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(54) METHOD AND MOBILE
TELECOMMUNICATIONS DEVICE FOR
TRANSMITTING DATA IN A MOBILE
RADIO NETWORK

(76) Inventors: Andreas Schmidt, Braunschweig (DE);
Markus Trauberg, Velchede (DE);
Josef Laumen, Hildesheim (DE)

Correspondence Address:
BELL, BOYD & LLOYD, LLC
P. O. BOX 1135
CHICAGO, IL 60690-1135 (US)

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(57) ABSTRACT

The present invention relates to a transmission of data in a mobile radio network, in particular a transmission of text and/or image data, with or without sound in multimedia messages, wherein at least one identification signal for a data record or several records is allocated to the data and the identification signal(s) is/are transmitted to the receiver of the data.

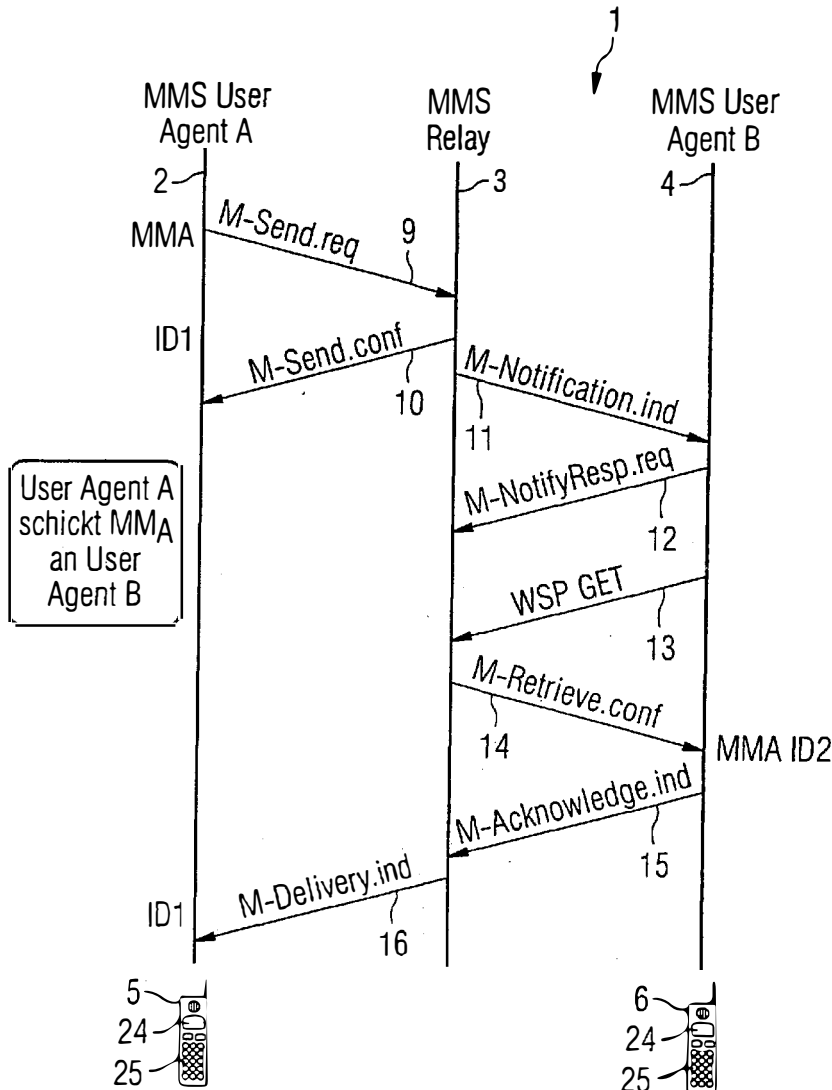


FIG 1

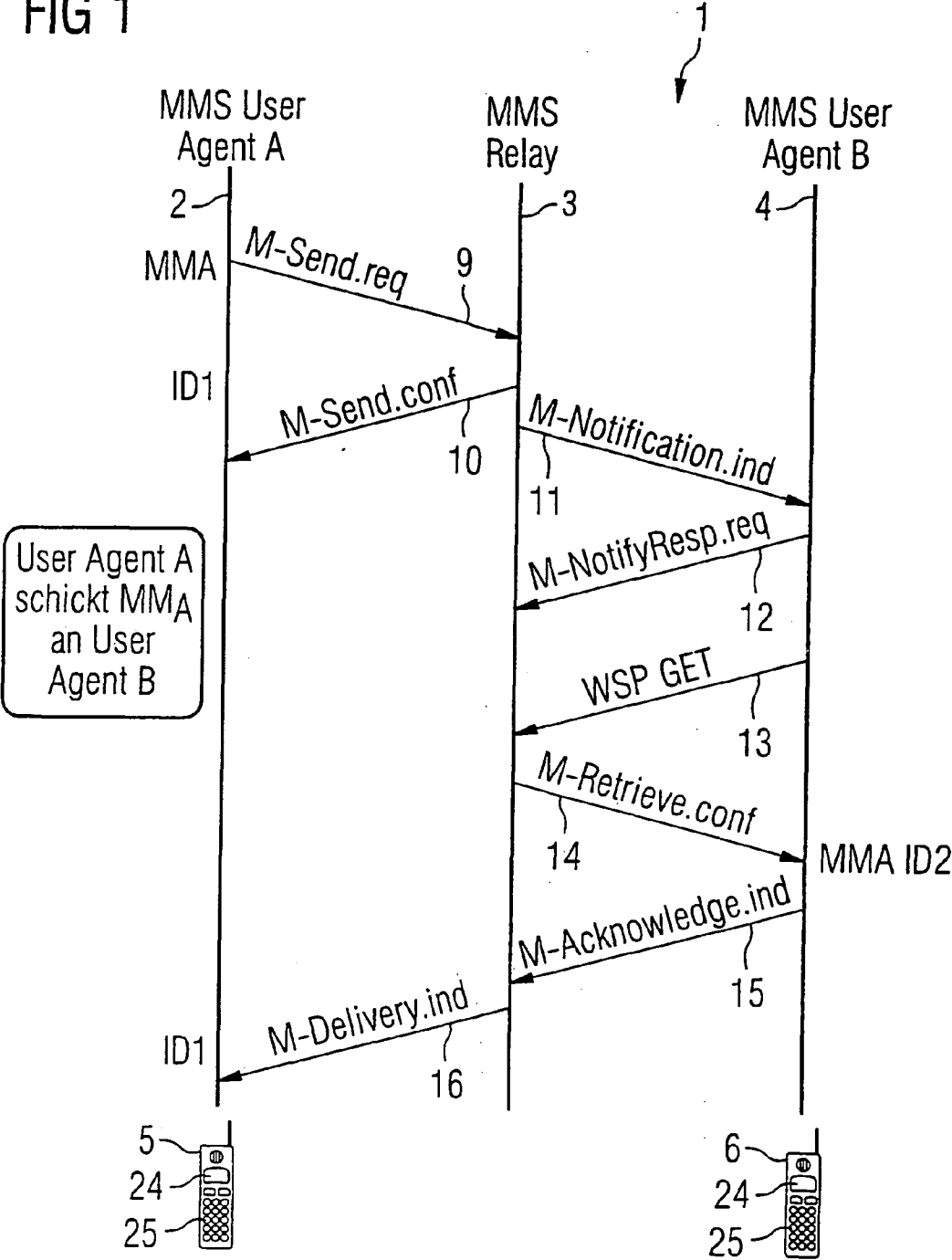


FIG 2

Name	Inhalt	Bemerkungen
X-Mms-Message-Type	Siehe Stand der Technik	Siehe Stand der Technik
