality:* Mandatory within group Advised Charge Information. *Values:* > = 0				
Advised Charge Currency	The currency in which the Charged Party has been advised of the charge. The Advised Charge Currency contains the	10 11	Audit Content	Fatal Severe	Syntax error. Syntax error.

	Currency Code, which identifies the currency used for Advised Charge. Note that this item will not be present if using the TAP file currency. The standard TAP file currency default is SDRs unless bilaterally agreed otherwise or a specific currency default for the file can be defined by item TAP Currency (use of TAP Currency will be by bilateral agreement between partners). *Derivation:* ISO 4217 [26]. *Conditionality:* Present within groups • Advised Charge Information • Total Advised Charge Value when different to TAP Currency and not SDRs. *Example:* Currency Code — Currency name EUR — Euro INR — Indian rupee XDR — SDR	20 21	Audit Content	Fatal Severe	Value out of range. Value out of range.

	USD U.S. dollar				
Advised Charge Currency	The currency in which the Charged Party has been advised of the charge. The Advised Charge Currency contains the Currency Code, which identifies the currency used for Advised Charge. Note that this item will not be present if using the TAP file currency. The standard TAP file currency default is SDRs unless bilaterally agreed otherwise or a specific currency default for the file can be defined by item TAP Currency (use of TAP Currency will be by bilateral agreement between partners). *Derivation:* ISO 4217 Currency Codes standard. *Conditionality:* Present within groups • Advised Charge Information • Total Advised Charge Value when different to TAP Currency and not SDRs. *Example:* Currency Code Currency name	10 11 20 21	Audit Content Audit Content	Fatal Severe Fatal Severe	Syntax error. Syntax error. Value out of range. Value out of range.

	EUR Euro INR Indian rupee XDR SDR USD U.S. dollar				
Advised Charge Information	Where a customer has been advised of a charge then the Advised Charge Information group identifies the actual charge and may, conditionally, provide additional information. The group must contain Advised Charge, all other information is conditional. Conditional information present may include Paid Indicator, Payment Method (optionally), Advised Charge Currency and Commission. *Conditionality:* Must be present within group Content Service Used when charge has been advised to the customer.	30	Content	Severe	Mandatory item Advised Charge not present within group.
Age of Location	This value represents the elapsed time in minutes since the last network contact of the mobile station (i.e. the actuality of the location information). *Derivation:* GSM/UMTS item AgeOfLocationInformation (See Annex C – LCS Charging).	20	LCS	Severe	Value out of range.

	Conditionality: Must be present within group LCS QoS Delivered where available from the network and LCS transaction status indicates 'last known location'. *Values:* This field is coded as an integer within the range 0- 32767. The value 0 indicates that the MS is currently in contact with the network, whereas the value 32767 indicates that the location information is at least 32767 minutes old.				
Aggregated Chargeable Unit Type	Aggregated Chargeable Unit Type indicates the type of units being aggregated within this occurrence of Aggregated Usage Record. Note that any aggregation of data volumes must be based on the network CDRs which are providing bytes before converting to any other data volume based Unit Type such as MB or GB. Note also that when converting bytes to other Unit Types the conversion must be based on 1024 bytes to KB, 1024 KB to MB, 1024 MB to GB. Conditionality: Mandatory within group Aggregated Usage Record. Values:	10 20	AUR AUR	Severe Severe	Syntax error. Value out of range.

	1 bytes 2 KB 3 MB 4 GB 5 MO seconds 6 MT seconds 7 MO & MT seconds combined 8 Number of MO SMS events 9 Number of inbound roamers 10 MSUs				
Aggregated Chargeable Units	The Aggregated Chargeable Units item indicates the number of units which are chargeable within the Aggregated Usage Record. The item Chargeable Unit Type defines what the units represent. Conditionality: Must be present within group Aggregated Usage Record. Values: > 0	10 20	AUR AUR	Severe Severe	Syntax error. Value out of range.

Aggregated Usage Charge	The invoiceable charge for the Aggregated Usage Record before any tax is added (if applicable, see AUR Tax Information). The Aggregated Usage Charge must not contain a negative value. The charge is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note; the currency may be subject to internal market bilateral agreements, see TAP Currency. Conditionality: Must be present within group Aggregated Usage Record when greater than 0 (zero). Values: > or = 0 (zero)	10 20 200	AUR AUR AUR	Severe Severe Severe	Syntax error. Value out of range. Aggregated Usage Charge not in line with roaming agreement. Charge validation must be done according to section 5.9. Notes for validation rule 200: Rounding rules are at the discretion of the Sender, therefore, when verifying the charge applied by the Sender the Recipient must allow for a tolerance of 0.02 units of TAP Currency (independently of the number of TAP Decimal Places used for the TAP file). No tolerance is allowed when the expected Charge is zero.
Aggregated Usage Date End	The Aggregated Usage Date End represents the end of the period of the usage being aggregated. Note that use of period based aggregation must be bilaterally agreed.	10 20 200	AUR AUR AUR	Severe Severe Severe	Syntax error. Value out of range.

	Conditionality: Must be present within group Aggregated Usage Record where the aggregation occurred over a period greater than one day and when period based aggregation bilaterally agreed. May be present within group Aggregated Usage Record where the date is the same as Aggregated Usage Date Start. Format: CCYYMMDD	201	AUR	Severe	Item contains date earlier than Aggregated Usage Date Start. Item contains date greater than Aggregated Usage Date Start and period based aggregation not bilaterally agreed.
Aggregated Usage Date Start	Where there is no Aggregated Usage Date End present then the Aggregated Usage Date Start represents the date of the usage being aggregated. Where there is an Aggregated Usage Date End present then the Aggregated Usage Date Start represents the start of the period of the usage being aggregated. Note that use of period based aggregation must be bilaterally agreed. Conditionality: Must be present within group Aggregated Usage Record	10 20	AUR AUR	Severe Severe	Syntax error. Value out of range.

	Format: CCYYMMDD				
Aggregated Usage Record	The Aggregated Usage Record represents usage of a unit type (Aggregated Chargeable Unit Type) which can be further segmented by a specified type of aggregation (defined in the Aggregation Type) Use of the Aggregated Usage Record is only allowed when bilaterally agreed. The AUR can only contain usage which has not been previously included in TAP, including previous AUR records or detail TAP records, and where the network CDRs being aggregated do not end after the Transfer Cut Off Timestamp. Where there are multiple time zones in the network the timestamps will need to be normalised to account for the different UTC time offsets applicable. The network CDR start or partial record start timestamp date defines the applicable aggregation date. Note that the only exception allowing resubmission of usage is where the AUR was previously rejected using RAP and is being resubmitted. Note also that a detail TAP record that was rejected using RAP can only be resubmitted as a detail TAP record, the usage cannot be resubmitted as part of an AUR.	30 31 32 35 36 37	AUR AUR AUR AUR AUR AUR	Severe Severe Severe Severe Severe Severe	Mandatory item Aggregated Usage Date Start missing within group. Item Call Type Level 1 missing within group and Aggregated Usage Charge is greater than 0 (zero). Mandatory item Call Type Level 2 missing within group and Aggregated Usage Charge is greater than 0 (zero). Mandatory item Call Type Level 3 missing within group and Aggregated Usage Charge is greater than 0 (zero). Mandatory item Aggregated Chargeable Unit Type missing within group. Mandatory item Aggregated Chargeable Units missing within group.

	Mandatory elements are Aggregated Usage Date Start, Aggregated Chargeable Unit Type and Aggregated Chargeable Units. Where the record represents aggregated usage over a period then the Aggregated Usage Date End must be present. Note that a period so identified cannot contain an IOT change for the aggregated usage. Every period must have a single rate applicable in the IOT across the complete period. Aggregated Usage Charge and Exchange Rate Code must be present when the charge is greater than zero but may be omitted when equal to zero. When the Aggregated Usage Charge is greater than zero Call Type Level 1, 2 and 3 must be present. When the aggregated usage relates to usage that will only be rated at a later time, for example invoice production, the Call Type Level 1/2/3 may be required to identify the rate applicable. AUR Tax Information must be present when taxes apply and when those taxes are greater than zero. This group is repeated for each tax applicable.	38 39 40	AUR AUR AUR	Severe Severe Severe	Item Aggregated Usage Charge not present and expected charge is greater than zero. Item Exchange Rate Code missing and Aggregated Usage Charge is greater than zero. Item Aggregation Identifier present when item Aggregation Type not present.

	Operator Specific Information may also be present, this is optional dependent on bilateral agreement. Conditionality: Mandatory within an occurrence of group Call Event Details where none of the following are present; Mobile Originated Call, Mobile Terminated Call, Supplementary Service Event, Service Centre Usage, GPRS Call, Content Transaction or Location Service.				
Aggregation Identifier	Where aggregation is based on one of the allowed types within the Aggregated Chargeable Unit Type and applicable rate (identified by Call Type Level 1/2/3 values) this identifies the item used for such aggregation. Note that if Aggregation Type indicates IMSI Range then the Aggregation Identifier will have from and to IMSIS separated by: character. Example 1: 801550000000000:801550999999999 Example 2: 801550100000000:801550109999999 Note that the numbers in the range are inclusive and will have the lower number first followed by: and then the higher number. Conditionality:	10 200 201	AUR AUR AUR	Severe Severe Severe	Syntax error. The associated Aggregation Type is IMSI (value 1) and Aggregation Identifier does not contain an IMSI which the Recipient is financially liable for as defined in the wholesale (roaming) agreement between the Sender and Recipient. The associated Aggregation Type is IMSI Range (value 5) and Aggregation Identifier does not contain an IMSI range which the Recipient is financially liable for as defined in the wholesale

	Mandatory within group Aggregated Usage Record when Aggregation Type is also present. Values: Values are defined by the Aggregation Type used.	202	AUR	Severe	(roaming) agreement between the Sender and Recipient. Where the Aggregation Identifier relates to an IMSI Range, the first number is higher than the second number in the IMSI Range.
Aggregation Type	Where aggregation is based on one of the allowed types within the Aggregated Chargeable Unit Type and applicable rate (identified by Call Type Level 1/2/3 values) this identifies the type used for such aggregation. Conditionality: Present within group Aggregated Usage Record when the aggregation is based on one of the defined Aggregation Types. Values: 1 IMSI 2 APN 3 Rating Group 4 CAMEL Service Key 5 IMSI Range	10 20	AUR AUR	Severe Severe	Syntax error. Value out of range.
AUR Tax Information	A repeating group containing the Tax Rate Code and the AUR Tax Value and, where applicable AUR Taxable Amount.	30	AUR	Severe	Mandatory item Tax Rate Code missing within group.

	AUR Tax Information will be present when taxes apply and when those taxes are greater than zero. Aggregated Usage Charge may have several tax elements associated with it, for example national tax, regional tax, local tax. This group is repeated for each tax applicable. Conditionality: There must be one occurrence within Aggregated Usage Record for each tax element associated with the Aggregated Usage Charge where the taxes are greater than zero.	31	AUR	Severe	Mandatory item AUR Tax Value missing within group.
AUR Tax Value	The actual value of the tax associated with the Tax Code and Aggregated Usage Charge. The AUR Tax Value must be greater than or equal to zero. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. Conditionality:	10 20 22	AUR AUR AUR	Severe Severe Severe	Syntax error. Value out of range. Where the associated Tax Rate Code relates to a Tax Rate, the AUR Tax Value does not correspond to the AUR Taxable Amount (or, where no AUR Taxable Amount is present, does not correspond to the Aggregated Usage Charge, and Tax Rate).

	Must be present within group AUR Tax Information when Aggregated Usage Charge is greater than zero and Tax Rate Code is present. Values: >= 0 (zero)	200	AUR	Severe	Note 1: Rounding rules are at the discretion of the Sender and a tolerance of 0.02 units of TAP Currency must be allowed (independent of the number of decimal places used for the TAP file). Note 2: No tolerance is allowed when the expected AUR Tax Value is zero. Note 3: In the absence of AUR Taxable Amount the AUR Tax Value must always be validated against the total Aggregated Usage Charge. Any Charge Type associated with the Tax Code in Taxation must be ignored. AUR Tax Value is not in line with the roaming agreement at the corresponding Aggregated Usage Date Start. Note that, where variable tax rates apply the exact validation of the tax rate may not be possible and, therefore, cannot be carried out.

					Note 1: Rounding rules are at the discretion of the Sender and a tolerance of 0.02 units of TAP Currency must be allowed, independent of the number of decimal places used for the TAP file. Note 2: No tolerance is allowed when the expected AUR Tax Value is zero.
AUR Taxable Amount	The actual part of the Aggregated Usage Charge to which the AUR Tax Value and Tax Rate (Code) relate. Note that some tax authorities allow for tax on tax. The AUR Taxable Amount must be greater than zero. The value is in SDRs with the number of decimal places defined by TAP Decimal Places. Note that the currency may be subject to internal market bilateral agreements, see TAP Currency. Conditionality: Must be present within group AUR Tax Information when Aggregated Usage Charge is greater than zero and Tax Rate Code is present.	10 20 100	Calls Calls Calls	Severe Severe Severe	Syntax error. Value out of range. AUR Taxable Amount not in line with roaming agreement.

	Values: > 0 (zero)				
Audit Control Information	The group identifies the end of the Transfer Batch. The following items are optional; Earliest Call Timestamp, Latest Call Timestamp and Operator Specific Information. Total Charge, Total Tax Value, Total Discount Value and Call Event Details Count are all mandatory. Conditionally present are Total Charge Refund, Total Advised Charge Value, Total Tax Refund and Total Discount Refund. *Conditionality:* Mandatory within group Transfer Batch.	30 31 32 33 36 37	Tf Batch Tf Batch Tf Batch Tf Batch Tf Batch Tf Batch	Fatal Fatal Fatal Fatal Fatal Fatal	Mandatory item Total Charge missing within group. Mandatory item Total Tax Value missing within group. Mandatory item Total Discount Value missing within group. Mandatory item Call Event Details Count missing within group. Item Total Tax Refund present and use of Content Transaction not bilaterally agreed. Also see error code 50 (section 5.3). Item Total Discount Refund present and use of Content Transaction not bilaterally agreed. Also see error code 50 (section 5.3).

		38	Tf Batch	Fatal	Group Total Advised Charge Value present and use of Content Transaction not bilaterally agreed. Also see error code 50 (section 5.3).
		39	Tf Batch	Fatal	Conditional group Total Advised Charge Value missing within group and one or more occurrences of Content Transaction present containing Advised Charge Information.
		40	Tf Batch	Fatal	Item Total Charge Refund expected with value greater than 0 and not present. **Note:** Error Codes 34 & 35 removed in TAP release 3.11 (01 May 2005).

4.2 B

Basic Service	The group Basic Service identifies the actual Basic Service used.	30	MOC MTC	Severe	Mandatory group Service Code missing within group.

	It must contain the Service Code, it will, conditionally also contain the following for UMTS: Transparency Indicator, Fixed Network User Rate, User Protocol Indicator, Guaranteed Bit Rate and Maximum Bit Rate. *Conditionality:* Mandatory within group Basic Service Used.				**Note:** Error Codes 31, 32, 33, 34, 35 and 36 removed in TAP release 3.11 (01 May 2005).
Basic Service Used	A group of data identifying the type of service used together with all related charging information. The group must have Basic Service and Charge Information present. Charging Timestamp item will be present as applicable and HSCSD Indicator will be present where HSCSD has been used. *Conditionality:* Mandatory within groups Mobile Originated Call Mobile Terminated Call one must be present.	30 32	MOC MTC MOC MTC	Severe Severe	Mandatory group Basic Service missing within group. Mandatory group Charge Information missing within group.
Batch Control Information	All items are mandatory except File Type Indicator which will only be present where the file represents test data, RAP File Sequence Number (used where the batch has previously been	30	Tf Batch	Fatal	Mandatory item Sender missing within group.

	returned with a fatal error and is now being resubmitted) and Operator Specific Information and File Creation Timestamp which are optional. *Conditionality:* Mandatory within group Transfer Batch.	31	Tf Batch	Fatal	Mandatory item Recipient missing within group.
		32	Tf Batch	Fatal	Mandatory item File Sequence Number missing within group.
		33	Tf Batch	Fatal	Mandatory item File Available Timestamp missing within group.
		34	Tf Batch	Fatal	Mandatory item Specification Version Number missing within group.
		36	Tf Batch	Fatal	Mandatory item Transfer Cut Off Timestamp missing within group.
		37	Tf Batch	Warning	File Sequence Number previously received and rejected with fatal error, therefore RAP File Sequence Number expected but not present.
		38	Tf Batch	Fatal	File Type Indicator present within group and Transfer Batch expected as chargeable data (that is, live data).

		39	Tf Batch	Fatal	File Type Indicator not present within group and Transfer Batch expected as test data (i.e. non chargeable data).
		40	Tf Batch	Warning	RAP File Sequence Number present although File Sequence Number has not previously been rejected with a fatal error (for example previously missing or new files).
		41	TfBatch	Fatal	Mandatory item Release Version Number missing within group. **Note:** Error Code 35 removed in TAP release 3.11 (01 May 2005).
Bearer Service Code	A code which uniquely defines a Bearer Service. Group Bearer Codes, identifiable by the description 'All', should only be used where details of the specific services affected are not available from the network. Note that compound Bearer Service group codes can only occur in conjunction with HSCSD usage or call independent supplementary service operations.	10	MOC MTC	Severe	Syntax error.
		11	SS	Warning	Syntax error.
		20	MOC MTC	Severe	Value out of range.
		21	SS	Warning	Value out of range.

	Note that codes 27 & 37 (General Data A/Synchronous Service) are used where a data rate greater than 9600bps is used, the data rate used is not identifiable/specified on the network CDRs. *Derivation:* GSM item BearerServiceCode (See Annex C – CS Domain Charging). The code is derived by taking the MAP encoding as specified for BearerServiceCode (See Annex C – CS Domain Charging) and translating bits 7-4 into a 'hex' character and bits 3-1 into a second 'hex' character. *Conditionality:* Must be present within group Service Code where the type of service used was a bearer service. Must not be present when the type of service used was a tele service and, therefore, Teleservice Code is present. *Values:* 00 All Bearer Services 20 All Data Circuit Asynchronous Services				

	21 Duplex Asynch. 300bps data circuit 22 Duplex Asynch. 1200bps data circuit 23 Duplex Asynch. 1200/75bps data circuit 24 Duplex Asynch. 2400bps data circuit 25 Duplex Asynch. 4800bps data circuit 26 Duplex Asynch. 9600bps data circuit 27 General Data Circuit Asynchronous Service 30 All Data Circuit Synchronous Services 32 Duplex Synch. 1200bps data circuit 34 Duplex Synch. 2400bps data circuit 35 Duplex Synch. 4800bps data circuit 36 Duplex Synch. 9600bps data circuit 37 General Data Circuit Synchronous Service 40 All Dedicated PAD Access Services 41 Duplex Asynch. 300bps PAD access 42 Duplex Asynch. 1200bps PAD access 43 Duplex Asynch. 1200/75bps PAD access 44 Duplex Asynch. 2400bps PAD access 45 Duplex Asynch. 4800bps PAD access 46 Duplex Asynch. 9600bps PAD access 47 General PAD Access Service 50 All Dedicated Packet Access Services 54 Duplex Synch. 2400bps PAD access 55 Duplex Synch. 4800bps PAD access				

	56 Duplex Synch. 9600bps PAD access 57 General Packet Access Service 60 All Alternat Speech/Asynchronous Services 70 All Alternate Speech/Synchronous Services 80 All Speech followed by Data Asynchronous Services 90 All Speech followed by Data Synchronous Services A0 All Data Circuit Asynchronous Services (compound) B0 All Data Circuit Synchronous Services (compound) C0 All Asynchronous Services (compound) D0 All Synchronous Services (compound)				

4.3 C

Call Event Details	Call Event Details is a repeating item which is one of Aggregated Usage Record, Mobile Originated Call, Mobile Terminated Call, Mobile Session, Messaging Event, Supplementary Service Event, Service Centre Usage, GPRS Call, Content Transaction or Location Service. Each occurrence must have no more than one of these present. *Conditionality:*	32 34 35	Tf Batch Tf Batch Tf Batch	Severe Severe Severe	Service Centre Usage present although not agreed bilaterally. Content Transaction present although not agreed bilaterally. Also see error code 50 (section 5.3). GPRS Call representing packet switched data present although no

	Mandatory within group Transfer Batch, one occurrence being present for each call/event present.				type of packet switched data service agreed bilaterally. **Note:** Packet switched data in the context of this validation excludes Wi-Fi. Also see error code 50 (section 5.4).
		36	Tf Batch	Severe	Location Service present although not agreed bilaterally. Also see error code 50 (section 5.4).
		37	TfBatch	Severe	Messaging Event present although not agreed bilaterally. Also see error code 50 (section 5.4).
		38	TfBatch	Severe	Mobile Session present although not agreed bilaterally. Also see error code 50 (section 5.4).
		39	TfBatch	Severe	GPRS Call representing Wi-Fi usage present although Wi-Fi not agreed bilaterally. See also error code 50 (section 5.4)

		40	TfBatch	Severe	Aggregated Usage Record present although not bilaterally agreed. See also error code 50 (section 5.4) **Note:** Error Code 33 removed in TAP release 3.11 (01 May 2005).
Call Event Details Count	This item is an audit control and contains a count of the number of occurrences of Call Event Details within the TAP transfer. *Conditionality:* Mandatory within group Audit Control Information. *Values:* > 0	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range. Value does not match the count of Call Event Details. Note that any rejected Call Event Details must be included for the purposes of this validation.
Call Event Start Timestamp	The timestamp gives the start of the call event. The time is given in the local time of the Sender PMN (or Serving Network where this is not the Sender). There must be a UTC Time Offset Code associated with the timestamp. Note that local time is the local time at the location of the chargeable subscriber. Where the location is not available,	10 20 30	MOC MTC GPRS MOC MTC GPRS MOC	Severe Severe Severe	Syntax error. Value out of range.

	as in some call forwarding scenarios, this will be a notional 'network local time'. Note that this timestamp is the event start time as provided by the network. This will be either the call answer time or the channel seizure time. If charging is from call answer time then this item can be populated with either call answer time of channel seizure time. In the case where Call Event Start Timestamp does not equal the point of charging then a Charging Timestamp must be provided. If charging is from channel seizure time then Call Event Start Timestamp must be populated with channel seizure time. In the case of an intermediate or last partial record of the same GPRS Call (GPRS Context) the timestamp must be populated with the record start time and not the context start timestamp (see item PDP Context Start Timestamp for identification of GPRS context start time in each partial record). *Derivation:*	100 101 200	MTC GPRS MOC MTC GPRS MOC MTC MOC MTC GPRS	Severe Severe Severe	Mandatory associated item UTC Time Offset Code missing. Call event start timestamp after charge detail timestamp. Call event start timestamp after charging timestamp. Call Event Start Timestamp before the commercial roaming start date (in VPMN local time if no other time zone explicitly agreed) for the specific network service and the TAP file is not a test file. **Note 1:** Old call records should not be rejected in principle in Roaming Hubbing migration scenarios. See BA.62 [16] for further details. **Note 2:** In cases where there is a lack of standardised mechanisms for the VPMN to block customers from

	GSM item answerTime or seizureTime (See Annex C – CS Domain Charging and PS Domain Charging). This will normally be the equivalent of the start of charging or, where the call event is non chargeable, the equivalent point. For Wi-Fi usage item event-timestamp (RFC 2869) in UTC time. *Conditionality:* Mandatory within groups MO Basic Call Information MT Basic Call Information GPRS Basic Call Information *Format*: CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959 *Example:* • PDP Context activated at 20090708235000				service invocation with reasonable efforts the VPMN is still entitled to charge the HPMN for such service invocation and consequently the records cannot be rejected for being before the commercial roaming start date. An example of a service that cannot be rejected for this reason is Circuit Switched Video Telephony. Examples of such service invocations that cannot be rejected for this reason are Circuit Switched Video Telephony and CAMEL information present in the call events

	• Two partials raised on TAP (cut across midnight) First partial: Call Event Start Timestamp = PDP Context Start Timestamp = 20090708235000 Second partial: Call Event Start Timestamp = 20090709000000 PDP Context Start Timestamp = 20090708235000				
Call Originator	The call originator applies only in respect of mobile terminated traffic. It identifies the person making the call. For SMS MT usage it identifies the SMSC delivering the SMS and, where available, the originator of the SMS. Also, some networks may inhibit the transfer of this information where CLI presentation is prohibited. *Derivation:* GSM item CallingNumber (See Annex C – CS Domain Charging). This item is of type AddressString. *Conditionality:* Must be present within group MT Basic Call Information where the network supports calling line identity (CLI) or if TeleService Code indicates SMS usage (values 20 or 21) and available from the network.				**Note:** Error Codes 30, 31, 32, 33 and 34 removed in TAP release 3.10 (01 May 2003). **Note:** Error Code 35 removed in TAP release 3.11 (01 May 2005).

Call Reference	An identifier local to the Recording Entity. The identifier distinguishes between transactions on the same mobile station. *Derivation:* GSM item CallReference (See Annex C – CS Domain Charging). GSM item Message Reference (see Annex C – CS Domian Charging) for SMS over circuit switched. GSM item Message Reference (See Annex C – PS Domain Charging) for SMS over GPRS For LCS, item Local Record Sequence Number (See Annex C – LCS Charging). *Conditionality:* Must be present within groups Network Location Location Service when available from the network.	10	MOC MTC SS LCS	Severe	Syntax error.
Call Type Group	A group identifying the IOT used by the VPMN to price the call.	30	MOC MTC	Severe	Mandatory item Call Type Level 1 missing within group.

	The group contains mandatory items Call Type Level 1, Call Type Level 2 and Call Type Level 3. *Conditionality:* Must be present within group Charge Information where Charge Information occurs within a Mobile Originated Call, or a Mobile Terminated Call, or a GPRS Call. Must be present within the following groups: Session Charge Information Messaging Event	 31 32	GPRS MSESS MSG MOC MTC GPRS MSESS MSG MOC MTC GPRS MSESS MSG	 Severe Severe	 Mandatory item Call Type Level 2 missing within group. Mandatory item Call Type Level 3 missing within group. **Note:** Error Code 33 removed in TAP release 3.11 (01 May 2005).
Call Type Level 1	The highest category call type in respect of the destination or origination of the call. *Conditionality:* Mandatory within group Call Type Group.	10	MOC MTC GPRS MSESS MSG AUR	Severe	Syntax error.

	Must be present within Aggregated Usage Record when the Aggregated Usage Charge is greater than 0 (zero). *Values:* 0 Unknown/Not Applicable 1 National 2 International 10 HGGSN/HP-GW 11 VGGSN/VP-GW 12 Other GGSN/Other P-GW 20 BCE Services 100 Wi-Fi **Notes:** Value 0 is for use only in the following cases: • Mobile Terminated Calls • Mobile Sessions where Mobile Session Service is "MT Voice over LTE" • Mobile Sessions where Mobile Session Service is "MO Voice over LTE" and the group Non Charged Party contains only a Public User ID • Aggregated Usage Records	20	MOC MTC GPRS MSESS MSG AUR	Severe	Value out of range. **Note:** Error Codes 100 & 101 removed in TAP release 3.09 (01 May 2002). **Note:** Error Code 102 removed in TAP release 3.12 (01 May 2012).

	Values 1 & 2 are for use only in the following cases: • Mobile Originated Calls, • Mobile Terminated Calls, • Mobile Sessions • Messaging Events • Aggregated Usage Record Values 10, 11 & 12 are for use in GPRS Calls and Aggregated Usage Records only. Value 100 is for use in GPRS Calls and Aggregated Usage Records representing Wi-Fi usage only Unknown/Not Applicable can be used when the VPMN cannot interpret the origin or does not differentiate charging based on any other of the Call Type Level 1 values.				
Call Type Level 2	An item which identifies the sub category of Call Type Level 1. This defines, in more detail, the classification of the call within the IOT, as used by the VPMN to price the call. *Conditionality:* Mandatory within group Call Type Group.	10 20	MOC MTC GPRS MSESS MSG AUR MOC MTC	Severe Severe	Syntax error. Value out of range.

	Must be present within Aggregated Usage Record when the Aggregated Usage Charge is greater than 0 (zero). *Values:* 0 Unknown/Not Applicable 1 Mobile 2 PSTN 3 Non Geographic 4 Premium Rate 5 Satellite destination 6 Forwarded call 7 Non forwarded call 10 QoS Broadband 11 QoS Narrowband 12 QoS Conversational 13 QoS Streaming 14 QoS Interactive 15 QoS Background 20 Unspecified/default LTE QCIs 21 LTE QCI 1 Conversational 22 LTE QCI 2 Conversational 23 LTE QCI 3 Conversational 24 LTE QCI 4 Streaming 25 LTE QCI 5 Interactive (specialised for signalling)		GPRS MSESS MSG AUR		**Note:** Error Code 100 removed in TAP release 3.12 (01 May 2012).

	26 LTE QCI 6 Interactive 27 LTE QCI 7 Interactive 28 LTE QCI 8 Interactive 29 LTE QCI 9 Background 65 LTE QCI 65 66 LTE QCI 66 69 LTE QCI 69 70 LTE QCI 70 80 NBI 81 LTE-M 82 5GSA (If Slice Service Type is needed, it can be provisioned in the CTL3) **Notes:** Value 0 (zero) is for use in the following cases (regardless of what has been defined in the IOT): • Mobile Originated Calls • Mobile Terminated Calls • Mobile Sessions • Messaging Events • GPRS Calls • Aggregated Usage Records Values 1,2,3,4 & 5 are for use only in the following cases:				

	• Mobile Originated Calls • Mobile Sessions where Mobile Session Service is "MO Voice over LTE" or Emergency Call • Aggregated Usage Records Value 6 is for use in Mobile Terminated Calls and Aggregated Usage Records only. Value 7 is for use in Mobile Terminated Calls, Aggregated Usage Records and Mobile Sessions where Mobile Session Service is "MT Voice over LTE" only. Values 10-15 and 20-29, 65, 66, 69 and 70 are for use in GPRS Calls and Aggregated Usage Records only. Values 21-29, 65, 66, 69 and 70 are for use where a specific charge rate is defined in the IOT for the referenced QCI. Value 20 is intended for use where a default QCI charge rate is defined in the IOT and applies. For example an IOT defines a rate for QCI 5 and a default rate for all other QCIs. Although values 20-29, 65-66 and 69-70 are intended for use as described above, they are also allowed without any IOT defined QCI specific charging. Premium Rate is as defined by the numbering plan administrator of the relevant country or region code.				

	Non Geographic is used, for example, for special services and Freephone / toll free services. Unknown/Not Applicable can be used when the VPMN cannot interpret the destination/origin or does not differentiate charging based on any other of the Call Type Level 2 values.				
Call Type Level 3	An item which identifies the sub category of Call Type Level 2. This defines, in more detail, the classification of the call within the IOT, as used by the VPMN to price the call. *Conditionality:* Mandatory within group Call Type Group. Must be present within Aggregated Usage Record when the Aggregated Usage Charge is greater than 0 (zero). *Values:* • numeric (>=0) as defined within the VPMN's IOT. • where a VPMN has not defined a Call Type Level 3 in their IOT they can use any numeric values (>=0) in TAP. When CTL2 is 5GSA, this attribute can provide the Slice Service Type. Values: 0-255	10 20	MOC MTC GPRS MSESS MSG AUR MOC MTC GPRS MSESS MSG AUR	Severe Severe	Syntax error. Value out of range. **Note:** Error Code 100 removed in TAP release 3.12 (01 May 2012).

Called Number	The called number is the international representation of the destination and contains different information depending on the call scenario: • Circuit Switched MO Call initiated by the roamer: The international representation of the number dialled by the roamer in establishing the call • Circuit Switched MO Call initiated as a result of an incoming call and invocation of conditional call forwarding: The international representation of the number to which the call is forwarded • SMS MO: The international representation of the SMSC address used The called number must always start with the valid country code as listed in E.164 “Assigned Country Codes” (spare and reserved codes are not valid, except the reserved code 970 for Palestine which is valid), and contain only numeric digits. All other characters must be removed. See examples in TD.58. In the following cases it is acceptable for the Called Number (if present) to contain only the country code:	10 11 20	MOC MOC MOC	Severe Warning Severe	Syntax error and call does not represent an emergency call (as defined in chapter 5.7). Syntax error and call represents emergency call (as defined in chapter 5.7). Value out of range or number does not start with a valid country code as listed in E.164 “Assigned Country Codes”, and either CAMEL Destination Number or Dialled Digits is not present. **Note 1:** Spare and reserved codes, indicated by the inclusion of the words “Reserved” or “Spare” in E.164 column “Country, Geographical area or Global service”, are NOT valid country codes, with the exception of reserved code 970 for Palestine which is valid.

	• Short code call: Only country code, or country code followed by short code • Emergency call: Only country code, or country code followed by the emergency service access code • Unsuccessful call attempt: Only country code, or full number starting with the country code • Specially routed call (for example using '*' or '#'): Only country code In all other cases the Called Number must contain the full long number as defined by E.164 "International public telecommunication number structure. *Derivation:* Derived from GSM item CalledNumber (See Annex C – CS Domain Charging) but it is represented in TAP in International format, i.e. the number begins with the Country Code. *Conditionality:*	21	MOC	Warning	**Note 2:** Additional E.164 notes for shared country codes listing the currently assigned networks and their identification codes must not be taken into account. For example, a full numeric Called Number starting with 881 is always valid no matter which digits follow. Value out of range or number does not start with a valid country code as listed in E.164 "Assigned Country Codes", and both CAMEL Destination Number and Dialled Digits are present. **Note 1:** Spare and reserved codes are NOT valid country codes, with the exception of reserved code 970 for Palestine which is valid. **Note 2:** Additional E.164 notes for shared country codes listing the currently assigned networks and their

	Must be present within group Destination except for one of the following: • use of the basic service emergency call • unsuccessful call attempt • when the call destination has been modified by CAMEL (CAMEL Destination Number is present) If Called Number is not present then, in case of unsuccessful call attempt or CAMEL destination modification, item Dialled Digits must be filled in. In the case of SMS-MO usage this field must always be present. *Values:* Each digit is numeric (0-9)				identification codes must not be taken into account. For example, a full numeric Called Number starting with 881 is always valid no matter which digits follow. **Note:** Error Code 201 removed in TAP release 3.12 (with effect from 01 May 2013).
Called Place	The Called Place indicates, in plain text, the name of the geographic area to which the call was placed, for example Atlanta, Roma, Sydney, or the type of service used, for example Freephone.	10	MOC	Warning	Syntax error.

	On international calls this item will contain the called country, e.g. Norway, South Africa, Thailand. *Conditionality:* Must be present within group Destination when provided by the VPMN's billing system. Not present within group Destination where the destination is non geographic, for example operator call (see also Call Type and Sender PMN Subtype). *Values:* ISO 646 [27] Actual content is at the Sender PMN discretion				
Called Place	The Called Place indicates, in plain text, the name of the geographic area to which the call was placed, for example Atlanta, Roma, Sydney, or the type of service used, for example Freephone. On international calls this item will contain the called country, e.g. Norway, South Africa, Thailand. *Conditionality:*	10	MOC	Warning	Syntax error.

	Must be present within group Destination when provided by the VPMN's billing system. Not present within group Destination where the destination is non geographic, for example operator call (see also Call Type and Sender PMN Subtype). *Values:* ISO 646 Actual content is at the Sender PMN discretion				
Called Region	Called Region contains the geographical region called or service used, this is a broader description than contained within Called Place, for example GA (Georgia), Lazio, NSW (New South Wales). *Conditionality:* Must be present within group Destination when provided by the VPMN's billing system. Not present within group Destination where the destination is international or non geographic. *Values:*	10	MOC	Warning	Syntax error.

	ISO 646 [27] Actual content is at the Sender PMN discretion				
Called Region	Called Region contains the geographical region called or service used, this is a broader description than contained within Called Place, for example GA (Georgia), Lazio, NSW (New South Wales). *Conditionality:* Must be present within group Destination when provided by the VPMN's billing system. Not present within group Destination where the destination is international or non geographic. *Values:* ISO 646 Actual content is at the Sender PMN discretion	10	MOC	Warning	Syntax error.
Calling Number	The calling number is the number from which the call was originated in the case of mobile terminated calls. For SMS MT this item must contain the SMSC MSISDN. *Derivation:* GSM item CallingNumber (See Annex C – CS Domain Charging). This item is of type AddressString. It is	10 20	MTC MTC	Warning Warning	Syntax error. Number not in international format. **Note:** Error Code 11 removed in TAP release 3.11 (01 May 2005).

	represented in TAP in international format, i.e. the number begins with the country code related to the calling number. *Conditionality:* Must be present within group Call Originator where available from the network. *Values:* Each digit is numeric (0 – 9)				
CAMEL Destination Number	The destination number returned by the CAMEL server to the interrogating (visited) MSC. **Note:** The CAMEL Destination Number, where present, is the relevant destination field for charging and takes precedence even where the Called Number and/or Dialled Digits is/are also present. *Derivation:* Derived from GSM item CalledNumber (See Annex C – CS Domain Charging and (for SMS over PS only) PS Domain Charging) but it is represented in TAP in International format, i.e. the number must start with a valid Country	10 20	MOC MOC	Severe Severe	Syntax error. Value out of range or number does not start with a valid country code as listed in E.164 “Assigned Country Codes”. **Note 1:** Spare and reserved codes are NOT valid country codes with the exception of reserved code 970 for Palestine which is valid. **Note 2:** Additional E.164 notes for shared country codes listing the currently assigned networks and their identification codes must not be taken

	Code for the routed destination. See Examples in TD.58 [33]. *Conditionality:* Mandatory within group 3G CAMEL Destination where GPRS Destination not present. *Values:* Each digit is numeric (0-9) or contains 'A' (representing *) or contains 'B' (representing #) or contains 'C' (representing a) or contains 'D' (representing b) or contains 'E' (representing c)	21	MOC	Severe	into account. For example, a full numeric CAMEL Destination Number starting with 881 is always valid no matter which digits follow. CAMEL Destination Number different from what the Home CAMEL Server returned. **Note:** The Sender may need to insert a country code in front of what the Home CAMEL Server returned. **Note:** Error Code 201 removed in TAP release 3.12 (with effect from 01 May 2013).
CAMEL Invocation Fee	The charge for the CAMEL invocation after discounts have been deducted, where applicable (see Discount Information) but before any tax is added, where applicable (see Tax Information). The item must not contain a negative value.	10 20	MOC MTC GPRS MOC MTC GPRS	Severe Severe	Syntax error. Value is negative.

	The charge is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Mandatory within group CAMEL Service Used where the charge is greater than zero. *Values:* > 0 (zero)	21 200 201	MOC MTC GPRS MOC MTC GPRS MOC MTC GPRS	Warning Severe Severe	Value is 0 (zero). CAMEL Invocation Fee not in line with roaming agreement. **Note:** Rounding rules are at the discretion of the Sender, therefore, when validating the charge applied by the Sender (by using Call Type Group information and the Sender's IOT) the Recipient must allow for a tolerance of 0.02 units of TAP Currency (independent of the number of TAP Decimal Places used for the TAP file). **Note:** No tolerance is allowed when the expected CAMEL Invocation Fee is zero. CAMEL Invocation Fee is greater than 0 (zero) and CAMEL call not expected.

					Note: The HPMN is responsible for configuring its CAMEL server appropriately to avoid the use of CAMEL service before commercial launch of CAMEL.
CAMEL Service Key	The identification of the CAMEL service logic to be applied to the IN subscriber. *Derivation:* GSM item ServiceKey (See Annex C – CS Domain Charging and PS Domain Charging). *Conditionality:* Mandatory within group CAMEL Service Used. *Range:* 0 – 2147483647 (derived from 0 to 2^31)	10 20	MOC MTC GPRS MOC MTC GPRS	Warning Warning	Syntax error. Value out of range.
CAMEL Service Level	The level of CAMEL service provided by the VPMN to the roaming CAMEL subscriber. The VPMN may vary the associated CAMEL invocation fee according to the level of service provided. The value is derived from the actual CAMEL features which have been used during the call:	10 20	MOC MTC GPRS MOC MTC GPRS	Severe Severe	Syntax error. Value out of range.

	• *Basic:* All CAMEL features excluding control of call duration and online charging. • *Medium*: All CAMEL features including control of call duration but excluding control of online charging. • *High*: All CAMEL features including control of online charging (i.e. timers set in the VMSC or SGSN [for GPRS]) but excluding control of call duration. • *Maximum:* All CAMEL features including control of online charging (i.e. timers set in the VMSC or SGSN [for GPRS]) and call duration. *Derivation:* From the definition in GSM Association PRD BA.27 [13]. *Conditionality:* Mandatory within group CAMEL Service Used where CAMEL Invocation Fee present within the call event. *Values:* 0 basic 1 medium				

	2 high 3 maximum				
CAMEL Service Used	This element is a group detailing the invocation of CAMEL services. The group must contain CAMEL Service Key. Where the CAMEL Invocation Fee is greater than zero this group must also contain the Exchange Rate Code. All other items are conditional. *Conditionality:* Must be present within groups • Mobile Originated Call • Mobile Terminated Call • GPRS Call where invocation of CAMEL services has taken place within the call.	30 31 33 35 36	MOC MTC GPRS MOC MOC MTC GPRS MOC MTC GPRS	Severe Severe Warning Severe Severe	Item CAMEL Service Level missing within group although CAMEL Invocation Fee is present and greater than zero. CAMEL Destination Number missing within group although number was modified by CAMEL (logical group 3G CAMEL Destination). Mandatory item CAMEL Service Key missing within group. GPRS Destination present within group (logical group 3G CAMEL Destination). CAMEL Destination Number present within group (logical group 3G CAMEL Destination).

		37	GPRS	Warning	Group GPRS Destination missing within group although APN was modified by CAMEL (logical group 3G CAMEL Destination).
		40	MOC MTC GPRS	Severe	Exchange Rate Code missing within the group and CAMEL Invocation Fee is greater than zero.
		41	MOC MTC GPRS	Severe	Tax Information missing within the group and CAMEL Invocation Fee is greater than zero and taxation is expected according to roaming agreement.
		42	MOC MTC GPRS	Severe	Tax Information present within the group but not expected in accordance with roaming agreement for the call/event and Tax Value referenced within the group is greater than zero.
		43	MOC MTC GPRS	Warning	Tax Information present within the group but not expected in accordance with roaming agreement for the

					call/event and Tax Value referenced within the group is not greater than zero. **Note:** Error Codes 32, 34, 38 & 39 removed in TAP release 3.11 (01 May 2005).
Cause For Termination	Indicates the reason for termination of the call where that reason is anything other than normal. *Derivation:* GSM items CauseForTerm and CauseForRecClosing(See Annex C – CS Domain Charging and PS Domain Charging). For Wi-Fi usage mapped from acct-terminate-cause (RFC 2866 [22]). For Voice over LTE network usage, IMS item CauseForRecordClosing (see Annex C - IMS Domain Charging) *Conditionality:* Must be present within groups	10 20 100	MOC MTC GPRS MSESS MOC MTC GPRS MSESS GPRS	Severe Severe Warning	Syntax error. Value out of range. Cause for termination specified and the call event represents first or intermediate partial.

	MO Basic Call Information MT Basic Call Information GPRS Basic Call Information Mobile Session where the call release is abnormal, see values below. Where the cause for termination is normal release, i.e. value 0, then the item is not present. *Values:* 1 Unsuccessful Service Delivery 3 Unsuccessful call attempt 4 Stable call abnormal termination 5 CAMEL initiated call release/Management intervention 20 Management intervention 21 Intra SGSN intersystem change 24 SGSN PLMNIDS change Values 4, 5 (CAMEL initiated call release), 20, 21 and 24 are valid within a GPRS Call context only where the call did not terminate normally. Where partial GPRS Calls are generated then only the last partial can contain a cause for termination where appropriate. Values 3, 4 and 5 (CAMEL initiated call release) are valid				

within a MOC/MTC only where the call did not terminate normally.
Values 4 and 20 are valid within a Wi-Fi context only where the call did not terminate normally. Where partial GPRS Calls for Wi-Fi usage are generated then only the last partial can contain a cause for termination where appropriate.
Values 1 and 5 (Management intervention) are valid for Voice over LTE only where the session did not terminate normally.

Note: Only the values as defined above are valid in TAP. There are other valid 3GPP values (listed in Annex C), however, they are not valid in TAP.

Following is a mapping between the RFC2866 Acct-Termination-Cause values and Cause for Termination values:

TD.57 Cause For Termination Values	**RFC2866 [22] Values**	**RFC2866 [22]22] Short Description**
<not present>	1	User Request
4	2	Lost Carrier
4	3	Lost Service

	4	4	Idle Timeout			
	4	5	Session Timeout			
	20	6	Admin Reset			
	20	7	Admin Reboot			
	4	8	Port Error			
	4	9	NAS Error			
	4	10	NAS Request			
	4	11	NAS Reboot			
	4	12	Port Unneeded			
	4	13	Port Preempted			
	4	14	Port Suspended			
	4	15	Service Unavailable			
	4	16	Callback			
	4	17	User Error			
	<not present>	18	Host Request			
Cell Identity	The identity of the cell from which the call originated or in which it terminated. *Derivation:* GSM item CellId (See Annex C – CS Domain Charging and PS Domain Charging). *Optionality:*			10	MOC MTC SS GPRS MSESS MSG	Warning	Syntax error.