X-Mms-Transaction-ID		
X-Mms-MMS-Version		
Date		
From		
To		
Cc		
Bcc		
Subject		
X-Mms-Message-Class		
X-Mms-Expiry		
X-Mms-Delivery-Time		
X-Mms-Priority		
17 X-Mms-Content-ID	Content-IDentifier = CI	Optional: Dieses Feld definiert die Lokalisierung des MM-Elements 7
18 X-Mms-Content-Type	Content-type-value = CTV	Optional: Spezifiziert den Inhaltstyp des MM-Elements 7
19 X-Mms-Content-Size	Content-size-value = CSV	Optional: Gesamtgröße des MM-Elements in Octets
20 X-Mms-Content-Name	Content-name = CNV	Optional: Name des MM-Elements 7
21 X-Mms-Content-Related-URI	Location-value = LV	Optional: Definiert die Lokalisierung eines anderen MM-Elements, auf das das beschriebene MM-Element 7 bezogen ist
22 X-Mms-External-Link-Flag	External-Link-Flag = ELF	Optional: Zeigt an, wenn die MM oder eine seiner MM-Elemente einen Link zu einem Element außerhalb der gesamten MM enthält
23 X-Mms-External-Link-Size	External-Link-Size = ELS	Optional: Gesamtgröße des gelinkten externen Elements in Octets