	Operators may decide not to transfer the Cell Identity. *Conditionality:* Present within groups Network Location GPRS Network Location Messaging Event Mobile Session if the call originates or terminates from a mobile, i.e. not available in call divert cases (subject to optionality). Is not present for Wi-Fi usage. The Cell Identity is a two octet string (See Annex C – CS Domain Charging), except for E-UTRAN (see below). For the TAP the octets are converted to a decimal integer number in the range 0 to 65535. The leading zeros are significant only for the 2 octet strings in the standard and not in TAP. For example 0110011000110000 equates to 26160 1001110000001010 equates to 39946 0001000011110001 equates to 4337				

	The E-UTRAN Cell Identifier (ECI) consists of 28 bits (see Annex C - PS Charging Domain) Where d represents the first Octet of the ECGI (E-UTRAN Cell Global Identifier) field, the ECI encoding within the ECGI field shall start with bit 4 of octet d+3 in the E-UTRAN Cell Global Identifier field (ECGI = MCC+MNC+ECI) which is the most significant bit while bit 1 of octet d+6 is the least significant bit.				
Charge	The charge for the Charge Detail after discounts have been deducted (if applicable, see Discount Information) but before any tax is added (if applicable, see Tax Information). The Charge must not contain a negative value. The charge is in SDRs with the number of decimal places defined by item TAP Decimal Places. **Note** the currency may be subject to internal market bilateral agreements, see TAP Currency. *Example:* A call of 2 minutes duration is charged at 1 SDR per 30 seconds; the call is liable for tax at 15% and the HPMN will get the call discounted at 20%.	10 20 200	Calls Calls Calls	Severe Severe Severe	Syntax error. Value out of range. Charge not in line with roaming agreement. Charge validation must be done according to section 5.9. **Note:** This error cannot be raised where the Charge is zero (0) for the following scenarios: Mobile Terminated Calls except SMS (Teleservice Code 20 or 21) Mobile Session with Mobile Session Service “MT Voice over LTE”

	Rated charge value 4.000 SDR Discount Rate 20% Tax Rate 15% TAP fields will have the following values: Discount Value 0.800 SDR (rated charge value * Discount Rate) Charge (Charge Type 00) 3.200 SDR (rated charge value – Discount Value) Tax Value 0.480 SDR (Charge * Tax Rate) *Conditionality:* Must be present within group Charge Detail and Messaging Event. *Values:* > or = 0 (zero)				**Notes for validation rule 200**: Rounding rules are at the discretion of the Sender, therefore, when verifying the charge applied by the Sender the Recipient must allow for a tolerance of 0.02 units of TAP Currency (independently of the number of TAP Decimal Places used for the TAP file). No tolerance is allowed when the expected Charge is zero. The TAP fields to be used as a basis for the calculation of the correct Charge depends on the value of the Charged Item as follows: A: Chargeable Units (if present) D, V, W, X: Chargeable Units C: Depends on the content E: Not Applicable F: Not Applicable L: Call Event Start Timestamp Error 200 on Charge can also be raised where the total invoicable

		205	Calls	Severe	Charge, in case of more than one Charge Information group, is not in line with the roaming agreement. One example is the population of two Charge Information groups in a GPRS CDR, one for upload and one for download, where both volumes are rounded up, although the Sender's IOT specifies charging for total (aggregated) volume. CTL1 is equal to 20 (BCE Services) and charge is not set to 0 **Note:** Error Code100 & 201 removed in TAP release 3.11 (01 May 2005). **Note:** Error Code 203 removed in TAP release 3.12 (with effect from 01 May 2013).
Charge Detail	A repeating group detailing the Charge and/or charge element.	32	Calls	Warning	Associated item Charged Item is one of E,F or L

	Charge and Charge Type are mandatory items, Charged Units is optional and all other items are conditional. *Conditionality:* Mandatory within group Charge Information and Session Charge Information, at least one occurrence must be present. Note that, where a Charge has been levied, even where that Charge is zero, there must be one occurrence, and only one, with a Charge Type of '00'.	33 38 39	Calls Calls Calls	Severe Severe Severe	and item Chargeable Units present within group. Associated item Charged Item is one of D,V,W or X and item Chargeable Units not present. Mandatory item Charge Type not present within group. Mandatory item Charge not present within group. **Note:** Error Codes 30, 31, 34, 35, 36 & 37 removed in TAP release 3.11 (01 May 2005).
Charge Detail Timestamp	The timestamp showing the start of charging for the Charge Detail within which it occurs. The time is given in the local time of the Sender PMN (or Serving Network where this is not the Sender). There must be a UTC Time Offset Code associated with the timestamp.	10 20 30	Calls Calls Calls	Severe Severe Severe	Syntax error. Value out of range. Mandatory associated item UTC Time Offset Code missing.

	Note that local time is the local time at the location of the chargeable subscriber. Where the location is not available, as in some call forwarding scenarios, this will be a notional 'network local time'. *Conditionality:* Must be present within group Charge Detail where it is not the same as the associated Charging Timestamp. *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959	100 101	Calls MOC MTC GPRS	Severe Severe	Charge Detail Timestamp earlier than Charging Timestamp and the Charge associated with this Charge Detail is greater than zero (note UTC time offset must be taken into consideration). Charge Detail Timestamp is later than the end of the call (Call Event Start Timestamp plus Total Call Event Duration) and the Charge associated with this Charge Detail is greater than zero (note UTC time offset must be taken into consideration).
Charge Information	Charge information is provided for all chargeable elements except within Messaging Event and Mobile Session call events. The group must contain Charged Item and at least one occurrence of Charge Detail. *Conditionality:* One or more occurrences must be present within groups	30 31 32	Calls Calls MOC	Severe Severe Severe	Item Charged Item missing within group. Item Exchange Rate Code missing within group and one or more Charge within an associated Charge Detail is greater than zero.

	Basic Service Used. GPRS Service Used Service Centre Usage Location Service Usage		MTC GPRS		Item Call Type Group missing within group where the Charge Information relates to Basic Service Used or GPRS Service Used.
	One occurrence must be present within group Supplementary Service Used where the event is chargeable.	33 34	Calls Calls	Severe Severe	Group Charge Detail missing within group.
	One or more occurrences must be present within group Content Service Used if the service is charged through the TAP on a wholesale basis, i.e. not using Advised Charge Information for settlement. **Note 1:** For GPRS CDRs the population of Charge Information groups must follow the Sender's IOT. If the Sender's IOT specifies separate charging of outgoing and incoming volume for GPRS then a Charge Information for outgoing volume (Charged Item V) and a Charge Information for incoming volume (Charged Item W) must be populated. It is not acceptable to aggregate charging into one Charge Information with Charged Item X in such case. It is possible to reject records (error 200 on Charge) not following this rule.	35 36	Calls Calls	Severe Severe	Group Tax Information missing within group but expected in accordance with roaming agreement for that particular call. Tax Information group missing must be interpreted as Tax Value zero. Tax Value zero may be applicable to low charge calls where rounded value results in 0 charge. In this case Tax Information is not required. Note (applicable from 01 May 2015): This error cannot be raised where variable tax rates apply to the call event and tax rate range starts from zero.

	Note 2: For voice, if the Sender's IOT specifies a setup fee and a duration based charge then the setup fee can either be included into the first charging interval (population of Charge Information with Charged Item D only in this case) or separate Charge Information groups with Charged Item F and Charged Item D can be populated.	37	Calls	Severe	Group Discount Information missing within group but expected in accordance with roaming agreement.
		38	MOC MTC	Severe	Occurrence of group Charge Detail containing Charge Type '00' missing within group. More than one occurrence of Charge Detail present with the same Charge Type value.
		39	MOC MTC	Severe	Breakout of Charge Types AIR (01) and/or TOLL (03) not present on a duration based charge, but expected in accordance with roaming agreement; i.e., only Charge Type 00 present within group. This validation rule can be applied only where bilaterally agreed between sender and recipient and where the call charge is greater than 0.

		40	Calls	Severe	In accordance with roaming agreement, charges are defined in individual Charge Types, but the Charge for Charge Type 00 does not equal sum of Charges for the other Charge Types as stated within roaming agreement. This validation rule can be applied only where bilaterally agreed between sender and recipient.
		41	Calls	Warning	Group Tax Information present within group but not expected in accordance with roaming agreement for the call/event and Tax Value referenced within the group is greater than 0 (zero).
		42	Calls	Warning	Group Tax Information present within group but not expected in accordance with roaming agreement for the call/event and Tax Value referenced within the group is not greater than 0 (zero).

					Call Type Group present within group and the call event is not a MOC, MTC or GPRS Call.
Charge Refund Indicator	The Charge Refund Indicator is present when the Content Transaction represents a refund. This item, when present, will change the signs of any revenue represented within the Content Service Used occurrence. *Conditionality:* Must be present within group Content Service Used when the Content Transaction represents a refund. *Values:* 1 Refund	10 20	Content Content	Severe Severe	Syntax error. Value out of range
Charge Type	When present within Charge Detail the item identifies the type of charge represented by the Charge Detail. When present within Taxation the item identifies the type of charge associated with the applied tax referenced by the associated Tax Rate Code. Should only be present where a charge breakdown is present in Charge Detail and where the	10 11 20	Calls Acctng Calls	Severe Fatal Severe	Syntax error. Syntax error. Value out of range. Note that 'reserved' values are out of range. Note that the use of value 50 is only for use by bilateral agreement,

	tax is applicable to only a specific Charge Type rather than to the total charge. **Note:** in the 'Values' list, below, some values are identified as 'reserved'. Reserved values are not to be considered valid values, they are noted here in order to prevent their usage, were they to be used this could create inter standard roaming conversion problems. Elements containing a reserved value will fail the 'Value Out Of Range' validation check. Charge Type 50 must be used by bilateral agreement only. When present, the Charge associated with Charge Type 50 will hold the total charge for Charge Information according to the published IOT. In this case, the Charge associated with Charge Type 00 will hold the invoiceable amount that is the total charge for Charge Information according to the discounted IOT. Where Charge Type 50 is used without bilateral agreement, it can be treated as a reserved number, which can result in a severe, out of range, error where the Recipient is unable to handle this within their system. Charge Type 50, and its' associated Charge, does not affect the invoiceable value of the call event. *Conditionality:*	21 22	Acctng Acctng	Fatal Warning	use without bilateral agreement can be treated as per reserved values, that is 'out of range' Value out of range. Note that 'reserved' values are out of range. Note that the use of value 50 is only for use by bilateral agreement, use without bilateral agreement can be treated as per reserved values, that is 'out of range' Value is '00'.

	Must be present within group Charge Detail. Must be present within group Taxation when the associated Tax Rate Code references a tax applied to a specific Charge Type. Note that this is not required for Charge Type '00'. *Values:* 00 Total charge for Charge Information (the invoiceable value) 01 Airtime charge 02 reserved 03 Toll charge 04 Directory assistance 05 – 20 reserved 21 VPMN surcharge 50 Total charge for Charge Information according to the published IOT 69 – 99 reserved **Note:** The use of value 50 is only for use by bilateral agreement, use without bilateral agreement can be treated as per reserved values, that is 'out of range'				

Chargeable Subscriber	Contains the identification of the chargeable subscriber. The group must contain either the SIM Chargeable Subscriber or the MIN Chargeable Subscriber but not both. Operators may bilaterally agree to make transfer of MSISDN mandatory. *Conditionality:* Mandatory within groups MO Basic Call Information MT Basic Call Information Supplementary Service Event. Conditional within group GPRS Chargeable Subscriber.	33	MOC MTC SS GPRS	Severe	Neither of groups SIM Chargeable Subscriber nor MIN Chargeable Subscriber present within group. **Note:** Error code 32 moved to SIM Chargeable Subscriber in TD57 v32.4
Chargeable Units	The Chargeable Units item indicates the number of units which are chargeable within the Charge Detail, this may not correspond to the number of rounded units charged. The item Charged Item defines what the units represent. *Derivation:* For duration based charge; GSM item CallDuration (See Annex C – CS Domain Charging and PS Domain Charging). CallDuration is defined in seconds.	10 20 100 101	Calls Calls MOC MTC GPRS GPRS	Severe Severe Severe Severe	Syntax error. Value out of range. Chargeable Units for Charge Type ‘00’ are greater than Total Call Event Duration for Charged Item ‘D’.

	The duration related to Wi-Fi usage is defined in seconds. Where GPRS services have been used in conjunction with volume based charge; outgoing volume GSM item DataVolumeGPRSUplink incoming volume GSM item DataVolumeGPRSDownlink total volume sum of GSM items DataVolumeGPRSUplink and DataVolumeGPRSDownlink The GPRS data volumes are defined in octets Where volume is related to Wi-Fi usage then the volume is defined in octets. Where volume is related to messages (Service Centre Usage) then the message length is represented in characters. The item content reflects the chargeable not charged units.	102 103	GPRS GPRS	Severe Severe	Chargeable Units for Charge Type '00' are greater than the sum of Data Volume Incoming and Data Volume Outgoing for Charged Item 'X'. Chargeable Units for Charge Type '00' are greater than the Data Volume Outgoing for Charged Item 'V'. Chargeable Units for Charge Type '00' are greater than the Data Volume Incoming for Charged Item 'W'.

	Examples: For Duration charge: Actual duration is 73 seconds Call charged in 30 second units (i.e. 90 seconds) Chargeable Units contains 73 For SCU based volume charge: Actual message length is 17 characters Message charged in 10 character units (that is, 20 characters) Chargeable Units contains 17 *Conditionality:* Must be present within group Charge Detail where the charge is either duration based or volume based. *Values:* > or = 0				
Charged Item	This field identifies the charging principle applied and the unitisation of Chargeable Units. It is not intended to identify the service used. *Conditionality:*	10 20	Calls Calls	Severe Severe	Syntax error. Value out of range.

	Mandatory within groups Charge Information Session Charge Information *Values:* A Call set up attempt C Content D Duration based charge E Event based charge F Fixed (one-off) charge L Calendar (for example daily usage charge) V Volume (outgoing) based charge W Volume (incoming) based charge X Volume (total volume) based charge The actual value used for Charged Item by a VPMN is at their discretion and dependent on the tariff applied. The use of 'C' within a Content Transaction is for use where none of the other values are more appropriate, for example if content is charged by data volume then one of 'V', 'W' or 'X' must be used. **Call/event type Valid values**				

	Circuit switched MO and MT calls A, D, F SMS MO and SMS MT E GPRS and Wi-Fi A, D, F, L, V, W, X Location Services D, E, F, L Service Centre Usage E Content Service C, D, F, L, V, W, X Supplementary Service (including USSD) E LTE Voice MO and MT calls A, D, F				
Charged Party	Group providing information on the chargeable party. IMSI is mandatory, MSISDN and IMEI are conditional and all other items are optional. *Conditionality:* Mandatory within groups Mobile Session and Messaging Event.	30	MSESS MSG	Severe	Mandatory Item IMSI not present within group.
Charged Party Equipment	Information relating to equipment used by the Charged Party for the Content Transaction. The group, when present, must contain items Equipment Id Type and Equipment Identifier. *Conditionality:* Present within group Charged Party Information where available.	30 31	Content Content	Warning Warning	Mandatory item Equipment Id Type missing within group. Mandatory item Equipment Id missing within group.

Charged Party Home Identification	Information identifying the home environment of the Charged Party. The group when present must contain items Home Id Type and Home Identifier. This information is not required when the Home and Recipient are the same entity. *Conditionality:* One or more occurrences may be present within group Charged Party Information where available.	30 31	Content Content	Severe Severe	Mandatory item Home Id Type missing within group. Mandatory item Home Identifier missing within group.
Charged Party Id Type	An item identifying the type of Charged Party Identifier. *Conditionality:* Mandatory within group Charged Party Identification. *Values:* 1 MSISDN 2 IMSI 3 MIN (Mobile Identification Number) 4 IP Address v4 5 IP Address v6 6 Login Name for example ‘gcgGenComp’	10 20	Content Content	Severe Severe	Syntax error. Value out of range.

	7 Account Number for example 'ACC00376' 8 E-mail Address for example 'Generic.Person@Domain.com'				
Charged Party Identification	The identification of the subscriber being charged for the transaction. The group must contain items Charged Party Id Type and Charged Party Identifier. The group must contain sufficient information for the Recipient to be able to uniquely identify the Charged Party. *Conditionality:* One or more occurrences must be present within group Charged Party Information.	30 31	Content Content	Severe Severe	Mandatory item Charged Party Id Type missing within group. Mandatory item Charged Party Identifier missing within group.
Charged Party Identifier	The item holds an identifier for the Charged Party. The identifier may only be unique in conjunction with other information within the Charged Party Information, for example MIN & ESN, MSISDN & TADIG Code. The type of identifier is contained in the associated Charged Party Id Type. *Conditionality:*	10 20 100 200	Content Content Content Content	Severe Severe Severe Severe	Syntax error. Value out of range and item is a MSISDN. Item content does not match Charged Party Id Type.

	Mandatory within group Charged Party Identification.				Item is an IMSI of a known network operator and initial characters are different from the network operator's MCC + MNC, or not as as bilaterally agreed.
Charged Party Information	Information relating to the Charged Party. The group must contain at least one occurrence of group Charged Party Identification. Additional information conditionally available may include Charged Party Home Identification, Charged Party Location and Charged Party Equipment. *Conditionality:* Mandatory within group Content Transaction.	30	Content	Severe	Mandatory group Charged Party Identification missing within group.
Charged Party Location	Information on the geographical location of the Charged Party at the time of Content Transaction request. This information may not be available or relevant, for example where the content is 'timer' requested (for example weekly). Availability of this information may also be subject to local regulatory rules/laws. *Conditionality:*	30 31	Content Content	Warning Warning	Mandatory item Location Id Type missing within group. Mandatory item Location Identifier missing within group.

	Must be present within group Charged Party Information where available.				
Charged Party Status	Indicates whether the chargeable subscriber is the originating or terminating party. *Conditionality:* Mandatory within group SCU Basic Information. *Values:* 0 Originating 1 Terminating	10 20	SCU SCU	Severe Severe	Syntax error. Value out of range.
Charged Units	The Charged Units item indicates the rounded number of units which are actually charged for within the Charge Detail occurrence. This value may not correspond to the number of Chargeable Units as it represents the charged units given the pricing unitisation/segmentation, for example first segment minimum 60 seconds charged followed by 30 second unit charge. The item Charged Item defines what the units represent. The item content reflects the rounded charged not chargeable units.	10 20	Calls Calls	Warning Warning	Syntax error. Value out of range.

	Charged Units must be presented in the same unitisation as the corresponding Chargeable Units. *Examples:* For Duration charge: Actual duration is 73 seconds Call charged in 30 second units (that is 90 seconds) Charged Units contains 90 Chargeable Units contains 73 For volume charge: Actual message length is 17 characters Message charged in 10 character units (that is 20 characters) Charged Units contains 20 Chargeable Units contains 17 A volume based charge indicates that the field represents a Data Volume or, in the case of Service Centre Usage, Message Length. *Optionality:*				

	Transfer is at the discretion of the Sender PMN. *Conditionality:* Must be present within group Charge Detail where Chargeable Units is present (subject to optionality). *Values:* > or = 0				
Charging ID	A charging identifier which can be used together with GGSN address or P-GW address to identify all records produced in SSGN(s) and GGSN or in S-GW(s) and P-GW involved in a single PDP context. For Wi-Fi usage this item is unique as a Wi-Fi record always represents a complete Wi-Fi session. *Derivation:* GSM item ChargingID (PS Domain Charging – see Annex C). For Wi-Fi the derivation is at the discretion of the Sender. Note that Charging Id must remain unique (together with the recording entity) during a significant amount of time.	10 20	GPRS GPRS	Severe Severe	Syntax error. Value out of range.

	Conditionality: Mandatory within group GPRS Basic Call Information *Range:* 0 – 4294967295 (derived from 0 to 2^32-1)				
Charging Point	An indicator detailing which of the two timestamps, Deposit or Completion, was used for tariffing purposes, i.e. the Charging Point. *Conditionality:* Mandatory within group SCU Timestamps. *Values:* C Completion Timestamp D Deposit Timestamp	10 20	SCU SCU	Severe Severe	Syntax error. Value out of range.
Charging Timestamp	The timestamp showing the start of the Charge Information. This item will be present where it is not the same as an associated Call Event Start Timestamp or where there is no such associated timestamp. The time is given in the local time of the Sender PMN (or Serving Network where this is not the Sender). There must be a UTC Time Offset Code associated with the timestamp.	10 20 30 100	Calls Calls Calls MOC MTC	Severe Severe Severe Severe	Syntax error. Value out of range. Mandatory associated item UTC Time Offset Code missing.

	Note that local time is the local time at the location of the chargeable subscriber. Where the location is not available, as in some call forwarding scenarios, this will be a notional 'network local time'. *Derivation:* GSM item answerTime or seizureTime (See Annex C – CS Domain Charging and PS Domain Charging). The actual derivation will be dependent upon the charging principles used by the Sender and as defined by their IOT. *Conditionality:* Mandatory within group Supplementary Service Used where this occurs within Supplementary Service Event Within group Location Service Usage the timestamp will only be present where it is not the same as the associated LCS Request Timestamp. Within group Basic Service Used the timestamp will only be present where it is not the same as an associated Call Event Start Timestamp. *Format:*	101 200	LCS SS LCS	Severe Severe	Charging Timestamp is later than end of call (Call Event Start Timestamp plus Total Call Event Duration). Charging Timestamp is later than LCS Request Timestamp plus Response Time. Charging Timestamp before the commercial roaming start date (in VPMN local time if no other time zone explicitly agreed) for the specific service and the TAP file is not a test file.

	CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959				
CLIR Status Indicator	Indicates the CLIR status of the call originator in the case of a Mobile Originated Call (call forwarding context where Third Party Information is present), Mobile Terminated Call or a Service Centre Usage where the terminating party is the Chargeable Subscriber. *Conditionality:* Must be present within groups Call Originator Third Party Information where available. Must be present within group SCU Basic Information where available and the Charged Party Status indicates a terminating short message. *Values:* 0 Presentation allowed 1 Presentation not allowed	10 20	MOC MTC SCU MOC MTC SCU	Warning Warning	Syntax error. Value out of range.
Commission	Commission due to the Recipient.	10	Content	Severe	Syntax error.

	This information will be present when commission is applied at a transaction level. Commission must not contain a negative value. However, a negative value is implied when Charge Refund Indicator is present. Taxes are not included in the commission. Taxation is not applicable to the commission. The charge is in the Advised Charge Currency, or TAP Currency where no associated Advised Charge Currency is present, or SDRs where neither is present. The number of decimal places is defined by item TAP Decimal Places. *Conditionality:* Present within group Advised Charge Information when commission is applied at a transaction level. *Values:* > = 0	20	Content	Severe	Value out of range.

Completion Timestamp	The date/time when the service was completed, for example delivered, transmitted, deleted, time expired. The time is given in the local time of the Sender PMN (or Serving Network where this is not the Sender). There must be a UTC Time Offset Code associated with the timestamp. **Note:** local time is the local time at the location of the chargeable subscriber. Where the location is not available, as in some call forwarding scenarios, this will be a notional 'network local time'. *Conditionality:* Mandatory within group SCU Timestamps. *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959	10 11 20 21 30 31 200	SCU SCU SCU SCU SCU SCU SCU	Warning Severe Warning Severe Warning Severe Severe	Syntax error and charging point is 'D'. Syntax error and charging point is 'C'. Value out of range and charging point is 'D'. Value out of range and charging point is 'C'. Mandatory associated item UTC Time Offset Code missing and charging point is 'D'. Mandatory associated item UTC Time Offset Code missing and charging point is 'C'. Completion Timestamp before the commercial roaming start date (in VPMN local time if no other time zone explicitly agreed) for the specific service and the TAP file is not a test file.

Content Charging Point	This item identifies which timestamp represents the charging point for this transaction. The item is only present where there is more than one timestamp present within Content Transaction Basic Info. If there is only one timestamp present then that is deemed to be the charging point by default. *Conditionality:* Must be present within group Content Service Used where more than one timestamp is present within group Content Transaction Basic Info. *Values:* 1 Order Placed Timestamp 2 Requested Delivery Timestamp 3 Actual Delivery Timestamp	10 11 20 21 100	Content Content Content Content Content	Severe Warning Severe Warning Severe	Syntax error and more than one timestamp present within Content Transaction Basic Info. Syntax error and only one timestamp present within Content Transaction Basic Info. Value out of range and more than one timestamp present within Content Transaction Basic Info. Value out of range and only one timestamp present within Content Transaction Basic Info. Referenced timestamp not present within associated group Content Transaction Basic Info.
Content Provider	A group giving information additional to the Content Provider Name which identifies the Content Provider. The group may be repeated to give as many identifiers as are available to the Sender. The group may not be present where	30 31	Content Content	Warning Warning	Mandatory item Content Provider Id Type missing within group. Mandatory item Content Provider Identifier missing within group.

	either only the Content Provider Name is known or the Content Provider is the Sender. The group when present must contain items Content Provider Id Type and Content Provider Identifier. *Conditionality:* Present within group Serving Parties Information where available.				
Content Provider Id Type	An item identifying the type of Content Provider Identifier *Conditionality:* Mandatory within groups Content Provider LCS SP Identification *Values:* 1 Name text representation, for example Amazon, Interflora,Yahoo! 2 TADIG code see items Sender/Recipient for example GBRVF, DEUD1 3 URL for example www.amazon.com	10 11 20 21	Content LCS Content LCS	Warning Severe Warning Severe	Syntax error. Syntax error Value out of range. Value out of range.

	4 IP Address v4 5 IP Address v6				
Content Provider Identifier	The item holds a unique identifier of the Content Provider. The type of identifier is contained in the associated Content Provider Id Type. *Conditionality:* Mandatory within groups Content Provider LCS SP Identification	10 100 101	Content Content LCS	Warning Warning Severe	Syntax error. Item content does not match Content Provider Id Type. Item content does not match Content Provider Id Type.
Content Provider Name	This is the name of the Content Provider as it may appear on a retail invoice, for example FT Market Watch. This name may not be the same as the trading name, for example Financial Times, London. *Conditionality:* Mandatory within group Serving Parties Information *Values:* Limited to maximum 24 characters length	10 100	Content Content	Severe Severe	Syntax error Length greater than 24 characters.
Content Service Used	A group identifying the details of the actual transaction and associated charges.	30	Content	Severe	Mandatory item Content Transaction Code missing within group.

	The group must contain an occurrence of each of Content Transaction Code, Content Transaction Type, Transaction Short Description and Transaction Identifier. All other items and groups are conditionally present with one or more occurrences of Charge Information. *Conditionality:* Mandatory within group Content Transaction.	31 32 33 34 35 100	Content Content Content Content Content Content	Severe Warning Severe Severe Severe Severe	Mandatory item Content Transaction Type missing within group. Mandatory item Transaction Short Description missing within group. Mandatory item Transaction Identifier missing within group. Item Object Type missing within group and 'Pull' Content Transaction Code used within 'Streaming' Content Transaction Type. Item Object Type missing within group and 'Pull' Content Transaction Code used within 'Download' Content Transaction Type. Total Data Volume value does not equal the sum of Data Volume Incoming + Data Volume Outgoing when all items are present within group.

		101	Content	Warning	Total Data Volume and either Data Volume Incoming or Data Volume Outgoing present within group.
		102	Content	Severe	Neither of groups Charge Information or Advised Charge Information present within group.
		103	Content	Severe	Conditional item Content Charging Point missing and more than one timestamp present within associated group Content Transaction Basic Info.
Content Transaction	Content Transaction represents the charging and transactional details for delivery of content to a customer. Usage of this element is by bilateral agreement between the Sender and Recipient. The group consists of mandatory groups Content Transaction Basic Info, Charged Party Information, Serving Parties Information and one or more occurrences of Content Service Usage. Operator Specific Information may, optionally, be present one or more times.	30	Content	Severe	Mandatory group Content Transaction Basic Info missing within group.
		31	Content	Severe	Mandatory group Charged Party Information missing within group.
		32	Content	Severe	Mandatory group Serving Parties Information missing within group.
		33	Content	Severe	Mandatory group Content Service Used missing within group.

	Conditionality: Mandatory within an occurrence of group Call Event Details where none of the following are present: Mobile Originated Call, Mobile Terminated Call, Supplementary Service Event, Service Centre Usage, GPRS Call or Location Service.				
Content Transaction Basic Info	Content Transaction Basic Info provides the basic detail of when the Content Transaction was made and the result of the transaction. Group must contain one timestamp. This can be of any type, Order Placed Timestamp, Requested Delivery Timestamp, or Actual Delivery Timestamp. *Conditionality:* Mandatory within Group Content Transaction.	30 31 32 33	Content Content Content Content	Severe Warning Warning Warning	No timestamp present within group. Item RAP File Sequence Number missing and Content Transaction previously received and rejected. Item RAP File Sequence Number present and Content Transaction not previously received and rejected. Item RAP File Sequence Number present and TAP transfer batch being resubmitted as corrected (having been previously rejected with fatal error).

Content Transaction Code	A code representing the service that has been used. *Conditionality:* Mandatory within group Content Service Used. *Values:* 0 Goods 1 Email 2 Push 3 Pull 4 Trade 5 Banking 6 Online Application 7 Instant Messaging	10 20	Content Content	Severe Severe	Syntax error. Value out of range.
Content Transaction Type	The type of Content Transaction that has been used. The value of this item is dependent on the value of Content Transaction Code. *Conditionality:* Mandatory within Group Content Service Used. *Values:* 0 Not applicable (i.e. none of the values below are relevant)	10 20	Content Content	Severe Severe	Syntax error. Value out of range.

	1 Send (applicable to Email) 2 Retrieve (applicable to Email, Push, Pull, Online Applications) 3 Storage (applicable to Email, Push, Pull, Online Applications) 4 Buy (applicable to Goods, Trade) 5 Sell (applicable to Goods, Trade) 6 Pre-order (applicable to Goods) 7 Quote (applicable to Trade) 8 Message (applicable to Push, Pull) 9 Browse (applicable to Pull) 10 Combined Send/Retrieve (applicable to Email) 11 Streaming (applicable to Pull) 12 Download (applicable to Pull) 13 Point to point (applicable to Instant Messaging) 14 Point to multipoint (applicable to Instant Messaging) 15 Chat (applicable to Instant Messaging and Online Appl.) 16 Presence Information (applicable to Instant Messaging) 17 Online game (applicable to Online Appl.)				
CSE Information	The information downloaded by the CAMEL server.	10	Calls	Warning	Syntax error.

	Derivation: GSM/UMTS item Free Format Data (See Annex C – CS Domain Charging and PS Domain Charging). *Conditionality:* Must be present within group CAMEL Service Used where information has been downloaded. *Value:* Maximum 40 bytes, the value must be encoded in binary hexadecimal format as received from the CAMEL Server via the network, i.e. the data must not be modified in any way.				
Currency Conversion	The Currency Conversion table consists of three mandatory elements, an Exchange Rate Code, a Number Of Decimal Places and associated Exchange Rate. For each Chargeable Item the Exchange Rate is quoted as a code which can be looked up within this table to obtain the appropriate exchange rate. This table is used on a once-off basis and applies only to the transfer which contains it. A new table is sent with each transfer. Codes are reusable from transfer to transfer.	30 31 32 33	Acctng Acctng Acctng Acctng	Fatal Fatal Fatal Fatal	Mandatory item Exchange Rate Code missing within group. Mandatory item Number Of Decimal Places missing within group. Mandatory item Exchange Rate missing within group. More than one occurrence of group with same Exchange Rate Code

	Conditionality: At least one occurrence must be present within group Accounting Information if one or more Charge is greater than zero within the Transfer Batch, one occurrence being present for each unique Exchange Rate Code used within group Charge Information.	34	Acctng	Fatal	where Number Of Decimal Places and/or Exchange Rate are not the same. More than one occurrence of group with same Exchange Rate Code where Number Of Decimal Places and Exchange Rate are the same (i.e. duplicate Currency Conversion table entry).
Customer Id Type	An item identifying the type of associated Customer Identifier. *Conditionality:* Mandatory within groups Tracking Customer Identification Tracked Customer Identification *Values:* 1 MSISDN 2 IMSI 3 MIN (Mobile Identification Number) 4 IP Address v4 5 IP Address v6 6 Login Name for example ‘gcgGenComp’	10 20	LCS LCS	Severe Severe	Syntax error. Value out of range.

	7 Account Number for example 'ACC00376' 8 E-mail Address for example 'Generic.Person@Domain.com' where only values 1, 2 & 3 must be used within the group Tracked Customer Identification.				
Customer Identifier	The item holds an identifier for the Charged Party. The identifier may only be unique in conjunction with other information within the Charged Party Information, for example MIN & ESN, MSISDN & TADIG Code. The type of identifier is contained in the associated Customer Id Type. *Conditionality:* Mandatory within groups Tracking Customer Identification Tracked Customer Identification	20 100 200	LCS LCS LCS	Severe Severe Severe	Value out of range and item is a MSISDN. Item content does not match Customer Id Type. Item is an IMSI of a known network operator and initial characters are different from the network operator's MCC + MNC, or not as bilaterally agreed

4.4 D

Data Interchange	A TAP Data Interchange must contain either a Transfer Batch, where there is data available for transfer, or a Notification file where there is no data available for transfer. For technical reasons trailing characters may be present after the group Data Interchange. Such characters should be ignored. For more details see section 5 (Classification Of Errors).				
Data Volume Incoming	The Data Volume Incoming identifies the number of incoming octets (bytes) within an occurrence of GPRS Service Used or Content Service Used. *Derivation:* GSM item dataVolumeGPRSDownlink (PS Domain Charging – see Annex C). For Wi-Fi usage items Acct-Input-Octets (RFC 2866 [22]) and Acct-Input-Gigawords (RFC 2869 [23]) converted into octets. *Conditionality:* Mandatory within group GPRS Service Used. Present within group Content Service Used when available.	10 20	GPRS Content GPRS Content	Severe Severe	Syntax error. Value out of range.

	Values: > or = 0 (zero)				
Data Volume Outgoing	The Data VolumeOutgoing identifies the number of outgoing octets (bytes) within an occurrence of GPRS Service Used or Content Service Used. *Derivation:* GSM item dataVolumeGPRSUplink (PS Domain Charging – see Annex C). For Wi-Fi usage items Acct-Output-Octets (RFC 2866 [22]) and Acct-Output-Gigawords (RFC 2869 [23]) converted into octets. *Conditionality:* Mandatory within group GPRS Service Used. Present within group Content Service Used when available. *Values:* > or = 0 (zero)	10 20	GPRS Content GPRS Content	Severe Severe	Syntax error. Value out of range.
Default Call Handling Indicator	Indicates whether or not a CAMEL call encountered default handling. *Derivation:* For non SMS GSM CAMEL calls:	10 20	MOC MTC GPRS MOC	Warning Warning	Syntax error. Value out of range.

	GSM item DefaultCallHandling (See Annex C – CS Domain Charging). For non SMS GPRS CAMEL calls: GSM item DefaultGPRS-Handling (See Annex C – PS Domain Charging). For all SMS CAMEL calls: GSM item DefaultSMS-Handling (See Annex C – CS Domain Charging and PS Domain Charging). *Conditionality:* Must be present within group CAMEL Service Used where the call has invoked default call handling otherwise it must not be present. *Values:* 0 Continue the call 1 Release the call		MTC GPRS		
Deposit Timestamp	The date/time when the message was deposited at the Service Centre. The time is given in the local time of the Sender PMN (or Serving Network where this is not the Sender). There must be a UTC Time Offset Code associated with the timestamp.	10 11 20	SCU SCU SCU	Warning Severe Warning	Syntax error and charging point is 'C'. Syntax error and charging point is 'D'. Value out of range and charging point is 'C'.

	Note that local time is the local time at the location of the chargeable subscriber. Where the location is not available, as in some call forwarding scenarios, this will be a notional 'network local time'. *Conditionality:* Mandatory within group SCU Timestamps. *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959	21 30 31 200	SCU SCU SCU SCU	Severe Warning Severe Severe	Value out of range and charging point is 'D'. Mandatory associated item UTC Time Offset Code missing and charging point is 'C'. Mandatory associated item UTC Time Offset Code missing and charging point is 'D'. Deposit Timestamp before the commercial roaming start date (in VPMN local time if no other time zone explicitly agreed) for the specific service and the TAP file is not a test file.
Destination	The Destination indicates the number dialled by the subscriber (Called Number) or the SMSC Address in case of SMS usage or in cases involving supplementary services such as call forwarding or transfer etc., the number to which the call is routed.	39 40	MOC MOC	Severe Severe	Neither item Called Number nor item Dialled Digits present within call and call does not represent an emergency call (as defined in chapter 5.7).

	The element contains additional optional information detailing the geographical destination of the call and, where available and appropriate, Dialled Digits and SMS Destination Number. *Conditionality:* Must be present within group MO Basic Call Information except where there is no number present on the air interface, for example emergency calls.	41 42 43	MOC MOC MOC	Severe Severe Severe	Item Called Number contains only country code and item Dialled Digits not present Item Called Number not present and item CAMEL Destination Number not present and call neither an unsuccessful call attempt nor an emergency call (as defined in chapter 5.7). Called Number not present and call represents SMS usage. Called Number contains CAMEL Routing Number and Dialled Digits not present. **Note:** Error code 43 can only be raised by HPMNs which have populated CAMEL Routing Numbers in their IR.21.

					Note: Error codes 31, 32, 33, 34, and 35 removed in TAP release 3.10 (01 May 2003). **Note:** Error Codes 30, 37 & 38 removed in TAP release 3.11 (01 May 2005).
Destination Network	The network towards which the call or message is routed. *Conditionality:* Must be present within group MO Basic Call Information where optimal routing is used. Must be present within group SCU Basic Information where available except where a short message has not been delivered. The full list of codes in use is given in PRD TD.13 [14]. *Example* GBRCN GBRVF DEUD1 DEUD2	10 20	SCU MOC SCU MOC	Warning Warning	Syntax error. Value out of range.
Dialled Digits	The Dialled Digits item contains the actual digits as dialled by the subscriber, i.e. unmodified, in establishing a call. This will contain '+' and '#' where appropriate.	10 20	MOC MOC	Severe Severe	Syntax error. Value out of range.

	The Dialled Digits item should contain everything the subscriber has entered before the send button is pushed (for example, pre-entered menu selections for voicemail). For emergency calls operators may optionally insert the digits '112' or their national emergency number into the Dialled Digits. *Conditionality:* Must be present within group Destination when available from the network. If Called Number is not present then, in the case of either unsuccessful call attempt or CAMEL call with presence of CAMEL Destination Number, Dialled Digits must be present. If Dialled Digits is not available from the network then Called Number must be present. *Values:* Each digit is numeric (0-9) or contains '+', '*' or '#'	21	MOC	Severe	Contains CAMEL Routing Number. **Note:** Error code 21 can only be raised by HPMNs which have populated CAMEL Routing Numbers in their IR.21.

	Note: The network may translate a dialled * to A and a dialled # to B. Where this is done then TAP must contain the original values of * or # as actually dialled by the subscriber.				
Discount Applied	Discount Applied is one of Fixed Discount Value or Discount Rate. *Conditionality:* Mandatory within group Discounting.				
Discount Code	A code associated with the Discount Applied. *Conditionality:* Mandatory within groups Discounting Discount Information *Values:* Range 0 .. 99	10 11 20 102 200	Calls Acctng Acctng Calls Calls	Severe Fatal Fatal Severe Severe	Syntax error. Syntax error. Value out of range. Specified discount code was not defined in group Discount Applied. Referenced discount is not in line with roaming agreement.
Discount Information	Information identifying any call level discounts given via a discount agreement between the Sender and Recipient.	30	Calls	Severe	Mandatory item Discount Code missing within group.

	A Discount Code must be present. Where the Discount Code refers to a Discount Rate then the Discount Value and Discountable Amount must also be present, where the Discount Code refers to a Fixed Discount Value then the Discount Value and Discountable Amount must not be present. *Conditionality:* Must be present within group Charge Information where discounts have been applied to the Charge Information. Must be present within group CAMEL Service Used where discounts have been applied to the CAMEL Invocation Fee.	31 32	Calls Calls	Severe Severe	Item Discount Value missing within group and Discount Code refers to a Discount Rate. Item Discountable Amount missing within group and Discount Code refers to a Discount Rate.
Discount Rate	The rate of discount applied to Charge Information where a percentage discount was applied as opposed to a fixed discount. The rate is held to 2 decimal places. *Conditionality:* Mandatory where no Fixed Discount Value present within group Discount Applied. *Values:* 0.00 thru 100.00	10 20	Acctng Acctng	Fatal Fatal	Syntax error. Value out of range.

Discount Value	The actual value of a discount element applicable to Charge Information where that discount is not a Fixed Discount Value. The Discount Value must be a positive value, i.e. greater than zero. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Must be present within group Discount Information where the Discount Code refers to a Discount Rate. *Values:* > 0 (zero)	10 20 22	Calls Calls Calls	Severe Severe Severe	Syntax error. Value out of range. Where the associated Discount Code relates to a Discount Rate, the Discount Value does not correspond to the Discountable Amount and Discount Rate. **Note:** Rounding rules are at the discretion of the Sender and a tolerance of 0.02 units of TAP Currency must be allowed (independent of the number of TAP decimal places used for the TAP file). **Note:** No tolerance is allowed when the expected Discount Value is zero.
Discountable Amount	The actual part of the Charge/Tax/CAMEL Invocation Fee to which the Discount Value and Discount Rate (Code) relate. The Discountable Amount must have a value greater than zero.	10 20 22	Calls Calls Calls	Severe Severe Severe	Syntax error. Value out of range. Discountable Amount is not in line with roaming agreement.

	The value is in SDRs with the number of decimal places defined by TAP Decimal Places. Note that the currency may be subject to internal market bilateral agreements, see TAP Currency. The Discountable Amount may include sum of all tax values, charges and CAMEL invocation fees or any part thereof. *Conditionality:* Must be present within group Discount Information where the associated Discount Code relates to a Discount Rate. *Values:* > 0 (zero)				
Discounting	A table containing discount information where the discount is applied at call level, as defined by a discount agreement between the Sender and Recipient. This table is used on a once-off basis and applies only to the transfer which contains it. A new table is sent with each transfer. Codes are reusable from transfer to transfer. *Conditionality:*	30 31 32	Acctng Acctng Acctng	Fatal Fatal Fatal	Mandatory group Discount Applied missing within group. Mandatory item Discount Code missing within group. More than one occurrence of group with same Discount Code where group Discount Applied is not the same.

	Mandatory within group Accounting Information where group Discount Information is present within Charge Information. One occurrence must be present for each unique Discount Code used within group Discount Information.	33	Acctng	Fatal	More than one occurrence of group with same Discount Code where group Discount Applied is the same (i.e. duplicate Discounting table entry).
Distance Charge Band Code	A code corresponding to a group of countries where a specific tariff is applied. The correspondence between a value and a specific group of countries, and hence tariff, is defined by the Sender PMN. The list of the countries for each area must be defined by the charging operator and specified in the SMS bilateral agreement. *Conditionality:* Must be present within group SCU Charge Type where distance has been a parameter used to calculate the Charge. *Values:* A Area A B Area B C Area C etc.	10 20	SCU SCU	Severe Severe	Syntax error. Value out of range.

4.5 E

Earliest Call Timestamp	The Earliest Call Timestamp is, as it implies, the earliest start of charging timestamp on any record. It is not necessarily the start of charging timestamp of the first charge record on the file. The timestamp contains the same timestamp as that of the earliest Call Event Details when all times have been normalised to UTC time. Where the batch contains SCU records either the completion or deposit timestamp must be taken into account according to the charging point value. When the batch contains Content Transaction call/events the Content Charging Point value must be taken into account if more than one of Order Placed Timestamp, Requested Delivery Timestamp or Actual Delivery Timestamp are present in the call/event. If only a single timestamp is present then this is taken as the charging point. If a Content Transaction contains more than one Content Charging Point then the earliest timestamp referenced must be used to derive the Earliest Call Timestamp.	10 20 30 100	Audit Audit Audit Audit	Warning Warning Warning Warning	Syntax error. Value out of range. Mandatory associated item UTC Time Offset missing. The timestamp does not match the timestamp of the earliest Call Event Detail Timestamp.

	When the batch contains Messaging Event or Mobile Session call/events the Service Start Timestamp value must be taken into account. Timestamps from calls with severe errors must also be taken into account if possible i.e. no type 10 or 20 errors occurred in the timestamp field The time is given in the local time of the Sender (or Serving Network where this is not the Sender). There must be a UTC Time Offset associated with the timestamp. *Optionality:* Transfer is at the discretion of the Sender PMN. *Conditionality:* Mandatory within group Audit Control Information subject to optionality. *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959				

Element ID	The identification of the network element which enables the Messaging Event. *Derivation:* For SMSC (See Annex C – CS Domain Charging and PS Domain Charging) (Msisdn). For S-CSCF and SM-IP-GW (see Annex C - SMS Charging) (ipv4 or ipv6 address) *Conditionality* Mandatory within group Network Element	10	MSG	Severe	Syntax Error
Element Type	The item identifying the type of network element. *Conditionality:* Mandatory within group Network Element. *Values:* SMSC (Short Message Service Centre) S-CSCF (Serving Call Session Control Function) SM-IP-GW (Short Message IP Gateway)	10 20	MSG MSG	Severe Severe	Syntax error. Value out of range
Equipment Id	An item that uniquely identifies the equipment used by the Charged Party.	10	Content	Warning	Syntax error.

	The type of identifier is contained in the associated Equipment Id Type. *Conditionality:* Mandatory within groups Charged Party Equipment Tracking Customer Equipment Tracked Customer Equipment.	100	Content LCS	Warning	Item content does not match Equipment Id Type.
Equipment Id Type	An item representing the type of Equipment Id. *Conditionality:* Mandatory within groups Charged Party Equipment. Tracking Customer Equipment Tracked Customer Equipment *Values:* 0 IMEI 1 ESN	10 20	Content LCS Content LCS	Warning Warning	Syntax error. Value out of range.
Equipment Identifier	A conditional group element which identifies the equipment used. The information present must be one of either IMEI or ESN.				

	Conditionality: Mandatory within groups Supplementary Service Event Mobile Originated Call Mobile Terminated Call GPRS Call where available from the network.				
ESN	The Electronic Serial Number. The identifier which uniquely identifies the equipment used by the subscriber during the call. This is a non GSM equipment identifier. *Derivation:* CIBER manual v2.0 section 12 [9]. *Conditionality:* Must be present within group Equipment Identifier where available. Will not be present where the terminal equipment is not involved in the call for example in forwarded call cases or the mobile equipment is identified by an IMEI.	10 20	MOC MTC SS GPRS MOC MTC SS GPRS	Warning Warning	Syntax error. Value out of range.
Event Reference	The Event Reference uniquely identifies a particular mobile session or messaging event, for example initiated by a SIP invitation. A single multimedia conference can give rise to several mobile sessions with different Event references, for	10	MSESS MSG	Severe	Syntax error.

	example, if a user invites a single individual several times to the same (long-running) conference. *Derivation:* IMS item IMS Charging Identifier See Annex C - IMS Charging Domain **Note:** for non IMS services (future use) the Event Reference needs to be defined on a case by case basis. *Conditionality:* Mandatory within groups Mobile Session Messaging Event				
Exchange Rate	The Exchange Rate is the exchange rate expressed as the number of units of Local Currency to one unit of the currency used in the TAP file. **Note** that, while SDR is usually the currency used in the TAP file, the currency may be different based on bilateral agreement and, where so agreed, will be indicated by the currency code in the TAP Currency element, see TAP Currency. For information on how exchange rates are calculated see PRD BA.11 [11][11].	10 200 201	Acctng Acctng Acctng	Fatal Fatal Fatal	Syntax error Exchange Rate less than expected (see BA.11 [11]) and applied to one or more Charges and at least one of the Charges the Exchange Rate is applied to is greater than zero. Exchange Rate higher than expected (see BA.11 [11]) and applied to one or more Charges.

	BA.11 [11] also defines what currencies are officially published by the GSER (GSMA Standardised Exchange Rates) tool, including launch dates for each currency. The number of decimal places present is indicated by the associated Number Of Decimal Places item. A minimum of 5 significant digits must be present in TAP except where the TAP Currency is the same as the Local Currency. **Note:** If the full number of significant digits as published in accordance with BA.11 [11] cannot be supported by the Sender, it is allowed to round to the number of significant digits that the Sender can support. It is allowed both to round up or down to the nearest value that can be defined using a minimum of 5 significant digits. If the Sender is able to support all significant digits as published, it must of course populate all significant digits in TAP. If the published value already contains only 5 significant digits or even less, no rounding must be applied by the Sender (trailing zeros are not significant). *Examples:*				**Note 1:** For all currencies not published by GSER: A tolerance of 2 units must be allowed on the 5th significant digit on the calculated exchange rate. **Note 2:** For all currencies published by GSER: To allow for cases where rounding could be applied by the Sender, the Recipient must allow for a tolerance to support the fact that the Sender can round either up or down to the number of significant digits it can support in TAP (see examples). At a minimum 5 significant digits must be present in TAP. **Note 3:** The rule for Exchange Rate higher than expected applies even where a charge is zero (0) as an Exchange Rate higher than expected can result in a Charge of zero due to rounding during rating.

	0.112233 can be rounded to 0.11223 or 0.11224. 123.456000 can be rounded to 123.45 or 123.46. 123.450000 must not be rounded, as it already contains only 5 significant digits (123.45). 123.400000 must not be rounded, as it already contains only 4 significant digits (123.4). *Conditionality:* Mandatory within group Currency Conversion.				Note 1 and Note 2 are applicable to both Exchange Rate less than and higher than expected validation (error codes 200 & 201).
Exchange Rate Code	A code associated with an Exchange Rate. In order to calculate the SDR value in TAP the local currency is divided by the exchange rate. In case the amount of local currency is divided by an exchange rate holding a lower value (i.e. the exchange rate is less than expected). The SDR amount will be higher and the VPMN actually overcharge the HPMN, especially if netting is in place. In case the amount of local currency is divided by an exchange rate holding a higher value (i.e. the exchange rate is greater than expected). The SDR amount will be lower and the VPMN	10 11 20 101	Acctng Calls Acctng Calls	Fatal Severe Fatal Severe	Syntax error. Syntax error Value out of range. Specified Exchange Rate Code not defined in group Currency Conversion. **Note:** Error code 200 removed in TAP release 3.11 (01 May 2005).

	actually undercharge the HPMN, especially if netting is in place. *Conditionality:* Mandatory within group Currency Conversion. Must be present within group Charge Information and Session Charge Information where a Charge greater than zero is present within any Charge Detail associated with the same Charge Information. Must be present within group CAMEL Service Used where the CAMEL Invocation Fee is greater than 0 (zero). Must be present within group Messaging Event where the Charge is greater than 0 (zero). Must be present within group Aggregated Usage Record when Aggregated Usage Charge is greater than zero. *Values:* Range 0 .. 99				**Note:** Error code 202 removed in TAP release 3.12 (01 May 2016).

4.6 F

File Available Timestamp	The date and time at which the file was made available to the Recipient PMN. **Note:** Where the Sender uses an agent for file transfer, this is the date and time the agent makes the file available to the Recipient or the Recipient's agent. Physically this will normally be the timestamp when the file transfer commenced to the Recipient PMN, i.e. start of push, however on some systems this will be the timestamp when the file was made available to be pulled. The time is given in the local time of the Sender PMN. There must be a UTC Time Offset associated with the item. **Note:** Where the Sender uses an agent for file transfer, the Timestamp and the UTC Time Offset could be that of the agent. Note that where a file is being resubmitted, for example where the file contained a fatal error on earlier submission, this timestamp must not contain the original timestamp, i.e. the item contains the timestamp when the file was made available on resubmission. *Conditionality:*	10 11 20 21 30 31 100 101 102	Btch Ctrl Notifictn Btch Ctrl Notifictn Btch Ctrl Notifictn Btch Ctrl Btch Ctrl Notifictn	Fatal Warning Fatal Warning Fatal Warning Fatal Warning Warning	Syntax error. Syntax error. Value out of range. Value out of range. Mandatory associated item UTC Time Offset missing. Mandatory associated item UTC Time Offset missing. Timestamp is earlier than the Transfer Cut Off Timestamp. Timestamp is earlier than the File Creation Timestamp. Timestamp is earlier than the Transfer Cut Off Timestamp.

	Mandatory within groups Batch Control Information Notification *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959	103 104 105	Notifictn Btch Ctrl Notifictn	Warning Fatal Warning	Timestamp is earlier than the File Creation Timestamp. Timestamp is more than one hour after the file received time at the HPMN. **Note:** The tolerance of one hour has been introduced as it cannot be guaranteed that Sender and Recipient system clocks are synchronised, in particular around daylight saving (wintertime/summertime) changes. Timestamp is after the file received time at the HPMN
File Creation Timestamp	The timestamp at which the TAP file was created. The time is given in the local time of the Sender PMN. There must be a UTC Time Offset associated with the item. *Optionality:* Senders may choose not to supply this information. *Conditionality:* Mandatory within groups	10 20 30 100	Notifictn Btch Ctrl Notifictn Btch Ctrl Notifictn Btch Ctrl Notifictn	Warning Warning Warning Warning	Syntax error. Value out of range. Mandatory associated item UTC Time Offset missing.

	Notification Batch Control Information subject to optionality. *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959		Btch Ctrl		Timestamp is earlier than the Transfer Cut Off Timestamp.
File Sequence Number	A unique reference which identifies each TAP Data Interchange sent by one PMN to another, specific, PMN. The sequence commences at 1 and is incremented by one for each subsequent TAP Data Interchange sent by the Sender PMN to a particular Recipient PMN. Separate sequence numbering must be used for Test Data and Chargeable Data. Having reached the maximum value (99999) the number must recycle to 1. Note that in the case of retransmission for any reason this number is not incremented.	10 20 100 200 201	Notifictn Btch Ctrl Notifictn Btch Ctrl Notifictn Btch Ctrl Notifictn Btch Ctrl Notifictn Btch Ctrl	Fatal Fatal Fatal Warning Fatal	Syntax error. Value out of range. The item does not match the File Sequence Number on the filename. File sequence number of the received file is greater than that expected File sequence number of the received file has already been received and

	Note that where the file sequence number is being reused with a file already received and successfully processed and the content of the two files is different, then the received file is to be considered as 'invalid reused sequence number' and rejected using the RAP process. Where the content of the two files is the same then the file is to be considered as a 'copy' of the original file and should be ignored (i.e. not rejected). *Conditionality:* Mandatory within groups Notification Batch Control Information. *Range:* 00001 – 99999 for Test Data 00001 – 99999 for Chargeable Data				successfully processed and the file is not a copy of the original file. **Note:** This error can also be raised if the original file details are not available (for example DCH migration scenario).
File Type Indicator	Indicates the type of data contained within the file, i.e. test or chargeable data. **Note:** Some values are reserved for proprietary use on internal interfaces; these values are considered out of range unless bilateral usage is agreed. *Conditionality:*	10 20	Btch Ctrl Notifictn Btch Ctrl Notifictn	Fatal Fatal	Syntax error. Value out of range.

	Present within groups Notification Batch Control Information where the file represents test data only, not present where the data is 'live' chargeable data. *Values:* T Test Data [Values B, H, S and V are reserved for proprietary use]				
Fixed Discount Value	The value of a fixed discount applied to a Call Event Details. The Fixed Discount Value must contain a positive value. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Mandatory where no Discount Rate present within Discount Applied. *Values:* > 0 (zero)	10 20	Acctng Acctng	Fatal Fatal	Syntax error. Value out of range.

Fixed Network User Rate	The Fixed Network (for example PSPDN) User Rate. *Derivation:* Bearer Capability Element, octet 6d, (See Annex C – CS Domain Charging). The value is derived by interpreting the 5 least significant bits of octet 6d as a binary number and converting it into an integer. *Conditionality:* Must be present within group Basic Service where a General Bearer Service has been invoked except where the item is not applicable, i.e. value is zero (0) or not available. *Values:* 1 9.6 kbits per second 2 14.4 kbits per second 3 19.2 kbits per second 4 28.8 kbits per second 5 38.4 kbits per second 6 48 kbits per second 7 56 kbits per second	10 20	MOC MTC MOC MTC	Warning Warning	Syntax error. Value out of range.

	8 64 kbits per second				

4.7 G

Geographical Location	Identifies the Geographical Location of the terminal equipment. All of the information within the group is optional (except for Wi-Fi usage as described under Conditionality below) and may not be available where the terminal was not involved in the call, for example call forwarding scenarios.	30	MOC MTC SS GPRS MSG MSESS	Warning	Item Serving Location Description is not present and Serving BID is present within group.
	Operators may bilaterally agree to make transfer of Serving BID and/or Serving Location Description mandatory. Exchange of the Serving Network element requires bilateral agreement. *Conditionality:* Must be present within group Location Information if the call involves the terminal equipment or if the Serving Network is different from the Sender.	31	MOC MTC SS GPRS MSG MSESS	Severe	Serving BID missing within group but expected in accordance with roaming agreement.
		32	MOC MTC SS GPRS	Severe	Serving Location Description missing within group but expected in accordance with roaming agreement.

	Must be present within group GPRS Location Information where available or if the Serving Network is different from the Sender. Must be present within group GPRS Location Information for Wi-Fi usage. Must be present within group Messaging Event where available or if the Serving Network is different from the Sender. Must be present within group Mobile Session where available or if the Serving Network is different from the Sender.	 33 34	MSG MSESS GPRS MOC MTC SS GPRS MSG MSESS	 Severe Severe	 Item Serving Location Description not present for Wi-Fi usage. Serving Network element present and its exchange not bilaterally agreed.
GPRS Basic Call Information	GPRS Basic Call Information provides the basic detail to identify the chargeable subscriber together with other core information. It comprises mandatory GPRS Chargeable Subscriber, GPRS Destination, Call Event Start Timestamp, Total Call Event Duration and Charging Id details together with conditional RAP File Sequence Number, Network Init. PDP Context, Partial Type Indicator and Cause For Termination information.	30 31 32	GPRS GPRS GPRS	Severe Warning Severe	Mandatory group GPRS Chargeable Subscriber missing within group. Item RAP File Sequence Number is missing and GPRS Call previously received and rejected. Mandatory group GPRS Destination missing within group.

	Conditionality: Mandatory within group GPRS Call.	33	GPRS	Severe	Mandatory item Call Event Start Timestamp missing within group.
		34	GPRS	Severe	Mandatory item Total Call Event Duration missing within group.
		35	GPRS	Severe	Mandatory item Charging Id missing within group.
		38	GPRS	Warning	Item RAP File Sequence Number present and TAP transfer batch being resubmitted as corrected (having been previously rejected with fatal error).
		41	GPRS	Warning	Item RAP File Sequence Number present and call not previously received and rejected.
		42	GPRS	Warning	Item Network Init. PDP Context present within group for Wi-Fi usage.
		43	GPRS	Severe	Item Partial Type Indicator present within group for Wi-Fi usage.

					Note: Error codes 36 & 37 removed in TAP release 3.10 (01 May 2003). **Note:** Error codes 39 & 40 removed in TAP release 3.11 (01 May 2005).
GPRS Call	GPRS Call is used to represent packet switched service usage. It consists of the mandatory information GPRS Basic Call Information, GPRS Location Information, and GPRS Service Used. Equipment Identifier will be present where available. Optionally Operator Specific Information may be supplied. This call event is also used for Wi-Fi usage. Where CAMEL services are supported and invoked then one occurrence of CAMEL Service Used will be present for the invocation. *Conditionality:* Mandatory within an occurrence of group Call Event Details where none of the following is present; Mobile Originated Call, Mobile Terminated Call, Supplementary Service Event, Service Centre Usage, Content Transaction or Location Service.	31 32 34 200	GPRS GPRS GPRS GPRS	Severe Severe Severe Warning	Mandatory group GPRS Basic Call Information missing within group. Mandatory group GPRS Location Information missing within group. Mandatory group GPRS Service Used missing within group. Number of GPRS partials received exceeds limit defined in BA.12 [12]. **Note:** Error codes 30, 35 & 201 removed in TAP release 3.11 (01 May 2005).

GPRS Chargeable Subscriber	Identifies the chargeable subscriber for the use of GPRS. Group Chargeable Subscriber and items PDP Address and Network Access Identifier are all conditional. For packet switched data usage (except Wi-Fi) group Chargeable Subscriber and item PDP Address must be present. For Wi-Fi usage one of either group Chargeable Subscriber or item Network Access Identifier must be present. Item PDP Address is not present. *Conditionality:* Mandatory within group GPRS Basic Call Information.	30 32 34 35	GPRS GPRS GPRS GPRS	Severe Warning Severe Severe	Item Chargeable Subscriber missing within group and the GPRS Call does not representWi-Fi usage. Item PDP Address missing within group and GPRS Call does not represent Wi-Fi usage. Neither item Network Access Identifier nor group Chargeable Subscriber present within group. Item Network Access Identifier present within group and the GPRS Call does not representWi-Fi usage. **Note:** Error codes 31 & 33 removed in TAP release 3.11 (01 May 2005).
GPRS Destination	Identifies the Access Point Name (Network Identifier and Operator Identifier parts). Within GPRS Basic Call Information this item must always contain the actual connected APN.	30 31	GPRS GPRS	Severe Warning	Mandatory item Access Point Name NI missing within group. Item Access Point Name OI missing within group. Note, this validation is only applicable where the serving

	In case of CAMEL invocation an additional instance of GPRS Destination may be present within group CAMEL Service Used. Where relevant it must be populated with the original APN as entered by the customer where it is available from the network. *Conditionality:* Mandatory within group GPRS Basic Call Information. Must be present within group CAMEL Service Used where the GPRS Destination has been modified by the CAMEL server and where it is available from the network.	32 34	GPRS GPRS	Warning Warning	network has upgraded to at least GSM Release '98. Note that this validation is not applicable to Wi-Fi usage. Item Access Point Name OI present within group for Wi-Fi usage. Mandatory item Access Point Name NI missing within group where it occurs within group 3G CAMEL Destination. **Note:** Error code 33 removed in TAP release 3.11 (01 May 2005).
GPRS Location Information	The GPRS Location Information identifies the GPRS Network Location, where appropriate, the Geographical Location and, optionally, the Home Location Information. *Conditionality:* Mandatory within group GPRS Call.	30 31 32	GPRS GPRS GPRS	Severe Severe Severe	Mandatory group GPRS Network Location missing within group. Group Geographical Location missing for Wi-Fi usage. Group Geographical Location missing but Serving BID expected in accordance with roaming agreement.

		33	GPRS	Severe	This validation rule can be applied only where bilaterally agreed between Sender and Recipient. Group Geographical Location missing but Serving Location Description expected in accordance with roaming agreement. This validation rule can be applied only where bilaterally agreed between Sender and Recipient.
GPRS Network Location	Identifies the mandatory GGSN/P-GW Address and SGSN/S-GW Address(es) using Recording Entity Codes (see Recording Entity Code). Location Area Code is present where available and Cell Identity is optionally present when available. For Wi-Fi usage this group will contain one Recording Entity Code for the Wi-Fi billing information recording entity. *Conditionality:* Mandatory within group GPRS Location Information.	31 32 33	GPRS GPRS GPRS	Severe Severe Severe	More than one Recording Entity Code is of type GGSN present within group. No Recording Entity Code of type GGSN and no Recording Entity Code of type P-GW present within group and not Wi-Fi usage. No Recording Entity Code of type SGSN and no Recording Entity Code of type S-GW present within group and not Wi-Fi usage.

		34	GPRS	Severe	For Wi-Fi usage, no Recording Entity Code of type Wi-Fi billing information recording entity present within group.
		35	GPRS	Severe	For Wi-Fi usage, more than one Recording Entity Code present within group.
		36	GPRS	Warning	For Wi-Fi usage, item Location Area Code present within group.
		37	GPRS	Warning	For Wi-Fi usage,item Cell Identity present within group.
		38	GPRS	Severe	Location Area Code missing within group but expected in accordance with roaming agreement. **Note:** This error cannot be raised for Wi-Fi usage.
		39	GPRS	Severe	More than one Recording Entity Code is of type P-GW present within group.
		40	GPRS	Severe	

					Recording Entity Codes of type GGSN and P-GW present within group.
GPRS Service Used	The GPRS Service Used group identifies the Data Volume Incoming and Outgoing together with Charging Information. Presence of the IMS Signalling Context will identify where the context represents IMS signalling only. *Conditionality:* Mandatory within group GPRS Call.	32 33 34	GPRS GPRS GPRS	Severe Severe Severe	Mandatory group Charge Information missing within group. Mandatory item Data Volume Incoming missing within group. Mandatory item Data Volume Outgoing missing within group. **Note:** Error code 30 removed in TAP release 3.11 (01 May 2005).
GSM Chargeable Subscriber	A group containing IMSI and/or MSISDN details of the SCU Chargeable Subscriber. The group must contain either one of IMSI or MSISDN but it will contain both where they are both available. *Conditionality:* Must be present within group SCU Chargeable Subscriber where MIN is not present.	30	SCU	Severe	Neither IMSI or MSISDN present within group.
Guaranteed Bit Rate	Describes the bitrate the UMTS bearer service must guarantee to the user or application for circuit switched UMTS.	10	MOC MTC	Severe	Syntax Error.

	Derivation: Item Guaranteed Bit Rate, see Annex C – CS Domain Charging. *Conditionality:* Mandatory within group Basic Service where available from the network. *Values:* 1 14400bps 2 28800bps 3 32000bps 4 33600bps 5 56000bps 6 57600bps 7 64000bps	20	MOC MTC	Severe	Value out of range.

4.8 H

Home BID	The Home BID (Billing Identifier) is a code identifying the home market area of the Chargeable Subscriber.	10	Calls	Warning	Syntax error.

	Derivation: CIBER manual v2.0 section 12 [9]. *Conditionality:* Mandatory within group Home Location Information. Optional within group Charged Party at the discretion of the Sender PMN.	20	Calls	Warning	Value out of range.
Home Id Type	This item gives the type of Home Identifier associated with it. *Conditionality:* Mandatory within groups Charged Party Home Identification Tracking Customer Home Id Tracked Customer Home Id. *Values:* 1 Name — Text representation, for example BT, Telecom Italia, Commerzbank 2 TADIG Code — See item Sender or Recipient, for example GBRVF, DEUD1 3 Home BID — See item Home BID	10 20	Content LCS Content LCS	Severe Severe	Syntax error. Value out of range.

	4 Home Location Description See item Home Location Description.				
Home Identifier	The item holds a unique identifier of the Charged Party's Home. This may be, for example, a mobile network, fixed network, banking institution etc. The type of identifier is contained in the associated Home Id Type. *Conditionality:* Mandatory within groups Charged Party Home Identification Tracking Customer Home Id Tracked Customer Home Id.	10 100	Content Content LCS	Severe Severe	Syntax error. Item content does not match Home Id Type.
Home Location Description	A text description giving the home market area of the Chargeable Subscriber. *Derivation:* CIBER manual v2.0 section 12 [9]. *Conditionality:* Mandatory within group Home Location Information.	10	Calls	Warning	Syntax error.

	Optional within group Charged Party at the discretion of the Sender PMN.				
Home Location Information	Home Location Information is an optional group which, when present must contain a Home BID and Home Location Description. *Optionality:* Optional within groups Location Information GPRS Location Information at the discretion of the Sender PMN.	30 31	Call Call	Warning Warning	Mandatory item Home BID missing within group. Mandatory item Home Location Description missing within group.
Horizontal Accuracy Delivered	The horizontal accuracy delivered for an LCS request measured in metres. *Derivation:* GSM/UMTS item Ext-GeographicalInformation (See Annex C – LCS Charging). The contents of the first 4 bits of the first octet indicate the type of shape used for the determination of the position. Dependant on the shape actually used the horizontal uncertainty has to be extracted from the remaining octets and has to be translated into a value in metres using the standards formulae, see Annex C – LCS Charging. The result must be rounded to full metres.	20	LCS	Severe	Value out of range. **Note:** This error can only be raised for TAP files made available on or after 24 May 2012.

	Conditionality: Must be present within group LCS QoS Delivered where available from the network. *Values:* >=0 (zero)				
Horizontal Accuracy Requested	The horizontal accuracy requested for an LCS request measured in metres. *Derivation:* LCS QoS IE Octet 4 (See Annex C – LCS Charging). The 7 least significant bits of octet 4 need to be interpreted as an uncertainty code. This needs to be transformed into a value in metres by applying the standards formulae, see Annex C – LCS Charging. The result must be rounded to full metres. *Conditionality:* Must be present within group LCS QoS Requested where available from the network. *Values:*	20	LCS	Severe	Value out of range. **Note:** This error can only be raised for TAP files made available on or after 24 May 2012.

	>=0 (zero)				
HSCSD Indicator	This indicator, set by the VPMN and passed to the Recipient, indicates that HSCSD has been used. *Conditionality:* Must be present within group Basic Service Used where HSCSD has been used, otherwise not present. *Values:* 1 HSCSD used	10 20	MOC MTC MOC MTC	Severe Severe	Syntax error. Value out of range.

4.9 I

IMEI	The International Mobile Equipment Identity number. The identifier which uniquely identifies the equipment used by the subscriber during the call. *Derivation:* GSM item IMEI (See Annex C – CS Domain Charging and PS Domain Charging). *Conditionality:*	10 20	MOC MTC SS GPRS MSESS MSG MOC MTC	Warning Warning	Syntax error. Value out of range.

	Must be present within the following groups where available: Equipment Identifier Charged Party Will not be present where the terminal equipment is not involved in the call for example in forwarded call cases or the mobile equipment is identified by an ESN. **Note:** While the IMEI is 16 digits in length, the check digit is not currently transmitted on the “air interface”.		SS GPRS MSESS MSG		
IMS Signalling Context	Where the GPRS context represents IMS signalling this identifier will be present. The item will not be present on the network CDR where the context is mixed IMS signalling and customer generated data volume exchange. The item will only be present on the network CDR where the context is representing solely IMS signalling usage. When the item is present on the CDR it is present as a null item. *Derivation:*	10 20	GPRS GPRS	Severe Severe	Syntax error. Value out of range.

	Item IMS Signalling Context, defined from R5 onwards (PS Domain Charging – see Annex C). *Conditionality:* Mandatory within group GPRS Service Used where available from the network. *Values:* **GPRS CDR Value** **TAP Value** null 1				
IMSI	The identifier which uniquely identifies the subscriber who has used the network and is liable for any charges that may be incurred. For Wi-Fi usage, if the identification of the subscriber is with Network Access Identifier or the MSISDN, this item, where present, must contain characters equal to the Home PMN's MCC+MNC or the full IMSI if available. If the recipient has not been allocated a MCC and MNC (for example, is not a GSM operator), this field, where present, is defined bilaterally between sender and recipient. *Derivation:*	10 20 200	Calls Calls Calls	Severe Severe Severe	Syntax error. Value out of range. **Note:** This error can also be raised if the length of the IMSI is not as expected by the HPMN First characters are different from home operators MCC + MNC, or not as bilaterally agreed (for example, if the recipient has not been allocated a MCC and MNC).

	GSM item servedIMSI (See Annex C – CS Domain Charging and PS Domain Charging). *Conditionality:* Mandatory within group SIM Chargeable Subscriber. Must be present within group GSM Chargeable Subscriber when available. Must be present for Wi-Fi usage when the IMSI is used for identifying the chargeable user. Must be present within group Charged Party.				
Internet Service Provider	Where an Internet Service Provider (ISP) has been used to access the service, i.e. initiate the Content Transaction, then this repeating group contains identifying information. *Conditionality:* Present within groups Serving Parties Information LCS SP Information where available.	30 31 32 33	Content Content LCS LCS	Warning Warning Severe Severe	Mandatory item ISP Id Type missing within group. Mandatory item ISP Identifier missing within group. Mandatory item ISP Id Type missing within group. Mandatory item ISP Identifier missing within group.
ISP Id Type	This item gives the type of Internet Service Provider (ISP) Identifier associated with it.	10 20	Content Content	Warning Warning	Syntax error. Value out of range.

	Conditionality: Mandatory within group Internet Service Provider. *Values:* *1 Name — Text representation, for example AOL, Vizzavi* *2 TADIG Code — See item Sender or Recipient, for example GBRVF, DEUD1* *3 URL — For example www.aol.co.uk , www.vizzavi.co.uk* *4 IP address v4* *5 IP address v6*	21	LCS	Severe	Value out of range.
ISP Identifier	The item holds a unique identifier of the Internet Service Provider (ISP). The type of identifier is contained in the associated ISP Id Type. *Conditionality:* Mandatory within group Internet Service Provider.	10 100 101	Content Content LCS	Warning Warning Severe	Syntax error. Item content does not match ISP Id Type. Item content does not match ISP Id Type.

4.10 L

Latest Call Timestamp	The Latest Call Timestamp is, as it implies, the Latest start of charging timestamp on any record. It is not necessarily the start of charging timestamp of the last charge record on the file. The timestamp contains the same timestamp as that of the latest Call Event Details when all times have been normalised to UTC time. In case the batch contains SCU records either the completion or deposit timestamp should be taken into account according to the charging point value. When the batch contains Content Transaction call/events the Content Charging Point value must be taken into account if more than one of Order Placed Timestamp, Requested Delivery Timestamp or Actual Delivery Timestamp are present in the call/event. If only a single timestamp is present then this is taken as the charging point. If a Content Transaction contains more than one Content Charging Point then the latest timestamp referenced must be used to derive the Latest Call Timestamp.	10 20 30 100	Audit Audit Audit Audit	Warning Warning Warning Warning	Syntax error. Value out of range. Mandatory associated item UTC Time Offset missing. The timestamp does not match the timestamp of the latest Call Event Detail Timestamp.

	When the batch contains Messaging Event or Mobile Session call/events the Service Start Timestamp value must be taken into account. Timestamps from calls with severe errors should also be taken into account if possible i.e. no 10 or 20 type error occurred in the record The time is given in the local time of the Sender (or Serving Network where this is not the Sender). There must be a UTC Time Offset associated with the timestamp. *Optionality:* Transfer is at the discretion of the Sender PMN. *Conditionality:* Mandatory within group Audit Control Information subject to optionality. *Format:* CCYYMMDDHHMMSS				

	Note: Within this timestamp the range for HHMMSS is 000000 – 235959				
LCS QoS Delivered	The group identifies the quality of service delivered where it is different from the quality of service requested, as identified in group LCS QoS Requested. All of the items within the group are subject to conditionality. *Conditionality:* Present within group Location Service Usage where the delivered service is not as requested.	30 31	LCS LCS	Severe Severe	Item LCS Transaction Status present and no other items present within group. Item Age Of Location missing from group and LCS Transaction Status contains ‘last known location’.
LCS QoS Requested	The group identifies the quality of service requested. The LCS Request Timestamp must be present. All other items are present where available. *Conditionality:* Mandatory within group Location Service Usage.	30	LCS	Severe	Item LCS Request Timestamp not present within group.
LCS Request Timestamp	The timestamp identifying the requested service usage. The item is normally in the local time of the Sender (or Serving Network where this is not the Sender). There must be an associated UTC Time Offset Code. *Conditionality:* Mandatory within group LCS QoS Requested.	20 30	LCS LCS	Severe Severe	Value out of range. Mandatory item UTC Time Offset Code missing.

	Format: CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 to 235959				
LCS SP Identification	Group containing identification of the location service content provider (LCS SP). The group comprises two mandatory items, Content Provider Id Type and Content Provider Identifier. *Conditionality:* One or more occurrences must be present within group LCS SP Information.	30 31	LCS LCS	Severe Severe	Mandatory item Content Provider Id Type missing within group. Mandatory item Content Provider Identifier missing within group.
LCS SP Information	This is a group containing the information to identify the Location Service Content Provider (LCS SP) and how they have accessed the network. There must be at least one occurrence of group LCS SP Identification present. Groups Internet Service Provider and Network must be present where the information is available.	30	LCS	Severe	Mandatory group LCS SP Identification missing within group.

	Conditionality: Must be present within group Location Service where the LCS SP can be identified.				
LCS Transaction Status	The status of the LCS transaction. *Derivation:* The value 'failure' must be set, if the GSM/UMTS item PositionMethodFailure-Diagnostic (See Annex C – LCS Charging) indicates a failure of processing the LCS request within the serving network of the tracked or requesting subscriber subscriber. The value 'last known location' must be set, if the GSM/UMTS item LocationEstimateType (See Annex C – LCS Charging) indicates this. The value 'last known location' must override the value 'failure'. The value 'denied' must be set if the LCS client is not authorised. I.e. the request is denied by the HPMN of the tracked subscriber. *Conditionality:* Must be present within group	20	LCS	Severe	Value out of range.

	LCS QoS Delivered for non-successful LCS transactions. *Values:* 1 last known location 2 failure 3 denied				
Local Currency	Contains the Currency Code which identifies the currency used to price the calls and/or events prior to conversion to SDRs and therefore used in Exchange Rate. This currency has to be the one used in the Sender's IOT. Note the use of SDRs may be subject to internal market bilateral agreements, see TAP Currency. Only one occurrence is allowed per TAP file and therefore it is not permitted to have a TAP file containing calls or events where the Local Currency was different. *Derivation:* ISO 4217 [26]. *Conditionality:* Mandatory within group Accounting Information.	10 20 21	Acctng Acctng Acctng	Fatal Fatal Fatal	Syntax error. Value out of range (not listed in ISO 4217 [26]). Value not as specified in the Sender's Inter Operator Tariff (IOT).

	Example: **Currency Code** **Currency Name** *AUD* *Australian Dollars* *CLP* *Chilean Pesetas* *GBP* *Pounds Sterling*				
Location Area Code	Identification of the Location Area Code of the mobile equipment handling the call. *Derivation:* GSM item LocationAreaCode or User Location Information (See Annex C – CS Domain Charging and PS Domain Charging). *Conditionality:* Must be present within groups Network Location GPRS Network Location Messaging Event Mobile Session when expected in accordance with roaming agreement. When not expected in accordance with roaming agreement, must be present except where not supported	10 11 20	MOC MTC SS GPRS MSG MSESS MOC MTC SS GPRS MSG MSESS MOC MTC SS GPRS	Warning Severe Warning	Syntax error. Syntax error and item expected in accordance with roaming agreement. Value out of range.

	by the network or the call does not terminate at the equipment for example in call forwarding cases. Is not present for Wi-Fi usage. The type of location information used by the PS core network depends on the type of Radio Access Network used. Location Area Code will be used in the case of 2G and 3G coverage while Tracking Area Code will be used in the case of LTE coverage. The Location Area Code is a two octet string (See Annex C – CS Domain Charging). For TAP the octets are converted to a decimal integer number in the range 0 to 65535. The leading zeros are significant only for the 2 octet strings in the standard and not in TAP. *Examples:* 0110011000110000 equates to 26160 1001110000001010 equates to 39946 0001000011110001 equates to 4337	21	MSG MSESS MOC MTC SS GPRS MSG MSESS	Severe	Value out of range and item expected in accordance with roaming agreement.

	The Tracking Area Code (TAC) is a two octet string which is used within EPC for LTE to identify a Tracking Area within a PMN (see Annex C – PS Domain Charging). Where d represents the first octet of the Tracking Area Identifier (TAI) field, the TAC encoding starts with bit 8 of octet d+3 as the most significant bit and bit 1 of octet d+4 represents the least significant bit.				
Location Id Type	This item gives the type of location identifier associated with it. *Conditionality:* Mandatory within groups Charged Party Location Tracked Customer Location Tracking Customer Location. *Values:* 1 Country Text representation 2 Country ITU E.164 representation [28] for example, 44 (UK), 49 (Germany) 3 Country Country code for example DEU (Germany), CAN (Canada)	10 20	Content Content LCS	Warning Warning	Syntax error. Value out of range.

	4 Region Text representation 5 Place Text representation 6 IP Location IP Address v4 7 IP Location IP Address v6 8 TADIG Code See item Sender or Recipient, for example GBRVF, DEUD1				
Location Identifier	The item holds a unique identifier of the Charged Party's location. The type of identifier is contained in the associated Location Id Type. *Conditionality:* Mandatory within groups Charged Party Location Tracked Customer Location Tracking Customer Location.	10 100	Content Content LCS	Warning Warning	Syntax error. Item content does not match Location Id Type.
Location Information	The location information identifies the Network Location, which includes the MSC responsible for handling the call and, where appropriate, the Geographical Location of the mobile. *Conditionality:* Mandatory within groups Mobile Originated Call	30 31	MOC MTC SS MOC MTC SS	Severe Severe	Mandatory item Network Location missing within group. Group Geographical Location missing but Serving BID expected in accordance with roaming agreement.

	Supplementary Service Event Mobile Terminated Call	32	MOC MTC SS	Severe	This validation rule can be applied only where bilaterally agreed between Sender and Recipient. Group Geographical Location missing but Serving Location Description expected in accordance with roaming agreement. This validation rule can be applied only where bilaterally agreed between Sender and Recipient.
Location Service	Location Service represents the charging and transactional details for use of the Location Service (LCS) by a tracking customer. The group contains mandatory group Location Service Usage. One of groups Tracking Customer Information or LCS SP Information must be present. Group Tracked Customer Information must be present where the tracked customer is not the tracking customer. Items Call Reference and RAP File Sequence Number are present where available and applicable. Repeating item Operator Specific Information is optionally present.	30 31 32 33	LCS LCS LCS LCS	Severe Severe Warning Warning	Neither of groups Tracking Customer Information or LCS SP Information present within group. Mandatory group Location Service Usage missing within group. Item RAP File Sequence Number missing and Location Service previously received and rejected.

	Conditionality: Mandatory within an occurrence of group Call Event Details where none of the following are present; Mobile Originated Call, Mobile Terminated Call, Supplementary Service Event, Service Centre Usage, Content Transaction or GPRS Call.	34	LCS	Warning	Item RAP File Sequence Number present and Location Service not previously received and rejected. Item RAP File Sequence Number present and TAP transfer batch being resubmitted as corrected (having been previously rejected with fatal error)..
Location Service Usage	Location Service Usage details the actual service quality requested and delivered together with the associated charging information. Group LCS QoS Requested must be present with repeating group Charge Information present at least once. *Conditionality:* Mandatory within group Location Service.	30 31	LCS LCS	Severe Severe	Mandatory group LCS QoS Requested missing within group. Mandatory group Charging Information missing within group.

4.11 M

Maximum Bit Rate	The maximum bit rate available for circuit switched UMTS.	10	MOC MTC	Severe	Syntax Error.

	Derivation: Maximum Bit Rate, see Annex C – CS Domain Charging *Conditionality:* Mandatory within group Basic Service where available from the network. *Values:* 1 14400bps 2 28800bps 3 32000bps 4 33600bps 5 56000bps 6 57600bps 7 64000bps	20	MOC MTC	Severe	Value out of range.
MDN	Mobile Directory Number. This item supports wireless number portability within the North American market. *Derivation:* CIBER manual v2.0 section 10 [9]. *Conditionality:*	10 20	MOC MTC SS GPRS MOC MTC SS GPRS	Warning Warning	Syntax error. Value out of range.

	When a MIN is present within group MIN Chargeable Subscriber then MDN must be present, when available, associated with item MIN. **Note:** Privacy laws in some countries may restrict the MDN availability.				
Message Description	Message Description is a free format description of the Short Message Service used. It is mandatory but the content is entirely at the discretion of the network supplying the access to the service. The description must be in English. *Conditionality:* Mandatory within group Message Description Information.	10	Mess Desc	Warning	Syntax error.
Message Description Code	A code used to cross reference the SCU Charge Type to the relevant description. *Conditionality:* Mandatory within group Message Description Information. Mandatory within group SCU Charge Type.	10 100	Mess Desc SCU SCU	Warning Warning	Syntax error. Specified message description code not defined in Message Description Information.

Message Description Information	A repeating table of pairs of Message Description and related Message Description Code. This table is used on a once-off basis and applies only to the transfer which contains it. A new table is sent with each transfer. Codes are reusable from transfer to transfer. *Conditionality:* One occurrence must be present within Transfer Batch for each unique Message Description Code used within group SCU Charge Type.	30 31 32 33	Tf Batch Tf Batch Tf Batch Tf Batch	Warning Warning Fatal Warning	Mandatory item Message Description Code missing within group. Mandatory item Message Description missing within group. More than one occurrence of group with same Message Description Code where Message Description is not the same. More than one occurrence of group with same Message Description Code where Message Description is the same.
Message Status	The completion status of the message. *Conditionality:* Mandatory within group SCU Charge Type. *Values:* 0 Unable to Deliver 1 Time Expired 2 Delivered / Succeeded	10 20	SCU SCU	Severe Severe	Syntax error. Value out of range.

	3 Deleted / Canceled by SME 4 Deleted / Canceled by Service Centre Operators				
Message Type	The type of service/message, for example fax, text. *Conditionality:* Mandatory within group SCU Charge Type. *Values:* 0 Text 1 Fax 2 Info	10 20	SCU SCU	Severe Severe	Syntax error. Value out of range.
Messaging Event	A Messaging Event item represents a type of message and is further defined by item Messaging Event Service. The Messaging Event must contain Messaging Event Service, Charged Party, Event Reference, Service Start Timestamp, Call Type Group, Charge and at least one occurrence of Recording Entity Code. Non Charged Party must be present where available and Messaging Event Service is “MO SMS over IP”.	30 31 32 33	MSG MSG MSG MSG	Severe Severe Severe Severe	Mandatory item Messaging Event Service missing within group. Mandatory group Charged Party missing within group. Mandatory item Event Reference missing within group. Mandatory item Service Start Timestamp missing within group.

	RAP File Sequence Number, Geographical Information, SIM Toolkit Indicator, Location Area Code, Tax Information and Exchange Rate Code will be present where applicable. One or more occurrences of Network Element will be present when available from the network. Operator Specific Information may also be present. This is optional dependent on bilateral agreement. Cell Identity may be optionally present. **Note:** This event type can only be used for SMS over IP (IMS based SMS) and cannot be used to represent SMS over SS7. SMS MO/MT over the VPMN's IMS Domain is provided in a TAP MSG Event. See section 5.10 on the provisioning rules of TAP CDRs in each type of SMS messaging scenario. *Conditionality:* Mandatory within an occurrence of group Call Event Details where none of the following are present; Mobile Originated Call, Mobile Terminated Call, Supplementary Service Event, Service Centre Usage, GPRS Call, Content Transaction, Mobile Session or Location Service .	34 35 36 37 38 39	MSG MSG MSG MSG MSG MSG	Severe Severe Severe Severe Severe Severe	Mandatory group Call Type Group missing within group. Mandatory item Charge missing within group. Mandatory item Recording Entity Code missing within group. Item Location Area Code missing within group but expected in accordance with roaming agreement Group Tax Information missing within group but expected in accordance with roaming agreement for that particular call. Tax Information group missing must be interpreted as Tax Value 0 (zero). Group Tax Information present within group but not expected in accordance with roaming agreement for the call/event and Tax Value referenced

					within the group is greater than 0 (zero).
		40	MSG	Warning	Group Tax Information present within group but not expected in accordance with roaming agreement for the call/event and Tax Value referenced within the group is not greater than 0 (zero).
		41	MSG	Severe	Item Exchange Rate Code missing within group and Charge is greater than 0 (zero).
		42	MSG	Severe	Group Geographical Location missing within group but Serving BID expected in accordance with roaming agreement. This validation can only be applied where bilaterally agreed between Sender and Recipient.
		43	MSG	Severe	Group Geographical Location missing within group but Serving Location

					Description expected in accordance with roaming agreement. This validation can only be applied where bilaterally agreed between Sender and Recipient.
Messaging Event Service	The type of service which is recorded in the Messaging Event. *Conditionality:* Mandatory within group Messaging Event *Values:* 1 MO SMS over IP (IMS based SMS) 2 MT SMS over IP (IMS based SMS)	10 20	MSG MSG	Severe Severe	Syntax error. Value out of range.
MIN	Mobile Identification Number is an item which uniquely identifies the subscriber who has used the network and is liable for any charges that may be incurred. The MIN is the mobile telephone number assigned by the HPMN. The format of the number may conform to the North American Number Plan where it belongs to a North American operator. *Derivation:* CIBER manual v2.0 section 12 [9].	10 20	Calls Calls	Severe Severe	Syntax error. Value out of range.

	Conditionality: Mandatory within group MIN Chargeable Subscriber. Must be present within group SCU Chargeable Subscriber when group GSM Chargeable Subscriber is not present.				
MIN Chargeable Subscriber	Contains the identification of a chargeable subscriber identified by a MIN. The group must contain the MIN of the chargeable subscriber and may optionally contain a MDN. *Conditionality:* Mandatory within group Chargeable Subscriber where SIM Chargeable Subscriber is not present.	30	MOC MTC SS GPRS	Severe	MIN not present within group.
MO Basic Call Information	MO Basic Call Information provides the basic detail of who made the call and where to in respect of mobile originated traffic. It comprises mandatory Chargeable Subscriber, Call Event Start Timestamp and Total Call Event Duration details together with conditional Destination, Destination Network, RAP File Sequence Number and Cause For Termination information.	30 31 32	MOC MOC MOC	Severe Severe Severe	Mandatory group Chargeable Subscriber missing within group. Mandatory item Call Event Start Timestamp missing within group. Mandatory item Total Call Event Duration missing within group.

	Where the call was initiated by the SIM toolkit application the SIM Toolkit Indicator flag will be present. *Conditionality:* Mandatory within group Mobile Originated Call.	33 34 35 36	MOC MOC MOC MOC	Warning Warning Severe Warning	Item RAP File Sequence Number missing and call previously received and rejected. Item RAP File Sequence Number present and call not previously received and rejected. Group Destination missing and call is not for use of emergency service. Item RAP File Sequence Number present and TAP transfer batch being resubmitted as corrected (having been previously rejected with fatal error). **Note:** Error codes 37 & 38 removed in TAP release 3.11 (01 May 2005).
Mobile Originated Call	A Mobile Originated Call item represents either tele or bearer service usage originated by the mobile subscription. In some cases the mobile itself may not be directly involved, for example some call forwarding scenarios.	30 31	MOC MOC	Severe Severe	Mandatory group MO Basic Call Information missing within group. Mandatory group Location Information missing within group.

	The Mobile Originated Call must contain the MO Basic Call Information, Location Information and Basic Services Used. **Note:** There must be only one occurrence of the Basic Service Used group within this group even though the physical syntax indicates that this may be a repeating group. Where CAMEL services are supported and invoked then one occurrence of CAMEL Service Used will be present for the invocation. Where a supplementary service is used in conjunction with a call and I deemed necessary for transfer (see Annex A) then Supplementary Service Code will be present. Third Party Information may also be present. Equipment Identifier will normally be transferred. The reason that it may not be present is because the call did not originate from the equipment. Operator Specific Information may also be present, this is optional dependent on bilateral agreement.	32 35	MOC MOC	Severe Severe	Mandatory group Basic Service Used missing within group. More than one occurrence of group Basic Service Used present within group. **Note:** Error codes 33 & 34 removed in TAP release 3.11 (01 May 2005).

	MO Voice over CSFB is provided in a TAP MOC Event. Please see section 5.9 on the provisioning rules of TAP CDRs in each type of voice call scenario. SMS MO over SGs is provided in a TAP MOC Event.Please see section 5.10 on the provisioning rules of TAP CDRs in each type of SMS messaging scenario. *Conditionality:* Mandatory within an occurrence of group Call Event Details where none of the following are present; Mobile Terminated Call, Supplementary Service Event, Service Centre Usage, GPRS Call, Content Transaction or Location Service .				
Mobile Session	A Mobile Session where the type of usage is further detailed by Mobile Session Service. The Mobile Session must contain Mobile Session Service, Charged Party, Event Reference, Recording Entity Code, Service Start Timestamp, Total Call Event Duration and Session Charge Information.	30 31 32 33	MSESS MSESS MSESS MSESS	Severe Severe Severe Severe	Mobile Session Service missing within group. Mandatory group Charged Party missing within group. Event Reference missing within group. Recording Entity Code missing within group.

	Non-Charged Party must be present where Mobile Session Service is “MO Voice over LTE”, otherwise it will be present where available for all other Mobile Session Services. Requested Destination must be present where Mobile Session Service is ‘MO Voice over LTE’, if available from the network. RAP File Sequence Number, SIM Toolkit Indicator, Geographical Information, Location Area Code and Cause for Termination will be present where applicable and available. Operator Specific Information may also be present. This is optional dependent on bilateral agreement. . Cell Identity may be optionally present. MO/MT Voice calls anchored in the VPMN’s IMS Domain must be provided in a TAP MSESS Event. Please see section 5.9 on the provisioning rules of TAP CDRs in each type of voice call scenario. *Conditionality:* Mandatory within an occurrence of group Call Event Details where none of the following are present; Mobile Originated Call, Mobile Terminated Call, Supplementary Service	34 35 36 37 38 39	MSESS MSESS MSESS MSESS MSESS MSESS	Severe Severe Severe Severe Severe Severe	Service Start Timestamp missing within group. Total Call Event Duration missing within group. Mandatory group Session Charge Information missing within group. Item Location Area Code missing within group but expected in accordance with roaming agreement. Group Geographical Location missing within group but Serving BID expected in accordance with roaming agreement. This validation can only be applied where bilaterally agreed between Sender and Recipient. Group Geographical Location missing within group but Serving Location

	Event, Service Centre Usage, GPRS Call, Content Transaction, Messaging Event or Location Service .	40	MSESS	Severe	Description expected in accordance with roaming agreement. This validation can only be applied where bilaterally agreed between Sender and Recipient. Group Non Charged Party missing within group and Mobile Session Service is “MO Voice over LTE”.
Mobile Session Service	The type of service which is recorded in the Mobile Session. *Conditionality:* Mandatory within group Mobile Session *Values:* 1 MO Voice over LTE 2 MT Voice over LTE 3 Emergency call over LTE	10 20	MSESS MSESS	Severe Severe	Syntax error. Value out of range.
Mobile Terminated Call	A Mobile Terminated Call item represents either tele or bearer service usage terminated by the mobile subscription. In some cases the mobile itself may not be directly involved, for example some call forwarding scenarios.	30 31	MTC MTC	Severe Severe	Mandatory group MT Basic Call Information missing within group. Mandatory group Location Information missing within group.

	Mandatory elements are the MT Basic Call Information and the Basic Service Used. Only one basic service will be present and it will not be possible, for example, to distinguish between the data and speech parts of alternate services. **Note:** There must be only one occurrence of the Basic Service Used group within this group even though the physical syntax indicates that this may be a repeating group. Location Information and Equipment Identifier will normally be present except, for example, where the call does not terminate at the equipment for example call forward on no reply. Where CAMEL services are supported and invoked then one occurrence of CAMEL Service Used will be present for the invocation. Operator Specific Information may also be present, this is optional dependent on bilateral agreement. MT Voice over CSFB is provided in a TAP MTC Event. Please see section 5.9 on the provisioning rules of TAP CDRs in each type of voice call scenario.	32 35	MTC MTC	Severe Severe	Mandatory group Basic Service Used missing within group. More than one occurrence of group Basic Service Used present within group. **Note:** Error codes 33 & 34 removed in TAP release 3.11 (01 May 2005).

	SMS MT over SGs is provided in a TAP MTC Event.Please see section 5.10 on the provisioning rules of TAP CDRs in each type of SMS messaging scenario. *Conditionality:* Mandatory within an occurrence of group Call Event Details where none of the following are present; Mobile Originated Call, Supplementary Service Event, Service Centre Usage, GPRS Call, Content Transaction or Location Service.				
MSISDN	The Mobile Subscriber ISDN number. *Derivation:* GSM item MSISDN (See Annex C – CS Domain Charging and PS Domain Charging). It is represented in TAP in international format, i.e. the number begins with the country code related to the calling number. *Conditionality:* Must be present within group SIM Chargeable Subscriber when available. When an IMSI is present within group GPRS Chargeable Subscriber then MSISDN must be present, when available, associated with item IMSI.	10 11 12	MOC MTC SS GPRS MSG MSESS SCU SCU	Warning Severe Warning	Syntax error and item MSISDN not expected in accordance with roaming agreement. Syntax error and IMSI not present or MSISDN expected in accordance with roaming agreement. Syntax error and IMSI present and MSISDN not expected in accordance with roaming agreement.

	Must be present within group GSM Chargeable Subscriber when available. Must be present within group Charged Party where available. Must be present when expected in accordance with roaming agreement. Must be present for Wi-Fi usage where the full IMSI or Network Access Identifier is not available. Note that privacy laws in some countries may restrict the MSISDN availability.	13	MOC MTC SS GPRS MSG MSESS	Severe	Syntax error and item MSISDN expected in accordance with roaming agreement.
		20	MOC MTC SS GPRS MSG MSESS	Warning	Number not represented in international format and MSISDN not expected in accordance with roaming agreement.
		21	SCU	Severe	Number not represented in international format and IMSI not present or MSISDN expected in accordance with roaming agreement.
		22	SCU	Warning	Number not represented in international format and IMSI present and MSISDN not expected in accordance with roaming agreement.