FIG 3

- 172 — X-Mms-Content-ID (0x80):
CI = Text-string (Textzeichen)
- 182 — X-Mms-Content-Type (0x81):
CTV = short-integer (ganze Zahl)
- 192 — X-Mms-Content-Size (0x82):
CSV = short-integer (ganze Zahl)
- 202 — X-Mms-Content-Name (0x83):
CN = Text-string (Textzeichen)
- 212 — X-Mms-Content-Related-URI (0x84):
CRV = Text-string (Textzeichen)
- 222 — X-Mms-External-Link-Flag (0x85):
ELF = Yes | No (Ja/Nein)
Yes = <Octet 128>
No = <Octet 129>
- 232 — X-Mms-External-Link-Size(0x86):
ELS = short-integer (ganze Zahl)
- X-Mms-Status (0x14):
Status-Value = Expired | Retrieved |
Rejected | Deferred | Partly-retrieved
Expired = <Octet 128>
Retrieved = <Octet 129>
Rejected = <Octet 130>
Deferred = <Octet 131>
Partly-retrieved = <Octet 132>

FIG 4

Name		Zugew. Nummer	laufende Nummer	Bemerkung
Bcc		0x01	1	(Stand der Technik)
Cc		0x02	2	
X-Mms-Content-Location		0x03	3	
Content-Type		0x04	4	
Date		0x05	5	
X-Mms-Delivery-Report		0x06	6	
X-Mms-Delivery-Time		0x07	7	
X-Mms-Expiry		0x08	8	
From		0x09	9	
X-Mms-Message-Class		0x0A	10	
Message-ID		0x0B	11	
X-Mms-Message-Type		0x0C	12	
X-Mms-MMS-Version		0x0D	13	
X-Mms-Message-Size		0x0E	14	
X-Mms-Priority		0x0F	15	
X-Mms-Read-Reply		0x10	16	
X-Mms-Report-Allowed		0x11	17	
X-Mms-Response-Status		0x12	18	
X-Mms-Sender-Visibility		0x13	19	
X-Mms-Status		0x14	20	
Subject		0x15	21	
To		0x16	22	
X-Mms-Transaction-id		0x17	23	
...		...	...	
17-X-Mms-Content-ID		0x80	27	Optional: Dieses Feld definiert die Lokalisierung des MM-Elements
18-X-Mms-Content-Type		0x81	28	Optional: Spezifiziert den Inhaltstyp des MM-Elements
19-X-Mms-Content-Size		0x82	29	Optional: Gesamtgröße des MM-Elements in Octets
20-X-Mms-Content-Name		0x83	30	Optional: Name des MM-Elements in Octets
21-X-Mms-Content-Related-URI		0x84	31	Optional: Definiert die Lokalisierung eines anderen MM-Elements auf das das beschriebene MM-Element bezogen ist
22-X-Mms-External-Link-Flag		0x85	32	Optional: Zeigt an, wenn die MM oder eine seiner MM-Elemente einen Link zu einem Element außerhalb der gesamten MM enthält
23-X-Mms-External-Link-Size		0x86	33	Optional: Gesamtgröße des gelinkten externen Elements in Octets

FIG 5

MNI

Name	Inhalt	Bemerkungen
X-Mms-Message-Type	gemäß WAP-Standard	Stand der Technik
X-Mms-Transaction-ID		
X-Mms-MMS-Version		
From		
17 X-Mms-Content-ID	Content-Identfier=CI	Optional: Dieses Feld definiert die Lokalisierung des MM-Elements
18 X-Mms-Content-Type	Content-type-value=CTV	Optional: Spezifiziert den Inhaltstyp des MM-Elements
19 X-Mms-Content-Size	Content-size-value=CSV	Optional: Gesamtgröße des MM-Elements in Octets
20 X-Mms-Content-Name	Content-name=CNV	Optional: Name des MM-Elements
21 X-Mms-Content-Related-URI	Location-value=LV	Optional: Definiert die Lokalisierung eines anderen MM-Elements auf das das beschriebene MM-Element bezogen ist
22 X-Mms-External-Link-Flag	External-Link-Flag=ELF	Optional: Zeigt an, wenn die MM oder eine seiner MM-Elemente einen Link zu einem Element außerhalb der gesamten MM enthält
23 X-Mms-External-Link-Size	External-Link-Size=ELS	Optional: Gesamtgröße des gelinkten externen Elements in Octets
X-Mms-Message-Class	gemäß WAP-Standard	Stand der Technik
X-Mms-Message-Size		
X-Mms-Expiry		
X-Mms-Content-Location		