		23	MOC MTC SS GPRS MSG MSESS	Severe	Number not represented in international format and MSISDN expected in accordance with roaming agreement
MT Basic Call Information	MT Basic Call Information provides the basic detail of who received the call and, conditionally, where from in respect of mobile terminated traffic. It comprises mandatory Chargeable Subscriber, Call Event Start Timestamp and Total Call Event Duration details together with conditional Call Originator, Originating Network, RAP File Sequence Number and Cause For Termination information. Where the call was initiated by the SIM toolkit application the SIM Toolkit Indicator flag will be present. *Conditionality:* Mandatory within group Mobile Terminated Call.	30 31 32 33 34 35	MTC MTC MTC MTC MTC MTC	Severe Severe Severe Warning Warning Warning	Mandatory group Chargeable Subscriber missing within group. Mandatory item Call Event Start Timestamp missing within group. Mandatory item Total Call Event Duration missing within group. Item RAP File Sequence Number missing and call previously received and rejected. Item RAP File Sequence Number present and call not previously received and rejected.

					Item RAP File Sequence Number present and TAP transfer batch being resubmitted as corrected (having been previously rejected with fatal error). **Note:** Error codes 36, 37 & 38 removed in TAP release 3.11 (01 May 2005).

4.12 N

Network	Information relating to the Network used to access the service where the network is different to the Sender and is known. *Conditionality:* Present within groups Serving Parties Information LCS SP Information where available.	30 31 32 33	Content Content LCS LCS	Warning Warning Severe Severe	Mandatory item Network Id Type missing within group. Mandatory item Network Identifier missing within group. Mandatory item Network Id Type missing within group. Mandatory item Network Identifier missing within group.

Network Access Identifier	The Network Access Identifier (NAI) is a username identifying a unique customer belonging to the Recipient when generating Wi-Fi CDRs. *Derivation:* IETF RFC 4282 [34]. *Conditionality:* Mandatory within group GPRS Chargeable Subscriber where the IMSI or MSISDN is not available for identification of chargeable user. *Format:* username@realm for example pascal.leblanc@francnet.com	10 20 200	GPRS GPRS GPRS	Severe Severe Severe	Syntax error. Value out of range. Realm not belonging to the Recipient.
Network Element	Group providing information on the Network Elements used to enable the Messaging Event. The group must contain Element ID and Element Type. *Conditionality:* One or more occurrence may be present in Messaging Event where the information is available from the network.	30 31 101 102	MSG MSG MSG MSG	Severe Severe Severe Severe	Element ID missing within group. Element Type missing within group. Element Type refers to SMSC and syntax of the associated Element ID does not conform to MSISDN.

		103	MSG	Severe	Element Type refers to S-CSCF and syntax of the associated Element ID does not conform to section 5.5 (Text Representation of IP Address) Element Type refers to SM-IP-GW and syntax of the associated Element ID does not conform to section 5.5 (Text Representation of IP Address).
Network Id Type	This item gives the type of Network Identifier associated with it. *Conditionality:* Mandatory within group Network. *Values:* 1 Name Text representation, for example BT, Telecom Italia, Commerzbank 2 TADIG Code See item Sender or Recipient, for example GBRVF, DEUD1 3 Home BID See item Home BID	10 20 21	Content Content LCS	Warning Warning Severe	Syntax error. Value out of range. Value out of range.

	4 Home Location Description — See item Home Location Description. 5 APN — Access Point Name 6 URL — For example www.amazon.com				
Network Identifier	The item holds a unique identifier of the Network. The type of identifier is contained in the associated Network Id Type. *Conditionality:* Mandatory within group Network.	10 100 101	Content Content LCS	Warning Warning Severe	Syntax error. Item content does not match Network Id Type. Item content does not match Network Id Type.
Network Information	Network Information is a group of related information which pertains to the Sender PMN. It consists of the UTC Time Offset Information table, which is mandatory and the Recording Entity Information table which must be present where Recording Entity Codes are present within the TAP file. *Conditionality:* Mandatory within group Transfer Batch.	30 33	Tf Batch Tf Batch	Fatal Fatal	Mandatory group UTC Time Offset Information missing within group. Call Event Details other than Content Transaction present within file and group Recording Entity Information missing within group. **Note:** Error codes 31 & 34 removed in TAP release 3.11 (01 May 2005).

Network Init. PDP Context	This item identifies where a GPRS Call was initiated by the network and not the terminal equipment. *Derivation:* Data item NetworkInitiatedPDPContext (PS Domain Charging – see Annex C). *Conditionality:* Must be present within group GPRS Basic Call Information when the PDP context was initiated by the network, otherwise not present. Is not present for Wi-Fi usage. *Values:* 1 Network initiated	10 20	GPRS GPRS	Severe Severe	Syntax error. Value out of range.
Network Location	Identifies the location information relating to the network. It must have the MSC Code present, identifying the MSC handling the call and the Call Reference will be present when available from the network. The Location Area Code and Cell Identity may be present and the Cell Identity is further optional at the discretion of the Sender PMN.	30 31	MOC MTC SS MOC MTC SS	Severe Severe	Mandatory item Recording Entity Code missing within group. Item Location Area Code missing within group but expected in accordance with roaming agreement.

	Conditionality: Mandatory within group Location Information.				
Non Charged Number	The number of the non-charged party, either that to which the message is or was to be delivered or from which it originated (dependent on the message direction and charging for the service). *Derivation:* For GSM subscribers GSM item CalledNumber (See Annex C – CS Domain Charging). This item is of type AddressString. In this case it is represented in TAP in international format, i.e. the number begins with the country code related to the calling number. This item may also be used for other address types, for example internet address. *Conditionality:* Mandatory within group SCU Basic Information. *Values:* For GSM subscribers each digit is numeric (0-9). Where the non-charged number represents other address types any value is allowed.	10 11	SCU SCU	Severe Warning	Syntax error and Charged Party Status is ‘originating’. Syntax error and Charged Party Status is ‘terminating’.

Non-Charged Party	A group containing information relating to the party in the service that is not charged. This is the called or calling party dependent upon the direction of the service. The group will contain Non Charged Party Number and/or Non Charged Public User ID. *Conditionality:* Must be present within groups Messaging Event where Messaging Event Service is 'MO SMS over IP' and Mobile Session where Mobile Session Service is 'MO Voice over LTE'. Must be present where available for other Service values	30	MSESS MSG	Severe	Neither Non Charged Party Number nor Non Charged Public User ID present
Non-Charged Party Number	The number of the non-charged party, either the number to which the call has been routed or from which it originated (dependent on the direction). Must be represented in international format. The Non-Charged Party Number must start with the valid country code as listed in E.164 "Assigned Country Codes" [28] and contain only numeric digits. All other characters must be removed.	10 11 12 20	MSESS MSESS MSG MSESS	Severe Warning Warning Severe	Syntax error and Mobile Session Service is 'MO Voice over LTE'. Syntax error and Mobile Session Service is 'MT Voice over LTE' Syntax error and Messaging Event Service is 'MO SMS over IP' or 'MT SMS over IP'

	If the service used is MO or MT SMS (see Messaging Event Service) then the content of the Non-Charged Party Number must be the SMSC address, in international format. *Derivation:* IMS item Called Party Address or Calling Party Address (See Annex C – IMS Domain Charging) *Conditionality:* Must be present within group Non-Charged Party where available from the network. *Values:* Each digit is numeric (0-9).	21 22	MSESS MSG	Warning Warning	Value out of range or number does not start with a valid country code as listed in E.164 “Assigned Country Codes” and Mobile Session Service ‘MO Voice over LTE’. **Note:** Spare and reserved codes are NOT valid country codes, with the exception of reserved code 970 for Palestine which is valid. Value out of range and Mobile Session Service is ‘MT Voice over LTE’ Value out of range and Messaging Event Service is ‘MO SMS over IP’ or ‘MT SMS over IP’. **Note:** Error Code 201 removed in TAP release 3.12 (with effect from 01 May 2013).

Non-Charged Public User ID	The Public User ID of the non-charged party. It is populated with the SIP URI to which the call has been routed or from which it originated (dependent on the direction). In case the TEL URI is provided from the network, it is not allowed to be populated in the Non-Charged Public User ID and must be populated only in the Non-Charged Party Number element. *Derivation:* IMS item Called Party Address or Calling Party Address (see Annex C – IMS Domain Charging) *Conditionality:* Must present within group Non-Charged Party where available from the network. *Examples:* sip:alice@atlanta.com sip:alice:secretword@atlanta.com;transport=tcp sips:alice@atlanta.com?subject=project%20x&priority=urgent sip:+1-212-555-1212:1234@gateway.com;user=phone sips:1212@gateway.com	10	MSG MSESS	Warning	Syntax Error

	sip:alice@192.0.2.4 sip:atlanta.com;method=REGISTER?to=alice%40atlanta.com sip:alice;day=tuesday@atlanta.com				
Notification	A Notification file is sent where the transfer mechanism is electronic file transfer and there is no data available for transfer. All items within the group are mandatory except RAP File Sequence Number which is conditional and File Creation Timestamp which is optional. *Conditionality:* Mandatory within group Data Interchange where no data is available for transfer and the transfer mechanism is electronic file transfer.	30 31 32 33 35 36 37	Notifictn Notifictn Notifictn Notifictn Notifictn Notifictn Notifictn	Fatal Fatal Fatal Fatal Warning Warning Warning	Mandatory item Sender missing within group. Mandatory item Recipient missing within group. Mandatory item File Sequence Number missing within group. Mandatory item Specification Version Number missing within group. Mandatory item File Available Timestamp missing within group. Mandatory item Transfer Cut Off Timestamp missing within group.

		38 39	Notifictn Notifictn	Warning Fatal	File Sequence Number previously received and rejected with fatal error, therefore RAP File Sequence Number expected but not present. RAP File Sequence Number present although File Sequence Number has not previously been rejected with a fatal error (for example previously missing or new files). Mandatory item Release Version Number missing within group. **Note:** Error Code 34 removed in TAP release 3.11 (01 May 2005).
Number Of Decimal Places	Identifies the number of decimal places represented within the item Exchange Rate. *Conditionality:* Mandatory within group Currency Conversion. *Values:*	10 20	Acctng Acctng	Fatal Fatal	Syntax error. Value out of range.

	> or = zero				

4.13 O

Object Type	This defines the type of object streamed or downloaded to the customer. *Derivation:* The object type values are based on, but not confined to, the withdrawn M-Services specification. *Conditionality:* Present within group Content Service Used where 'Pull' Content Transaction Code used and either Content Transaction Type 'Streaming' or 'Download' used. *Values:* 0 Not known/other (Valid for use with streaming and download where the type of object cannot be identified or does not match one of the values below.)	10 20 21	Content Content Content	Severe Severe Severe	Syntax error. Object Type out of range for Content Transaction Code and Type Pull/Streaming combination. Object Type out of range for Content Transaction Code and Type Pull/Download combination.

	For use with Pull or Streaming: 1 Speech – Audio MPEG 4 AMR 2 Audio – Audio MPEG 4 AAC 3 Audio – MP3 4 Audio – WAVE 5 Video – H.263 real time video 6 Video – MPEG 4 7 – 19 Reserved for future use. For use with Pull or Download 20 Ring Tone – MIDI 21 Ring Tone – Audio MP4 22 Ring Tone – iMelody 23 Ring Tone – WAVE 24-29 Reserved for future use. 30 Wallpaper/Screen Saver – JPEG 31 Wallpaper/Screen Saver – WBMP 32 Wallpaper/Screen Saver –GIF87a & GIF89 34 Wallpaper/Screen Saver –Java MIDlet 35-39 Reserved for future use 40 Picture – JPEG 41 Picture – WBMP 42 Picture – GIF87a & GIF89 43 Picture – PNG				

	44 Picture – BMP 45-49 Reserved for future use 50 Speech – Audio MPEG 4 AMR 51-59 Reserved for future use 60 Audio – Audio MPEG 4 61 Audio – Audio MP3 62 Audio – WAVE 63-69 Reserved for future use 70 Vector Graphic – FFS 71-79 Reserved for future use 80 Video – H.263 real time video 81 Video – MPEG 4 82 Video – MPEG 2 DVD 83-89 Reserved for future use 90 Game 91-99 Reserved for future use 100 Application 101-109 Reserved for future use **Note:** Reserved values are 'out of range' until values are assigned.				
Operator Specific Information	This is an optional repeating item which will contain information which is beyond the scope of TAP and has been bilaterally agreed.	30	All	Warning	Item is present without bilateral agreement.

	The content of the item is defined by bilateral agreement and may vary according to the context, for example content when occurring within Mobile Originated Call may vary from that when occurring within Transfer Batch. *Optionality:* Present when agreed bilaterally within groups Notification Batch Control Information Aggregated Usage Record Mobile Originated Call Mobile Terminated Call Mobile Session Messaging Event Supplementary Service Event Service Centre Usage GPRS Call Content Transaction Location Service Audit Control Information.				
Order Placed Timestamp	The timestamp representing the time at which the Charged Party placed the order for the content. This is given in the time	10	Content	Severe	Syntax error and timestamp referenced as Charging Point.

	of the serving Content Provider. There must be an associated UTC Time Offset Code. *Conditionality:* Must be present within group Content Transaction Basic Info when no other timestamp present within group or when item referenced as the Charging Point. *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 to 235959	11 20 21 30 31 100 101	Content Content Content Content Content Content Content	Warning Severe Warning Severe Warning Severe Warning	Syntax error and timestamp not referenced as Charging Point. Value out of range and timestamp referenced as Charging Point. Value out of range and timestamp not referenced as Charging Point. Mandatory associated UTC Time Offset Code missing and timestamp referenced as Charging Point. Mandatory associated UTC Time Offset Code missing and timestamp not referenced as Charging Point. Order Placed Timestamp after associated Charge Detail timestamp and timestamp referenced as Charging Point. Order Placed Timestamp after associated Charge Detail timestamp

		200	Content	Severe	and timestamp not referenced as Charging Point. Order Placed Timestamp before the commercial roaming start date (in VPMN local time if no other time zone explicitly agreed) for the specific service and the TAP file is not a test file.
Originating Network	The network from which the call or message was routed. In the case of optimal routing the Originating Network code is different from the HPMN code. *Conditionality:* Must be present within groups MT Basic Call Information SCU Basic Information if available. *For example:* GBRCN GBRVF DEUD1 DEUD2	10 20	MTC SCU MTC SCU	Warning Warning	Syntax error. Value out of range.

4.14 P

Paid Indicator	A flag which shows that the Charged Party has paid for the service by another mechanism, for example credit card, account, debit card. The flag's presence shows that the charge is not intended for the retail invoice. *Conditionality:* Must be present within group Advised Charge Information where the charge is being/has been settled by a mechanism external to TAP. *Values:* 1 Paid	10 20	Content Content	Severe Severe	Syntax error. Value out of range.
Partial Type Indicator	The Partial Type Indicator identifies the first and last partials in a sequence. *Conditionality:* Must be present within group GPRS Basic Call Information where the Call Event Detail represents a partial. Not present for Wi-Fi usage as there are no partial records for Wi-Fi sessions.	10 20	GPRS GPRS	Severe Severe	Syntax error. Value out of range.

	Values: F first partial I intermediate partial L last partial				
Payment Method	Where the charge is being/has been settled by a mechanism other than TAP this item identifies the payment method (to be) used. *Optionality:* This item is made available at the discretion of the Content Provider and/or Sender. *Conditionality:* Must be present within group Advised Charge Information where item Paid Indicator is also present, subject to optionality. *Values:* 0 not known 1 credit card 2 debit card 3 account 4 cash	10 20	Content Content	Warning Warning	Syntax error. Value out of range.

	5 cheque 6 direct debit 7 standing order 8 money order/banker''s draft **Note:** Value 0 (not known) is not a default value and must only be used where there is the intention to identify the payment method but it is genuinely not identifiable by the Content Provider/Sender, for example mixed payment or information not passed by retail outlet.				
PDP Address	An address (served) used with a Packet Data Protocol context of a GPRS connection. This is an IP address. *Derivation:* GSM item PDP Address (PS Domain Charging – see Annex C). For Wi-Fi usage, item Framed-IP-Address (RFC 2865). *Conditionality:* Mandatory within group GPRS Chargeable Subscriber. For Wi-Fi usage, present when available.	10	GPRS	Warning	Syntax error. Does not conform to section 5.5.
PDP Context Start Timestamp	The timestamp gives the start of the PDP context in the case where the Call Event Details (GPRS Call) represents an intermediate or last partial of a PDP context.	10 20	GPRS GPRS	Warning Warning	Syntax error. Value out of range.

	The time is given in the local time of the Sender PMN (or Serving Network where this is not the Sender). There must be a UTC Time Offset Code associated with the timestamp. **Note:** The local time is the local time at the location of the chargeable subscriber. Where the location is not available, as in some call forwarding scenarios, this will be a notional 'network local time'. *Optionality:* Operators may decide not to supply this information (normally this will be because it is not available from the billing system). *Conditionality:* Must be present within group GPRS Basic Call Information where available and Partial Type Indicator is present identifying the GPRS Call as either an intermediate or last partial (subject to optionality). *Format:* CCYYMMDDHHMMSS	30 31 100	GPRS GPRS GPRS	Warning Warning Warning	Mandatory associated item UTC Time Offset Code missing. PDP Context Start Timestamp present but Partial Type Indicator is either not present or identifies GPRS Call as the 'first' partial. PDP Context Start Timestamp is later than Call Event Start Timestamp. **Note:** Error Code 101 removed in TAP release 3.11 (01 May 2005).

	Note: Within this timestamp the range for HHMMSS is 000000 – 235959				
Positioning Method	The technology used for positioning a tracked mobile subscriber (e.g. Assisted GPS). *Derivation:* Positioning Data IE (See Annex C – LCS Charging). The positioning technology can be derived by converting bits the five most significant bits (bits 8-4) into an integer. It needs to be noted that more than one positioning method may be recorded in the Positioning Data IE (See Annex C – LCS Charging). In order to identify the positioning technology actually used bits 3-1 which code the usage of the positioning technology need to be analysed. *Conditionality:* Must be present within group LCS QoS Delivered where available from the network. *Values:* 0 Timing Advance 1 Reserved	20	LCS	Severe	Value out of range.

	2 Reserved 3 Mobile Assisted E-OTD 4 Mobile Based E-OTD 5 Mobile Assisted GPS 6 Mobile Based GPS 7 Conventional GPS 8-15 Reserved for GSM 16-31 Reserved for network specific positioning methods				
Priority Code	Indicates the priority assigned to the short message. *Conditionality:* Mandatory within group SCU Charge Type. *Values:* 0 Low 1 Normal 2 High	10 20	SCU SCU	Severe Severe	Syntax error. Value out of range.
Public User ID	An address identifying the subscriber, either in the form of a SIP URI or TEL URI. *Derivation:* IMS item SubscriptionID (See Annex C – IMS Domain Charging)	10	MSG MSESS	Warning	Syntax Error

	Conditionality: Must present within group Charged Party where available from the network. *Examples:* sip:alice@atlanta.com sip:alice:secretword@atlanta.com;transport=tcp sips:alice@atlanta.com?subject=project%20x&priority=urgent sip:+1-212-555-1212:1234@gateway.com;user=phone sips:1212@gateway.com sip:alice@192.0.2.4 sip:atlanta.com;method=REGISTER?to=alice%40atlanta.com sip:alice;day=tuesday@atlanta.com				

4.15 R

RAP File Sequence Number	A unique reference which identifies the Returned Account Procedure (RAP) file in which the record or batch was returned to the Sender PMN by the Recipient PMN.	10	Notifictn Btch Ctrl	Warning	Syntax error.

	The record or batch, the error(s) having been resolved, is now being resubmitted to the Recipient PMN. **Note:** Where a TAP file is being resubmitted as corrected the RAP File Sequence Number is not required on the Call Event Details but it must be present on either the Notification or Batch Control Information, as appropriate. **Note:** The RAP File Sequence Number must not be present when a previously missing TAP file (Transfer Batch or Notification) is sent. *Conditionality:* Must be present within groups Notification Batch Control Information where the TAP file is being resubmitted as corrected. Must be present within groups Aggregated Usage Record MO Basic Call Information MT Basic Call Information Mobile Session Messaging Event	11 20 21	Calls Btch Ctrl Notifictn Calls	Severe Warning Severe	Syntax error Value out of range. Value out of range

	Supplementary Service Event Service Centre Usage GPRS Basic Call Information Content Transaction Basic Info Location Service where the record is being resubmitted as corrected. *Range:* 00001 – 99999 for Test Data 00001 – 99999 for Chargeable Data				
Recipient	A unique identifier used to determine which network the data is being sent to, i.e. the Recipient. *Derivation:* GSM Association PRD TD.13 [14]. *Conditionality:* Mandatory within group Notification. Mandatory within group Batch Control Information. *Examples:* GBRCN GBRVF DEUD1	10 20 100	Notifictn Btch Ctrl Notifictn Btch Ctrl Notifictn Btch Ctrl	Fatal Fatal Fatal	Syntax error. Value out of range. The item does not match the Recipient on the filename.

	DEUD2 **Note:** These codes must be in uppercase (as defined in TD.13 [14]).				
Recording Entity Code	A code associated with a Recording Entity. *Conditionality:* Mandatory within groups Recording Entity Information Location Service Network Location Service Centre Usage where it must be of type 'Service Centre' Mobile Session Messaging Event In the case of GPRS network usage two or more occurrences must be present within group GPRS Network Location where one, and only one, occurrence must be of type 'GGSN' or 'P-GW' (see Recording Entity Type) and all other occurrences must be of type 'SGSN' or 'S-GW'.	10 11 12 13	Network MOC MTC MSESS MSG SS SCU GPRS LCS GPRS GPRS	Fatal Severe Severe Severe	Syntax error Syntax error Value out of range for a GPRS call (except for Wi-Fi usage), i.e. the Recording Entity Code refers to a recording entity of a type other than GGSN, SGSN, P-GW or S-GW. Value out of range for a GPRS call (only for Wi-Fi usage), i.e. the Recording Entity Code refers to a

	In the case of Wi-Fi usage one occurrence must be present identifying the Wi-Fi billing information recording entity or the location of usage.				recording entity of a type other than Wi-Fi billing information recording entity.
	In the case of SMS over IP (IMS based SMS) usage, two or more occurrences must be present within groups Messaging Event. There must be one occurrence of type 'P-CSCF' and one occurrence of type 'SGSN' or 'S-GW'. An occurrence of type 'P-GW' may be present when used to enable the event. In the case of voice over LTE usage, two or more occurrences must be present within groups Mobile Session. There must be one occurrence of type 'P-CSCF', 'TRF' or 'ATCF' and one occurrence of type 'SGSN' or 'S-GW'. An occurrence of type 'P-GW' may be present when used to enable the event. *Values:* 0 .. 10000	20 100 101 102	Network MOC MTC MSESS MSG SS SCU GPRS LCS MOC MTC SS SCU	Fatal Severe Warning Severe	Value out of range. Specified recording entity code not defined in the Recording Entity Information Entity Code refers to MSC (Recording Entity Type 1) and syntax of the referenced Recording Entity Identification does not conform to MSISDN, Signalling Point Code or name. Entity Code refers to SMSC (Recording Entity Type 2) and syntax

					of the referenced Recording Entity Identification does not conform to MSISDN.
		103	GPRS	Severe	Entity Code refers to GGSN (Recording Entity Type 3) and syntax of the referenced Recording Entity Identification does not conform to section 5.5.
		104	MOC MTC GPRS MSESS MSG	Severe	Entity Code refers to SGSN (Recording Entity Type 4) and syntax of the referenced Recording Entity Identification does not conform to MSISDN or section 5.5.
		105	LCS	Severe	Recording Entity Code refers to GMLC (Recording Entity Type 5) and syntax of the referenced Recording Entity Identification does not conform to MSISDN or to section 5.5.
		106	GPRS MSG	Severe	Entity Code refers to P-GW (Recording Entity Type 7) and syntax of the

			MSESS		referenced Recording Entity Identification does not conform to Section 5.5.
		107	GPRS MSG MSESS	Severe	Entity Code refers to S-GW (Recording Entity Type 8) and syntax of the referenced Recording Entity Identification does not conform to Section 5.5.
		108	MSG MSESS	Severe	Entity Code refers to P-CSCF (Recording Entity Type 9) and syntax of the referenced Recording Entity Identification does not conform to Section 5.5.
		109	MSESS	Severe	Entity Code refers to TRF (Recording Entity Type 10) and syntax of the referenced Recording Entity Identification does not conform to Section 5.5.
		110	MSESS	Severe	Entity Code refers to ATCF (Recording Entity Type 11) and syntax of the

					referenced Recording Entity Identification does not conform to Section 5.5.
Recording Entity Identification	The identification of the entity recording the call. *Derivation:* For MSC encoded as one of the following according to the requirements of the Sender PMN. The MSISDN of the entity (See Annex C – CS Domain Charging and PS Domain Charging) for example 44836100456 The signalling point code (See Annex C – CS Domain Charging and PS Domain Charging) for example 253464 A name for example “HELSINKI” or “Switch 1”. For SMSC entity (See Annex C – CS Domain Charging and PS Domain Charging) (Msisdn). For GSN entities (See Annex C – CS Domain Charging and PS Domain Charging) (GSNAddress). For GSN entities, where SMS usage is recorded see Annex C – CS Domain Charging and PS Domain Charging (GSNAddress or Msisdn). For GMLC entities see Annex C – CS Domain Charging and PS Domain Charging (Msisdn) or as Ipv4 Address or as Ipv6 Address.	10	Network	Fatal	Syntax error.

	For Wi-Fi usage this could be the name (uppercase) or an IP address of the Wi-Fi billing information recording entity or location of the usage. For P-CSCF, TRF and ATCF see Annex C - IMS Domain Charging. *Conditionality:* Mandatory within group Recording Entity Information.				
Recording Entity Information	A repeating group which identifies a Recording Entity Identification together with an associated Recording Entity Code and Recording Entity Type. This table is used on a once-off basis and applies only to the transfer which contains it. A new table is sent with each transfer. Codes are reusable from transfer to transfer. *Conditionality:* One occurrence must be present within group Network Information for each unique Recording Entity Code used within the TAP file.	30 31 32 33 34	Network Network Network Network Network	Fatal Fatal Fatal Fatal Fatal	Mandatory item Recording Entity Code missing within group. Mandatory item Recording Entity Type missing within group. Mandatory item Recording Entity Identification missing within group. More than one occurrence of group with same Recording Entity Code where Recording Entity Type and /or Recording Entity Identification are not the same.

					More than one occurrence of group with same Recording Entity Code where Recording Entity Type and Recording Entity Identification are the same (i.e. duplicate Recording Entity Information table entry).
Recording Entity Type	An item identifying the type of recording entity. *Conditionality:* Mandatory within group Recording Entity Information. *Values:* 1 MSC (Mobile Services Switching Centre) 2 SMSC (Short Message Service Centre) 3 GGSN (Gateway GPRS Support Node) or P-GW (PDN Gateway) 4 SGSN (Serving GPRS Support Node) 5 GMLC (Gateway Mobile Location Centre) 6 Wi-Fi Billing Information Recording Entity 7 P-GW (PDN Gateway) 8 S-GW (Serving Gateway) 9 P-CSCF (Proxy Call Session Control Function) 10 TRF (Transit and Roaming Function) 11 ATCF (Access Transfer Control Function)	10 20	Network Network	Fatal Fatal	Syntax error. Value out of range.

	12 CHF (5G Charging Function) **Note 1:** The usage of value 3 for P-GW is for the situation where a VPMN accessing a gateway node on the HPMN side from a visited SGSN may not be able to identify whether access was to a GGSN or P-GW. **Note 2:** Both S-GW and SGSN could be used for both 3G and 4G networks and do not imply a specific Radio Access Technology (RAT).				
Release Version Number	Indicates the release version associated with the Specification Version Number. *Conditionality:* Mandatory within group Notification. Mandatory within group Batch Control Information. *Values:* 12	10 20	Notifictn Btch Ctrl Notifictn Btch Ctrl	Fatal Fatal	Syntax error. Value out of range. **Note:** This error can be used to reject an unexpected release version (subject to the rules of Section 7).
Requested Delivery Timestamp	The timestamp representing the time requested by the Charged Party to initiate the start of the Content Transaction. This is given in the time of the serving Content Provider. There must be an associated UTC Time Offset Code.	10 11	Content Content	Severe Warning	Syntax error and timestamp referenced as Charging Point. Syntax error and timestamp not referenced as Charging Point.

	Example: The Charged Party may request to download all messages at 2200hrs in order to take advantage of off-peak rates even when placing the order at an earlier time. *Conditionality:* Must be present within group Content Transaction Basic Info when no other timestamp present within group or when item referenced as the Charging Point. *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 to 235959	20 21 30 31 100 101	Content Content Content Content Content Content	Severe Warning Severe Warning Severe Warning	Value out of range and timestamp referenced as Charging Point. Value out of range and timestamp not referenced as Charging Point. Mandatory associated UTC Time Offset Code missing and timestamp referenced as Charging Point. Mandatory associated UTC Time Offset Code missing and timestamp not referenced as Charging Point. Requested Delivery Timestamp after associated Charge Detail timestamp and timestamp referenced as Charging Point. Requested Delivery Timestamp after associated Charge Detail timestamp and timestamp not referenced as Charging Point.

		200	Content	Severe	Requested Delivery Timestamp before the commercial roaming start date (in VPMN local time if no other time zone explicitly agreed) for the specific service and the TAP file is not a test file.
Requested Destination	A group containing information relating to the original destination to which the customer requested to be connected. *Conditionality:* Must be present within group Mobile Session where available from the network and Mobile Session Service is 'MO Voice over LTE'.				
Requested Number	The TEL URI of the original destination to which the customer requested to be connected. Must be represented in international format. This is the equivalent of the Dialled Digits for Circuit Switched calls, however reformatted. The Requested Number must start with the valid country code as listed in E.164 "Assigned Country Codes" [28] and contain only numeric digits. All other characters must be removed. *Derivation:*				

	IMS item Requested Party Address (See Annex C – IMS Domain Charging) *Conditionality:* Must be present within group Requested Destination where available from the network and Mobile Session Service is 'MO Voice over LTE'. *Values:* Each digit is numeric (0-9).				
Requested Public User ID	The SIP URI of the original destination to which the customer requested to be connected. In case the TEL URI is provided from the network, it is not allowed to be populated in the Requested Public User ID and must be populated only in the Requested Number element. *Derivation:* IMS item Requested Party Address (see Annex C – IMS Domain Charging) *Conditionality:*				

	Must be present within group Requested Destination where available from the network and Mobile Session Service is 'MO Voice over LTE'. *Examples:* sip:alice@atlanta.com sip:alice:secretword@atlanta.com;transport=tcp sips:alice@atlanta.com?subject=project%20x&priority=urgent sip:+1-212-555-1212:1234@gateway.com;user=phone sips:1212@gateway.com sip:alice@192.0.2.4 sip:atlanta.com;method=REGISTER?to=alice%40atlanta.com sip:alice;day=tuesday@atlanta.com				
Response Time	The actual response time for processing the LCS request measured in seconds. *Derivation:* GSM/UMTS item measureDuration (See Annex C – LCS Charging). *Conditionality:* Must be present within group				

	LCS QoS Delivered where available from the network				
Response Time Category	The response time category as requested for the response of an LCS request. *Derivation:* LCS QoS IE octet 6 (See Annex C – LCS Charging). The value is derived by interpreting the 2 most significant bits of octet 6 as an integer. *Conditionality:* Must be present within group LCS QoS Requested where available from the network *Values:* 0 response time not specified 1 low delay 2 delay tolerant 3 reserved	20	LCS	Severe	Value out of range.

4.16 S

SCU Basic Information	Service Centre Usage (SCU) Basic Information provides details of who made the call and where to, who received the call and where from, in respect of mobile originated and mobile terminated traffic respectively and the direction of the transaction. The Chargeable Subscriber, Charged Party Status and Non Charged Number elements are all mandatory. All other elements are conditionally present. *Conditionality:* Mandatory within group Service Centre Usage.	30 31 32 33 34	SCU SCU SCU SCU SCU	Severe Severe Severe Warning Warning	Mandatory group SCU Chargeable Subscriber missing within group. Mandatory item Charged Party Status missing within group. Mandatory item Non Charged Number missing within group and Charged Party Status is 'originating'. Mandatory item Non Charged Number missing within group and Charged Party Status is 'terminating'. Item CLIR Status Indicator missing within group and Charged Party Status is 'terminating'.
SCU Charge Type	Contains the elements used to price the service usage, message status, priority code, distance charge band code and message type. Where the charge is based on volume, for example message length, this information will be present within the associated Charge Information.	30 31	SCU SCU	Severe Severe	Mandatory item Message Status missing within group. Mandatory item Priority Code missing within group.

	All elements within the group are mandatory except Distance Charge Band Code which will not be present where it was not a parameter in Charge calculation. *Conditionality:* Mandatory within group Service Centre Usage.	32 33 34	SCU SCU SCU	Severe Severe Warning	Item Distance Charge Band Code missing within group and distance defined as a pricing parameter within SMS bilateral agreement. Mandatory item Message Type missing within group. Mandatory item Message Description Code missing within group.
SCU Chargeable Subscriber	Occurs within SCU Basic Information. Contains the identification of the chargeable subscriber. The group must contain either the group GSM Chargeable Subscriber or the MIN of the chargeable subscriber, both may not be present. *Conditionality:* Mandatory within group SCU Basic Information				
SCU Timestamps	Contains the timestamps for message deposit and completion of actions together with an indicator showing which timestamp was used as the Charging Point. All elements within the group are mandatory.	30 31	SCU SCU	Severe Severe	Mandatory item Deposit Timestamp missing within group. Mandatory item Completion Timestamp missing within group.

	Conditionality: Mandatory within group Service Centre Usage.	32	SCU	Severe	Mandatory item Charging Point missing within group.
Sender	A unique identifier used to determine the network which is the Sender of the data. The full list of codes in use is given in TADIG PRD TD.13 [14]. *Conditionality:* Mandatory within group Notification. Mandatory in group Batch Control Information. *Example content:* GBRCN GBRVF DEUD1 DEUD2 **Note:** These codes must be in uppercase (as defined in TD.13 [14]).	10 20 100	Notifictn Btch Ctrl Notifictn Btch Ctrl Notifictn Btch Ctrl	Fatal Fatal Fatal	Syntax error. Value out of range. The item does not match the Sender on the filename.
Service Centre Usage	A Service Centre Usage item represents usage of an APMNs Short Message Service Centre (SMSC).	30 31	SCU SCU	Severe Warning	Mandatory group SCU Basic Information missing within group.

	This usage can only occur where there is a bilateral agreement to make these services available to the HPMN's subscribers. All elements within the group are mandatory except RAP File Sequence Number and Serving Network which are conditional and Operator Specific Information which is optional. Exchange of the Serving Network element requires bilateral agreement. *Conditionality:* Mandatory within an occurrence of group Call Event Details where none of the following are present; Mobile Originated Call, Mobile Terminated Call, Supplementary Service Event, GPRS Call, Content Transaction or Location Service . 32 33 34 35 36 37	SCU SCU SCU SCU SCU SCU	Warning Severe Severe Severe Severe Warning	Item RAP File Sequence Number missing and SCU previously received and rejected. Item RAP File Sequence Number present and SCU not previously received and rejected. Mandatory item Recording Entity Code missing within group. Mandatory group Charge Information missing within group. Mandatory group SCU Charge Type missing within group. Mandatory group SCU Timestamps missing within group. Item RAP File Sequence Number present and TAP transfer batch being resubmitted as corrected (having been previously rejected with fatal error).

		38	SCU	Severe	Serving Network element present and its exchange not bilaterally agreed. **Note:** Error code 39 removed in TAP release 3.11 (01 May 2005).
Service Code	The Service Code is one of Teleservice Code or Bearer Service Code as determined by the service type used. *Conditionality:* Mandatory within group Basic Service. One occurrence must be present within group Supplementary Service Used for each basic service affected by the Supplementary Service action except where this applies to all basic services when it will not be present.				**Note:** Error codes 30, 31, 32 & 33 removed in TAP release 3.11 (01 May 2005).
Service Start Timestamp	The timestamp gives the start of the event or call. The time is given in the local time of the Sender PMN (or Serving Network where this is not the Sender). There must be a UTC Time Offset Code associated with the timestamp. Note that this timestamp is the event start time as provided by the network.	10 20 30	MSESS MSG MSG MSESS MSESS MSG	Severe Severe Severe	Syntax error. Value out of range. Mandatory associated item UTC Time Offset Code missing.

	Derivation: IMS item Service Delivery Start Time Stamp (See Annex C – IMS Domain Charging *Conditionality:* Mandatory within group Mobile Session. *Format*: CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959	100 200	MSESS MSESS MSG	Severe Severe	Service Start Timestamp after Charge Detail Timestamp. Service Start Timestamp before the commercial roaming start date (in VPMN local time if no other time zone explicitly agreed) for the specific network service and the TAP file is not a test file. **Note:** Old call records should not be rejected in principle in Roaming Hubbing migration scenarios. See BA.62 for further details.
Serving BID	The Serving BID (Billing Identifier) is a code associated with a geographical area such as a cell site or group of cell sites. Where a Serving BID has been supplied there must be a Serving Location Description present. The Serving BID presence is not required where only the Serving Location Description is used as a pricing parameter as per the Sender's IOT definition. *Derivation:*	10 20	MOC MTC SS GPRS MSESS MSG MOC MTC SS GPRS	Severe Severe	Syntax error. Value out of range.

	Listed on the BID report in effect for the applicable call date as defined within PRD TD.38 [35]. *Optionality:* Operators may decide not to transfer the Serving BID. *Conditionality:* Must be present within group Geographical Location where available (subject to optionality). Value must be assigned to the Sender unless a Serving Network element is present in the call record. In that case, it must belong to the operator identified in the Serving Network element.	21	MSESS MSG MOC MTC SS GPRS MSESS MSG	Severe	Value not assigned to Sender or, if a Serving Network element is present in the record, not assigned to the operator identified in the Serving Network element. **Note:** Please see TD.38 [35] for clarification regarding Roaming Hubbing where alias TADIG Codes are used.
Serving Location Description	A text description giving the geographical location of the terminal equipment. Operators may optionally use a description as a default where there has been no terminal equipment involved. The Serving Location Description must be present where there is an associated Serving BID and its content will then be predefined. Where the location of the subscriber is a pricing parameter the Serving Location Description will contain a value as explicitly defined in the IOT of the Sender. Note that in case the IOT defines both a 'normal' charge and one or more 'exceptional'	10	MOC MTC SS GPRS MSESS MSG	Severe	Syntax error.

	charge(s) then only call/events containing an 'exceptional' charge need to contain the Serving Location Description. For Wi-Fi usage this item must be present and will contain a text description of the Wi-Fi Hot Spot or location, for example "London City Airport". Other than the above described circumstances the content is at the discretion of the Sender and is optionally supplied. *Derivation:* Listed on the BID report in effect for the applicable call date as defined in TD.38 [35] where the Serving BID is present. Where the location of the subscriber is a pricing parameter the Serving Location Description (if present) must contain a value as explicitly defined in the IOT of the Sender. In all other cases the content is at the discretion of the Sender. *Optionality:* Operators may omit this information unless one of the following: • Item Serving BID present.				

	• The location of the subscriber is a pricing parameter as explicitly defined in the Sender's IOT. • Wi-Fi usage *Conditionality:* Must be present within group Geographical Location where a Serving BID is present or where the location of the subscriber is a pricing parameter as explicitly defined in the Sender's IOT. Must be present within group Geographical Location for Wi-Fi network usage.				
Serving Network	A unique identifier used to determine the network where the call event was originally created. While this would normally be a TADIG PMN code (see TADIG PRD TD.13 [14]) this may not be true in certain specific cases, for example inter standard roaming. The exchange and content of the Serving Network element need to be bilaterally agreed. *Conditionality:* Must be present within groups Geographical Location	10 20	MOC MTC SS SCU GPRS MSESS MSG AUR MOC MTC SS SCU	Severe Severe	Syntax error. Value out of range, that is, it is not a bilaterally agreed value.

	Service Centre Usage Aggregated Usage Record if the Serving Network is different from the Sender. Exchange of the Serving Network element requires bilateral agreement.		GPRS MSESS MSG AUR		
Serving Parties Information	Information on entities that were used to access the Content Service. This group must contain the item Content Provider Name. Additional data should be provided when the information is available to the Sender. *Conditionality:* Mandatory within group Content Transaction.	30	Content	Severe	Mandatory item Content Provider Name missing within group.
Session Charge Information	Session Charge Information is provided for chargeable elements within Mobile Session call/events. The group must contain Charged Item and Call Type Group and at least one occurrence of Charge Detail. *Conditionality:* One or more occurrences must be present within group Mobile Session	30 31 32	MSESS MSESS MSESS	Severe Severe Severe	Item Charged Item missing within group. Item Exchange Rate Code missing within group and one or more Charge within an associated Charge Detail is greater than zero.

		33	MSESS	Severe	Item Call Type Group missing within group
		34	MSESS	Severe	Group Charge Detail missing within group. Group Tax Information missing within group but expected in accordance with roaming agreement for that particular call. Tax Information group missing must be interpreted as Tax Value zero.
		36	MSESS	Severe	Occurrence of group Charge Detail containing Charge Type ‘00’ missing within group.
		37	MSESS	Severe	More than one occurrence of Charge Detail present with the same Charge Type value.
		38	MSESS	Severe	Breakout of Charge Types AIR (01) and/or TOLL (03) not present on a duration based charge, but expected in accordance with roaming agreement;

		39	MSESS	Severe	that is only Charge Type 00 present within group. This validation rule can be applied only where bilaterally agreed between sender and recipient and where the call charge is greater than 0. In accordance with roaming agreement, charges are defined in individual Charge Types, but the Charge for Charge Type 00 does not equal sum of Charges for the other Charge Types as stated within roaming agreement. This validation rule can be applied only where bilaterally agreed between sender and recipient.
		40	MSESS	Severe	Group Tax Information present within group but not expected in accordance with roaming agreement for the call/event and Tax Value referenced within the group is greater than 0 (zero).
		41	MSESS	Warning	

					Group Tax Information present within group but not expected in accordance with roaming agreement for the call/event and Tax Value referenced within the group is not greater than 0 (zero).
SIM Chargeable Subscriber	Contains the identification of a chargeable subscriber identified by an IMSI. The group must contain the IMSI of the chargeable subscriber and may optionally contain an MSISDN. Operators may bilaterally agree to make transfer of the MSISDN mandatory. *Conditionality* Mandatory within group Chargeable Subscriber where MIN Chargeable Subscriber is not present.	30 32	MOC MTC SS GPRS MOC MTC SS GPRS	Severe Severe	IMSI missing within group. MSISDN missing within group but expected in accordance with roaming agreement.
SIM Toolkit Indicator	The SIM Toolkit Indicator will be present when the call has been initiated by the SIM Toolkit application. *Conditionality:* Must be present within groups MO Basic Call Information	10 20	MOC MTC MSG MSESS MOC	Warning Warning	Syntax error Value out of range

	MT Basic Call Information Messaging Event Mobile Session where the call has been initiated by the SIM toolkit. *Values:* 1 initiated by SIM toolkit		MTC MSG MSESS		
SMS Destination Number	The SMS Destination Number item contains the actual destination (intended recipient) of the SMS text message. *Derivation:* Derived from item destinationNumber (SmsTpDestinationNumber) (See Annex C – CS Domain Charging and PS Domain Charging). Must be populated with the digits exactly as entered by the subscriber. *Conditionality:* Must be present within group Destination for SMS MO calls when the information is available from the network. *Values:* Each digit is numeric (0-9) or contains '+', '*' or '#'.	10 20	MOC MOC	Severe Severe	Syntax error. Value out of range.

SMS Originator	The SMS Originator holds the identification of the actual sender of the SMS (not the SMSC). Must be populated with the data as received from the network. *Conditionality:* Must be present within group Call Originator where available from the network and TeleService Code indicates SMS usage.	10	MTC	Warning	Syntax error. **Note:** Error Code 20 removed in TAP release 3.11 (01 May 2005).
Specification Version Number	To enable a PMN to encode and/or read a file it is necessary to uniquely identify the format. This is achieved through the Specification Version Number. There must be a Release Version Number associated with this item. *Conditionality:* Mandatory within group Notification. Mandatory within group Batch Control Information. *Value:* 3 for TAP3	10 20	Notifictn Btch Ctrl Notifictn Btch Ctrl	Fatal Fatal	Syntax error. Value out of range.
Supplementary Service Code	A code which uniquely defines the supplementary service, a group of supplementary services, or a USSD message.	10 11	SS MOC	Severe Warning	Syntax error. Syntax error.

	Derivation for Supplementary Service: GSM item SupplementaryServiceCode (See Annex C – CS Domain Charging). The code is derived by taking the MAP encoding (See Annex C – Supplementary Service Codes) and translating bits 8-5 into a 'hex' character and bits 4-1 into a second 'hex' character. *Conditionality:* Mandatory within group Supplementary Service Used. Mandatory within group Mobile Originated Call where a supplementary service has been used in conjunction with the call unless supplied in a separate Supplementary Service Event record. *Values:* 00 All supplementary services 10 All line identification services 11 Calling number identification presentation 12 Calling number identification restriction 13 Connected number identification presentation 14 Connected number identification restriction 18 All name identification SS 19 Calling name presentation	20 21 22 30	SS MOC MOC SS	Severe Warning Severe Warning	Value out of range. Value out of range. Value 'FF'. USSD, value 'FF', present and associated Charge Information does not contain a charge greater than zero.

	20 All call forwarding 21 Call forwarding unconditional 24 Call deflection 28 All conditional Call Forwarding 29 Call forwarding on mobile subscriber busy 2A Call forwarding on no reply 2B Call forwarding on subscriber not reachable 30 All call offering services 31 Call transfer 40 All call completion services 41 Call waiting 42 Call hold 43 Completion of calls to busy subscribers – origination side 44 Completion of calls to busy subscribers – destination side 45 Multicall 50 All multi party services 51 Multi party service 60 All community of interest services 61 Closed user groups 70 All charging supplement services 71 Advice of charge (information) 72 Advice of charge (charging)				

	80 All additional info transfer services 81 UUS1 user to user signalling 82 UUS2 user to user signalling 83 UUS3 user to user signalling 90 All call barring 91 All Barring of outgoing Call Services 92 Barring of all outgoing calls 93 Barring of all outgoing international calls 94 Barring of all OG international except HPMN 99 All Barring of incoming Call Services 9A Barring of all incoming calls 9B Barring of all IC calls when outside HPMN FF USSD Message				
Supplementary Service Event	A Supplementary Service Event element represents usage of supplementary services or an USSD message. The supplementary service can happen outside or in conjunction with a standard call dependent on network configuration. Chargeable Subscriber, Location Information, Equipment Identifier and Supplementary Service Used must be present. RAP File Sequence Number is conditionally present.	30 31 32	SS SS SS	Severe Warning Warning	Mandatory group Chargeable Subscriber missing within group. Item RAP File Sequence Number missing and SS previously received and rejected. Item RAP File Sequence Number present and SS not previously received and rejected.

	Operator Specific Information may also be present, this is optional dependent on bilateral agreement. *Conditionality:* Mandatory within an occurrence of group Call Event Details where none of the following are present; Mobile Originated Call, Mobile Terminated Call, Service Centre Usage, GPRS Call, Content Transaction or Location Service.	33 35 36	SS SS SS	Severe Warning Severe	Mandatory group Location Information missing within group. Item RAP File Sequence Number present and TAP transfer batch being resubmitted as corrected (having been previously rejected with fatal error). Mandatory group Supplementary Service Used missing within group. **Note:** Error codes 37 & 38 removed in TAP release 3.11 (01 May 2005).
Supplementary Service Parameters	The Supplementary Service Parameters element is an element of the Supplementary Service Used. The contents of the element and the value it represents is entirely dependent upon the Supplementary Service Action. *Derivation for Supplementary Service:* GSM item ssParameters (See Annex C – CS Domain Charging). *Conditionality:*	10 20	SS SS	Warning Warning	Syntax error. Value out of range.

	Must be present within group Supplementary Service Used where relevant, i.e. for those Supplementary Service Actions detailed below. **Note:** In the case of USSD message, when the whole message content is not available, at least the USSD service code must be present. *Values:* **Event** / **Action** / **Parameter** Call forward unconditional / Reg'n / Forwarded to number Call fwd busy / Reg'n / Forwarded to number Call fwd no reply / Reg'n / Forwarded to number Call fwd not reachable / Reg'n / Forwarded to number Explicit Call Transfer / Inv'n / Transferred to number USSD message / USSD Inv'n / The contents of the USSD message as entered by the user or sent by the mobile station				
Supplementary Service Used	This element details the Supplementary Service used and relevant charging information.	30	SS	Severe	Mandatory item Supplementary Service Code missing within group.

	The group must contain the fields Supplementary Service Code, Action Code and Charging Timestamp. Conditionally the following information may also be present; Supplementary Service Parameters, Charge Information and Service Code (which may be repeated for each service affected). *Conditionality:* Within group Supplementary Service Event the group is mandatory and may only occur once.	31	SS	Severe	Mandatory item Action Code missing within group.
		32	SS	Warning	Item Supplementary Service Parameters present when Supplementary Service is not for call forward registration or does not represent USSD usage.
		33	SS	Warning	Item Supplementary Service Parameters not present when Supplementary Service is for call forward registration or invocation usage.
		36	SS	Severe	Mandatory item Charging Timestamp missing within group.
		101	SS	Severe	Invalid or non transferable Supplementary Service Code and Action code combination present within group.

					Note: Error codes 34, 35, 37, 38 & 100 removed in TAP release 3.11 (01 May 2005).

4.17 T

TAP Currency	TAP Currency contains the Currency Code which identifies the currency used for charges throughout the Transfer Batch where that currency is not in the standard SDRs. The use of a currency other than SDRs will be by bilateral agreement. The item is only provided for use in internal markets. *Derivation:* ISO 4217 [26]. *Optionality:* Only present within internal markets where agreed bilaterally. *Conditionality:*	10 20 200	Acctng Acctng Acctng	Fatal Fatal Fatal	Syntax error. Value out of range. **Note:** This error cannot be raised for the values XDR and SDR. TAP Currency not in line with bilateral agreement.

	Subject to optionality, must be present within Accounting Information when currency other than Special Drawing Rights is used as specified in the roaming agreement. *Example:* **Currency Code** **Currency name** *EUR* *Euro* *INR* *Indian rupee* *USD* *US Dollar*				
TAP Decimal Places	Identifies the number of decimal places used within all absolute monetary values within the TAP file. The same number of decimal places must be present for all tax, discount, charge and audit values throughout the whole TAP file. *Conditionality:* Mandatory within group Accounting Information. *Values:* Range 0 – 6	10 20	Acctng Acctng	Fatal Fatal	Syntax error. Value out of range.
Tax Indicator	This indicator, set by the Sender and passed to the Recipient, indicates that the related tax is a Value Added Tax.	10 20	Acctng Acctng	Warning Warning	Syntax error. Value out of range.

	Conditionality: Can be present within group Taxation where the related tax is a Value Added Tax. Indication of a Value Added Tax by population of the field is optional and up to the Sender. *Values:* 1 Value Added Tax				
Tax Information	A repeating group containing the Tax Rate Code and the Tax Value and, where applicable Taxable Amount. Each element of Charge Information may have several tax elements associated with it, for example national tax, regional tax, local tax. *Conditionality:* There must be one occurrence within Charge Information for each tax element associated with the Charge Information (see also Taxation). There must be one occurrence within group CAMEL Service Used for each tax element associated with the CAMEL Invocation Fee.	30 31	Calls Calls	Severe Severe	Mandatory item Tax Rate Code missing within group. Mandatory item Tax Value missing within group. **Note:** Error code 32 removed in TAP release 3.11 (01 May 2005).

	There must be one occurrence within Session Charge Information for each tax element associated with the Session Charge Information (see also Taxation). There must be one occurrence within group Messaging Event for each tax element associated with the Charge (see also Taxation).				
Tax Rate	A tax rate associated with a Tax Type and Tax Rate Code. The Tax Rate defines the rate applicable to the charge. Due to the fact that the charge may not be invoiced until a later point in time and that some national legislations dictate that the tax rate applicable is determined by the invoice date, there is a possibility that the rate on the invoice may differ from the rate on the transfer. However, the likelihood of this happening is extremely low. The rate is given to 5 decimal places. *Conditionality:* Mandatory within group Taxation except where the associated Tax Rate Code represents an absolute/fixed tax value in which case it must not be present. *Values:*	10 20	Acctng Acctng	Fatal Fatal	Syntax error. Value out of range.

	00.00000 thru 99.99999				
Tax Rate Code	A code associated with a Tax Type and Tax Rate. *Conditionality:* Mandatory within group Taxation. Mandatory within group Tax Information. Mandatory within group AUR Tax Information *Values:* Range 0 .. 999	10 11 20 100 200	Acctng Calls Acctng Calls Calls	Fatal Severe Fatal Severe Severe	Syntax error. Syntax error. Value out of range. Specified Tax Rate Code was not defined in the group Taxation The referenced Tax Rate is not in line with the roaming agreement at the corresponding call date. Note that, where variable tax rates apply to the call/event the exact validation of the tax rate may not be possible and, therefore, cannot be carried out.
Tax Type	The type of tax represented by the Tax Rate Code and Tax Rate combination. *Conditionality:* Mandatory within group Taxation. *Values:*	10 20	Acctng Acctng	Fatal Fatal	Syntax error. Value out of range.

	01 National (for example Federal, Dominion, VAT, etc.) 02 Regional (for example State, Province) 03 County 04 Local/City **Note**: Tthe above tax types may represent specific taxes, for example any of Public Utilities, Sales & Use, Communications taxes may be National, Regional, County or Local/City.				
Tax Value	The actual value of the tax associated with the Tax Code and Charge Information. The Tax Value must be of a value greater than or equal to zero. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Mandatory within group Tax Information. *Values:* >= 0 (zero)	10 20 22	Calls Calls Calls	Severe Severe Severe	Syntax error. Value out of range. Where the associated Tax Rate Code relates to a Tax Rate, the Tax Value does not correspond to the Taxable Amount (or, where no Taxable Amount is present, does not correspond to the total Charge within Charge Information) and Tax Rate. **Note 1:** Rounding rules are at the discretion of the Sender and a tolerance of 0.02 units of TAP Currency must be allowed

					(independent of the number of decimal places used for the TAP file). **Note 2:** No tolerance is allowed when the expected Tax Value is zero. **Note 3:** In the absence of Taxable Amount the Tax Value must always be validated against the total charge (Charge Type 00) in the given Charge Information, even if another Charge Type has been specified in the definition of the applied Tax Code in Taxation.
		200	Calls	Severe	Tax Value is not in line with the roaming agreement at the corresponding call event date. Note that, where variable tax rates apply to the call event the exact validation of the tax rate may not possible and, therefore, cannot be carried out. **Note 1:** Rounding rules are at the discretion of the Sender and a tolerance of 0.02 units of TAP

					Currency must be allowed, independent of the number of decimal places used for the TAP file. **Note 2:** No tolerance is allowed when the expected Tax Value is zero. **Note 3:** This error cannot be raised where both the Charge and the Tax Value are zero (0) for the following scenarios: Mobile Terminated Calls except SMS (Teleservice Code 20 or 21) Mobile Session with Mobile Session Service “MT Voice over LTE”
Taxable Amount	The actual part of the Charge to which the Tax Value and Tax Rate (Code) relate. The Taxable Amount must of a value greater than zero. **Note:** When the associated tax is defined with a Charge Type then the Taxable Amount should be populated based on the charges with the same Charge Type. The value is in SDRs with the number of decimal places defined by TAP Decimal Places. Note that the currency may be	10 20 100	Calls Calls Calls	Severe Severe Severe	Syntax error. Value out of range. Taxable Amount not in line with roaming agreement.

	subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Must be present within group Tax Information where the associated Tax Value and Tax Rate Code do not relate to the total Charge within Charge Information. *Values:* > 0 (zero)				
Taxation	The Taxation table is a repeating group of Tax Rate Code, Tax Type, Tax Rate, Charge Type and Tax Indicator. Tax Rate Code and Tax Type are mandatory. Tax Rate and Charge Type are conditional. Tax Indicator is optional. This table is used on a once-off basis and applies only to the transfer which contains it. A new table is sent with each transfer. Codes are reusable from transfer to transfer. *Conditionality:* Mandatory within group Accounting Information except where taxes are not applicable. One occurrence must be	30 31 33 34	Acctng Acctng Acctng Acctng	Fatal Fatal Fatal Warning	Mandatory item Tax Rate Code missing within group. Mandatory item Tax Type missing within group. More than one occurrence of group with same Tax Rate Code where Tax Type, Tax Rate and/or Charge Type are not the same. More than one occurrence of group with same Tax Rate Code where Tax

	present for each unique Tax Rate Code used within group Tax Information.				Type and Tax Rate are the same (i.e. duplicate Taxation table entries). **Note:** Error codes 32 and 35 removed in TAP release 3.11 (01 May 2005).
TeleService Code	A code which uniquely defines a TeleService. Group TeleService Codes, identifiable by the description 'All', should only be used where details of the specific services affected are not available from the network. Note that compound TeleService group codes can only occur in call independent supplementary service operations. *Derivation:* GSM item TeleServiceCode (See Annex C – CS Domain Charging). The code is derived by taking the MAP encoding (See Annex C – Teleservice Codes) and translating bits 8-5 into a 'hex' character and bits 4-1 into a second 'hex' character. *Conditionality:*	10 11 20 21	MOC MTC SS MOC MTC SS	Severe Warning Severe Warning	Syntax error. Syntax error. Value out of range. **Note:** Value 21 is only allowed for MTC and value 22 is only allowed for MOC. Value out of range.

	Must be present within group Service Code where the type of service used was a teleservice. Must not be present when the type of service used was a bearer service and, therefore, Bearer Service Code is present. *Values:* 00 All teleservices 10 All Speech transmission services 11 Telephony 12 Emergency calls 20 All SMS Services 21 Short Message MT/PP 22 Short Message MO/PP 60 All Fax Services 61 Facsimile Group 3 & alternative speech 62 Automatic Facsimile Group 3 63 Automatic Facsimile Group 4 70 All data teleservices (compound) 80 All teleservices except SMS (compound) 90 All voice group call services 91 Voice group call 92 Voice broadcast call				

Third Party Information	A group containing information identifying the original calling party in a call forwarding call context. The group must contain a CLIR Status Indicator and Third Party Number will be conditionally present. *Example:* Party S calls Party T and a conditional call forward takes place to Party U. The MOC relating to the call forward leg (from party T to party U) will contain, in the Third Party Information, details of party S (subject to availability). *Conditionality:* Must be present within group Mobile Originated Call where the associated Supplementary Service Code indicates a conditional call forward invocation and the information is available from the network.				**Note:** Error Codes 30, 31, 32, 33 and 34 removed in TAP release 3.10 (01 May 2003).
Third Party Number	The Third Party Number is the number identifying the original calling party in a conditional call forwarding context. *Derivation:* GSM item CallingNumber (See Annex C – CS Domain Charging). This item is of type AddressString. It is	10 20	MOC MOC	Warning Warning	Syntax error. Number not represented in international format.

	represented in TAP in international format, i.e. the number begins with the country code related to the calling number. *Conditionality:* Must be present within group Third Party Information where available. *Values:* Each digit is numeric (0-9)				
Total Advised Charge	The sum of all the advised charges associated with the corresponding currency excluding those representing a refund (Charge Refund Indicator). The Total Advised Charge must not contain a negative value. Note that charges from records with severe errors should also be included where possible. The number of decimal places is defined by item TAP Decimal Places. C*onditionality:* Mandatory within group Total Advised Charge Value.	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range. Value does not match the calculated sum of non refund advised charges associated with the same currency.

	Values: > or = 0 (zero)				
Total Advised Charge Refund	The sum of all the advised charges associated with the corresponding currency representing a refund (Charge Refund Indicator). The Total Advised Charge Refund must be greater than zero. Note that charges from records with severe errors should also be included where possible. The number of decimal places is defined by item TAP Decimal Places. *Conditionality:* Present within group Total Advised Charge Value where refunds are present and the total is greater than zero. *Values:* > (zero)	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range. Value does not match the calculated sum of refund advised charges associated with the same currency.
Total Advised Charge Value	A repeating group holding the sums of all advised charges and commissions by associated currency.	30 100	Audit Audit	Fatal Fatal	Mandatory item Total Advised Charge missing within group. Item Total Commission expected and not present.

	The group must contain Total Advised Charge. Conditional items are Advised Charge Currency, Total Commission, Total Advised Charge Refund, Total Commission Refund. *Conditionality:* Present within group Audit Control Information where Content Transactions are present within the file and there are Advised Charges present within one or more of the Content Transactions.	101 102	Audit Audit	Fatal Fatal	Item Total Commission Refund expected and not present. Item Total Advised Charge Refund expected and not present.
Total Call Event Duration	The item contains the actual total duration of a call event as a number of seconds. The Total Call Event Duration must always contain the call duration calculated from the call end time (channel release) minus the Call Event Start Timestamp, or Service Start Timestamp, as applicable. The item is used, in conjunction with the Call Event Start Timestamp or Service Start Timestamp (and UTC Time Offset Code) to calculate the call event end time. This is needed for ageing calculations and validation against the File Available Timestamp. *Conditionality:*	10 20 100 200	MOC MTC GPRS MSESS MOC MTC GPRS MSESS MOC MTC GPRS	Severe Severe Severe Warning	Syntax error. Value out of range Total Call Event Duration is greater than 0 (zero) for SMS call. Total Call Event Duration exceeds limit defined in BA.12 [12].

	Mandatory within groups MO Basic Call Information MT Basic Call Information Mobile Session GPRS Basic Call Information *Values:* > or = 0 **Note:** for SMS calls the value must be 0 (zero).				**Note:** Not applicable to Wi-Fi usage.
Total Charge	The sum of all the charges associated with Charge Type 00 and CAMEL Invocation Fee, excluding those representing a refund (Charge Refund Indicator). The Total Charge must not contain a negative value. Note that charges from records with severe errors must also be included where possible. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency.	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range. Value does not match the calculated sum of non refund charges which includes sum of CAMEL Invocation Fee for all CAMEL calls in the Transfer Batch.

	Conditionality: Mandatory within group Audit Control Information. *Values:* > or = 0 (zero)				
Total Charge Refund	The sum of all the charges associated with Charge Type 00 representing a refund (Charge Refund Indicator). The Total Charge Refund must be greater than zero. Note that charges from records with severe errors should also be included where possible. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Present within group Audit Control Information where refunds are present and the total is greater than zero. *Values:* > 0 (zero)	10 20 21 100	Audit Audit Audit Audit	Fatal Fatal Fatal Fatal	Syntax error. Value out of range (except zero). Item Total Charge Refund has a value of zero. Value does not match the calculated sum of refund charges associated with Charge Type 00.

Total Commission	The sum of all the commissions associated with the corresponding currency excluding those representing a refund (Charge Refund Indicator). The Total Commission must be greater than zero. Note that commissions from records with severe errors should also be included where possible. The number of decimal places is defined by item TAP Decimal Places. *Conditionality:* Present within group Total Advised Charge Value where the non refund commissions total is greater than zero. *Values:* > 0 (zero)	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range. Value does not match the calculated sum of non refund commissions associated with the same currency.
Total Commission Refund	The sum of all the commissions associated with the corresponding currency representing a refund (Charge Refund Indicator). The Total Commission Refund must be greater than zero.	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range.

	Note that commissions from records with severe errors should also be included where possible. The number of decimal places is defined by item TAP Decimal Places. *Conditionality:* Present within group Total Advised Charge Value where refunds are present and the total is greater than zero. *Values:* > 0 (zero)				Value does not match the calculated sum of refund commissions associated with the same currency.
Total Data Volume	The Total Data Volume identifies the total number of octets (bytes) within the one occurrence of Content Service Used. This item is used instead of items Data Volume Incoming and Outgoing where the data direction cannot be separately identified. *Conditionality:* Present within group Content Service Used when information is available. *Values:*	10 20	Content Content	Severe Severe	Syntax error. Value out of range.

	> or = 0 (zero)				
Total Discount Refund	The sum of the Discount Values plus each application of a Fixed Discount Value contained in the batch representing a refund (Charge Refund Indicator). The Total Discount Refund must be greater than zero. This is present for audit purposes only. Note that discount from records with severe errors should also be included where possible. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Present within group Audit Control Information where the refund discount total is greater than zero. *Values:* > 0 (zero)	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range Value does not match the calculated sum of refund discounts from Call Event Details.

Total Discount Value	The sum of the Discount Values plus each application of a Fixed Discount Value contained in the batch excluding those representing a refund (Charge Refund Indicator). The Total Discount Value must not contain a negative value. This is present for audit purposes only. Note that discount from records with severe errors should also be included where possible. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Mandatory within group Audit Control Information. *Values:* > or = 0 (zero)	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range Value does not match the calculated sum of non refund discounts from Call Event Details.
Total Tax Refund	The sum of the Tax Values contained in the batch representing a refund (Charge Refund Indicator).	10 20	Audit Audit	Fatal Fatal	Syntax error. Value out of range

	The Total Tax Refund must be greater than zero. This is present for audit purposes only. Note that tax from records with severe errors should also be included where possible. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Present within group Audit Control Information where the refund tax total is greater than zero. *Values:* > 0 (zero)	100	Audit	Fatal	Value does not match the calculated sum of refund taxes from Call Event Details.
Total Tax Value	The sum of the Tax Values (Tax Value and AUR Tax Valu) contained in the batch excluding those representing a refund (Charge Refund Indicator). The Total Tax Value must not contain a negative value.	10 20 100	Audit Audit Audit	Fatal Fatal Fatal	Syntax error. Value out of range.

	This is present for audit purposes only. Note that taxes from records with severe errors should also be included where possible. The value is in SDRs with the number of decimal places defined by item TAP Decimal Places. Note the currency may be subject to internal market bilateral agreements, see TAP Currency. *Conditionality:* Mandatory within group Audit Control Information. *Values:* > or = 0 (zero)				Value does not match the calculated sum of non refund taxes from Call Event Details.
Total Transaction Duration	The item contains the actual total duration of a Content Transaction as a number of seconds. The item can be used in conjunction with the latest associated timestamp (Order Placed, Requested Delivery or Actual Delivery timestamps) to calculate the Content Transaction end time used for age validation. *Conditionality:*	10 20	Content Content	Severe Severe	Syntax error. Value out of range.

	Present within group Content Transaction Basic Info where available. *Values:* > = 0				
Tracked Customer Equipment	Information relating to equipment used by the Tracked Customer. The group, when present, must contain items Equipment Id Type and Equipment Identifier. *Conditionality:* Present within group Tracked Customer Information where available.	30 31	LCS LCS	Warning Warning	Mandatory item Equipment Id Type missing within group. Mandatory item Equipment Id missing within group.
Tracked Customer Home Id	Information identifying the home environment of the Tracked Customer. The group, when present, must contain items Home Id Type and Home Identifier. *Conditionality:* One or more occurrences may be present within group Tracked Customer Information where available.	30 31	LCS LCS	Severe Severe	Mandatory item Home Id Type missing within group. Mandatory item Home Identifier missing within group.

Tracked Customer Identification	The identification of the customer being tracked. The group must contain items Customer Id Type and Customer Identifier. *Conditionality:* One or more occurrences must be present within group Tracked Customer Information.	30 31	LCS LCS	Severe Severe	Mandatory item Customer Id Type missing within group. Mandatory item Customer Identifier missing within group.
Tracked Customer Information	Information identifying the tracked customer. The group must contain at least one occurrence of group Tracked Customer Identification with all other groups being conditional on availability. The group identifies a single tracked customer. As the identification of a customer/home/location may be done in more than one way or by combination of elements (for example MSISDN-IMSI-Account Number: Home BID-TADIG Code: Country-Region) the groups containing these elements may occur more than once. *Conditionality:* Mandatory within group Location Service where it is not the same as the tracking customer.	30	LCS	Severe	Mandatory group Tracked Customer Identification missing within group.

Tracked Customer Location	Information on the location of the tracked customer. This is not the actual location as delivered by the location service request, it identifies the geographical or virtual location of the tracked customer, for example country, network, ip address. Availability of this data may be subject to local regulatory rules/laws. *Conditionality:* Must be present within group Tracked Customer Information where available.	30 31	LCS LCS	Warning Warning	Mandatory item Location Id Type missing within group. Mandatory item Location Identifier missing within group.
Tracking Customer Equipment	Information relating to equipment used by the Tracking Customer. The group, when present, must contain items Equipment Id Type and Equipment Identifier. *Conditionality:* Present within group Tracking Customer Information where available.	30 31	LCS LCS	Warning Warning	Mandatory item Equipment Id Type missing within group. Mandatory item Equipment Id missing within group.

Tracking Customer Home Id	Information identifying the home environment of the Tracking Customer. The group, when present, must contain items Home Id Type and Home Identifier. *Conditionality:* One or more occurrences may be present within group Tracking Customer Information where available.	30 31	LCS LCS	Severe Severe	Mandatory item Home Id Type missing within group. Mandatory item Home Identifier missing within group.
Tracking Customer Identification	The identification of the customer requesting the tracking. The group must contain items Customer Id Type and Customer Identifier. *Conditionality:* One or more occurrences must be present within group Tracking Customer Information.	30 31	LCS LCS	Severe Severe	Mandatory item Customer Id Type missing within group. Mandatory item Customer Identifier missing within group.
Tracking Customer Information	Information identifying the tracking customer. The group must contain at least one occurrence of group Tracking Customer Identification with all other groups being conditional on availability. *Conditionality:*	30	LCS	Severe	Mandatory group Tracking Customer Identification missing within group.

	Must be present within group Location Service where the Tracking Customer can be identified.				
Tracking Customer Location	Information on the location of the tracking customer. This is the geographical or virtual location of the tracking customer, for example country, network, ip address. Availability of this data may be subject to local regulatory rules/laws. *Conditionality:* Must be present within group Tracking Customer Information where available.	30 31	LCS LCS	Warning Warning	Mandatory item Location Id Type missing within group. Mandatory item Location Identifier missing within group.
Tracking Frequency	The time interval measured in seconds between two consecutive location estimates for continuous/periodic tracking. *Conditionality:* Must be present within group LCS QoS Requested/Delivered where applicable and available from the network *Values:* >=0 (zero)	20	LCS	Severe	Value out of range. **Note:** This error can only be raised for TAP files made available on or after 24 May 2012.

Tracking Period	The overall tracking period measured in seconds for continuous/periodic tracking. *Conditionality:* Must be present within group LCS QoS Requested/Delivered where applicable and available from the network *Values:* >=) (zero)	20	LCS	Severe	Value out of range. **Note:** This error can only be raised for TAP files made available on or after 24 May 2012.
Transaction Authorisation Code	The authorisation code passed to the Content Provider for this content transaction. This will only be present where there are no privacy/regulatory implications and when the information is available. *Conditionality:* Present within group Content Service Used where available.	10	Content	Warning	Syntax error.
Transaction Description Suppression	Indicates that the Charged Party has requested the Transaction Description (short & detail) to be suppressed and therefore not to be detailed on any correspondence to the Charged Party.	10 20	Content Content	Warning Warning	Syntax error. Value out of range.

	Conditionality: Present within group Content Service Used when the Charged Party has requested the description of the detail to be suppressed. *Values:* 1 Suppress description				
Transaction Detail Description	The item contains, in plain text, the long description detailing the Content Service. For example names and quantities of the stocks traded, title of books purchased or name of ring tone downloaded. This item gives a more precise definition of the transaction than the Transaction Short Description. *Conditionality:* Present within group Content Service Used where available.	10	Content	Warning	Syntax error.
Transaction Identifier	An identifier uniquely representing the Content Transaction for the given Content Provider. This will often be an identifier notified to the customer at the time of transaction request, for example order number.	10	Content	Severe	Syntax error.

	Conditionality: Mandatory within group Content Service Used.				
Transaction Short Description	The item contains, in plain text, the short description detailing the Content Service. For example Stock Information, Books, or Mobile Accessories. This item gives a more general definition of the transaction than the Transaction Detail Description. *Conditionality:* Mandatory within group Content Service Used. *Values:* Limited to maximum 24 characters length	10 100	Content Content	Warning Warning	Syntax error Length greater than 24 characters.
Transaction Status	Indicates the status of the Transaction when the status is anything other than Normal or Success. *Conditionality:* Present within group Content Transaction Basic Info when the status of the transaction is other than Normal/Success. *Values:* 0 Unconfirmed 1 Failed	10 20	Content Content	Severe Severe	Syntax error. Value out of range.

Transfer Batch	A TAP file which must contain at least one Call Event Detail and must also contain supporting Batch Control Information and Audit Control Information. Accounting Information must be present where any Call Event Detail contains a charge. It may also contain Message Description Information details where these have been used within the batch. *Conditionality:* Mandatory within group Data Interchange.	30 31 32 34 35 36	Tf Batch Tf Batch Tf Batch Tf Batch Tf Batch Tf Batch	Fatal Fatal Fatal Warning Fatal Fatal	Mandatory group Batch Control Information missing within group. Group Accounting Information not present and a charge is present within the Transfer Batch. Mandatory group Network Information missing within group. Group Message Description Information not present and a Service Centre Usage is present within Transfer Batch. Group Call Event Details not present within group. Mandatory group Audit Control Information missing from group. **Note:** Error code 33 removed in TAP release 3.11 (01 May 2005).

Transfer Cut Off Timestamp	The timestamp used to select calls for transfer. All call records available prior to the timestamp are transferred. This gives an indication to the HPMN as to how 'up-to-date' the information is. Where the timestamp is present within a Notification file it is nominal showing that no data available for transfer are being held by the Sender PMN with a Charging Timestamp prior to this. The time is given in the local time of the Sender PMN. There must be a UTC Time Offset associated with the item. *Conditionality:* Mandatory within group Notification. Mandatory within group Batch Control Information. *Format:* CCYYMMDDHHMMSS **Note:** Within this timestamp the range for HHMMSS is 000000 – 235959	10 20 30	Btch Ctrl Btch Ctrl Btch Ctrl	Fatal Fatal Fatal	Syntax error. Value out of range. Mandatory associated item UTC Time Offset missing.
Transparency Indicator	An indicator which shows whether the service was used in transparent or non-transparent mode. The item is applicable only to UMTS calls.	10	MOC MTC	Severe	Syntax error.

	Derivation: GSM item TransparencyIndicator (See Annex C – CS Domain Charging). *Conditionality:* Must be present within group Basic Service where call is UMTS and the indicator is relevant. *Values:* 0 Transparent 1 Non-Transparent	20	MOC MTC	Severe	Value out of range.

4.18 U

User Protocol Indicator	This item identifies the high layer user protocol signalled between the mobile station and the network. *Derivation:*	10 20	MOC MTC MOC MTC	Severe Severe	Syntax error. Value out of range.

Derived values using bits 0-3 of GSM/UMTS item Rate Indication (See Annex C – CS Domain Charging). The 'Source Value' (see *Values* below) is derived using Other Rate Adaption bits (2 & 3) followed by Rate Adaption bits (0 & 1).

Conditionality:

Must be present within group Basic Service where derivable from the network supplied data (i.e. Rate Indication).

Values:

UPI Value	Meaning	Source Value (Rate Indication bits 2&3, 0&1)
0	No rate adaption	nn00
1	V.110,I.460/X.30 rate adaption	nn01
2	ITU-T X.31 flag stuffing	nn10
3	V.120	0011
4	H.223 & H.245*	0111

	5 PIAFS 1011 **Note:** 'nn' represents any value. * Note that H.324 (which is used by circuit switched video telephony) uses the "H.223/H.245" setting at the protocol level.				
UTC Time Offset	All timestamps are in the local time of the Sender PMN (or Serving Network where appropriate). So that the time can be equated to time in the Recipient PMN, the difference between local time and UTC time must be supplied. *Derivation:* UTC Time Offset = Local Time minus UTC Time *Examples:* Washington DC, USA 1000hrs 10/Oct/97 UTC Time 1500hrs 10/Oct/97 UTC Time Offset = 10 – 15 = -5 Madrid, Spain 1600hrs 10/Oct/97 UTC Time 1500hrs 10/Oct/97 UTC Time Offset = 16 – 15 = +1	10 11 12 13 14 15 16	Notifictn Network Btch Ctrl Btch Ctrl Btch Ctrl Audit Audit	Warning Fatal Warning Fatal Fatal Warning Warning	Syntax error. Syntax error. Syntax error and associated item is File Creation Timestamp. Syntax error and associated item is Transfer Cut Off Timestamp. Syntax error and associated item is File Available Timestamp. Syntax error and associated item is Earliest Call Timestamp. Syntax error and associated item is Latest Call Timestamp.

	Sydney, Australia 0100hrs 11/Oct/97 UTC Time 1500hrs 10/Oct/97 UTC Time Offset = (01 + 24) – 15 = +10 (**Note:** where dates are different 24 hours are added to the time of the greater date) *Conditionality:* Mandatory within items File Creation Timestamp Transfer Cut Off Timestamp File Available Timestamp Earliest Call Timestamp Latest Call Timestamp Mandatory within group UTC Time Offset Information. Note that the HPMN needs the location and UTC Time Offset for each type of timestamp. On a call level there might be more than one UTC Time Offset valid. *Format:* ±HHMM *Range:* -1300 to +1400 in steps of 15 MM (minutes)	20 21 22 23 24 25 26	Notifictn Network Btch Ctrl Btch Ctrl Btch Ctrl Audit Audit	Warning Fatal Warning Fatal Fatal Warning Warning	Value out of range. Value out of range. Value out of range and associated item is File Creation Timestamp. Value out of range and associated item is Transfer Cut Off Timestamp. Value out of range and associated item is File Available Timestamp. Value out of range and associated item is Earliest Call Timestamp. Value out of range and associated item is Latest Call Timestamp.

UTC Time Offset Code	A code associated with a UTC Time Offset. The code is used with its associated timestamp to enable conversion of the Sender PMN's local time to UTC time. *Conditionality:* Mandatory within group UTC Time Offset Information. Mandatory within items Call Event Start Timestamp Charging Timestamp Charge Detail Timestamp Deposit Timestamp Completion Timestamp Order Placed Timestamp Requested Delivery Timestamp Actual Delivery Timestamp LCS Request Timestamp PDP Context Start Timestamp Service Start Timestamp *Values:* Range 0 .. 99	10 11 20 100	Network Calls Network Calls	Fatal Severe Fatal Severe	Syntax error. Syntax error. Value out of range. Specified UTC Time Offset Code not defined in group UTC Time Offset Information.

UTC Time Offset Information	A table containing UTC Time Offset Information. This table is used on a once-off basis and applies only to the transfer which contains it. A new table is sent with each transfer. Codes are reusable from transfer to transfer. *Conditionality:* One or more occurrences must be present within group Network Information.	30 31 32 33	Network Network Network Network	Fatal Fatal Fatal Fatal	Mandatory item UTC Time Offset Code missing within group. Mandatory item UTC Time Offset missing within group. More than one occurrence of group with same UTC Time Offset Code where UTC Time Offset is not the same. More than one occurrence of group with same UTC Time Offset Code where UTC Time Offset is the same.

4.19 V

Vertical Accuracy Delivered	The vertical accuracy delivered for an LCS request measured in metres. *Derivation:*	20	LCS	Severe	Value out of range. **Note:** This error can only be raised for TAP files made available on or after 24 May 2012.

	GSM/UMTS item Ext-GeographicalInformation (See Annex C – LCS Charging). The contents of the first 4 bits of the first octet indicate the type of shape used for the determination of the position. Dependant on the shape actually used the horizontal uncertainty has to be extracted from the remaining octets and has to be translated into a value in metres using the standards formulae, see Annex C – LCS Charging. The result must be rounded to full metres. *Conditionality:* Must be present within group LCS QoS Delivered where available from the network *Values:* >=) (zero)				
Vertical Accuracy Requested	The vertical accuracy requested for an LCS request measured in metres. *Derivation:* LCS QoS IE Octet 5 (See Annex C – LCS Charging). The 7 least significant bits of octet 5 need to be interpreted as an uncertainty altitude code. This needs to be transformed into a value in metres by applying the standards formulae, see	20	LCS	Severe	Value out of range. **Note:** This error can only be raised for TAP files made available on or after 24 May 2012.

	Annex C – LCS Charging. The result must be rounded to full metres. **Note:** TS 23.032 [36] specifies different formulas for the calculation of the horizontal and vertical accuracy in metres. *Conditionality:* Must be present within group LCS QoS Requested where available from the network *Values:* >=) (zero)				

4.20 Context Abbreviations

Acctng	Accounting Information
Audit	Audit Control Information
AUR	Aggregated Usage Record
Btch Ctrl	Batch Control Information
Calls	Call Event Details
Content	Content Transaction
GPRS	GPRS Call
LCS	Location Service
Mess Desc	Message Description Information
MSESS	Mobile Session
MOC	Mobile Originated Call
MSG	Messaging Event
MTC	Mobile Terminated Call
Network	Network Information
Notifictn	Notification
SCU	Service Centre Usage
SS	Supplementary Service Event
Tf Batch	Transfer Batch

Table 34: Context Abbreviations

5 Classification of Errors

5.1 Known Issues Impact

All validations must take into account those issues which have been identified since the last release.

IDS TDS maintains and publishes a Known Issues List which highlights issues and, where appropriate or applicable, workarounds.

The Known Issues List can be found on the GSMA Infocentre Roaming>Format Release Pages>Known Issues Lists page (https://infocentre2.gsma.com/roaming/Format-Release-Pages/Pages/Known-Issues-List-.aspx).

5.2 Severity Levels

All errors are assigned one of the following severity levels:

- Fatal
  A fatal error puts into question the content of the complete file, i.e. all records in the file. In case of a fatal error either the file format is not correct or the file control information contains

invalid data. When a fatal error is encountered in the file, the HPMN can refuse liability for the complete file.

- Severe
  Records with severe errors affect the ability to charge the subscriber. They should not have been forwarded by the VPMN Operator to the HPMN Operator who may reject financial liability for the individual call/event, a rejected call/event may be included in a rejects and returns process where available.

- Warning
  Records with warnings are billable, i.e. the problem does not affect the ability of the HPMN to charge its customer. The record contains data that might be created as a result of some failure or might cause problems for customer care. These errors are a result of optional field validation. The HPMN is not obliged to report such errors and they may instead opt to avoid raising them at all. The purpose of defining this type of error is to provide a mechanism for the VPMN Operator to be informed about the deviations from TAP standard so that they can correct any such errors to increase the quality of their files.

The severity of errors may depend on the context in which the element or group appears in the Transfer Batch.

In order to not stop the invoicing of all the call/events in a file when a call/event could be rejected with both a 'Fatal' and a 'Severe' error the Recipient is advised to use the 'Severe' error and not the 'Fatal' one.

TD.57 contains all the validation rules that can be applied to a TAP3 file**. The Recipient is advised to apply only the rules that concerns the fields used by their billing system and not all of them.** Unnecessary RAP processing or even disputing will then be prevented.

5.3 Naming and Numbering of Error Codes

The following rules apply to the naming and numbering of errors defined in the data dictionary:

10 to 19	Format Errors The data does not match the picture value, for example alpha character in numeric field. The error description refers to these values as Syntax error. Syntax errors relate to the physical implementation document (section 6 Physical Structure) where the data type for the item is specified. Explanatory comments in the ASN.1 syntax have to be taken into account (for example the structure of an Ipv4 address). Syntax errors cannot be raised based on the

	information in the data dictionary as these errors must be explicitly reported as range errors. All these errors are uniquely identified by error code and field name.
20 to 29	Value out of range in field The value in a field does not match the range or is not in the list of values allowed for this field. All these errors are uniquely identified by error code and field name.
30 to 49	Invalid group structure The group has elements either missing but expected or present and not expected, that is, the structure of the group is invalid. All these errors are uniquely identified by error code and field name. **Note:** In cases where the physical ASN.1 structure of a TAP file contains an additional group that allows for building a list of elements, any group structure validation rules that apply to the group as defined in the Data Dictionary must be applied to the lower level group as defined in the ASN.1 physical specification. The effect of this is that the 'list' element is transparent.
100 to 199	Inconsistencies between fields These errors affect more than one field and are caused by contradicting values. There could be contradicting values in the subfields of one field, in different fields of the same record, or for example contradictions between the file name and values listed in the record. All these errors have an error code in the range 100 to 199 and are uniquely identified by error code and field name.
200 to 249	Specific Errors Specific errors are errors that do not fit into one of the groups above. Possible reasons are duplicate calls or old data. All these errors have an error code in the range 200 to 249 and are uniquely identified by error code and field name.

Table 35: Naming and Numbering of Errors

5.3.1 Bilaterally Agreed Validation Errors

Errors which may occur after proprietary validation rules as agreed by operators bilaterally. A range of codes 9000-9999 is reserved for these types of error.

Note: These errors can only be used following an explicit agreement between the two roaming partners to implement validation rules that are not defined in TD.57. These error codes cannot be raised over the public interface without such explicit bilateral agreement

between the operators. For validation rules that are already defined in TD.57 the standard TD.57 error codes must be used.

5.4 Other General Errors Not Listed in the Data Dictionary

50	Notifictn Tf Batch	Fatal	Unknown tag. The tag is not recognised as a valid tag within TAP and does not occur at extension marker position. Note that this can include tags where there is no bilateral agreement for their use and the receiving party's systems have not been modified to be able to handle them.
51	Notifictn Tf Batch	Fatal	Non repeating element occurs more than once within the group.
52	Notifictn Tf Batch	Fatal	Tag invalid within context, for example MO Basic Call Information occurring within Mobile Terminated Call and does not occur at extension marker position.
53	Notifictn Tf Batch	Fatal	File not encoded according to ASN.1 BER, for example file received with a size of zero bytes.
54	Notifictn Tf Batch	Warning	Binary data after the first valid ASN.1 unit present in file and ignored.
55	All	Fatal	Encoded INTEGER larger than 4 bytes and related data element is not one of the elements specified in Abstract Syntax section where allowed maximum is 8 bytes.
56	Audit and GPRS	Fatal	Encoded INTEGER larger than 8 bytes.
57	All	Warning	Valid ASN.1 encoded information found and ignored at extension marker position. **Note:** Further processing of the ASN.1 data identified as being part of extension marker information must not be applied.

Table 36: General Errors Not Included in Data Dictionary

Errors 50 – 53 above are deemed to be fatal as their occurrence is indicative of a corruption within the ASN.1 syntax.

Note that during the validation process not all errors for a specific data element can be reported because some errors make it impossible or unnecessary to continue validation of the element, therefore, error codes should be reported in the following sequence:

- 50 – 59
- 30 – 49
- 10 – 19

- 20 – 29

It is not necessary to continue validation of an element once a ‘severe’ or ‘fatal’ error has been encountered. If a ‘warning’ error is encountered it is still necessary to continue validation in case a ‘severe’ or ‘fatal’ error is also present for the element.

Where an error has been found it is only necessary to report the first instance of the most severe error to the sender PMN.

The above error 52 can only be applied if the physical ASN.1 syntax is violated. Logical errors cannot be rejected using error 52.

For example: A Call Type Group present within the Charge Information for a Supplementary Service Event does not violate the ASN.1 syntax.

The ASN.1 syntax allows production of elements with a size (length) of zero bytes. This is valid according to BER but all parties creating TAP must take measures to avoid such implementations. When such errors are encountered in a TAP file it is allowed to raise either of the following errors:

- Syntax Error on the zero length item
- Group Structure Error applicable to the group which contains the item; this treats it as though the zero length item were not present in the group.

The severity of the error must be according to the severity of the applicable Syntax or Group Structure error. The Group Structure Error may not always be applicable.

A VPMN cannot treat an item with length zero as an invalid BER encoding, i.e. fatal error code 53 (file not encoded according to ASN.1 BER) must not be applied.

For example; where the field Tax Value in Tax Information is present but has no content (length is zero) the HPMN can only raise one of the following errors:

- Severe error code 10 (syntax error) on item Tax Value in the Calls context.
- Severe error code 31 (tax value missing) on group Tax Information in the Calls context.

No other validation rule is applicable.

Where an empty ‘list’ construction element is found (represented by ‘sequence of’ keyword in ASN.1 syntax) the underlying logical element is to be treated as not present.

Where a single ‘logical’ field, as per the Data Dictionary, is represented physically in ASN.1 as a composite element consisting of several ASN.1 fields, physical structure errors like missing elements should be handled as syntax error in the ‘logical’ field.

5.5 Validation Rules Not Described in the Data Dictionary

250	MOC	Severe	Call is duplicate. Chargeable Subscriber, Recording Entity Type and Identification, Call Event Start Time, Called Number, Service Code and Total Call Duration match call record already processed and the call reference is identical in both call records. If Called Number is not present Dialled Digits must be used.
251	MTC	Severe	Call is duplicate. Chargeable Subscriber, Recording Entity Type and Identification, Call Event Start Time, Calling Number, Service Code and Total Call Duration match call record already processed and the Call Reference is identical in both call records.
252	SS	Severe	Event is duplicate. Chargeable Subscriber, Recording Entity Type and Identification, Charging Timestamp, Supplementary Service Code and Action match call record already processed and the Call Reference is identical in both call records.
253	SCU	Severe	Event is duplicate. SCU Chargeable Subscriber, Recording Entity Type and Identification, Deposit Timestamp, Non Charged Number and Message Type match call record already processed.
255	GPRS	Severe	Call is duplicate. Chargeable Subscriber, Recording Entity Identification (where the Recording Entity Type is GGSN, P-GW or Wi-Fi Billing Information Recording Entity), Charging Id and Call Event Start Time match call record already processed and an Operator Specific Information (OSI) starting with the keyword “AccountingSessionID:” is identical in both cases.
256	Content	Severe	Call is duplicate if Content Provider Name, Transaction Identifier, Charge Refund Indicator match Content Transaction already processed.
257	LCS	Severe	Call is duplicate if Recording Entity Type and Identification, Call Reference, LCS Request Timestamp, Response Time, Tracking Customer and Tracked Customer is the same as Location Service record already processed.
258	MSG	Severe	Message is a duplicate. IMSI, Service Start Timestamp, Messaging Event Service and Event Reference are identical in both call records.
259	MSESS	Severe	Call is a duplicate. IMSI, Service Start Timestamp, non-charged party (see note below) , Mobile Session Service, Total Call Event Duration and Event Reference are identical in both call records. **Note:** Non charged party can be represented in either Non Charged Party Number or Non Charged Public User Id and if any of the two elements (on two different CDRs) have the same content then they are considered duplicates (case sensitive string compare, leading and trailing spaces to be ignored). Such duplicate scenarios are:

			• Non Charged Party Number in CDR1 matches Non Charged Party Number in CDR2. • Non Charged Party Number in CDR1 matches Non Charged Public User Id in CDR2. • Non Charged Public User Id in CDR1 matches Non Charged Party Number in CDR2. • Non Charged Public User Id in CDR1 matches Non Charged Public User Id in CDR2.
280	AUR	Severe	Record is a duplicate. Aggregated Usage Date Start, Aggregated Usage Date End (when present), Serving Network (when present), Aggregation Identifier (when present), Aggregated Chargeable Unit Type and Aggregated Chargeable Units are identical in both records.

Note:
The duplicate check is made against previously accepted records that were transferred in a chargeable data (CD) file. Records that were transferred in test data (TD) files cannot be used as a basis for the duplicate check. A record is not deemed accepted if it is being rejected in RAP.

Timestamp fields used for the duplicate call check must be normalised to UTC before comparing them to each other. For the purpose of normalisation the associated UTC offsets must be used. This rule applies to Call Event start time (MOC, MTC, GPRS), Charging Timestamp (SS), Deposit Timestamp (SCU) and LCS Request Timestamp (LCS).

When the Call Reference is not present (or has a value of 0) calls may be mistakenly detected as duplicate calls for example in specific cases of call forwarding. Such cases should be handled with care and any disputes must be resolved manually.

Where the Recording Entity Identification refers to an IPv6 address leading zeros in the segments of the address must be ignored for duplicate check.

The Call Reference is used for the duplicate check criteria only when the call references in both call records contain non zero values. Leading zeroes in Call Reference must be ignored for duplicate checking.

The Operator Specific Information (OSI) starting with the keyword “AccountingSessionID:” is used for duplicate check criteria only when populated in both call records and only when the GPRS Call CDRs represent Wi-Fi sessions (identified by RecordingEntityType).

Note that where ‘Chargeable Subscriber’ is referenced above for duplicate call check purposes IMSI or MIN by itself is sufficient. When IMSI or MIN is present in a call MSISDN and/or MDN, when also present in the same call, must not be included when performing the duplicate check.

Although not part of the standard duplicate check, for practical reasons, the Recipient may choose to include the Sender information when implementing the duplicate check. Under these circumstances truly duplicate TAP events submitted in different Sender TAP files may not be detected.

142	Calls	Severe	Call Event Details ends after the File Available Timestamp. The timestamp of the call event completion may be calculated from the Call Event Start Timestamp and the Total Call Event Duration.

			For Aggregated Usage Record, where present, the Aggregated Usage Date End must be used for the completion time. Where Aggregated Usage Date End not present use Aggregated Usage Date Start. For Supplementary Service Event the Charging Timestamp must be used for the completion time. For SCU the Completion Timestamp should be taken into consideration For Content Transaction the latest timestamp of Order Placed Timestamp, Requested Delivery Timestamp or Actual Delivery Timestamp in conjunction with the Total Transaction Duration must be used. For Location Service the LCS Request Timestamp must be used in conjunction with the Response Time. For Mobile Session the timestamp of the call event completion may be calculated from the Service Start Timestamp and Total Call Event Duration. For Messaging Event the Service Start Timestamp must be used for the completion time.
260	Calls	Warning	Call old. Call is older than 'Standard Timescale' specified in BA.08 [10].
261	Calls	Severe	Call older than allowed in 'Exceptional Situations' in BA.08 [10]
262	Btch Ctrl Notifictn	Warning	Difference between actual date/time file received and File Available Timestamp is greater than the Standard File Transmission Timescale as specified in BA.08 [10].
263	Btch Ctrl	Fatal	Difference between actual date/time file received and File Available Timestamp is greater than the Exceptional File Transmission Timescale as specified in BA.08 [10].

Note:
Call age is calculated as difference between the call completion time or, where the call/event has no duration, the timestamp associated with the call/event and the File Available Timestamp normalized to use the same time basis (for example UTC). For Aggregated Usage Record there is an implicit timestamp of 23:59:59, this applies to whichever date is being used for the calculation (Aggregated Usage Date Start / Aggregated Usage Date End).

In the case of Aggregated Usage Record the Aggregation Usage Start Date must be used. The Aggregation Usage Start Date must be compared against the date part of the File Available Timestamp only.

In case of SCU either the Completion or Deposit Timestamp should be used to get call event age depending on the value of charging point: completion time when 'C' and deposit time when 'D'.

In the case of Content Transaction the latest timestamp of Order Placed Timestamp, Requested Delivery Timestamp or Actual Delivery Timestamp in conjunction with the Total Transaction Duration must be used. For Location Service the LCS Request Timestamp must be used in conjunction with the Response Time to find the end time. 'Standard Timescale' and 'Exceptional Situations' age can be redefined on a bilateral basis. 'Standard' and 'Exceptional' 'File Transmission Timescales' can be redefined on a bilateral basis.			
270	Audit	Warning	Total number of occurrences of group Call Event Details within the TAP transfer batch exceeds 200,000.
271	Tf Batch	Fatal	The size of the TAP Transfer Batch file is larger than 100MB (100 x 1024 x 1024 bytes). This error should not be applied if the file can be processed.
272	Tf Batch	Fatal	The applicable IOT of the Sender does not comply with the applicable regulatory terms.

Table 37: Validation Rules Not Included in the Data Dictionary

5.6 Text Representation of IP Addresses

The text representation of IP addresses must be formatted as follows:

For Ipv4 addresses as x.x.x.x where 'x's represent the decimal values of the four 8-bit segments. Any section of the address can have up to 3 digits. Leading zeros for any section of the address are optional.

Examples of valid Ipv4 addresses:

- 192.68.0.13
- 192.068.000.013

For Ipv6 addresses as x:x:x:x:x:x:x:x where 'x's represent the hexadecimal values of the eight 16-bit segments. Leading zeros for any section of the address are optional. Compression of zeros by usage of the symbol "::" is not allowed. This might require a normalisation of the Ipv6 address for population in TAP when read from the network in a compressed form. Presentation of the last 2 sections of the address in Ipv4 format is not allowed either. Hexadecimal characters can be upper or lower case.

Examples of valid Ipv6 addresses:

- FEDC:BA98:7654:3210:FEDC:BA98:7654:3210
- 1080:0:0:0:8:800:200c:417a
- 28:04:64:aB:Cd:0:0:0

Ipv4 and Ipv6 addresses must not include embedded blank spaces.

Note that IP addresses are ASCII strings and therefore leading and trailing spaces must be discarded.

5.7 Validation of ASCII String Type elements

For the following ASCII String elements, case sensitivity will not be part of any validation:

- Access Point Name NI
- Access Point Name OI
- Called Place
- Called Region
- Content Provider Name
- Message Description
- Public User ID
- Serving Location Description
- Transaction Detail Description
- Transaction Short Description

For example, if a Serving Location Description is specified in the IOT as “Cruiseship”, the corresponding TAP element with a value of “cruiseship”, “CRUISESHIP” or “Cruiseship” will pass the validation successfully.

All other elements are validated as per the Data Dictionary and case sensitive validation will be applied as stated.

5.8 Identification of Emergency Calls

For emergency calls over circuit switched these can be identified in TAP in the following ways:

- Usage of Teleservice 12, in this case Dialled Digits may not be present.

- Usage of Teleservice 10 or 11 together with population of Dialled Digits. The value of Dialled Digits can be “112” or any other emergency call short code as defined in the VPMN’s AA.14.

For emergency voice calls over LTE, these can be identified in TAP in the following way:

- Usage of value ‘3 ‘ (Emergency call over LTE) within Mobile Session Service.

5.9 TAP Record Charge Validation Procedure

This section defines the TAP record Charge validation procedure. All operators, or their agents, must follow the below procedure when validating TAP charges in received TAP records.

- The charge (and tax) in the TAP record must first be validated against the technical charging parameters (see below) in the TAP record, without taking the Call Type Levels into consideration.
- If the technical charging parameters do not identify any rate in the IOT then the TAP record can be rejected.
- If the technical charging parameters identify a unique rate in the IOT and the charge is incorrect according to those parameters then the TAP record can be rejected.
- If the technical charging parameters identify a unique rate in the IOT and the charge is correct according to those parameters then the TAP record must be accepted. In this case the Call Type Levels will be ignored.
- If the technical charging parameters identify more than one rate in the IOT, further analysis must be done on the identified IOT rates to compare the Call Type Levels in the TAP record with the Call Type Levels for those rates in the IOT.
  Note: In this case, it is acceptable to rely on Call Type Levels to further define the rate (as described below) because it is not always possible or practical for the IOT to contain exact number ranges for all rates.
- When Call Type Levels analysis is required it has to be tried in up to three steps, first by just including Call Type Level 1, second a combination of Call Type Levels 1 and 2, and third a combination of Call type levels 1, 2 and 3. If a step results in identifying a single rate in the Sender's IOT then the next step won't be applied any more.
  - If the additional Call Type Level analysis does not identify a unique rate in the Sender's IOT then the TAP record can be rejected.
  - If the additional Call Type Level analysis does identify a unique rate in the Sender's IOT and the Charge is correct then the TAP record must be accepted.
  - If the additional Call Type Level analysis does identify a unique rate in the Sender's IOT and the Charge is incorrect then the TAP record can be rejected.
- The Call Type Levels in the TAP record and as defined in the Sender's IOT cannot be cross validated against technical charging parameters.

The below table defines what technical charging parameters are used in the charge validation for each type of call record:

AUR	Aggregated Usage Date Start, Serving Network, Aggregation Type, Aggregated Chargeable Unit Type and Units.
MOC	Service, Location, Destination (CAMEL Destination Number when present, otherwise Called Number and/or Dialled Digits), IAC, Time Band, Charged Item with associated Chargeable Units
MSESS	Service, Location, Destination (Non-Charged Party and/or Requested Destination), IAC, Time Band, Charged Item with associated Chargeable Units
MTC	Service, Location, Time Band, Charged Item with associated Chargeable Units
MO SMS	Location, Destination (the SMSC, CAMEL Destination Number when present, otherwise Called Number) and Time Band
MSG	Location, Destination (the SMSC, Non-Charged Party) and Time Band
MT SMS	Location and Time Band
SSE	Service, Location and Time Band
USSD	Location and Time Band
PSData	Location, APN, Time Band, Charged Item with associated Chargeable Units
Wi-Fi	Location, Hotspot, Time Band, Charged Item with associated Chargeable Units

Table 38: Technical Charging Parameters

The following flowchart helps illustrate the above procedure.

Note: The flowchart needs to be read together with the text above.

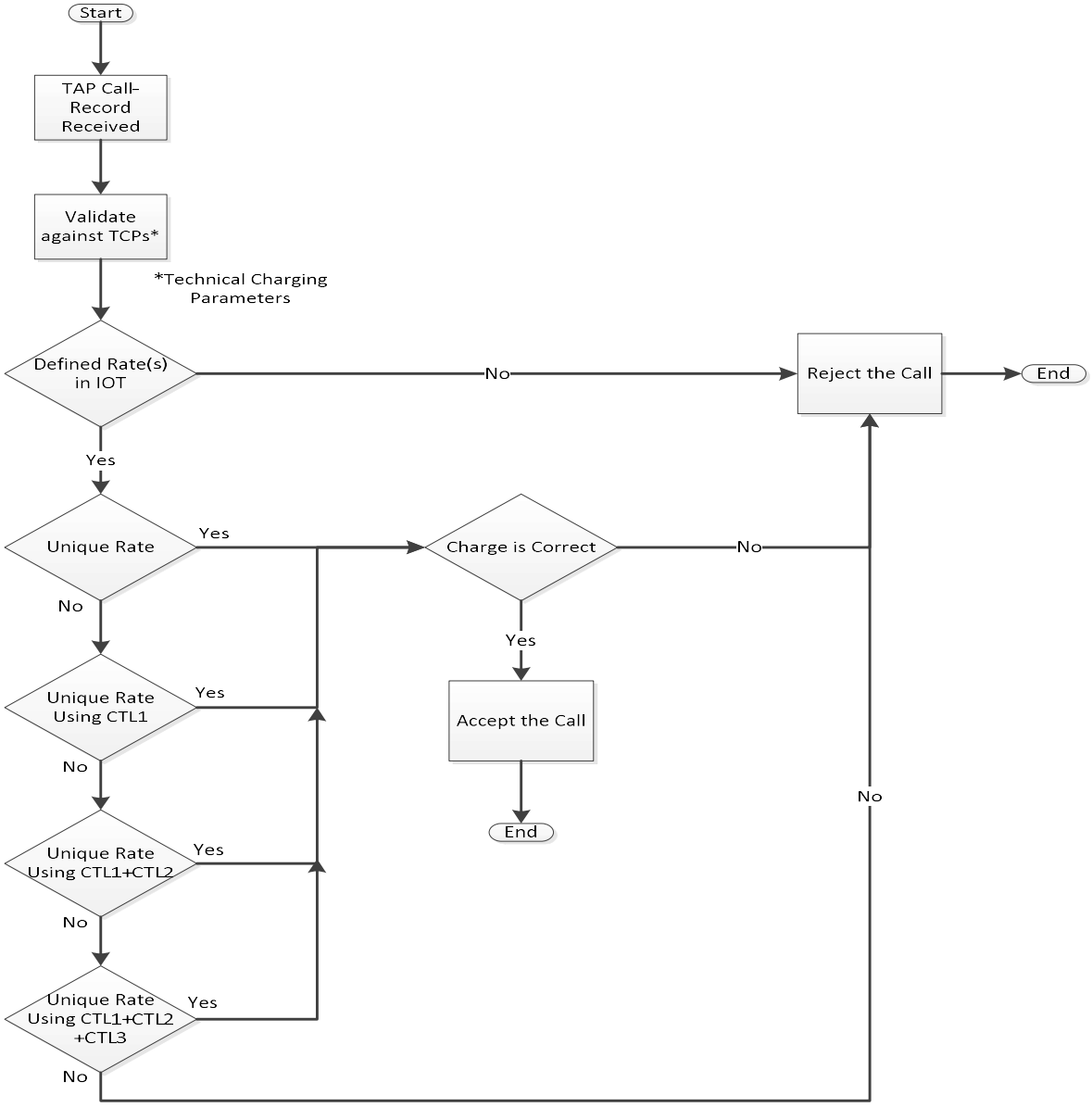

Figure 34: TAP Record Charge Validation Procedure

5.9 Provision of TAP Events on VoLTE handover scenarios

Note: The ongoing REVOLVER work will impact this section and the following reflects options 2 and 3 in the REVOLVER white paper.

Enhanced SRVCC enable seamless handover of VoLTE Calls from LTE to the CS network and vice versa. A single TAP Mobile Session CDR (MSESS CDR) must be generated for the

complete VoLTE Call usage also where the VoLTE call has been anchored in the IMS network and handover has taken place between different network technologies.

A MOC CDR must not be provided on the TAP interface for the VoLTE Network CDR generated by the MSC on the CS network where the VoLTE call has been anchored in the IMS network. The detailed rules on the provision of TAP CDRs on the handover scenarios are described below to avoid double charging on the HPMN side.

The table below describes the rules that need to be followed on the provision of TAP CDRs in each voice call scenario as follows:

Call Scenario	TAP CDR	Comments
Voice over CS Network (2G/3G)	MOC / MTC Event	The Voice Call use CS Network nodes only.
Voice over CSFB	MOC / MTC Event	The Voice Call use CS Network nodes only.
Origination/Termination of Voice over IMS Call	MSESS Event[1]	The Voice Call use IMS Network nodes only.
Origination/Termination of VoIMS on LTE Network with handover to CS Network (2G/3G)	MSESS Event[1]	The Voice Call is anchored in IMS Network
Origination/Termination of VoIMS on CS Network (2G/3G) with handover to the LTE Network	MSESS Event[1]	The Voice Call is anchored in IMS Network

Table 39: TAP Event Types for VoLTE Call Scenarios

(1) **Note:** Apply for both Mobile Originated and Terminated VoIMS call scenarios

There are two VoLTE architectures which have been endorsed by the GSMA on the standard routing of VoLTE calls to the end destination in the roaming environment. The two routing scenarios are:

1. VoLTE Home Routing
2. VPMN Assisted Routing.

The following table describes the source network CDRs needed to obtain the necessary Charging Information on the provision of the TAP CDRs per each routing scenario and with /without eSRVCC which would have potentially taken place during an ongoing VoLTE call.

Call Scenario	Network CDR Source	TAP CDR	Comments
VoLTE Home Routing	P-CSCF Network CDR or ATCF Network CDR	MSESS Event	No eSRVCC has taken place

VoLTE Home Routing & eSRVCC[1]	ATCF Network CDR[1]	MSESS Event	
VoLTE Home Routing & eSRVCC[2]	P-CSCF Network CDR	MSESS Event	The P-CSCF & MSC Network CDRs must be aggregated into the TAP MSESS Event.
	MSC Network CDR		
VPMN Assisted Routing	TRF Network CDR	MSESS Event	No eSRVCC has taken place
VPMN Assisted Routing & eSRVCC	TRF Network CDR	MSESS Event	

Table 40: Network CDR Sources for VoLTE Call Scenarios

Notes: (1) In line with 3GPP R11 or above(2) Not in line with 3GPP R11 or above

5.10 Provision of TAP Events on SMS Messaging

The table below describes the rules to be followed on the provision of TAP CDRs in each type of SMS Messaging scenario as follows:

SMS Messaging Scenario	TAP CDR	Comments
SMS MO/MT over CS Network (2G/3G)	MOC / MTC Event	The SMS message is submitted over CS network nodes.
SMS MO/MT over SGs	MOC / MTC Event	The SMS message is submitted over CS network nodes.
SMS MO/MT in SGSN	MOC / MTC Event	The SMS message is submitted over PS network nodes
SMS MO/MT over IMS	MSG Event	The submission of the SMS message uses E-UTRAN , EPC and IMS network nodes.
SMS MO/MT in MME	MSG Event	The submission of the SMS message uses E-UTRAN and MME network nodes.

Table 41: TAP Event Types for SMS Messaging Scenarios

The following table describes the source network CDRs needed to obtain the necessary Charging Information on the provision of the TAP CDRs per each SMS Messaging scenario type:

Call Scenario	Network CDR Source	Comments
SMS MO/MT over CS Network (2G/3G)	SMS-MO Network CDR SMS-MT Network CDR	The SMS message is submitted over CS network nodes.
SMS MO/MT over SGs	SMS-MO Network CDR SMS-MT Network CDR	The SMS message is submitted over CS network nodes.
SMS MO/MT in SGSN	S-SMO-CDR SGSN Network CDR S-SMT-CDR SGSN Network CDR	The SMS message is submitted over PS network nodes
SMS MO/MT in MME	S-SMO-CDR MME Network CDR S-SMT-CDR MME Network CDR	The submission of the SMS message uses E-UTRAN and MME network nodes.

Table 42: Network CDR Sources for SMS Messaging Scenarios

Note: A Network CDR has not been standardised for SMS submission over IMS Domain where the SIP Message method has been used to route the SMS from the visited P-CSCF to the Home S-CSCF.

5.11 Provision of TAP Events on VoLTE S8 Home Routed (S8HR) Scenarios

The table below describes the network CDRs and potential TAP CDRs for some common VoLTE S8 Home Routed (S8HR) scenarios as follows:

Call Scenario	Network CDR Source	TAP CDR	Comment
Signalling session without any voice or video calls	One S-GW CDRs Event: • Bearer Charging Id value = ‘X’	One GPRS Call record: • IMS Signalling (QCI value = 5 and Bearer Bearer Charging Id value = ‘X’)	If signalling is charged Could also be SMS
Voice call	Two S-GW CDRs Events: • Bearer Charging Id value = ‘X’ • Bearer Charging Id value = ‘Y’	Two GPRS Call records: • Voice media bearer (QCI value = 1 and Bearer Charging Id value = ‘X’)	No SRVCC has taken place

Call Scenario	Network CDR Source	TAP CDR	Comment
		• IMS Voice Signalling (QCI value = 5 and Bearer Charging Id value = 'Y')	
3 Voice calls	Four S-GW CDRs Events: • Bearer Charging Id value = 'X1' • Bearer Charging Id value = 'X2' • Bearer Charging Id value = 'X3' • Bearer Charging Id value = 'Y'	Two GPRS Call records: • Voice media bearer (QCI value = 1 and Bearer Charging Id value = 'X1') • Voice media bearer (QCI value = 1 and Bearer Charging Id value = 'X2') • Voice media bearer (QCI value = 1 and Bearer Charging Id value = 'X3') • IMS Voice Signalling (QCI value = 5 and Bearer Charging Id value = 'Y')	No SRVCC has taken place
Voice and video call	Three S-GW CDRs Events: • Bearer Charging Id value = 'X' • Bearer Charging Id value = 'Y' • Bearer Charging Id value = 'Z'	Three GPRS Call records: • Voice media bearer (QCI value = 1 and Bearer Charging Id value = 'X') • Video media bearer (QCI value = 2 and Bearer Charging Id value = 'Y') • IMS Voice Signalling (QCI value = 5 and Bearer Charging Id value = 'Z')	No SRVCC eSRVCC has taken place
Voice with handover LTE to 3G	Two S-GW CDRs Events: • Bearer Charging Id value = 'X' • Bearer Charging Id value = 'Y'	Two GPRS Call records: • Voice media bearer (QCI value = 1 and Bearer Charging Id value = 'X')	SRVCC eSRVCC has taken place

Call Scenario	Network CDR Source	TAP CDR	Comment
	One MSC-SRVCC Event	• IMS Voice Signalling (QCI value = 5 and Bearer Charging Id value = 'Y') One MOC record	

Table 43: Network / TAP CDR Types for VoLTE S8HR Scenarios

Note: BA.27 recommends charging for signalling, however if the VPMN doesn't charge for signalling the corresponding record may not be present in TAP. If a signalling record is present in TAP, then it may not be part of the same TAP file as the voice/video parts. One signalling record could support many calls, so there is not a 1-1 mapping between any signalling record and the call that take place during that signalling session. TD.58 contains more detailed examples.

5.12 Provision of TAP Events on VoLTE LBO HR, like for S8HR (new option)

From a wholesale perspective, Origination and Termination of Voice over IMS calls could be handled like S8HR, as GPRS Calls. The TAP CDR will be provided by the SGW.

Similarly, the TAP CDR for SMS MO/MT over IMS will be provided like a GPRS call, from the SGW. No MSG CDR will be created.

The **table 43** remains applicable.

6 Physical Structure

This document defines the physical format of Data Record Format Version 03.

In contrast to Data Record Format versions 01 and 02, Data Record Format version 03 uses a flexible format encoding based on the ASN.1 standard which is widely used within the telecommunication world.

Accordingly, the specification of the physical format consists of two parts:

- The definition of the abstract syntax.
- The definition of the transfer syntax (i.e. the encoding rules).

6.1 Abstract Syntax

This section defines the abstract syntax for Data Record Format version 03 using the ASN.1 standard as specified within ITU Rec. X.680 [37].

In order to support a wide range of ASN.1 conversion tools, this specification only uses basic ASN.1 features which are common to both versions of the standard.

Namely, the following basic data types are used:

- INTEGER
- OCTET STRING
- VisibleString (only for TAP file creation)
- NumericString (only for TAP file creation)

Furthermore the following ASN.1 features for the construction of new data types are used:

- SEQUENCE / SEQUENCE OF
- CHOICE

Depending on the level of conformance to the ASN.1 standard and the actual functionality of their conversion utility, operators can employ further ASN.1 features for the implementation of the validation rules as laid out within the data dictionary. Most notably this applies to the following ASN.1 features for the definition of new ASN.1 subtypes:

- Definition of value ranges for subtypes derived from the INTEGER type
- Definition of permitted alphabets for string (sub)types

It is possible to use these subtyping features on top of the following ASN.1 specification, because they do not affect the actual physical encoding according to the Basic Encoding Rules.

Although ASN.1 does not limit the size of INTEGERs the maximum size of a TAP encoded INTEGER is 8 bytes for the following elements within the Data Dictionary:

Total Charge	Audit
Total Discount Value	Audit
Total Tax Value	Audit
Data Volume Incoming	GPRS, Content
Data Volume Outgoing	GPRS, Content
Chargeable Units	GPRS, Content
Charged Units	GPRS, Content

Charging Id	GPRS
Total Discount Refund	Audit
Total Charge Refund	Audit
Total Advised Charge	Audit
Total Advised Charge Refund	Audit
Total Commission	Audit
Total Commission Refund	Audit
Total Data Volume	Content
Total Tax Refund	Audit
Aggregated Usage Charge	AUR
Aggregated Chargeable Units	AUR
AUR Tax Value	AUR
AUR Taxable Amount	AUR

Table 44: 8 Byte Integers

For any other data item the maximum size of an encoded INTEGER is 4 bytes. This gives an implicit default value range constraint on any INTEGER defined within the specification that has no explicit value range defined.

It is strongly recommended to use an enhanced ASN.1 syntax specification when creating TAP files. The additions that can be done will significantly increase the integrity of created TAP files by specifying ASN.1 constraints that can be automatically followed by the compiler and coding tool at TAP file creation. The recommended modifications for file creation are indicated within the ASN.1 specification as follows:

- “OPTIONAL, -- *m.m.” which should be replaced by “,”.
- Common data types should be redefined as indicated in the comments of the ‘non tagged common data types’ section.
- Size constraints should be uncommented, i.e. remove the ‘-- ‘ before the keyword ‘SIZE’.

ASN.1 definition and tag numbers for fields Specification Version Number and Release Version Number must remain the same in all TAP releases to enable cross release pre-decoding identification of the specification and release version used in any TAP file.

The following ranges for tags are currently used:

0	Reserved for TAP use
1 to 6	In use for TAP
7	Reserved for TAP use – application # released TAP 3.11
8	In use for TAP and RAP
9 to 13	In use for TAP

13			Reserved for TAP use – application # released TAP 3.11
14	to	17	In use for TAP
18	to	31	Reserved for TAP use
32			Reserved for TAP use – application # released TAP 3.4
33	to	35	Reserved for TAP use – application # released TAP 3.11
36	to	46	In use for TAP
47	to	48	Reserved for TAP use – application # released TAP 3.4
49	to	50	Reserved for TAP use – application # released TAP 3.11
51			Reserved for TAP use – application # released TAP 3.10
52	to	54	Reserved for TAP use – application # released TAP 3.11
55	to	59	In use for TAP
60	to	61	Reserved for TAP use – application # released TAP 3.11
62	to	76	In use for TAP
77	to	78	Reserved for TAP use – application # released TAP 3.11
79	to	80	In use for TAP
81	to	84	Reserved for TAP use – application # released TAP 3.11
85	to	86	Reserved for TAP use – application # released TAP 3.11
87	to	92	In use for TAP
93			Reserved for TAP use – application # released TAP 3.11
94	to	98	In use for TAP
99	to	100	Reserved for TAP use – application # released TAP 3.11
101			In use for TAP
102			Reserved for TAP use – application # released TAP 3.11
103	to	111	In use for TAP
112			Reserved for TAP use – application # released TAP 3.11
113	to	118	In use for TAP
119	to	120	Reserved for TAP use – application # released TAP 3.11
121	to	123	In use for TAP
124	to	127	Reserved for TAP use – application # released TAP 3.11
128	to	129	In use for TAP
130	to	132	Reserved for TAP use – application # released TAP 3.11
133			In use for TAP
134			Reserved for TAP use – application # released TAP 3.11
135	to	136	In use for TAP
137			Reserved for TAP use – application # released TAP 3.11
138			In use for TAP
139	to	140	Reserved for TAP use – application # released TAP 3.11
141	to	142	In use for TAP
143			In use for TAP and RAP
144	to	147	In use for TAP
148			Reserved for TAP use – application # released TAP 3.11
149			Reserved for TAP use – application # released TAP 3.10
150	to	151	Reserved for TAP use – application # released TAP 3.11
152	to	153	In use for TAP
154	to	155	Reserved for TAP use – application # released TAP 3.11
156			In use for TAP
157	to	158	Reserved for TAP use – application # released TAP 3.11
159			In use for TAP

160			Reserved for TAP use – application # released TAP 3.10
161			Reserved for TAP use – application # released TAP 3.11
162	to	167	In use for TAP
168			Reserved for TAP use – application # released TAP 3.11
169	to	170	In use for TAP
171			Reserved for TAP use – application # released TAP 3.11
172			Reserved for TAP use – application # released TAP 3.4
173	to	176	Reserved for TAP use – application # released TAP 3.11
177	to	178	Reserved for TAP use – application # released TAP 3.4
179	to	180	Reserved for TAP use – application # released TAP 3.11
181	to	186	In use for TAP
187			Reserved for TAP use
188	to	190	In use for TAP
190			Reserved for TAP use – application # released TAP 3.11
191	to	193	In use for TAP
194			Reserved for TAP use
195	to	196	In use for TAP
197			Reserved for TAP use
198	to	201	In use for TAP
202	to	203	Reserved for TAP use – application # released TAP 3.11
204			In use for TAP
205			Reserved for TAP use
206			In use for TAP
207			Reserved for TAP use – application # released TAP 3.11
208	to	219	In use for TAP
220	to	222	Reserved for TAP use – application # released TAP 3.11
223			In use for TAP
224			Reserved for TAP use – application # released TAP 3.11
225	to	228	In use for TAP
229			Reserved for TAP use – application # released TAP 3.11
230			Reserved for TAP use – application # released TAP 3.10
231	to	234	In use for TAP
235	to	243	Reserved for TAP use – application # released TAP 3.11
244	to	245	In use for TAP
246	to	247	Reserved for TAP use – application # released TAP 3.11
248			Reserved for TAP use
249			Reserved for TAP use – application # released TAP 3.11
250	to	251	In use for TAP
252			Reserved for TAP use – application # released TAP 3.11
253	to	256	In use for TAP
257			Reserved for TAP use – application # released TAP 3.11
258	to	262	In use for TAP
263	to	264	Reserved for TAP use – application # released TAP 3.11
265	to	267	Reserved for TAP use – application # released TAP 3.10
268			Reserved for TAP use – application # released TAP 3.11
269			Reserved for TAP use – application # released TAP 3.10
270	to	275	Reserved for TAP use – application # released TAP 3.11
276	to	278	Reserved for TAP use – application # released TAP 3.10

279	to	282	In use for TAP
283	to	284	Reserved for TAP use – application # released TAP 3.11
285	to	295	In use for TAP
296			Reserved for TAP use – application # released TAP 3.11
297	to	398	In use for TAP
399			Reserved for TAP use – application # released TAP 3.11
400			In use for TAP
401			Reserved for TAP use – application # released TAP 3.11
402	to	405	In use for TAP
406			Reserved for TAP use – application # released TAP 3.11
407			In use for TAP
408	to	409	Reserved for TAP use – application # released TAP 3.11
410	to	464	In use for TAP
465	to	511	Reserved for TAP use
512	to	1023	Reserved for RAP usage

Table 45: Tag Ranges

```
--
--
-- The following ASN.1 specification defines the abstract syntax for
--
--        Data Record Format Version 03
--                           Release 12
--
-- The specification is structured as follows:
--   (1) structure of the Tap batch
--   (2) definition of the individual Tap 'records'
--   (3) Tap data items and groups of data items used within (2)
--   (4) Common, non-Tap data types
--   (5) Tap data items for content charging
--
-- It is mainly a translation from the logical structure
-- diagrams. Where appropriate, names used within the
-- logical structure diagrams have been shortened.
-- For repeating data items the name as used within the logical
-- structure have been extended by adding 'list' or 'table'
-- (in some instances).
--


TAP-0312  DEFINITIONS IMPLICIT TAGS  ::=

BEGIN

--
-- Structure of a Tap batch
--

DataInterChange ::= CHOICE
{
    transferBatch TransferBatch,
    notification  Notification,
...
}

-- Batch Control Information must always, both logically and physically,
-- be the first group/item within Transfer Batch - this ensures that the
-- TAP release version can be readily identified.  Any new groups/items
-- required may be inserted at any point after Batch Control Information

TransferBatch ::= [APPLICATION 1] SEQUENCE
```

```
{
    batchControlInfo       BatchControlInfo           OPTIONAL, -- *m.m.
    accountingInfo         AccountingInfo             OPTIONAL,
    networkInfo            NetworkInfo                OPTIONAL, -- *m.m.
    messageDescriptionInfo MessageDescriptionInfoList OPTIONAL,
    callEventDetails       CallEventDetailList        OPTIONAL, -- *m.m.
    auditControlInfo       AuditControlInfo           OPTIONAL, -- *m.m.
...
}

Notification ::= [APPLICATION 2] SEQUENCE
{
    sender                     Sender                     OPTIONAL, -- *m.m.
    recipient                  Recipient                  OPTIONAL, -- *m.m.
    fileSequenceNumber         FileSequenceNumber         OPTIONAL, -- *m.m.
    rapFileSequenceNumber      RapFileSequenceNumber      OPTIONAL,
    fileCreationTimeStamp      FileCreationTimeStamp      OPTIONAL,
    fileAvailableTimeStamp     FileAvailableTimeStamp     OPTIONAL, -- *m.m.
    transferCutOffTimeStamp    TransferCutOffTimeStamp    OPTIONAL, -- *m.m.
    specificationVersionNumber SpecificationVersionNumber OPTIONAL, -- *m.m.
    releaseVersionNumber       ReleaseVersionNumber       OPTIONAL, -- *m.m.
    fileTypeIndicator          FileTypeIndicator          OPTIONAL,
    operatorSpecInformation    OperatorSpecInfoList       OPTIONAL,
...
}

CallEventDetailList ::=  [APPLICATION 3] SEQUENCE OF CallEventDetail

CallEventDetail ::= CHOICE
{
    mobileOriginatedCall   MobileOriginatedCall,
    mobileTerminatedCall   MobileTerminatedCall,
    supplServiceEvent      SupplServiceEvent,
    serviceCentreUsage     ServiceCentreUsage,
    gprsCall               GprsCall,
    contentTransaction     ContentTransaction,
    locationService        LocationService,
    messagingEvent         MessagingEvent,
    mobileSession          MobileSession,
    aggregatedUsageRecord  AggregatedUsageRecord,
...
}

--
```

```
-- Structure of the individual Tap records
--

BatchControlInfo ::= [APPLICATION 4] SEQUENCE
{
    sender                      Sender                      OPTIONAL, -- *m.m.
    recipient                   Recipient                   OPTIONAL, -- *m.m.
    fileSequenceNumber          FileSequenceNumber          OPTIONAL, -- *m.m.
    fileCreationTimeStamp       FileCreationTimeStamp       OPTIONAL,
    transferCutOffTimeStamp     TransferCutOffTimeStamp     OPTIONAL, -- *m.m.
    fileAvailableTimeStamp      FileAvailableTimeStamp      OPTIONAL, -- *m.m.
    specificationVersionNumber SpecificationVersionNumber   OPTIONAL, -- *m.m.
    releaseVersionNumber        ReleaseVersionNumber        OPTIONAL, -- *m.m.
    fileTypeIndicator           FileTypeIndicator           OPTIONAL,
    rapFileSequenceNumber       RapFileSequenceNumber       OPTIONAL,
    operatorSpecInformation     OperatorSpecInfoList        OPTIONAL,
...
}

AccountingInfo ::= [APPLICATION 5] SEQUENCE
{
    taxation                  TaxationList           OPTIONAL,
    discounting               DiscountingList        OPTIONAL,
    localCurrency             LocalCurrency          OPTIONAL, -- *m.m.
    tapCurrency               TapCurrency            OPTIONAL,
    currencyConversionInfo    CurrencyConversionList OPTIONAL,
    tapDecimalPlaces          TapDecimalPlaces       OPTIONAL, -- *m.m.
...
}

NetworkInfo ::= [APPLICATION 6] SEQUENCE
{
    utcTimeOffsetInfo         UtcTimeOffsetInfoList OPTIONAL, -- *m.m.
    recEntityInfo             RecEntityInfoList     OPTIONAL,
...
}

MessageDescriptionInfoList ::= [APPLICATION 8] SEQUENCE OF
MessageDescriptionInformation

AggregatedUsageRecord ::= [APPLICATION 453] SEQUENCE
{
    aggregatedUsageDateStart AggregatedUsageDateStart    OPTIONAL, -- *m.m.
    aggregatedUsageDateEnd   AggregatedUsageDateEnd      OPTIONAL,
```

```
    servingNetwork           ServingNetwork             OPTIONAL,
    aggregationType          AggregationType            OPTIONAL,
    aggregationIdentifier    AggregationIdentifier      OPTIONAL,
    callTypeLevel1           CallTypeLevel1             OPTIONAL,
    callTypeLevel2           CallTypeLevel2             OPTIONAL,
    callTypeLevel3           CallTypeLevel3             OPTIONAL,
    aggregatedChrgUnitType   AggregatedChrgUnitType     OPTIONAL, -- *m.m.
    aggregatedChrgUnits      AggregatedChrgUnits        OPTIONAL, -- *m.m.
    aggregatedUsageCharge    AggregatedUsageCharge      OPTIONAL,
    exchangeRateCode         ExchangeRateCode           OPTIONAL,
    aURTaxInformationList    AURTaxInformationList      OPTIONAL,
    rapFileSequenceNumber    RapFileSequenceNumber      OPTIONAL,
    operatorSpecInformation  OperatorSpecInformationList OPTIONAL,
...
}

MobileOriginatedCall ::= [APPLICATION 9] SEQUENCE
{
    basicCallInformation    MoBasicCallInformation    OPTIONAL, -- *m.m.
    locationInformation     LocationInformation       OPTIONAL, -- *m.m.
    equipmentIdentifier     ImeiOrEsn                 OPTIONAL,
    basicServiceUsedList    BasicServiceUsedList      OPTIONAL, -- *m.m.
    supplServiceCode        SupplServiceCode          OPTIONAL,
    thirdPartyInformation   ThirdPartyInformation     OPTIONAL,
    camelServiceUsed        CamelServiceUsed          OPTIONAL,
    operatorSpecInformation OperatorSpecInfoList      OPTIONAL,
...
}

MobileTerminatedCall ::= [APPLICATION 10] SEQUENCE
{
    basicCallInformation    MtBasicCallInformation    OPTIONAL, -- *m.m.
    locationInformation     LocationInformation       OPTIONAL, -- *m.m.
    equipmentIdentifier     ImeiOrEsn                 OPTIONAL,
    basicServiceUsedList    BasicServiceUsedList      OPTIONAL, -- *m.m.
    camelServiceUsed        CamelServiceUsed          OPTIONAL,
    operatorSpecInformation OperatorSpecInfoList      OPTIONAL,
...
}


SupplServiceEvent ::= [APPLICATION 11] SEQUENCE
{
    chargeableSubscriber      ChargeableSubscriber    OPTIONAL, -- *m.m.
```

```
    rapFileSequenceNumber     RapFileSequenceNumber   OPTIONAL,
    locationInformation       LocationInformation     OPTIONAL, -- *m.m.
    equipmentIdentifier       ImeiOrEsn               OPTIONAL,
    supplServiceUsed          SupplServiceUsed        OPTIONAL, -- *m.m.
    operatorSpecInformation   OperatorSpecInfoList    OPTIONAL,
...
}


ServiceCentreUsage ::= [APPLICATION 12] SEQUENCE
{
    basicInformation          ScuBasicInformation     OPTIONAL, -- *m.m.
    rapFileSequenceNumber     RapFileSequenceNumber   OPTIONAL,
    servingNetwork            ServingNetwork          OPTIONAL,
    recEntityCode             RecEntityCode           OPTIONAL, -- *m.m.
    chargeInformation         ChargeInformation       OPTIONAL, -- *m.m.
    scuChargeType             ScuChargeType           OPTIONAL, -- *m.m.
    scuTimeStamps             ScuTimeStamps           OPTIONAL, -- *m.m.
    operatorSpecInformation   OperatorSpecInfoList    OPTIONAL,
...
}

GprsCall ::= [APPLICATION 14] SEQUENCE
{
    gprsBasicCallInformation  GprsBasicCallInformation  OPTIONAL, -- *m.m.
    gprsLocationInformation   GprsLocationInformation   OPTIONAL, -- *m.m.
    equipmentIdentifier       ImeiOrEsn                 OPTIONAL,
    gprsServiceUsed           GprsServiceUsed           OPTIONAL, -- *m.m.
    camelServiceUsed          CamelServiceUsed          OPTIONAL,
    operatorSpecInformation   OperatorSpecInfoList      OPTIONAL,
...
}

ContentTransaction ::= [APPLICATION 17] SEQUENCE
{
 contentTransactionBasicInfo ContentTransactionBasicInfo OPTIONAL, -- *m.m.
 chargedPartyInformation     ChargedPartyInformation     OPTIONAL, -- *m.m.
 servingPartiesInformation   ServingPartiesInformation   OPTIONAL, -- *m.m.
 contentServiceUsed          ContentServiceUsedList      OPTIONAL, -- *m.m.
 operatorSpecInformation     OperatorSpecInfoList        OPTIONAL,
...
}

LocationService ::= [APPLICATION 297] SEQUENCE
```

```
{
    rapFileSequenceNumber       RapFileSequenceNumber       OPTIONAL,
    recEntityCode               RecEntityCode               OPTIONAL, -- *m.m.
    callReference               CallReference               OPTIONAL,
    trackingCustomerInformation TrackingCustomerInformation OPTIONAL,
    lCSSPInformation            LCSSPInformation            OPTIONAL,
    trackedCustomerInformation  TrackedCustomerInformation  OPTIONAL,
    locationServiceUsage        LocationServiceUsage        OPTIONAL, -- *m.m.
    operatorSpecInformation     OperatorSpecInfoList        OPTIONAL,
...
}

MessagingEvent ::= [APPLICATION 433] SEQUENCE
{
    messagingEventService     MessagingEventService     OPTIONAL, -- *m.m.
    chargedParty              ChargedParty              OPTIONAL, -- *m.m.
    rapFileSequenceNumber     RapFileSequenceNumber     OPTIONAL,
    simToolkitIndicator       SimToolkitIndicator       OPTIONAL,
    geographicalLocation      GeographicalLocation      OPTIONAL,
    eventReference            EventReference            OPTIONAL, -- *m.m.
    recEntityCodeList         RecEntityCodeList         OPTIONAL, -- *m.m.
    networkElementList        NetworkElementList        OPTIONAL,
    locationArea              LocationArea              OPTIONAL,
    cellId                    CellId                    OPTIONAL,
    serviceStartTimestamp     ServiceStartTimestamp     OPTIONAL, -- *m.m.
    nonChargedParty           NonChargedParty           OPTIONAL,
    exchangeRateCode          ExchangeRateCode          OPTIONAL,
    callTypeGroup             CallTypeGroup             OPTIONAL, -- *m.m.
    charge                    Charge                    OPTIONAL, -- *m.m.
    taxInformationList        TaxInformationList        OPTIONAL,
    operatorSpecInformation   OperatorSpecInfoList      OPTIONAL,
...
}

MobileSession ::= [APPLICATION 434] SEQUENCE
{
    mobileSessionService      MobileSessionService      OPTIONAL, -- *m.m.
    chargedParty              ChargedParty              OPTIONAL, -- *m.m.
    rapFileSequenceNumber     RapFileSequenceNumber     OPTIONAL,
    simToolkitIndicator       SimToolkitIndicator       OPTIONAL,
    geographicalLocation      GeographicalLocation      OPTIONAL,
    locationArea              LocationArea              OPTIONAL,
    cellId                    CellId                    OPTIONAL,
    eventReference            EventReference            OPTIONAL, -- *m.m.
```

```
    recEntityCodeList         RecEntityCodeList         OPTIONAL, -- *m.m.
    serviceStartTimestamp     ServiceStartTimestamp     OPTIONAL, -- *m.m.
    causeForTerm              CauseForTerm              OPTIONAL,
    totalCallEventDuration    TotalCallEventDuration    OPTIONAL, -- *m.m.
    nonChargedParty           NonChargedParty           OPTIONAL,
    requestedDestination      RequestedDestination      OPTIONAL,
    sessionChargeInfoList     SessionChargeInfoList     OPTIONAL, -- *m.m.
    operatorSpecInformation   OperatorSpecInfoList      OPTIONAL,
...
}

AuditControlInfo ::= [APPLICATION 15] SEQUENCE
{
    earliestCallTimeStamp       EarliestCallTimeStamp       OPTIONAL,
    latestCallTimeStamp         LatestCallTimeStamp         OPTIONAL,
    totalCharge                 TotalCharge                 OPTIONAL, -- *m.m.
    totalChargeRefund           TotalChargeRefund           OPTIONAL,
    totalTaxRefund              TotalTaxRefund              OPTIONAL,
    totalTaxValue               TotalTaxValue               OPTIONAL, -- *m.m.
    totalDiscountValue          TotalDiscountValue          OPTIONAL, -- *m.m.
    totalDiscountRefund         TotalDiscountRefund         OPTIONAL,
    totalAdvisedChargeValueList TotalAdvisedChargeValueList OPTIONAL,
    callEventDetailsCount       CallEventDetailsCount       OPTIONAL, -- *m.m.
    operatorSpecInformation     OperatorSpecInfoList        OPTIONAL,
...
}


--
-- Tap data items and groups of data items
--

AccessPointNameNI ::= [APPLICATION 261] AsciiString --(SIZE(1..63))

AccessPointNameOI ::= [APPLICATION 262] AsciiString --(SIZE(1..37))

ActualDeliveryTimeStamp ::= [APPLICATION 302] DateTime

AddressStringDigits ::= BCDString

AdvisedCharge ::= [APPLICATION 349] Charge

AdvisedChargeCurrency ::= [APPLICATION 348] Currency
```

```
AdvisedChargeInformation ::= [APPLICATION 351] SEQUENCE
{
    paidIndicator         PaidIndicator         OPTIONAL,
    paymentMethod         PaymentMethod         OPTIONAL,
    advisedChargeCurrency AdvisedChargeCurrency OPTIONAL,
    advisedCharge         AdvisedCharge         OPTIONAL, -- *m.m.
    commission            Commission            OPTIONAL,
...
}

AgeOfLocation ::= [APPLICATION 396] INTEGER

AURTaxInformation ::= [APPLICATION 454] SEQUENCE
{
    taxCode                  TaxCode                  OPTIONAL, -- *m.m
    aURTaxValue              AURTaxValue              OPTIONAL, -- *m.m
    aURTaxableAmount         AURTaxableAmount         OPTIONAL,
...
}

AggregatedUsageDateStart ::= [APPLICATION 455] LocalDate

AggregatedUsageDateEnd ::= [APPLICATION 456] LocalDate

AggregationType ::= [APPLICATION 457] INTEGER

AggregationIdentifier ::= [APPLICATION 458] AsciiString

AggregatedChrgUnitType ::= [APPLICATION 459] INTEGER

AggregatedChrgUnits ::= [APPLICATION 460] INTEGER

AggregatedUsageCharge ::= [APPLICATION 461] AbsoluteAmount

AURTaxInformationList ::= [APPLICATION 464]  SEQUENCE OF AURTaxInformation

AURTaxValue ::= [APPLICATION 462] AbsoluteAmount

AURTaxableAmount ::= [APPLICATION 463] AbsoluteAmount

BasicService ::= [APPLICATION 36] SEQUENCE
{
    serviceCode                BasicServiceCode       OPTIONAL, -- *m.m.
    transparencyIndicator      TransparencyIndicator  OPTIONAL,
```

```
    fnur                        Fnur                    OPTIONAL,
    userProtocolIndicator       UserProtocolIndicator   OPTIONAL,
    guaranteedBitRate           GuaranteedBitRate       OPTIONAL,
    maximumBitRate              MaximumBitRate          OPTIONAL,
...
}

BasicServiceCode ::= [APPLICATION 426] CHOICE
{
    teleServiceCode      TeleServiceCode,
    bearerServiceCode    BearerServiceCode,
...
}

BasicServiceCodeList ::= [APPLICATION 37] SEQUENCE OF BasicServiceCode

BasicServiceUsed ::= [APPLICATION 39] SEQUENCE
{
    basicService                BasicService          OPTIONAL, -- *m.m.
    chargingTimeStamp           ChargingTimeStamp     OPTIONAL,
    chargeInformationList       ChargeInformationList OPTIONAL, -- *m.m.
    hSCSDIndicator              HSCSDIndicator        OPTIONAL,
...
}

BasicServiceUsedList ::= [APPLICATION 38] SEQUENCE OF BasicServiceUsed

BearerServiceCode ::= [APPLICATION 40] HexString --(SIZE(2))

CalledNumber ::= [APPLICATION 407] AddressStringDigits

CalledPlace ::= [APPLICATION 42] AsciiString

CalledRegion ::= [APPLICATION 46] AsciiString

CallEventDetailsCount ::= [APPLICATION 43] INTEGER

CallEventStartTimeStamp ::= [APPLICATION 44] DateTime

CallingNumber ::= [APPLICATION 405] AddressStringDigits

CallOriginator ::= [APPLICATION 41]  SEQUENCE
{
    callingNumber               CallingNumber         OPTIONAL,
```

```
    clirIndicator               ClirIndicator         OPTIONAL,
    sMSOriginator               SMSOriginator         OPTIONAL,
...
}

CallReference ::= [APPLICATION 45] OCTET STRING --(SIZE(1..8))

CallTypeGroup ::= [APPLICATION 258] SEQUENCE
{
    callTypeLevel1      CallTypeLevel1          OPTIONAL, -- *m.m.
    callTypeLevel2      CallTypeLevel2          OPTIONAL, -- *m.m.
    callTypeLevel3      CallTypeLevel3          OPTIONAL, -- *m.m.
...
}

CallTypeLevel1 ::= [APPLICATION 259] INTEGER

CallTypeLevel2 ::= [APPLICATION 255] INTEGER

CallTypeLevel3 ::= [APPLICATION 256] INTEGER

CamelDestinationNumber ::= [APPLICATION 404] AddressStringDigits

CamelInvocationFee ::= [APPLICATION 422] AbsoluteAmount

CamelServiceKey ::= [APPLICATION 55] INTEGER

CamelServiceLevel ::= [APPLICATION 56] INTEGER

CamelServiceUsed ::= [APPLICATION 57] SEQUENCE
{
    camelServiceLevel         CamelServiceLevel             OPTIONAL,
    camelServiceKey           CamelServiceKey               OPTIONAL, -- *m.m.
    defaultCallHandling       DefaultCallHandlingIndicator  OPTIONAL,
    exchangeRateCode          ExchangeRateCode              OPTIONAL,
    taxInformation            TaxInformationList            OPTIONAL,
    discountInformation       DiscountInformation           OPTIONAL,
    camelInvocationFee        CamelInvocationFee            OPTIONAL,
    threeGcamelDestination    ThreeGcamelDestination        OPTIONAL,
    cseInformation            CseInformation                OPTIONAL,
...
}

CauseForTerm ::= [APPLICATION 58] INTEGER
```

```
CellId ::= [APPLICATION 59] INTEGER

Charge ::= [APPLICATION 62] AbsoluteAmount

ChargeableSubscriber ::= [APPLICATION 427] CHOICE
{
    simChargeableSubscriber SimChargeableSubscriber,
    minChargeableSubscriber MinChargeableSubscriber,
...
}

ChargeableUnits ::= [APPLICATION 65]  INTEGER

ChargeDetail ::= [APPLICATION 63] SEQUENCE
{
    chargeType              ChargeType              OPTIONAL, -- *m.m.
    charge                  Charge                  OPTIONAL, -- *m.m.
    chargeableUnits         ChargeableUnits         OPTIONAL,
    chargedUnits            ChargedUnits            OPTIONAL,
    chargeDetailTimeStamp   ChargeDetailTimeStamp   OPTIONAL,
...
}

ChargeDetailList ::= [APPLICATION 64] SEQUENCE OF ChargeDetail

ChargeDetailTimeStamp ::= [APPLICATION 410] ChargingTimeStamp

ChargedItem ::= [APPLICATION 66]  AsciiString --(SIZE(1))

ChargedParty ::= [APPLICATION 436] SEQUENCE
{
    imsi                    Imsi                    OPTIONAL, -- *m.m.
    msisdn                  Msisdn                  OPTIONAL,
    publicUserId            PublicUserId            OPTIONAL,
    homeBid                 HomeBid                 OPTIONAL,
    homeLocationDescription HomeLocationDescription OPTIONAL,
    imei                    Imei                    OPTIONAL,
...
}

ChargedPartyEquipment ::= [APPLICATION 323] SEQUENCE
{
    equipmentIdType EquipmentIdType OPTIONAL, -- *m.m.
```

```
    equipmentId     EquipmentId     OPTIONAL, -- *m.m.
...
}

ChargedPartyHomeIdentification ::= [APPLICATION 313] SEQUENCE
{
    homeIdType     HomeIdType     OPTIONAL, -- *m.m.
    homeIdentifier HomeIdentifier OPTIONAL, -- *m.m.
...
}

ChargedPartyHomeIdList ::= [APPLICATION 314] SEQUENCE OF
                                             ChargedPartyHomeIdentification

ChargedPartyIdentification ::= [APPLICATION 309] SEQUENCE
{
    chargedPartyIdType         ChargedPartyIdType         OPTIONAL, -- *m.m.
    chargedPartyIdentifier     ChargedPartyIdentifier     OPTIONAL, -- *m.m.
...
}

ChargedPartyIdentifier ::= [APPLICATION 287] AsciiString

ChargedPartyIdList ::= [APPLICATION 310] SEQUENCE OF ChargedPartyIdentification

ChargedPartyIdType ::= [APPLICATION 305] INTEGER

ChargedPartyInformation ::= [APPLICATION 324] SEQUENCE
{
    chargedPartyIdList       ChargedPartyIdList        OPTIONAL, -- *m.m.
    chargedPartyHomeIdList   ChargedPartyHomeIdList    OPTIONAL,
    chargedPartyLocationList ChargedPartyLocationList  OPTIONAL,
    chargedPartyEquipment    ChargedPartyEquipment     OPTIONAL,
...
}

ChargedPartyLocation ::= [APPLICATION 320] SEQUENCE
{
    locationIdType     LocationIdType     OPTIONAL, -- *m.m.
    locationIdentifier LocationIdentifier OPTIONAL, -- *m.m.
...
}

ChargedPartyLocationList ::= [APPLICATION 321] SEQUENCE OF ChargedPartyLocation
```

```
ChargedPartyStatus ::= [APPLICATION 67] INTEGER

ChargedUnits ::= [APPLICATION 68]  INTEGER

ChargeInformation ::= [APPLICATION 69] SEQUENCE
{
    chargedItem         ChargedItem         OPTIONAL, -- *m.m.
    exchangeRateCode    ExchangeRateCode    OPTIONAL,
    callTypeGroup       CallTypeGroup       OPTIONAL,
    chargeDetailList    ChargeDetailList    OPTIONAL, -- *m.m.
    taxInformation      TaxInformationList  OPTIONAL,
    discountInformation DiscountInformation OPTIONAL,
...
}

ChargeInformationList ::= [APPLICATION 70] SEQUENCE OF ChargeInformation

ChargeRefundIndicator ::= [APPLICATION 344] INTEGER

ChargeType ::= [APPLICATION 71] NumberString --(SIZE(2..3))

ChargingId ::= [APPLICATION 72] INTEGER

ChargingPoint ::= [APPLICATION 73]  AsciiString --(SIZE(1))

ChargingTimeStamp ::= [APPLICATION 74]  DateTime

ClirIndicator ::= [APPLICATION 75] INTEGER

Commission ::= [APPLICATION 350] Charge

CompletionTimeStamp ::= [APPLICATION 76] DateTime

ContentChargingPoint ::= [APPLICATION 345] INTEGER

ContentProvider ::= [APPLICATION 327] SEQUENCE
{
    contentProviderIdType     ContentProviderIdType     OPTIONAL, -- *m.m.
    contentProviderIdentifier ContentProviderIdentifier OPTIONAL, -- *m.m.
...
}

ContentProviderIdentifier ::= [APPLICATION 292] AsciiString
```

```
ContentProviderIdList ::= [APPLICATION 328] SEQUENCE OF ContentProvider

ContentProviderIdType ::= [APPLICATION 291] INTEGER

ContentProviderName ::= [APPLICATION 334] AsciiString

ContentServiceUsed ::= [APPLICATION 352] SEQUENCE
{
    contentTransactionCode       ContentTransactionCode       OPTIONAL, -- *m.m.
    contentTransactionType       ContentTransactionType       OPTIONAL, -- *m.m.
    objectType                   ObjectType                   OPTIONAL,
    transactionDescriptionSupp   TransactionDescriptionSupp   OPTIONAL,
    transactionShortDescription  TransactionShortDescription  OPTIONAL, -- *m.m.
    transactionDetailDescription TransactionDetailDescription OPTIONAL,
    transactionIdentifier        TransactionIdentifier        OPTIONAL, -- *m.m.
    transactionAuthCode          TransactionAuthCode          OPTIONAL,
    dataVolumeIncoming           DataVolumeIncoming           OPTIONAL,
    dataVolumeOutgoing           DataVolumeOutgoing           OPTIONAL,
    totalDataVolume              TotalDataVolume              OPTIONAL,
    chargeRefundIndicator        ChargeRefundIndicator        OPTIONAL,
    contentChargingPoint         ContentChargingPoint         OPTIONAL,
    chargeInformationList        ChargeInformationList        OPTIONAL,
    advisedChargeInformation     AdvisedChargeInformation     OPTIONAL,
...
}

ContentServiceUsedList ::= [APPLICATION 285] SEQUENCE OF ContentServiceUsed

ContentTransactionBasicInfo ::= [APPLICATION 304] SEQUENCE
{
    rapFileSequenceNumber      RapFileSequenceNumber      OPTIONAL,
    orderPlacedTimeStamp       OrderPlacedTimeStamp       OPTIONAL,
    requestedDeliveryTimeStamp RequestedDeliveryTimeStamp OPTIONAL,
    actualDeliveryTimeStamp    ActualDeliveryTimeStamp    OPTIONAL,
    totalTransactionDuration   TotalTransactionDuration   OPTIONAL,
    transactionStatus          TransactionStatus          OPTIONAL,
...
}

ContentTransactionCode ::= [APPLICATION 336] INTEGER

ContentTransactionType ::= [APPLICATION 337] INTEGER
```

```
CseInformation ::= [APPLICATION 79] OCTET STRING --(SIZE(1..40))

CurrencyConversion ::= [APPLICATION 106] SEQUENCE
{
    exchangeRateCode      ExchangeRateCode      OPTIONAL, -- *m.m.
    numberOfDecimalPlaces NumberOfDecimalPlaces OPTIONAL, -- *m.m.
    exchangeRate          ExchangeRate          OPTIONAL, -- *m.m.
...
}

CurrencyConversionList ::= [APPLICATION 80] SEQUENCE OF CurrencyConversion

CustomerIdentifier ::= [APPLICATION 364] AsciiString

CustomerIdType ::= [APPLICATION 363] INTEGER

DataVolume ::= INTEGER

DataVolumeIncoming ::= [APPLICATION 250] DataVolume

DataVolumeOutgoing ::= [APPLICATION 251] DataVolume

--
--  The following datatypes are used to denote timestamps.
--  Each timestamp consists of a local timestamp and a
--  corresponding UTC time offset.
--  Except for the timestamps used within the Batch Control
--  Information and the Audit Control Information
--  the UTC time offset is identified by a code referencing
--  the UtcTimeOffsetInfo.
--

--
-- We start with the “short” datatype referencing the
-- UtcTimeOffsetInfo.
--

DateTime ::= SEQUENCE
{
     --
     -- Local timestamps are noted in the format
     --
     --     CCYYMMDDhhmmss
     --
```

```
     -- where CC  =  century  ('19', '20',...)
     --       YY  =  year     ('00' - '99')
     --       MM  =  month    ('01', '02', ... , '12')
     --       DD  =  day      ('01', '02', ... , '31')
     --       hh  =  hour     ('00', '01', ... , '23')
     --       mm  =  minutes  ('00', '01', ... , '59')
     --       ss  =  seconds  ('00', '01', ... , '59')
     --
    localTimeStamp     LocalTimeStamp    OPTIONAL, -- *m.m.
    utcTimeOffsetCode  UtcTimeOffsetCode OPTIONAL, -- *m.m.
...
}

--
-- The following version is the "long" datatype
-- containing the UTC time offset directly.
--

DateTimeLong ::= SEQUENCE
{
    localTimeStamp     LocalTimeStamp OPTIONAL, -- *m.m.
    utcTimeOffset      UtcTimeOffset  OPTIONAL, -- *m.m.
...
}

DefaultCallHandlingIndicator ::= [APPLICATION 87] INTEGER

DepositTimeStamp ::= [APPLICATION 88] DateTime

Destination ::= [APPLICATION 89] SEQUENCE
{
    calledNumber               CalledNumber          OPTIONAL,
    dialledDigits              DialledDigits         OPTIONAL,
    calledPlace                CalledPlace           OPTIONAL,
    calledRegion               CalledRegion          OPTIONAL,
    sMSDestinationNumber       SMSDestinationNumber  OPTIONAL,
...
}

DestinationNetwork ::= [APPLICATION 90] NetworkId

DialledDigits ::= [APPLICATION 279] AsciiString

Discount ::= [APPLICATION 412] DiscountValue
```

```
DiscountableAmount ::= [APPLICATION 423] AbsoluteAmount

DiscountApplied ::= [APPLICATION 428] CHOICE
{
    fixedDiscountValue    FixedDiscountValue,
    discountRate          DiscountRate,
...
}

DiscountCode ::= [APPLICATION 91] INTEGER

DiscountInformation ::= [APPLICATION 96] SEQUENCE
{
    discountCode        DiscountCode            OPTIONAL, -- *m.m.
    discount            Discount                OPTIONAL,
    discountableAmount  DiscountableAmount      OPTIONAL,
...
}

Discounting ::= [APPLICATION 94] SEQUENCE
{
    discountCode    DiscountCode    OPTIONAL, -- *m.m.
    discountApplied DiscountApplied OPTIONAL, -- *m.m.
...
}

DiscountingList ::= [APPLICATION 95]  SEQUENCE OF Discounting

DiscountRate ::= [APPLICATION 92] PercentageRate

DiscountValue ::= AbsoluteAmount

DistanceChargeBandCode ::= [APPLICATION 98] AsciiString --(SIZE(1))

EarliestCallTimeStamp ::= [APPLICATION 101] DateTimeLong

ElementId ::= [APPLICATION 437] AsciiString

ElementType ::= [APPLICATION 438] INTEGER

EquipmentId ::= [APPLICATION 290] AsciiString

EquipmentIdType ::= [APPLICATION 322] INTEGER
```

```
Esn ::= [APPLICATION 103] NumberString

EventReference ::= [APPLICATION 435]  AsciiString

ExchangeRate ::= [APPLICATION 104] INTEGER

ExchangeRateCode ::= [APPLICATION 105] Code

FileAvailableTimeStamp ::= [APPLICATION 107] DateTimeLong

FileCreationTimeStamp ::= [APPLICATION 108] DateTimeLong

FileSequenceNumber ::= [APPLICATION 109] NumberString --(SIZE(5))

FileTypeIndicator ::= [APPLICATION 110] AsciiString --(SIZE(1))

FixedDiscountValue ::= [APPLICATION 411] DiscountValue

Fnur ::= [APPLICATION 111] INTEGER

GeographicalLocation ::= [APPLICATION 113]  SEQUENCE
{
    servingNetwork              ServingNetwork              OPTIONAL,
    servingBid                  ServingBid                  OPTIONAL,
    servingLocationDescription  ServingLocationDescription  OPTIONAL,
...
}

GprsBasicCallInformation ::= [APPLICATION 114] SEQUENCE
{
    gprsChargeableSubscriber    GprsChargeableSubscriber OPTIONAL, -- *m.m.
    rapFileSequenceNumber       RapFileSequenceNumber    OPTIONAL,
    gprsDestination             GprsDestination          OPTIONAL, -- *m.m.
    callEventStartTimeStamp     CallEventStartTimeStamp  OPTIONAL, -- *m.m.
    totalCallEventDuration      TotalCallEventDuration   OPTIONAL, -- *m.m.
    causeForTerm                CauseForTerm             OPTIONAL,
    partialTypeIndicator        PartialTypeIndicator     OPTIONAL,
    pDPContextStartTimestamp    PDPContextStartTimestamp OPTIONAL,
    networkInitPDPContext       NetworkInitPDPContext    OPTIONAL,
    chargingId                  ChargingId               OPTIONAL, -- *m.m.
...
}
```

```
GprsChargeableSubscriber ::= [APPLICATION 115] SEQUENCE
{
    chargeableSubscriber        ChargeableSubscriber    OPTIONAL,
    pdpAddress                  PdpAddress              OPTIONAL,
    networkAccessIdentifier     NetworkAccessIdentifier OPTIONAL,
...
}

GprsDestination ::= [APPLICATION 116] SEQUENCE
{
    accessPointNameNI           AccessPointNameNI      OPTIONAL, -- *m.m.
    accessPointNameOI           AccessPointNameOI      OPTIONAL,
...
}

GprsLocationInformation ::= [APPLICATION 117] SEQUENCE
{
    gprsNetworkLocation         GprsNetworkLocation     OPTIONAL, -- *m.m.
    homeLocationInformation     HomeLocationInformation OPTIONAL,
    geographicalLocation        GeographicalLocation    OPTIONAL,
...
}

GprsNetworkLocation ::= [APPLICATION 118] SEQUENCE
{
    recEntity                   RecEntityCodeList OPTIONAL, -- *m.m.
    locationArea                LocationArea      OPTIONAL,
    cellId                      CellId            OPTIONAL,
...
}

GprsServiceUsed ::= [APPLICATION 121]  SEQUENCE
{
    iMSSignallingContext        IMSSignallingContext  OPTIONAL,
    dataVolumeIncoming          DataVolumeIncoming    OPTIONAL, -- *m.m.
    dataVolumeOutgoing          DataVolumeOutgoing    OPTIONAL, -- *m.m.
    chargeInformationList       ChargeInformationList OPTIONAL, -- *m.m.
...
}

GsmChargeableSubscriber ::= [APPLICATION 286] SEQUENCE
{
    imsi     Imsi   OPTIONAL,
    msisdn   Msisdn OPTIONAL,
```

```
...
}

GuaranteedBitRate ::= [APPLICATION 420] OCTET STRING --(SIZE (1))

HomeBid ::= [APPLICATION 122]  Bid

HomeIdentifier ::= [APPLICATION 288] AsciiString

HomeIdType ::= [APPLICATION 311] INTEGER

HomeLocationDescription ::= [APPLICATION 413] LocationDescription

HomeLocationInformation ::= [APPLICATION 123] SEQUENCE
{
    homeBid                     HomeBid                     OPTIONAL, -- *m.m.
    homeLocationDescription     HomeLocationDescription     OPTIONAL, -- *m.m.
...
}

HorizontalAccuracyDelivered ::= [APPLICATION 392] INTEGER

HorizontalAccuracyRequested ::= [APPLICATION 385] INTEGER

HSCSDIndicator ::= [APPLICATION 424] AsciiString --(SIZE(1))

Imei ::= [APPLICATION 128] BCDString --(SIZE(7..8))

ImeiOrEsn ::= [APPLICATION 429] CHOICE
{
    imei  Imei,
    esn   Esn,
...
}

Imsi ::= [APPLICATION 129] BCDString --(SIZE(3..8))

IMSSignallingContext ::= [APPLICATION 418] INTEGER

InternetServiceProvider ::= [APPLICATION 329] SEQUENCE
{
    ispIdType        IspIdType        OPTIONAL, -- *m.m.
    ispIdentifier    IspIdentifier    OPTIONAL, -- *m.m.
...
```

```
}

InternetServiceProviderIdList ::= [APPLICATION 330] SEQUENCE OF
InternetServiceProvider

IspIdentifier ::= [APPLICATION 294] AsciiString

IspIdType ::= [APPLICATION 293] INTEGER

ISPList ::= [APPLICATION 378] SEQUENCE OF InternetServiceProvider

NetworkIdType ::= [APPLICATION 331] INTEGER

NetworkIdentifier ::= [APPLICATION 295] AsciiString

Network ::= [APPLICATION 332] SEQUENCE
{
    networkIdType     NetworkIdType     OPTIONAL, -- *m.m.
    networkIdentifier NetworkIdentifier OPTIONAL, -- *m.m.
...
}

NetworkList ::= [APPLICATION 333] SEQUENCE OF Network

LatestCallTimeStamp ::= [APPLICATION 133] DateTimeLong

LCSQosDelivered ::= [APPLICATION 390] SEQUENCE
{
    lCSTransactionStatus          LCSTransactionStatus        OPTIONAL,
    horizontalAccuracyDelivered   HorizontalAccuracyDelivered OPTIONAL,
    verticalAccuracyDelivered     VerticalAccuracyDelivered   OPTIONAL,
    responseTime                  ResponseTime                OPTIONAL,
    positioningMethod             PositioningMethod           OPTIONAL,
    trackingPeriod                TrackingPeriod              OPTIONAL,
    trackingFrequency             TrackingFrequency           OPTIONAL,
    ageOfLocation                 AgeOfLocation               OPTIONAL,
...
}

LCSQosRequested ::= [APPLICATION 383] SEQUENCE
{
    lCSRequestTimestamp           LCSRequestTimestamp         OPTIONAL, -- *m.m.
    horizontalAccuracyRequested   HorizontalAccuracyRequested OPTIONAL,
    verticalAccuracyRequested     VerticalAccuracyRequested   OPTIONAL,
```

```
    responseTimeCategory          ResponseTimeCategory        OPTIONAL,
    trackingPeriod                TrackingPeriod              OPTIONAL,
    trackingFrequency             TrackingFrequency           OPTIONAL,
...
}

LCSRequestTimestamp ::= [APPLICATION 384] DateTime

LCSSPIdentification ::= [APPLICATION 375] SEQUENCE
{
 contentProviderIdType         ContentProviderIdType     OPTIONAL, -- *m.m.
 contentProviderIdentifier     ContentProviderIdentifier OPTIONAL, -- *m.m.
...
}

LCSSPIdentificationList ::= [APPLICATION 374] SEQUENCE OF LCSSPIdentification

LCSSPInformation ::= [APPLICATION 373] SEQUENCE
{
    lCSSPIdentificationList       LCSSPIdentificationList OPTIONAL, -- *m.m.
    iSPList                       ISPList                 OPTIONAL,
    networkList                   NetworkList             OPTIONAL,
...
}

LCSTransactionStatus ::= [APPLICATION 391] INTEGER

LocalCurrency ::= [APPLICATION 135] Currency

LocalDate ::= NumberString --(SIZE(8))
     --
     -- Local dates are noted in the format
     --
     --     CCYYMMDD
     --
     -- where CC  =  century  (‘19’, ‘20’,...)
     --       YY  =  year     (‘00’ - ‘99’)
     --       MM  =  month    (‘01’, ‘02’, ... , ‘12’)
     --       DD  =  day      (‘01’, ‘02’, ... , ‘31’)
     --

LocalTimeStamp ::= [APPLICATION 16] NumberString --(SIZE(14))

LocationArea ::= [APPLICATION 136] INTEGER
```

```
LocationDescription ::= AsciiString

LocationIdentifier ::= [APPLICATION 289] AsciiString

LocationIdType ::= [APPLICATION 315] INTEGER

LocationInformation ::= [APPLICATION 138]  SEQUENCE
{
    networkLocation             NetworkLocation         OPTIONAL, -- *m.m.
    homeLocationInformation     HomeLocationInformation OPTIONAL,
    geographicalLocation        GeographicalLocation    OPTIONAL,
...
}

LocationServiceUsage ::= [APPLICATION 382] SEQUENCE
{
    lCSQosRequested               LCSQosRequested       OPTIONAL, -- *m.m.
    lCSQosDelivered               LCSQosDelivered       OPTIONAL,
    chargingTimeStamp             ChargingTimeStamp     OPTIONAL,
    chargeInformationList         ChargeInformationList OPTIONAL, -- *m.m.
...
}

MaximumBitRate ::= [APPLICATION 421] OCTET STRING --(SIZE (1))

Mdn ::= [APPLICATION 253] NumberString

MessageDescription ::= [APPLICATION 142] AsciiString

MessageDescriptionCode ::= [APPLICATION 141] Code

MessageDescriptionInformation ::= [APPLICATION 143] SEQUENCE
{
    messageDescriptionCode MessageDescriptionCode OPTIONAL, -- *m.m.
    messageDescription     MessageDescription     OPTIONAL, -- *m.m.
...
}

MessageStatus ::= [APPLICATION 144] INTEGER

MessageType ::= [APPLICATION 145] INTEGER

MessagingEventService ::= [APPLICATION 439] INTEGER
```

```
Min ::= [APPLICATION 146] NumberString --(SIZE(2..15))

MinChargeableSubscriber ::= [APPLICATION 254] SEQUENCE
{
    min     Min    OPTIONAL, -- *m.m.
    mdn     Mdn    OPTIONAL,
...
}

MoBasicCallInformation ::= [APPLICATION 147] SEQUENCE
{
    chargeableSubscriber        ChargeableSubscriber    OPTIONAL, -- *m.m.
    rapFileSequenceNumber       RapFileSequenceNumber   OPTIONAL,
    destination                 Destination             OPTIONAL,
    destinationNetwork          DestinationNetwork      OPTIONAL,
    callEventStartTimeStamp     CallEventStartTimeStamp OPTIONAL, -- *m.m.
    totalCallEventDuration      TotalCallEventDuration  OPTIONAL, -- *m.m.
    simToolkitIndicator         SimToolkitIndicator     OPTIONAL,
    causeForTerm                CauseForTerm            OPTIONAL,
...
}

MobileSessionService ::= [APPLICATION 440] INTEGER

Msisdn ::= [APPLICATION 152] BCDString --(SIZE(1..9))

MtBasicCallInformation ::= [APPLICATION 153] SEQUENCE
{
    chargeableSubscriber        ChargeableSubscriber    OPTIONAL, -- *m.m.
    rapFileSequenceNumber       RapFileSequenceNumber   OPTIONAL,
    callOriginator              CallOriginator          OPTIONAL,
    originatingNetwork          OriginatingNetwork      OPTIONAL,
    callEventStartTimeStamp     CallEventStartTimeStamp OPTIONAL, -- *m.m.
    totalCallEventDuration      TotalCallEventDuration  OPTIONAL, -- *m.m.
    simToolkitIndicator         SimToolkitIndicator     OPTIONAL,
    causeForTerm                CauseForTerm            OPTIONAL,
...
}

NetworkAccessIdentifier ::= [APPLICATION 417] AsciiString

NetworkElement ::= [APPLICATION 441]  SEQUENCE
{
```

```
      elementType             ElementType  OPTIONAL, -- *m.m.
      elementId               ElementId    OPTIONAL, -- *m.m.
...
}

NetworkElementList ::= [APPLICATION 442] SEQUENCE OF NetworkElement

NetworkId ::= AsciiString --(SIZE(1..6))

NetworkInitPDPContext ::= [APPLICATION 245] INTEGER

NetworkLocation ::= [APPLICATION 156]  SEQUENCE
{
    recEntityCode               RecEntityCode OPTIONAL, -- *m.m.
    callReference               CallReference OPTIONAL,
    locationArea                LocationArea  OPTIONAL,
    cellId                      CellId        OPTIONAL,
...
}

NonChargedNumber ::= [APPLICATION 402] AsciiString

NonChargedParty ::= [APPLICATION 443]  SEQUENCE
{
    nonChargedPartyNumber       NonChargedPartyNumber  OPTIONAL,
    nonChargedPublicUserId      NonChargedPublicUserId OPTIONAL,
...
}

NonChargedPartyNumber ::= [APPLICATION 444] AddressStringDigits

NonChargedPublicUserId ::= [APPLICATION 445] AsciiString

NumberOfDecimalPlaces ::= [APPLICATION 159] INTEGER

ObjectType ::= [APPLICATION 281] INTEGER

OperatorSpecInfoList ::= [APPLICATION 162] SEQUENCE OF OperatorSpecInformation

OperatorSpecInformation ::= [APPLICATION 163] AsciiString

OrderPlacedTimeStamp ::= [APPLICATION 300] DateTime

OriginatingNetwork ::= [APPLICATION 164] NetworkId
```

```
PacketDataProtocolAddress ::= [APPLICATION 165] AsciiString

PaidIndicator ::= [APPLICATION 346] INTEGER

PartialTypeIndicator ::=  [APPLICATION 166] AsciiString --(SIZE(1))

PaymentMethod ::= [APPLICATION 347] INTEGER

PdpAddress ::= [APPLICATION 167] PacketDataProtocolAddress

PDPContextStartTimestamp ::= [APPLICATION 260] DateTime

PlmnId ::= [APPLICATION 169] AsciiString --(SIZE(5))

PositioningMethod ::= [APPLICATION 395] INTEGER

PriorityCode ::= [APPLICATION 170] INTEGER

PublicUserId ::= [APPLICATION 446] AsciiString

RapFileSequenceNumber ::= [APPLICATION 181]  FileSequenceNumber

RecEntityCode ::= [APPLICATION 184] Code

RecEntityCodeList ::= [APPLICATION 185] SEQUENCE OF RecEntityCode

RecEntityId ::= [APPLICATION 400] AsciiString

RecEntityInfoList ::= [APPLICATION 188] SEQUENCE OF RecEntityInformation

RecEntityInformation ::= [APPLICATION 183] SEQUENCE
{
    recEntityCode  RecEntityCode OPTIONAL, -- *m.m.
    recEntityType  RecEntityType OPTIONAL, -- *m.m.
    recEntityId    RecEntityId   OPTIONAL, -- *m.m.
...
}

RecEntityType ::= [APPLICATION 186] INTEGER

Recipient ::= [APPLICATION 182]  PlmnId

ReleaseVersionNumber ::= [APPLICATION 189] INTEGER
```

```
RequestedDeliveryTimeStamp ::= [APPLICATION 301] DateTime

RequestedDestination ::= [APPLICATION 450]  SEQUENCE
{
    requestedNumber          RequestedNumber         OPTIONAL,
    requestedPublicUserId    RequestedPublicUserId   OPTIONAL,
...
}

RequestedNumber ::= [APPLICATION 451] AddressStringDigits

RequestedPublicUserId ::= [APPLICATION 452] AsciiString

ResponseTime ::= [APPLICATION 394] INTEGER

ResponseTimeCategory ::= [APPLICATION 387] INTEGER

ScuBasicInformation ::= [APPLICATION 191] SEQUENCE
{
    chargeableSubscriber      ScuChargeableSubscriber    OPTIONAL, -- *m.m.
    chargedPartyStatus        ChargedPartyStatus         OPTIONAL, -- *m.m.
    nonChargedNumber          NonChargedNumber           OPTIONAL, -- *m.m.
    clirIndicator             ClirIndicator              OPTIONAL,
    originatingNetwork        OriginatingNetwork         OPTIONAL,
    destinationNetwork        DestinationNetwork         OPTIONAL,
...
}

ScuChargeType ::= [APPLICATION 192]  SEQUENCE
{
    messageStatus               MessageStatus          OPTIONAL, -- *m.m.
    priorityCode                PriorityCode           OPTIONAL, -- *m.m.
    distanceChargeBandCode      DistanceChargeBandCode OPTIONAL,
    messageType                 MessageType            OPTIONAL, -- *m.m.
    messageDescriptionCode      MessageDescriptionCode OPTIONAL, -- *m.m.
...
}

ScuTimeStamps ::= [APPLICATION 193]  SEQUENCE
{
    depositTimeStamp            DepositTimeStamp    OPTIONAL, -- *m.m.
    completionTimeStamp         CompletionTimeStamp OPTIONAL, -- *m.m.
    chargingPoint               ChargingPoint       OPTIONAL, -- *m.m.
```

```
...
}

ScuChargeableSubscriber ::= [APPLICATION 430] CHOICE
{
    gsmChargeableSubscriber    GsmChargeableSubscriber,
    minChargeableSubscriber    MinChargeableSubscriber,
...
}

Sender ::= [APPLICATION 196]  PlmnId

ServiceStartTimestamp ::= [APPLICATION 447] DateTime

ServingBid ::= [APPLICATION 198]  Bid

ServingLocationDescription ::= [APPLICATION 414] LocationDescription

ServingNetwork ::= [APPLICATION 195]  AsciiString

ServingPartiesInformation ::= [APPLICATION 335] SEQUENCE
{
  contentProviderName           ContentProviderName           OPTIONAL, -- *m.m.
  contentProviderIdList         ContentProviderIdList         OPTIONAL,
  internetServiceProviderIdList InternetServiceProviderIdList OPTIONAL,
  networkList                   NetworkList                   OPTIONAL,
...
}

SessionChargeInfoList ::= [APPLICATION 448] SEQUENCE OF SessionChargeInformation

SessionChargeInformation ::= [APPLICATION 449] SEQUENCE
{
      chargedItem             ChargedItem             OPTIONAL, -- *m.m.
      exchangeRateCode        ExchangeRateCode        OPTIONAL,
      callTypeGroup           CallTypeGroup           OPTIONAL, -- *m.m.
      chargeDetailList        ChargeDetailList        OPTIONAL, -- *m.m.
      taxInformationList      TaxInformationList      OPTIONAL,
...
}

SimChargeableSubscriber ::= [APPLICATION 199] SEQUENCE
{
    imsi     Imsi   OPTIONAL, -- *m.m.
```

```
    msisdn   Msisdn OPTIONAL,
...
}

SimToolkitIndicator ::= [APPLICATION 200] AsciiString --(SIZE(1))

SMSDestinationNumber ::= [APPLICATION 419] AsciiString

SMSOriginator ::= [APPLICATION 425] AsciiString

SpecificationVersionNumber  ::= [APPLICATION 201] INTEGER

SsParameters ::= [APPLICATION 204] AsciiString --(SIZE(1..40))

SupplServiceActionCode ::= [APPLICATION 208] INTEGER

SupplServiceCode ::= [APPLICATION 209] HexString --(SIZE(2))

SupplServiceUsed ::= [APPLICATION 206] SEQUENCE
{
    supplServiceCode       SupplServiceCode       OPTIONAL, -- *m.m.
    supplServiceActionCode SupplServiceActionCode OPTIONAL, -- *m.m.
    ssParameters           SsParameters           OPTIONAL,
    chargingTimeStamp      ChargingTimeStamp      OPTIONAL, -- *m.m.
    chargeInformation      ChargeInformation      OPTIONAL,
    basicServiceCodeList   BasicServiceCodeList   OPTIONAL,
...
}

TapCurrency ::= [APPLICATION 210] Currency

TapDecimalPlaces ::= [APPLICATION 244] INTEGER

TaxableAmount ::= [APPLICATION 398] AbsoluteAmount

Taxation ::= [APPLICATION 216] SEQUENCE
{
    taxCode      TaxCode      OPTIONAL, -- *m.m.
    taxType      TaxType      OPTIONAL, -- *m.m.
    taxRate      TaxRate      OPTIONAL,
    chargeType   ChargeType   OPTIONAL,
    taxIndicator TaxIndicator OPTIONAL,
...
}
```

```
TaxationList ::= [APPLICATION 211]  SEQUENCE OF Taxation

TaxCode ::= [APPLICATION 212] INTEGER

TaxIndicator ::= [APPLICATION 432] AsciiString --(SIZE(1))

TaxInformation ::= [APPLICATION 213] SEQUENCE
{
    taxCode          TaxCode       OPTIONAL, -- *m.m.
    taxValue         TaxValue      OPTIONAL, -- *m.m.
    taxableAmount    TaxableAmount OPTIONAL,
...
}

TaxInformationList ::= [APPLICATION 214]  SEQUENCE OF TaxInformation

-- The TaxRate item is of a fixed length to ensure that the full 5
-- decimal places is provided.

TaxRate ::= [APPLICATION 215] NumberString (SIZE(7))

TaxType ::= [APPLICATION 217] AsciiString --(SIZE(2))

TaxValue ::= [APPLICATION 397] AbsoluteAmount

TeleServiceCode ::= [APPLICATION 218] HexString --(SIZE(2))

ThirdPartyInformation ::= [APPLICATION 219]  SEQUENCE
{
    thirdPartyNumber            ThirdPartyNumber      OPTIONAL,
    clirIndicator               ClirIndicator         OPTIONAL,
...
}

ThirdPartyNumber ::= [APPLICATION 403] AddressStringDigits

ThreeGcamelDestination ::= [APPLICATION 431] CHOICE
{
    camelDestinationNumber    CamelDestinationNumber,
    gprsDestination           GprsDestination,
...
}
```

```
TotalAdvisedCharge ::= [APPLICATION 356] AbsoluteAmount

TotalAdvisedChargeRefund ::= [APPLICATION 357] AbsoluteAmount

TotalAdvisedChargeValue ::= [APPLICATION 360] SEQUENCE
{
    advisedChargeCurrency    AdvisedChargeCurrency    OPTIONAL,
    totalAdvisedCharge       TotalAdvisedCharge       OPTIONAL, -- *m.m.
    totalAdvisedChargeRefund TotalAdvisedChargeRefund OPTIONAL,
    totalCommission          TotalCommission          OPTIONAL,
    totalCommissionRefund    TotalCommissionRefund    OPTIONAL,
...
}

TotalAdvisedChargeValueList ::= [APPLICATION 361] SEQUENCE OF
TotalAdvisedChargeValue

TotalCallEventDuration ::= [APPLICATION 223] INTEGER

TotalCharge ::= [APPLICATION 415] AbsoluteAmount

TotalChargeRefund ::= [APPLICATION 355] AbsoluteAmount

TotalCommission ::= [APPLICATION 358] AbsoluteAmount

TotalCommissionRefund ::= [APPLICATION 359] AbsoluteAmount

TotalDataVolume ::= [APPLICATION 343] DataVolume

TotalDiscountRefund ::= [APPLICATION 354] AbsoluteAmount

TotalDiscountValue ::= [APPLICATION 225] AbsoluteAmount

TotalTaxRefund ::= [APPLICATION 353] AbsoluteAmount

TotalTaxValue ::= [APPLICATION 226] AbsoluteAmount

TotalTransactionDuration ::= [APPLICATION 416] TotalCallEventDuration

TrackedCustomerEquipment ::= [APPLICATION 381] SEQUENCE
{
    equipmentIdType               EquipmentIdType OPTIONAL, -- *m.m.
    equipmentId                   EquipmentId     OPTIONAL, -- *m.m.
...
```

```
}

TrackedCustomerHomeId ::= [APPLICATION 377] SEQUENCE
{
    homeIdType                  HomeIdType     OPTIONAL, -- *m.m.
    homeIdentifier              HomeIdentifier OPTIONAL, -- *m.m.
...
}

TrackedCustomerHomeIdList ::= [APPLICATION 376] SEQUENCE OF
TrackedCustomerHomeId

TrackedCustomerIdentification ::= [APPLICATION 372] SEQUENCE
{
    customerIdType              CustomerIdType     OPTIONAL, -- *m.m.
    customerIdentifier          CustomerIdentifier OPTIONAL, -- *m.m.
...
}

TrackedCustomerIdList ::= [APPLICATION 370] SEQUENCE OF
TrackedCustomerIdentification

TrackedCustomerInformation ::= [APPLICATION 367] SEQUENCE
{
    trackedCustomerIdList       TrackedCustomerIdList     OPTIONAL, -- *m.m.
    trackedCustomerHomeIdList   TrackedCustomerHomeIdList OPTIONAL,
    trackedCustomerLocList      TrackedCustomerLocList    OPTIONAL,
    trackedCustomerEquipment    TrackedCustomerEquipment  OPTIONAL,
...
}

TrackedCustomerLocation ::= [APPLICATION 380] SEQUENCE
{
    locationIdType              LocationIdType     OPTIONAL, -- *m.m.
    locationIdentifier          LocationIdentifier OPTIONAL, -- *m.m.
...
}

TrackedCustomerLocList ::= [APPLICATION 379] SEQUENCE OF TrackedCustomerLocation

TrackingCustomerEquipment ::= [APPLICATION 371] SEQUENCE
{
    equipmentIdType             EquipmentIdType OPTIONAL, -- *m.m.
    equipmentId                 EquipmentId     OPTIONAL, -- *m.m.
```

```
...
}

TrackingCustomerHomeId ::= [APPLICATION 366] SEQUENCE
{
    homeIdType                  HomeIdType     OPTIONAL, -- *m.m.
    homeIdentifier              HomeIdentifier OPTIONAL, -- *m.m.
...
}

TrackingCustomerHomeIdList ::= [APPLICATION 365] SEQUENCE OF
TrackingCustomerHomeId

TrackingCustomerIdentification ::= [APPLICATION 362] SEQUENCE
{
    customerIdType              CustomerIdType     OPTIONAL, -- *m.m.
    customerIdentifier          CustomerIdentifier OPTIONAL, -- *m.m.
...
}

TrackingCustomerIdList ::= [APPLICATION 299] SEQUENCE OF
TrackingCustomerIdentification

TrackingCustomerInformation ::= [APPLICATION 298] SEQUENCE
{
    trackingCustomerIdList      TrackingCustomerIdList     OPTIONAL, -- *m.m.
    trackingCustomerHomeIdList  TrackingCustomerHomeIdList OPTIONAL,
    trackingCustomerLocList     TrackingCustomerLocList    OPTIONAL,
    trackingCustomerEquipment   TrackingCustomerEquipment  OPTIONAL,
...
}

TrackingCustomerLocation ::= [APPLICATION 369] SEQUENCE
{
    locationIdType              LocationIdType     OPTIONAL, -- *m.m.
    locationIdentifier          LocationIdentifier OPTIONAL, -- *m.m.
...
}

TrackingCustomerLocList ::= [APPLICATION 368] SEQUENCE OF
TrackingCustomerLocation

TrackingFrequency ::= [APPLICATION 389] INTEGER
```

```
TrackingPeriod ::= [APPLICATION 388] INTEGER

TransactionAuthCode ::= [APPLICATION 342] AsciiString

TransactionDescriptionSupp ::= [APPLICATION 338] INTEGER

TransactionDetailDescription ::= [APPLICATION 339] AsciiString

TransactionIdentifier ::= [APPLICATION 341] AsciiString

TransactionShortDescription ::= [APPLICATION 340] AsciiString

TransactionStatus ::= [APPLICATION 303] INTEGER

TransferCutOffTimeStamp ::= [APPLICATION 227] DateTimeLong

TransparencyIndicator ::= [APPLICATION 228] INTEGER

UserProtocolIndicator ::= [APPLICATION 280] INTEGER

UtcTimeOffset ::= [APPLICATION 231] AsciiString --(SIZE(5))

UtcTimeOffsetCode ::= [APPLICATION 232] Code

UtcTimeOffsetInfo ::= [APPLICATION 233] SEQUENCE
{
    utcTimeOffsetCode   UtcTimeOffsetCode OPTIONAL, -- *m.m.
    utcTimeOffset       UtcTimeOffset     OPTIONAL, -- *m.m.
...
}

UtcTimeOffsetInfoList ::= [APPLICATION 234]  SEQUENCE OF UtcTimeOffsetInfo

VerticalAccuracyDelivered ::= [APPLICATION 393] INTEGER

VerticalAccuracyRequested ::= [APPLICATION 386] INTEGER


--
-- Tagged common data types
--

--
-- The AbsoluteAmount data type is used to
```

```
-- encode absolute revenue amounts.
-- The accuracy of all absolute amount values is defined
-- by the value of TapDecimalPlaces within the group
-- AccountingInfo for the entire TAP batch.
-- Note, that only amounts greater than or equal to zero are allowed.
-- The decimal number representing the amount is
-- derived from the encoded integer
-- value by division by 10^TapDecimalPlaces.
-- for example for TapDecimalPlaces = 3 the following values
-- will be derived:
--       0   represents    0.000
--      12   represents    0.012
--    1234   represents    1.234
-- for TapDecimalPlaces = 5 the following values will be
-- derived:
--       0   represents    0.00000
--    1234   represents    0.01234
--  123456   represents    1.23456
-- This data type is used to encode (total)
-- charges, (total) discount values and
-- (total) tax values.
--
AbsoluteAmount ::= INTEGER

Bid ::=  AsciiString --(SIZE(5))

Code ::= INTEGER

--
-- Non-tagged common data types
--
--
-- Recommended common data types to be used for file encoding:
--
-- The following definitions should be used for TAP file creation instead of
-- the default specifications (OCTET STRING)
--
--    AsciiString ::= VisibleString
--
--    Currency ::= VisibleString
--
--    HexString ::= VisibleString
--
--    NumberString ::= NumericString
```

```
--
--    AsciiString contains visible ISO 646 characters.
--    Leading and trailing spaces must be discarded during processing.
--    An AsciiString cannot contain only spaces.

AsciiString ::= OCTET STRING

--
-- The BCDString data type (Binary Coded Decimal String) is used to represent
-- several digits from 0 through 9, a, b, c, d, e.
-- Two digits are encoded per octet.  The four leftmost bits of the octet
represent
-- the first digit while the four remaining bits represent the following digit.
-- A single f must be used as a filler when the total number of digits to be
-- encoded is odd.
-- No other filler is allowed.

BCDString ::= OCTET STRING

--
-- The currency codes from ISO 4217
-- are used to identify a currency
--
Currency ::= OCTET STRING

--
-- HexString contains ISO 646 characters from 0 through 9, A, B, C, D, E, F.
--

HexString ::= OCTET STRING

--
-- NumberString contains ISO 646 characters from 0 through 9.
--

NumberString ::= OCTET STRING

--
-- The PercentageRate data type is used to
-- encode percentage rates with an accuracy of 2 decimal places.
-- This data type is used to encode discount rates.
-- The decimal number representing the percentage
-- rate is obtained by dividing the integer value by 100
-- Examples:
```

```
--
--     1500  represents  15.00 percent
--     1     represents   0.01 percent
--
PercentageRate ::= INTEGER

END
```

6.2 Transfer Syntax

The Transferred Account Information Elements, as defined above, have to be encoded using the Basic Encoding Rules (BER) as specified within ITU Rec. X.690 [38].

6.3 File Naming Conventions

6.3.1 Chargeable TAP Data

TAP files containing chargeable data must follow the following naming convention:

CDxxxxxyyyyySEQNO

where

CD	identifies the file as containing chargeable data
xxxxx	contains the sender PMN in uppercase
yyyyy	contains the recipient PMN in uppercase
SEQNO	contains the File Sequence Number

6.3.2 Test TAP Data

TAP files containing test data must follow the following naming convention:

TDxxxxxyyyyySEQNO

where

TD	identifies the file as containing test data
xxxxx	contains the sender PMN in uppercase
yyyyy	contains the recipient PMN in uppercase
SEQNO	contains the File Sequence Number

7 Migration to a New Release

The rules in this section apply to TAP files exchanged over the public interface. TAP files exchanged over the private interface, for example between an operator and their agent, is out of scope of these migration rules.

There is an Effective Date for each release. This is the date from which companies may send and must be able to receive the release over the public interface.

As only the latest two TAP versions are supported on the public interface, the Effective Date of a new release (n) also indicates the date from which release n-2 cannot be sent on the public interface. See also paragraph below regarding handling of resubmitted files. Any exceptions to this must be bilaterally agreed in good time before the Effective Date to ensure TAP exchanges are not impacted.

BA.12 [12] defines the liabilities regarding file conversion between versions.

Any company implementing a new release may implement the input and output simultaneously or may implement one at a time.

Companies which plan to migrate to a new release before the Effective Date are responsible for bilaterally agreeing such exchange with their roaming partners.

Where a TAP file has been rejected or reported as missing and it has been created before migration, the file may be corrected and/or resubmitted in either the original release or the currently supported release, taking the timescales defined in BA.08 [10] into consideration where applicable.

It is not allowed to revert to the old release, once the first files of the new release have been exchanged in commercial operation (excluding resubmitted files which have been rejected/reported as missing before the release switch, test files and files up-converted in error by DCH).

Each company must state in its AA.14 (RAEX Op Data [39] & [40]) what TAP versions it can send and receive over the public interface and changes to this must be sent at least 2 weeks before the change becomes effective. A migration to a release containing major changes must only be performed after the appropriate format testing has been completed.

Annex A Supplementary Services

In order to determine the records raised in conjunction with the use of Supplementary Services it is necessary to distinguish between the administration of services by the subscriber and additional information raised as a result of the usage of those services.

In general the following functions (actions) are available to the subscriber for the administration of supplementary services.

- Registration:
  The programming by the subscriber of information to enable subsequent operation of a service for example the “forwarded-to” number for call forwarding.
- Activation:
  Some services, call forwarding for example, are activated as a result of registration and no further action is required. Other services, call barring for example, must be explicitly activated.
- Deactivation:
  Deactivates a previously activated service.
- Erasure:
  The deletion of information provided during registration.
- Interrogation:
  This function permits the subscriber to interrogate the status of supplementary services and any information (numbers, passwords etc.) stored during registration.
- Invocation:
  The use of a service. A supplementary service may be invoked by the subscriber or automatically by the network.

Call Hold and Call Transfer, for example, are both invoked explicitly by the subscriber whereas Call Forwarding on No Reply is invoked implicitly by the network if the subscriber fails to answer an incoming call within a predefined time limit.

All supplementary service events are considered instantaneous even though, for example, an interrogation may take several seconds to complete by the network. Nevertheless most supplementary service actions utilise network resources and charging principles take account of this.

The invocation of a supplementary service occurs in conjunction with a mobile originated or mobile terminated call event (attempt). Depending on the network configuration (see 3GPP TS 32.005 [4]), the invocation of the supplementary service can be recorded either within the same call record as the corresponding call or within a separate ‘supplementary service action’ call record. On the TAP interface both concepts are supported (IN line vs. OFF line recording). Wherever the information is received within a single call record from the network by the VPMN operator, only one call event should be created for TAP, in order to support customer care enquiries by the HPMN operator.

Not all of the actions described are relevant for all supplementary services. Valid combinations are described in detail in 3GPP TS 22.004 [1]. The following table contains the relevant combinations for the purpose of TAP.

For the purposes of the table a notation is used as follows:

'-' An invalid combination of Service Code and Action (as defined by 3GPP TS 22.004 [1])

'Y' A valid and relevant combination of Service Code and Action which must be transferred in the TAP

'O' A valid and relevant combination of Service Code and Action which optionally can be transferred in the TAP for customer care purposes

'N' A valid and relevant combination of Service Code and Action which must not be transferred in the TAP

'F' A valid and relevant combination of Service Code and Action that is for further study
In addition to the actions described in 3GPP TS 22.004 [1] further possible actions are described within the man-machine interface, 3GPP TS 22.030 [2]. These are:

- Deactivate all call forwarding
- Deactivate all conditional call forwarding
- Deactivate all call barring
- Deactivate all incoming call bars
- Deactivate all outgoing call bars

For further details concerning general use of supplementary services see 3GPP TS 22.004 [1].

		Registration	Erasure	Activation	Deactivation	Interrogation	Invocation	Password
00	All supplementary services	-	-	-	-	-	-	O
10	All line identification service	-	-	-	-	-	-	-
11	Calling number identification presentation	-	-	-	-	N	O	-
12	Calling number identification restriction	-	-	O	-	N	N	-
13	Connected number identification presentation	-	-	-	-	N	N	-
14	Connected number identification restriction	-	-	N	-	N	N	-
18	All name identification SS	-	-	-	-	N	N	-
19	Calling name presentation	-	-	-	-	N	O	-
20	All call forwarding	O	O	O	O	-	-	-
21	Call forwarding unconditional	O	O	O	O	N	-	-
24	Call deflection	-	-	-	-	-	O	-
28	All conditional call forwarding	O	O	O	O	-	-	-
29	Call forwarding on mobile subscriber busy	O	O	O	O	N	Y	-
2A	Call forwarding on no reply	O	O	O	O	N	Y	-
2B	Call forwarding on subscriber not reachable	O	O	O	O	N	Y	-
30	All call offering services	-	-	-	-	-	-	-
31	Call transfer	-	-	-	-	-	O	-
40	All call completion services	-	-	-	-	-	-	-
41	Call waiting	-	-	O	O	N	N	-
42	Call hold	-	-	-	-	-	O	-
43	Completion of calls to busy subscribers – origination side	-	O	O	O	N	O	-
44	Completion of calls to busy subscribers – destination side	-	O	O	O	N	O	-

		Registration	Erasure	Activation	Deactivation	Interrogation	Invocation	Password
45	Multicall	N	-	-	-	N	O	-
50	All multi party services	-	-	-	-	-	-	-
51	Multi party service	-	-	-	-	-	O	-
60	All community of interest services	-	-	-	-	-	-	-
61	Closed user groups	-	-	-	-	-	O	-
70	All charging supplementary services	-	-	-	-	-	-	-
71	Advice of charge – information	-	-	-	-	-	O	-
72	Advice of charge – charging	-	-	-	-	-	O	-
80	All additional info transfer services	-	-	-	-	-	-	-
81	UUS1 user to user signalling	-	-	O	O	-	O	-
82	UUS2 user to user signalling	-	-	O	O	-	O	-
83	UUS3 user to user signalling	-	-	O	O	-	O	-
90	All call barring	O	-	-	O	-	-	N
91	All barring of outgoing call services	-	-	-	O	-	-	-
92	Barring of all outgoing calls	-	O	O	O	N	-	-
93	Barring of all outgoing international calls	-	O	O	O	N	-	-
94	Barring of all outgoing international except HPMN	-	O	O	O	N	-	-
99	All barring of incoming call services	-	-	-	O	-	-	-
9A	Barring of all incoming calls	-	O	O	O	N	-	-
9B	Barring of all IC calls when outside HPMN	-	O	O	O	N	-	-

Table 46: Relevant Supplementary Service Combinations to be Transferred in TAP

Annex B Changes from Previous Specification Version Number

This section lists the requirements for TAP Specification Version Number 3, i.e. the changes needed from TAP Specification Version Number 2 Release Version Number 2.

Aggregated Usage	WAS	12	Bilaterally agreed new record for representation of aggregated wholesale usage and charges – Aggregated Usage Record. Effective from 01 July 2017.
Wi-Fi changes	Wi-Fi Roaming Task Force	12	Changes to enable interoperability with Wi-Fi roaming. Effective from 01 May 2013.
Charge validation	BARG	12	Standardisation of the Charge validation procedure. Effective from 01 May 2013.
Support of Voice and SMS over LTE (VoLTE)	BARG	12	Adds two new Call Event Detail records, one to support voice over LTE (Mobile Session) and another to support SMS over LTE (Messaging Event).
Enabler for differential MTC charging	BARG	12	Addition of Call Type Levels, with new values, to enable charge differentiation for MTCs based on incoming route.
Support of LTE/SAE bit pipe accounting model	BARG	11	Adds new recording entity types. Updates to Call Type Level 1 and duplicate checks.
Addition of optional Tax Indicator	BARG	11	Addition of optional Tax Indicator to identify VAT specifically.
Clarification on item derivations	TADIG	11	Clarification and simplification of item derivations for each GSM/3GPP release.
Additional valid SS Code/Action Code combinations	TADIG	11	Alignment of valid SS actions with technical standards.
Network Extensions support	BARG	11	Addition of validation rule to support bilateral use of Serving Network to identify Network Extensions.
Support published and discounted IOTs	BARG	11	Enable inclusion of published IOT charge in addition to invoiceable, discounted, charge.
Simplification of TAP	BARG	11	Simplification of data structures in line with BA.12. Major changes include Replacement of HSCSD parameters with simple indicator Simplification of CAMEL including representation of charges Simplification of Charge Information including removal of Day Category and Time Band information Removal of dual service codes (MOC/MTC)

			Removal of QoS in GPRS ~ replaced by inclusion of Call Type Level 1/2/3 and new values for these items Removal of Value Added Service
Removal of implementation annexes	TADIG	11	Removal of implementation guidance annexes to new handbook (TD.58).
Removal of redundant ASN.1 items	TADIG	11	ASN.1 items no longer in use removed and application numbers released for future use.
IMS support	BARG	11	Addition of IMS Signalling Indicator.
Additional items for UMTS CS bearer	BARG	11	New items added to support UMTS circuit switched bearer usage charging principles.
Clarification of video telephony representation	TADIG	11	Text addition to clarify technical representation of video telephony protocol.
Enhanced flexibility of ASN.1 structures	TADIG	11	Rationalisation of Recording Entity representation in physical format.
Enhanced MOC duplicate check	TADIG	11	Cater for Dialled Digits within MOC duplicate check.
Enhanced Wi-Fi representation	TADIG	11	Addition of specific username identification item. Revised derivation details for WiFi data volumes. Increase in allowable number of recording entities.
Fatal Exchange Rate error at call level	TADIG	11	Change exchange rate validation errors at call level from severe to fatal.
Identification of SMS destination number	BARG	11	New item added to MOC for identification of actual SMS destination number.
Physical enhancement for non GSM applications	TADIG	11	Allow non telephony identification of non charged parties.
Reduction in maximum file size.	TADIG	11	Change maximum TAP file size to 100Mb.
Satellite value in Call Type	BARG	11	Addition of new ‘satellite’ value in Call Type Level 2.
Wi-Fi duplicate check	TADIG	11	Enhancement to GPRS Call duplicate check to cater for Wi-Fi usage.
Addition of Dialled Digits	BARG	10	New item Dialled Digits added to complement Called Number.
Additional validation for multiple basic services	TADIG	10	Additional validation to stop misrepresentation of basic service usage.
Annex to clarify GPRS SMS identification	TADIG	10	New annex to clarify how to distinguish CS and PS SMS usage.
Annex to clarify various charge related items	TADIG	10	New annex detailing item population where Charged Item is ‘N’, also population of tax items.
Annex to clarify various timestamp & duration items	TADIG	10	New annex clarifying population of Total Call Event Duration and related items within charging related items.
Bilateral location and charge validation	NA TADIG	10	NA market area validation (bilateral) of location information (Serving BIDs and Serving Location Descriptions) and Air/Toll charge breakdown.

CAMEL support in GPRS	BARG	10	Addition of CAMEL information to GPRS contexts.
Change ASN.1 type (VAS elements)	TADIG	10	Change ASN.1 types for VAS Description and VAS Short Description.
Change Called Country representation	BARG TADIG	10	Change derivation of Called Country Code to use ISO standard.
Change to representation of taxes	TADIG	10	Tax information broken down to allow validation of tax value against taxable charges.
Clarification of timestamps in GPRS partials	TADIG	10	Clarification on population of Call Event Start Timestamp within intermediate and last GPRS partials.
Clarification on Called Number and Dialled Digit population	TADIG	10	New annex giving examples of how to populate Called Number and Dialled Digits.
Clarification on GPRS partial handling	TADIG	10	New annex giving guidelines re handling of GPRS partials.
Clarification re BER usage	TADIG	10	Clarification that strict BER is to be used for encoding TAP.
Consistent Called Number representation	BARG	10	Called Number to always be represented in 'international' format
Content Transaction ASN.1 correction	TADIG	10	Change of ASN.1 syntax to allow repeating Content Service Used representation.
Daily Usage Charge support	BARG	10	Clarification of how to represent Daily Usage Charges.
Duplicate file handling clarification	TADIG	10	Clarification on how to handle duplicate files and reused sequence numbers.
GMLC recording entity clarification	TADIG	10	Clarification on how to populate Recording Entity for GMLCs.
GPRS cause for termination clarification	TADIG	10	Clarification to representation of cause for termination in GPRS partial cases.
GPRS partial limits	BARG	10	Number of GPRS partials for single context limited.
GPRS QoS parameters rationalised	BARG	10	GPRS GSM and UMTS QoS parameters rationalised to reflect charging requirement and infrastructure capability.
Handling unexpected CAMEL information	BARG	10	Additional validation to reject unexpected CAMEL invocation charges.
Increase integer sizes	TADIG	10	Various items of type INTEGER require size increases from 4 bytes to 8 bytes.
Invalid ASN.1 tag clarification	TADIG	10	Clarification regarding BER and syntax violation (invalid tags).
Location Service support	BARG	10	New call/event to support Location Services (LCS).
Market area specific validation included	NA TADIG	10	Inclusion of bilateral validation for North American market. This is a market specific validation rather than only bi-polar – bi-polar changes would not be included.
M-Services support	BARG	10	Addition of new item and item values to support m-services requirement.

Partial Type validation	BARG	10	Partial Type Indicator validation severity increased to severe.
Reference data constraints	TADIG	10	Various changes to validation severity and ranges to limit reference data tables to reasonable levels.
SS events correction	TADIG	10	Correction to table of SS events eligible for inclusion in TAP.
Taxation validation	BARG NA BARG	10	Additional validation to ensure tax is in line with roaming agreements
UMTS CS bearer usage	BARG	10	Additional items and restructuring of existing items to allow differential pricing of UMTS CS bearer usage.
USSD usage validation	BARG	10	Additional validation for USSD usage.
USSD validation	BARG	10	Insertion of validation rules for USSD usage.
Validation of commercial liability	TADIG	10	New validation to ensure that a HPMN can reject financial liability for call/events dated prior to the commercial roaming start date either for new agreements or new services.
Validation of empty ASN.1 items	TADIG	10	Clarification on handling of zero length (empty) ASN.1 items.
Various general corrections	TADIG	10	Value derivation corrections for QoS Peak Throughput, User Protocol Indicator. Removal of IOT references in discounting. Correction of contexts for VAS Used validation. Clarification/correction to valid ranges for various items of type AddressStringDigits.
Wi-Fi support	BARG TADIG	10	Interim solution to enable Wi-Fi support by reusing GPRS Call elements.
Additional validation for Charging Timestamp	TADIG	09	New validation rule (severe error) to check integrity of Charging Timestamp.
Clarification of bilateral item validation	TADIG	09	Clarification to validation rules applicable when bilateral items/groups present.
Clarification of population of Destination group items	TADIG	09	New appendix to clarify the derivation of Type Of Number and Numbering Plan, includes extracts from the relevant GSM technical papers.
Clarification to call timestamp derivation	TADIG	09	Addition of derivation and descriptive text to Call Event Start Timestamp and Charging Timestamp.
Correction to support GPRS SMS	TADIG	09	Allow GSN recording entity identification to contain either GSNAddress or Msisdn.
Correction to Transfer Cut Off Timestamp validation	BARG	09	Existing validation severity to become fatal errors.
GPRS Call duplicate check	BARG	09	Change to the GPRS duplicate check to enforce only one GPRS Call for any given part of a context (i.e. no separate SGSN and GGSN charging).

Removal of Delivery Note information	TADIG	09	Removal of all references to Delivery Note, now contained in TD.33.
Revised Call Type validation	BARG	09	New validation to validate Call Type information against the IOT.
Serving Network validation	TADIG	09	New syntax validation rule added.
Tax treatment clarification	BARG	09	Statement that 391mitted391 of tax information from a call/event where tax is applicable must be the same as zero tax (i.e. tax cannot be 391mitted from the TAP file and later applied to an invoice only).
Various editorial corrections	TADIG	09	See the following: Validation rules for Quality Of Service Used. Call Reference contexts. Charge Information diagram (Time Band Subtype). GPRS Basic Call Information diagram (Charging Id). Validation rules for Order Placed Timestamp, Requested Delivery Timestamp and Actual Delivery Timestamp. Physical syntax optionality correction for Content Transaction items.
Note Release Version skipped	TADIG	08	Release Versions skipped to align PRD versions with TAP versions (see also TD.34 TAP Release Management).
Note Release Version skipped	TADIG	07	Release Versions skipped to align PRD versions with TAP versions (see also TD.34 TAP Release Management).
Note Release Version skipped	TADIG	06	Release Versions skipped to align PRD versions with TAP versions (see also TD.34 TAP Release Management).
Note Release Versions 05 – 08 inclusive skipped	TADIG	05	Release Versions skipped to align PRD versions with TAP versions (see also TD.34 TAP Release Management).
Addition of Content Transaction	BARG	04	New Call Event Details to cater for content transaction charging plus associated audit control information.
Addition of GPRS Call partial context start timestamp	TADIG	04	New item PDP Context Start Timestamp for intermediate and last partials to identify true context start (optional item).
Additional occurrences of free format data item	TADIG	04	Change Operator Specific Information to be repeating.
Called Number Analysis presence rationalised	TADIG	04	Called Number Analysis group only required if MOCs or SCUs present within file.
Change Ipv6 address length	TADIG	04	Change IPTextV6Address size to reflect standard (RfC 2373).
Exceptional file transmission timescale validation.	BARG	04	Addition of ‘fatal’ validation for excessive differences between actual time a TAP file is received and the indicated availability timestamp.

Fix relative positions of Specification and Release Version Numbers within file.	TADIG	04	Clarification to ensure version number items must never be moved from their relative positions within files.
New item Mobile Directory Number	NA TADIG	04	New item MDN to support mobile number portability within an inter standard roaming environment (CIBER/TAP).
New item Serving Network	TADIG	04	New item Serving Network to identify the serving network when this is not the TAP file sender.
Pegged exchange rate validation.	BARG	04	Revised/new validation to ensure variances from expected pegged exchange rates do not penalise the HPMN.
Support CAMEL usage within GPRS context	BARG	04	Addition of CAMEL usage data within GPRS Call. Changes to CAMEL usage data structure to support GPRS invocation.
Support GPRS and inter standard roaming	TADIG	04	Chargeable subscriber structure change within GPRS Call to support MINs and MDNs.
Support revised IOT structure	BARG	04	Changes to Call Type structure and values to support 3 level IOT structure.
Support UMTS QoS	BARG	04	Addition of UMTS QoS parameters within GPRS Call.
Additional GPRS call validation	TADIG	03	Enhanced GPRS data item validation to ensure data integrity.
ASN.1 list validation clarification	TADIG	03	Clarification of validation for ASN.1 lists.
BID/Serving location validation	NA TADIG	03	Additional validation to support use of BIDs.
Exchange Rate validation	TADIG	03	Exchange Rate not required for zero rated calls.
Rationalisation of reference data validation	TADIG	03	Changes to various reference data element validation to ensure consistency.
Removal of incorrect/redundant validation rules	TADIG	03	Removal of rules 30 & 31 for Call Event Details. Removal of rule 30 for Basic HSCSD Parameters.
SMSC identification	BARG	03	Inclusion of SMSC address within MTCs where SMS received.
Tax Value validation changes	NA TADIG	03	Changes to relax Tax Value validation where the Sender has variable tax rates applicable to part or whole of the Charge.
Various clarifications	TADIG	03	Upper case Sender and Recipient items. Derivation of Charged and Chargeable Units. Meaning of ‘reserved’ values. Integer size within ASN.1 specification. Call Type validation. UTC Time Offset description.

Support of charging for USSDs	BARG	02	An interim solution for USSD charging; reuse of the Supplementary Service Event.
Support use of Notification within Rejects & Returns testing	TADIG	02	Addition of test file indicator (file type indicator) to Notification files.
Test timeliness of TAP file transfer.	BARG	02	Addition of a validation rule comparing the File Available Timestamp with the actual date/time the file was received at the HPMN (or their nominated agent).
14.4 kbps User Rate	SERG	01	Addition of channel coding within HSCSD.
Additional call destination details (mobile originated calls)	NAIG	01	Addition of called place and region information.
Alternate TAP currency	NAIG	01	Addition of currency item to show where the currency of the charges on the TAP are not in SDRs. This is for use by bilateral agreement, primarily in internal markets, for example national roaming.
Call level discounts	BARG	01	Discount rates and absolute amounts per call/event. All charges will be net of discounts.
CAMEL phase 2	BARG SERG	01	Addition of CAMEL service level used and free format CAMEL server information. The 'follow-on' feature will be supported by raising separate CDRs for each 'follow-on' leg.
Cause for termination	BARG NAIG SERG	01	Addition of cause for call termination information.
Charges by rate period	NAIG	01	Charge information allows provision of charges at rate period level.
EFR	BARG SERG	01	Speech versions requested and used included.
Enhanced location information	NAIG SATIG	01	Addition of longitude and latitude. Addition of served BID information and/or descriptive location information.
Enhancement to duplicate checks	TADIG	01	Addition of MSC call reference number.
Extra decimal places on charge amounts.	BARG	01	Addition of a new item identifying the number of decimal places used throughout the TAP file.
FIGS	SMG10 FF	01	Inclusion of a fraud monitoring indicator and third party number.
Flexible format encoding mechanism	GSM Association	01	ASN.1 used.
GPRS phase 1	BARG SERG	01	Addition of a new call type for GPRS service usage.
Home market location information	NAIG	01	Addition of home BID information.
HPMN Repricing	BARG	01	Addition of type of call, day category and time band information. Charge information structured to show changes in rate periods.

HSCSD	BARG SERG	01	Addition of HSCSD information elements.
Identification of 'local' currency	TADIG	01	Addition of local currency item, i.e. the currency of the charge prior to conversion to SDRs (see Alternate TAP currency).
Identification of tax at call/event level	BARG	01	All call charges will be exclusive of tax and specific tax values will be associated with each call/event, where appropriate.
Millennium compliance	BARG TADIG	01	All dates expanded to include century information.
MSP	BARG SERG	01	MSISDN used included on the transfer.
Multiple tax types	IIG NAIG	01	The table of tax codes is enhanced to cater for multiple types of tax
Provision of non-specific data item	NAIG	01	Inclusion of a general purpose item for use by bilateral agreement and its content will be specified between roaming partners.
Removal of table size constraints	TADIG SATIG	01	Supported by the flexible format.
Separation of Air and Toll charges	IIG NAIG	01	Separate charge details may be supplied identifying individual elements of the invoiceable charge.
SIM Application Toolkit	SERG	01	Addition of an indicator identifying where the call/event was initiated by the SIM application toolkit.
SPNP	BARG SERG	01	Implicitly supported using CAMEL service usage information.
Support of multiple standard roaming	SATIG	01	IS41 characteristics are supported by inclusion of the MIN and ESN.
Support of Rejects & Returns process	BARG NAIG	01	Addition of item identifying data to be resubmitted having been previously rejected as invalid.
Total call/event duration	BARG TADIG	01	Addition of total call duration. This allows calls where charging was by volume only to be 'age checked' correctly.

Table 47: Specification changes

Annex C Description of 3GPP Releases and Specifications

C.1 Charging Specifications

The table below provides a description of the development of 3GPP releases and the corresponding charging specifications applicable to every GSM/3GPP release.

Note: All 3GPP specifications (including the old GSM specifications previously maintained by ETSI) can be found on the 3GPP ftp site: http://www.3gpp.org/ftp/Specs/archive/.

CS domain charging	TS 12.05 [17]	TS 12.05 [17]	TS 32.005 [4]	TS 32.205 [6]	TS 32.298 [8]
PS domain charging		TS 12.15 [18]	TS 32.015 [5]	TS 32.215 [7]	TS 32.298 [8]
IMS domain charging				TS 32.225 [41]	TS 32.298 [8]
SMS Charging					TS 32.298 [8] & 32.274 [42]
LCS charging					TS 32.298 [8]

Table 48: 3GPP Charging Specifications for 3GPP Releases

C.2 Cause for Termination

The below two tables list the Cause for Termination values which are valid for each 3GPP release. The valid values have been separately listed for circuit switched and packet switched and IMS domains.

0	Normal Release	Y	Y	Y	Y
1	Partial Record	Y	Y	Y	Y
2	Partial Record Call Reestablishment	Y	Y	Y	Y
3	Unsuccessful Call Attempt	Y	Y	Y	Y
4	Stable Call Abnormal Termination	Y	Y	Y	Y
5	CAMEL Initiated Call Release		Y	Y	Y
6	CAMEL CPH Call Configuration Change			Y*	

Table 49: Cause for Termination Values – Circuit Switched Domain

***Note:** Value 6 above was only present in Release 5.

0	Normal Release	Y	Y	Y	Y
4	Abnormal Release	Y	Y	Y	Y
5	CAMEL initiated Call Release		Y	Y	Y
16	Volume Limit	Y	Y	Y	Y
17	Time Limit	Y	Y	Y	Y
18	SGSN Change	Y	Y	Y	Y
19	Maximum Change Condition	Y	Y	Y	Y
20	Management Intervention	Y	Y	Y	Y
21	Intra SGSN Intersystem Change			Y	Y
22	RAT Change				Y
23	MS Time Zone Change				Y
24	SGSN PLMNID Change				Y

Table 50: Cause for Termination Values – Packet Switched Domain

0	Service Delivery End Successfully	Y	Y
1	Unsuccessful Service Delivery	Y	Y
3	Time limit	Y	Y
4	Service Change	Y	Y
5	Management Intervention	Y	Y
6	Maxchangecond	Y (see note below)	

Table 51: Cause for Termination Values – IMS Domain

Note: Value 6 above was only present in Release 5

C.3 Service Codes

The below three tables shows the development of the 3GPP releases and the corresponding valid Teleservice codes , Bearer Service codes and Supplementary Service Codes for each 3GPP release.

00	All teleservices	Y	Y	Y

10	All Speech transmission services	Y	Y	Y
11	Telephony	Y	Y	Y
12	Emergency calls	Y	Y	Y
20	All SMS services	Y	Y	Y
21	Short message MT/PP	Y	Y	Y
22	Short message MO/PP	Y	Y	Y
60	All facsimile transmission services	Y	Y	Y
61	Facsimile group 3 & alternative speech	Y	Y	Y
62	Automatic facsimile group 3	Y	Y	Y
63	Automatic facsimile group 4	Y	Y	Y
70	All data teleservices (compound)	Y	Y	Y
80	All teleservices except SMS (compound)	Y	Y	Y
90	All voice group call services		Y	Y
91	Voice group call		Y	Y
92	Voice broadcast call		Y	Y

Table 52: 3GPP Releases and Corresponding Valid Teleservice Codes

00	All Bearer Services	Y	Y
20	All Data Circuit Asynchronous Services	Y	Y
21	Duplex Asynch. 300bps data circuit	Y	Y
22	Duplex Asynch. 1200bps data circuit	Y	Y
23	Duplex Asynch. 1200/75bps data circuit	Y	Y
24	Duplex Asynch. 2400bps data circuit	Y	Y
25	Duplex Asynch. 4800bps data circuit	Y	Y
26	Duplex Asynch. 9600bps data circuit	Y	Y
27	General Data Circuit Asynchronous Service	Y	Y
30	All Data Circuit Synchronous Services	Y	Y

32	Duplex Synch. 1200bps data circuit	Y	Y
34	Duplex Synch. 2400bps data circuit	Y	Y
35	Duplex Synch. 4800bps data circuit	Y	Y
36	Duplex Synch. 9600bps data circuit	Y	Y
37	General Data Circuit Synchronous Service	Y	Y
40	All Dedicated PAD Access Services	Y	Y
41	Duplex Asynch. 300bps PAD access	Y	Y
42	Duplex Asynch. 1200bps PAD access	Y	Y
43	Duplex Asynch. 1200/75bps PAD access	Y	Y
44	Duplex Asynch. 2400bps PAD access	Y	Y
45	Duplex Asynch. 4800bps PAD access	Y	Y
46	Duplex Asynch. 9600bps PAD access	Y	Y
47	General PAD Access Service	Y	Y
50	All Dedicated Packet Access Services	Y	Y
54	Duplex Synch. 2400bps PAD access	Y	Y
55	Duplex Synch. 4800bps PAD access	Y	Y
56	Duplex Synch. 9600bps PAD access	Y	Y
57	General Packet Access Service	Y	Y
60	All Alternate Speech/Asynchronous Services	Y	Y
70	All Alternate Speech/Synchronous Services	Y	Y
80	All Speech followed by Data Asynchronous Services	Y	Y
90	All Speech followed by Data Synchronous Services	Y	Y
A0	All Data Circuit Asynchronous Services (compound)	Y	Y
B0	All Data Circuit Synchronous Services (compound)	Y	Y
C0	All Asynchronous Services (compound)	Y	Y
D0	All Synchronous Services (compound)	Y	Y

Table 53: 3GPP Releases and Corresponding Valid Bearer Service Codes

00	All supplementary services	Y	Y	Y	Y
10	All line identification services	Y	Y	Y	Y
11	Calling number identification presentation	Y	Y	Y	Y
12	Calling number identification restriction	Y	Y	Y	Y

13	Connected number identification presentation	Y	Y	Y	Y
14	Connected number identification restriction	Y	Y	Y	Y
18	All name identification SS		Y	Y	Y
19	Calling name presentation		Y	Y	Y
20	All call forwarding	Y	Y	Y	Y
21	Call forwarding unconditional	Y	Y	Y	Y
24	Call deflection		Y	Y	Y
28	All conditional Call Forwarding	Y	Y	Y	Y
29	Call forwarding on mobile subscriber busy	Y	Y	Y	Y
2A	Call forwarding on no reply	Y	Y	Y	Y
2B	Call forwarding on subscriber not reachable	Y	Y	Y	Y
30	All call offering services	Y	Y	Y	Y
31	Call transfer	Y	Y	Y	Y
40	All call completion services	Y	Y	Y	Y
41	Call waiting	Y	Y	Y	Y
42	Call hold	Y	Y	Y	Y
43	Completion of calls to busy subscribers – originating side	Y	Y	Y	Y
44	Completion of call to busy subscribers – destination side		Y	Y	Y
45	Multicall			Y	Y
50	All multi party services	Y	Y	Y	Y
51	Multi party service	Y	Y	Y	Y
60	All community of interest services	Y	Y	Y	Y
61	Closed user groups	Y	Y	Y	Y
70	All charging supplement services	Y	Y	Y	Y
71	Advice of charge (information)	Y	Y	Y	Y
72	Advice of charge (Charging)	Y	Y	Y	Y
80	All additional info transfer services	Y	Y	Y	Y
81	UUS1 user to user signalling	Y	Y	Y	Y
82	UUS2 user-to-user signalling			Y	Y
83	UUS3 user-to-user signalling			Y	Y
90	All call barring	Y	Y	Y	Y
91	All Barring of outgoing Call Services	Y	Y	Y	Y
92	Barring of all outgoing calls	Y	Y	Y	Y

93	Barring of all outgoing international calls	Y	Y	Y	Y
94	Barring of all OG international except HPMN	Y	Y	Y	Y
99	All Barring of incoming Call Services	Y	Y	Y	Y
9A	Barring of all incoming calls	Y	Y	Y	Y
9B	Barring of all IC calls when outside HPMN	Y	Y	Y	Y
FF	USSD Message	Y	Y	Y	Y

Table 54: 3GPP Releases and Supplementary Service Codes

Annex D Document Management

D.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
3.00.00	24 Apr 1999	**TAP 3.1 Major Release** Version update from GSM Association approval. Document is approved as baseline for Specification Version Number 3 Release Version Number 1		
3.01.00	04 Aug 1999	Incorporation of CR008; inclusion of essential corrections.		
3.02.00	15 Sep 1999	Incorporation of CRs 009, 010, 011, 012, 013.		
3.03.00	26 Oct 1999	Incorporation of CRs 014, 015.		
3.04.00	05 Jan 2000	Incorporation of CRs 016, 017, 018, 019, 020, 021, 022, 023.		
3.05.00	01 May 2000	Incorporation of CRs 024, 026-027, 029-033, 035-041.		
3.05.01	22 May 2000	Incorporation of CR 043.		
3.05.02	07 Aug 2000	Incorporation of CR 048.		
3.06.00	08 May 2000	**TAP 3.2 Major Release** Version update from GSM Association approval. Document is approved as baseline for Specification Version Number 3 Release Version Number 2 Incorporation of CRs 025, 028, 034, 042.		

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
3.06.01	07 August 2000	Incorporation of CRs 044 – 057.		
3.06.02	18 Dec 2000	Incorporation of CR 084.		
3.07.00	16 Oct 2000	**01 May 2001: TAP 3.3 Major Release** Version update from GSM Association approval. Document is approved as baseline for Specification Version Number 3 Release Version Number 3 Incorporation of CRs 058 – 069, 073.		
3.07.01	09 Mar 2001	Incorporation of CRs 075, 079 – 080, 082, 084 – 085, 088, 090 – 093.		
3.08.00	16 Oct 2000	**01 November 2001: TAP 3.4 Major Release** Version update from GSM Association approval. Document is approved as baseline for Specification Version Number 3 Release Version Number 4 Incorporation of CRs 070 – 072.		
3.08.01	09 Mar 2001	Incorporation of CRs 074, 076 – 078, 086 – 087, 089.		
3.08.02	17 Jul 2001	Incorporation of CRs 095, 096, 099 – 104, 106 – 108		
3.09.00	30 Nov 2001	**01 May 2002: TAP 3.09 Major Release** Version update from GSM Association approval. Document is approved as baseline for Specification Version Number 3 Release Version Number 9 (note release versions 5-8 skipped) Incorporation of CRs 110, 111, 113 – 124, 126 – 130		
3.10.00	14 Jun 2002	**01 May 2003: TAP 3.10 Major Release** Version update from GSM Association approval. Document is approved as baseline for major changes for Specification Version Number 3 Release Version Number 10 Incorporation of CRs 094, 097, 109, 112, 125, 131 – 167		
3.10.01	20 Nov 2002	Version update from GSM Association approval. Document is approved as baseline for the final definition of Specification Version Number 3		

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		Release Version Number 10 Incorporation of CRs 168 – 197		
3.11.00	29 May 2003	**01 May 2005: TAP 3.11 Major Release** Version update from GSM Association approval. Document is approved as baseline for major changes for Specification Version Number 3 Release Version Number 11 Incorporation of CRs 198 – 204, 206 – 225		
3.11.01	21 Jun 2004	Version update from GSM Association approval. Document is approved as final baseline for major changes for Specification Version Number 3 Release Version Number 11 Incorporation of CRs 226, 227, 229, 231, 232, 234 – 241, 244 – 247, 249 – 278		
3.11.02	17 Dec 2004	Version update from GSM Association approval. Document is approved as baseline for the definition of Specification Version Number 3 Release Version Number 11 Incorporation of CRs 279 – 295		
3.11.03	26 May 2005	Version update from GSM Association approval. Document is approved as baseline for the definition of Specification Version Number 3 Release Version Number 11 Incorporation of CRs 296 – 301 and 307		
3.11.04	18 Oct 2005	Version update from GSM Association approval. Document is approved as baseline for the definition of Specification Version Number 3 Release Version Number 11 Incorporation of CRs 308, 310 – 313, 317 – 320		
3.11.05	01 Jun 2006	Version update from GSM Association approval. Document is approved as baseline for the definition of Specification Version Number 3 Release Version Number 11 Incorporation of CRs 324 – 329, 331		
3.11.06	01 Dec 2006	Version update from GSM Association approval. Document is approved as baseline for the definition of Specification Version Number 3		

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		Release Version Number 11 Incorporation of CRs 332 – 340, 344 – 345		
3.11.07	12 Feb 2007	Version update from GSM Association approval. Document is approved as baseline for the definition of Specification Version Number 3 Release Version Number 11 Incorporation of CR 347		
3.11.08	20 Jun 2007	Version update from GSM Association approval. Document is approved as baseline for the definition of Specification Version Number 3 Release Version Number 11 Incorporation of CRs 348, 350 – 354		
3.11.09	11 Oct 2007	Incorporation of CR 355		
3.11.10	25 Oct 2007	**01 May 2008: TAP 3.11 Minor Release** Definition of TAP3.11.10, Minor Release, 1 May 2008. Incorporation of CRs 362 – 363.		
3.11.11	22 May 2008	Incorporation of CRs 364 – 370.		
3.11.12	22 Dec 2008	Incorporation of CRs 371 – 378.	TADIG #66 (e-vote)	Peter Chapman / Vodafone
3.11.13	04 Jun 2009	CR381 – TADIG doc 67_035 – Total Commission error correction. CR382 – TADIG doc 67_036rev1 – Timestamp range clarification. CR384 – TADIG doc 67_038 – Error correction to SS Code conditionality. CR386 – TADIG doc 67_040 – Call Event Start Timestamp clarification.	TADIG #67	Peter Chapman / Vodafone
3.11.14	26 Nov 2009	CR387 – TADIG doc 68_021 – Clarify TAP currency CR388 – TADIG doc 68_022 – Clarification on GPRS partial example CR389 – TADIG doc 68_023 – Clarification on timestamp formats CR390 – TADIG doc 68_024 – Clarification on ASN.1 binary encoding rules CR391 – TADIG doc 68_025 – Error correction to Tax Value tolerance CR392 – TADIG doc 68_026 – Clarification on CAMEL Default	TADIG #68	Peter Chapman / Vodafone

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		Call Handling Indicator conditionality CR393 – TADIG doc 68_027 – Editorial change re maintaining location information CR394 – TADIG doc 68_028 – Clarification on validation of old call records in roaming hubbing scenarios CR395 – TADIG doc 68_029 – Clarification on tolerance on non IMF currency exchange rates CR396 – TADIG doc 68_030 – Validation of Serving BID with alias TADIG Codes in roaming hubbing		
28.00	31 Dec 2009	**01 May 2010: TAP 3.11 Minor Release** MCR399 – TADIG doc 68_096 – Definition of minor TAP3 release for 01 May 2010 mCR 379 – TADIG doc 66_052 – Rejection of CAMEL MOCs with CAMEL Routing Number in Called Number mCR 380 – TADIG doc 66_053 – File Available Timestamp tolerance added mCR 397 – TADIG doc 68_031rev1 – New validation rule for Local Currency mCR 398 – TADIG doc 68_032rev1 – Support of LTE/SAE bit pipe accounting model mCR 400 – TADIG doc 69_004 – tolerance on exchange rates for IMF currencies	TADIG #68 EMC #79 TADIG #66 TADIG #66 TADIG #68 TADIG #68 TADIG e-vote 03-17 Dec 09	Peter Chapman / Vodafone
28.1	08 Feb 2010	mCR 401 – TADIG doc 69_005 – Error Correction to Recording Entity Code validation	TADIG e-vote 12-25 Jan 10	Peter Chapman / Vodafone
28.2	28 May 2010	mCR 402 – TADIG doc 69_013 – clarification to tolerance on exchange rates for IMF currencies mCR 403 – TADIG doc 69_014 – clarification to tolerance on exchange rates for non IMF currencies mCR 404 – TADIG doc 69_015 – editorial change to remove redundant validation on Serving Network	TADIG #69	Peter Chapman / Vodafone
28.3	16 Dec 2010	mCR 406 – TADIG doc 70_013 – Clarification on Called Number mCR 407 – TADIG doc 70_014 – Clarification on Dialled Digits	TADIG #70	Peter Chapman / Vodafone

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		mCR 408 – TADIG doc 70_015 – Clarification on Recording Entity Identification values		
29.0	21 Jan 2011	**01 May 2011: TAP 3.11 Minor Release** mCR 405 – TADIG doc 69_016 – Improved validation on Teleservice Code MCR 409 – TADIG doc 70_016 – Validation change for zero rated MTCs	TADIG #69 TADIG #70 EMC Email Approval	Peter Chapman / Vodafone
29.1	07 Mar 2011	Correction of editorial errors in data dictionary Cause for Termination and Charge Type, plus other formatting corrections.	N/A	Peter Chapman / Vodafone
29.2	15 Apr 2011	Correction of ASN.1 syntax definition errors introduced by automatic Word correction.	N/A	Peter Chapman / Vodafone
29.3	02 Jun 2011	mCR 411 – Clarification on Fatal error 53. mCR 413 – Supplementary Service Code additions.	TADIG #71	Peter Chapman / Vodafone
30.0	30 Jun 2011	**01 May 2012: TAP 3.12 Major Release** mCR 414 – TADIG doc 71_058 – Remove mandatory marking from Equipment Identifier within ASN.1 for SSE. mCR 415 – TADIG doc 71_059 – Exchange Rate greater than expected. mCR 416 – TADIG doc 71_060 – Introduction of Call Type Levels to MTCs. mCR 417 – TADIG doc 71_061 – Support for Voice and SMS over LTE (VoLTE). mCR 418 – TADIG doc 71_071 – Adapt MSISDN physical representation to the one given by 3GPP. MCR 419 – TADIG doc 71_085 – Definition of Major TAP3 release 01 May 2012.	TADIG #71 EMC #94	Peter Chapman / Vodafone
30.1	28 Dec 2011	mCR 420 – TADIG doc 72_004 – new UTC time offset mCR 421 – TADIG doc 72_036 – clarification note for exchange rate higher than expected mCR 422 – TADIG doc 72_037 – default Call Type Level 3 values mCR 423 – TADIG doc 72_038rev1 – inclusion of call destination number into IOT check	TADIG e-vote TADIG #72 TADIG #72 TADIG e-vote TADIG #72	Peter Chapman / Vodafone

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		mCR 424 – TADIG doc 72_039rev1 – error corrections re VoLTE mCR 425 – TADIG doc 72_040 – exclude SMS MT from call type level validation mCR 426 – TADIG doc 72_041 – transfer cut off timestamp warning error corrected to fatal mCR 427 – TADIG doc 72_042 – IP address format clarification mCR 428 – TADIG doc 72_043 – updated 3GPP references for release 10 mCR 429 – TADIG doc 72_044rev1 – SS action codes error correction mCR 430 – TADIG doc 72_045 – introduction of IMS Charging Identifier (Event Reference) on TAP mCR 431 – TADIG doc 72_046 – validation change to Network Information catering for Content Transactions mCR 432 – TADIG doc 73_004 – adition of derivation for Cell Id in LTE	TADIG #72 TADIG #72 TADIG #72 TADIG #72 TADIG #72 TADIG #72 TADIG e-vote	
30.2	15 Mar 2012	Editorial change adding missing validation contexts MSESS & MSG to Serving BID/Location Description/Network elements. mCR433 – TADIG doc 73_009 – Call Type Levels validation	TADIG e-vote	Peter Chapman / Vodafone
30.3	31 May 2012	mCR 434 – TADIG doc 73_020 – clarification on duplicate call validation. mCR 435 – TADIG doc 73_021 – clarification on GPRS before launch regarding LTE. mCR 436 – TADIG doc 73_022 – clarification regarding Recording Entity Types. mCR 437 – TADIG doc 73_023 – error correction on Network Element. mCR 438 – TADIG doc 73_024 – error correction regarding maximum TAP file size. mCR 439 – TADIG doc 73_025 – ignore leading zeroes for Call Reference in duplicate call check. mCR 440 – TADIG doc 73_026 – add validation rules to integer fields which should not be negative.	TADIG #73	Peter Chapman / Vodafone

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		mCR 441 – TADIG doc 73_027 – clarification to error 201 on File Sequence Number. mCR 442 – TADIG doc 73_043 – changes to duplicate check validation description related to MSESS. mCR 443 – TADIG doc 73_076 – clarification on Call Type Level 1. mCR 444 – TADIG doc 73_079 – Call Type Level 1 validation rule exception.		
30.4	22 Nov 2012	mCR 445 – TADIG doc 74_018 – Clarification on usage of Non Cahrged Party for duplicate call check in Mobile Session. mCR 446 – TADIG doc 74_019 – Consistency in 3GPP references. mCR 447 – TADIG doc 74_020 – Validation on Partial Type Indicator. mCR 448 – TADIG doc 74_021 – Clarification on validation of Exchange Rate. mCR 449 – TADIG doc 74_022 – Population of the TEL URI in the Non Charged Party Number. mCR 450 – TADIG doc 74_023 – Clarifications on Ipv6 population. mCR 451 – TADIG doc 74_045 – Clarification on the derivation of User Location Information in LTE. mCR 452 – TADIG doc 74_046 – Correcting the derivation of the Call Reference for SMS over CS.	TADIG #74	Peter Chapman / Vodafone
31.0	10 Dec 2012	**01 May 2013: TAP 3.12 Minor Release (see also v32.0)** mCR 453 – TADIG doc 74_017 – WiFi related changes. mCR 1001 – Clarification of Charge validation procedure.	TADIG #74 TADIG e-vote	Peter Chapman / Vodafone
31.0	04 Mar 2013	Editorial removal of duplicate Data Dictionary entries (H).	TDS #49	Peter Chapman / Vodafone
31.1	22 Mar 2013	mCR 1002 – addition of Chargeable Subscriber as GPRS Call duplicate check parameter	TADIG e-vote	Jenny Chong / GSMA
31.2	23 May 2013	mCR 1003 – TADIG doc 75_010 – validation clarifications mCR 1004 – TADIG doc 75_011 – correction for Serving Location Description in WiFi case mCR 1005 – TADIG doc 75_012 – correction on SS Used description	TADIG #75	Peter Chapman / Vodafone

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		mCR 1006 – TADIG doc 75_020 – correction on Network Access Identifier validation		
32.0	03 Oct 2013	**01 May 2013: TAP 3.12 Minor Release (correction, see also v31.0)** mCR 1007 – clarification that VT calls cannot be rejected prior to commercial launch MCR 1011 – Add requested destination to Mobile Session (**Note:** extra ASN.1 group entry added within MobileSession – missing from original CR)	TADIG e-vote TADIG e-vote	Peter Chapman / Vodafone
32.1	05 Dec 2013	mCR 1008 – TADIG doc 76_009rev1 – Add SS to severe error 142 mCR 1009 – TADIG doc 76_010rev1 – Remove GPRS context from severe 101 on Call Event Start Timestamp mCR 1010 – TADIG doc 76_011rev1 – EUInternet APN validation mCR 1012 – TADIG doc 76_012 – Call Reference in duplicate call validation mCR 1013 – TADIG doc 76_013rev1 – Calirify Non-Charged Party Number content for SMS usage mCR 1014 – TADIG doc 76_014 – Support two TAP versions on public interface mCR 1015 – TADIG doc 76_029rev1 – new section Migration To A New Release – from TD.34 mCR 1016 – TADIG doc 76_015 – removal of incorrect validation rule – GPRS Network Location mCR 1017 – TADIG doc 76_016 – Commercial launch date clarification	TADIG #76	Peter Chapman / Vodafone
32.1	05 Dec 2013	Insert missing Data Dictionary text for mCR 1010 – TADIG doc 76_011rev1 – EUInternet APN validation.	Editorial change	Peter Chapman / Vodafone
32.2	02 Jun 2014	mCR1018 – TADIG doc 77_023 – Charge validation clarifications mCR1021 – TADIG doc 77_025 – Clarification on usage of Call Reference in duplicate call check mCR1022 – TADIG doc 77_015 – Extension of duplicate call check criteria for GPRS Wi-Fi case	TADIG #77	Peter Chapman / Vodafone

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
		mCR1023 – TADIG doc 77_022 – Addition of two new Recording Entity Types, TRF and ATCF		
32.3	15 Sep 2014	mCR1025 – Call Type Level 2 clarification regarding premium rate defining body. mCR1027 – Bilaterally agreed error codes clarification.	TADIG e-vote	Peter Chapman / Vodafone
32.4	14 Jan 2015	mCR1026 - TADIG doc 78_042 - Add validation error for missing IMSI (or MIN) mCR1028 - TADIG doc 78_010 - Provision of TAP events on VoLTE handover scenarios mCR1029 - TADIG doc 78_012 - Removing the Recording Entity Type in error code 255 mCR1030 - TADIG doc 78_018 - Add clarification note to error 34 of Charge Information group	TADIG #78	Peter Chapman / Vodafone
32.5	04 Mar 2015	CR1033 - Clarification on Charge Information regarding Sender's IOT CR1034 - Validation of value 'EU Internet' in APN	IDS e-vote	Peter Chapman / Vodafone
32.6	04 Jun 2015	CR1036 - editorial correction to validation context for Chargeable Subscriber CR1037 - align section 1 with GSMA template structure CR1039 - no CAMEL record rejection as long as CAMEL Invocation Fee zero	IDS #79	Peter Chapman / Vodafone
33.0	04 Jun 2015	**01 November 2015: TAP 3.12 Minor Release** CR1035 - add QCI values to Call Type Level 2	IDS #79	Peter Chapman / Vodafone
33.1	30 Jul 2015	CR1042 - Provision of TAP Events for voice and SMS messaging scenarios CR1043 - Allow inclusion of access charge into first interval	IDS e-vote	Peter Chapman / Vodafone
33.2	18 Nov 2015	CR1044 - Modify error 200 on Charge to cover total invoiceable charge CR1048 - Allow VoLTE emergency call use of Call Type Level 2 value 3 CR1049 - Clarification of S-GW/SGSN usage in TAP CR1050 - Clarify validation 20 on Called Number for shared country codes CR1051 - Addition of firther QCI values to Call Type Level 2	IDS #80	Peter Chapman / Vodafone

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
34.0	18 Nov 2015	**01 May 2016: TAP 3.12 Minor Release** CR1047 - GSMA Exchange Rate System	IDS #80	Peter Chapman / Vodafone
34.0	14 Apr 2016	Editorial correction: Annex B text “Call Type Level ½/3” corrected to 1/2/3	n/a	Peter Chapman / Services
34.1	25 May 2016	CR1052 - Clarification on population of taxes related to charge types CR1053 - Clarification on spare and reserved ITU country codes CR1054 - Clarification on the importance of CAMEL Destination Number CR1055 - Provision of TAP Events on S8HR scenarios CR1056 - Clarification of exchange rate tolerance after GSER launch CR1057 - Clarify that Known Issues must be taken into account	IDS #81	Peter Chapman / Vodafone
35.0	25 May 2016	**01 November 2016: TAP 3.12 Minor Release** CR1059 - Add new CTL2 values for new QCI values	IDS #81	Peter Chapman / Vodafone
35.1	08 Dec 2016	CR1060 – clarification that CTL2 values 20-29 allowed indepenedent of IOT. CR1061 – correction on eSRVCC and removal of scenario ‘3 voice calls’.	IDS #82	Peter Chapman / Vodafone
36.0	08 Dec 2016	**01 July 2017: TAP 3.12 Minor Release** CR1062 – Definition of new Aggregated Usage Record	IDS #82	Peter Chapman / Vodafone
36.0	12 Jan 2016	Editorial Update: added rapFileSequenceNumber to AggregatedUsageRecord physical structure	Editorial	Shamit Bhat/ GSMA
36.1	07 Apr 2017	CR1064 - Syntax error correction	IDS e-vote	Peter Chapman / Vodafone
36.2	18 May 2017	CR1065 – AUR age validation change	IDS #83	Peter Chapman / Vodafone
36.2	21 Jun 2017	Editorial: changed reference to section 5.8 to 5.9 in charge element definition	Editorial	Shamit Bhat/ GSMA
36.3	30 Nov 2017	CR1066 – Clarification on AccountingSessionId usage in GPRS Call duplicate check	IDS #84	Peter Chapman / Vodafone
36.4	16 May 2019	TD.57 CR1067 TAP 3.12 Format Specification	IDS #87	Randall Peterson/

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
				Union Wireless
36.5	23 Dec 2019	TD.57 CR1068 TAP 3.12 Format Specification	IDS #88	Randall Peterson/ Union Wireless
36.6	15 Dec 2020	TD.57 CR1069 TAP versions on the Public Interface	IDS #90	Randall Peterson/ Union Wireless
36.7	05 Jan 2026	TD.57 CR1070r1 BCE Services Identification	IDS-BCE	Carmen Kwok/GSMA
37.0	22 September 2026	CR1071 Change to Non-Confidential to allow sharing on gsma.com	WAS/TG	Randy Peterson, Comfone

D.2 Other Information

Type	Description
Document Owner	IDS-BCE
Editor / Company	Randy Peterson, Comfone

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