FIG 6

MRC

Name	Inhalt	Bemerkungen
X-Mms-Message-Type	Message-type-value= m-retrieve-conf	gemäß WAP-Standard
X-Mms-Transaction-ID	Transaction-id-value	
X-Mms-MMS-Version	MMS-version-value	
Message-ID	Message-ID-value	
Date	Data-value	
From	From-value	
To	To-value	
Cc	Cc-value	
Subject	Subject-value	
X-Mms-Message-Class	Message-class-value	
X-Mms-Priority	Priority-value	
X-Mms-Delivery-Report	Delivery-report-value	
X-Mms-Read-Reply	Read-reply-value	
Content-Type	Content-type-value	

gemäß WAP-Standard

FIG 7

MAI

Name	Inhalt	Bemerkungen
X-Mms-Message-Type	Message-type-value = m-acknowledge-ind	Stand der Technik
X-Mms-Transaction-ID	Transaction-id-value	
X-Mms-MMS-Version	MMS-version-value	
X-Mms-Report-Allowed	report-allowed-value	

gemäß WAP-Standard

FIG 8

MDI

Name	Inhalt	Bemerkungen
X-Mms-Message-Type	Message-type-value = m-delivery-ind	Stand der Technik
X-Mms-MMS-Version	MMS-version-value	
X-Mms-Message-ID	Message-ID-value	
To	To-value	
Date	Date-value	
X-Mms-Status	Status-value	

FIG 9

M-Send.req (MMS User Agent A → MMS Relay):

X-Mms-Message-Type: m-send-req
 X-Mms-Transaction-ID: TRANSACTION-ID#1
 X-Mms-Version: 1.0
 Date: Fri, 14 Jul 2000 14:12:19 +0100
 From: markus.trauberg@t-online.de
 To: andreas.schmidt@sal.siemens.de
 To: josef.laumen@sal.siemens.de
 Subject: Urlaubsgruesse aus Spiekeroog
 X-Mms-Delivery-Report: Yes
 X-Mms-Content-ID: <000714.1412.1markus.trauberg >
 X-Mms-Content-Name: "Urlaubsgruesse.txt"
 X-Mms-External-Link-Flag: Yes
 X-Mms-External-Link-Size: 8245
 X-Mms-Content-ID: <000714.1412.2markus.trauberg >
 X-Mms-Content-Name: "unser Ferienhaus.jpg"
 X-Mms-Content-ID: <000714.1412.3markus.trauberg >
 X-Mms-Content-Name: "Spiekeroog.smi"
 X-Mms-Content-Related-ID: <000714.1412.2markus.trauberg >
 X-Mms-Content-Related-ID: <000714.1412.4markus.trauberg >
 X-Mms-Content-Related-ID: <000714.1412.5markus.trauberg >
 X-Mms-Content-ID: <000714.1412.4markus.trauberg >
 X-Mms-Content-Name: "Meeresrauschen .mp3"
 X-Mms-Content-ID: <000714.1412.5markus.trauberg >
 X-Mms-Content-Name: "Inselbahn .mpg"
 Content-Type: Application/vnd.wap.multipart.related
 Start: <000714.1412.3markus.trauberg >
 nEntries: 5
 HeadersLen: XX
 DataLen: XX
 Content-Type: text/plain;
 X-Mms-Content-ID: <000714.1412.1markus.trauberg >
 Liebe Kollegen,

 Schöne Grüße aus dem Urlaub. Spiekeroog ist mal wieder ganz bezaubernd.
 Falls ihr auf den Geschmack kommt, findet ihr hier mehr Info: <http://www.spiekeroog.de>
 Viel Spaß noch bei der Arbeit ;-)
 MfG
 Markus
 HeadersLen: XX
 DataLen: 1265
 Content-Type: image/jpeg
 X-Mms-Content-ID: <000714.1412.2markus.trauberg >
 ...
 HeadersLen: XX
 DataLen: 588
 Content-Type: presentation_description/smil,
 X-Mms-Content-ID: <000714.1412.3markus.trauberg >
 ...
 HeadersLen: XX
 DataLen: 82345
 Content-Type: audio/mp3,
 X-Mms-Content-ID: <000714.1412.4markus.trauberg >
 ...
 HeadersLen: XX
 DataLen: 632564
 Content-Type: video/mpeg4
 X-Mms-Content-ID: <000714.1412.5markus.trauberg >

FIG 10

M-Send.conf (MMS Relay → MMS User Agent A) :

X-Mms-Message-Type: m-send-conf
X-Mms-Transaction-ID: TRANSACTION-ID#1
X-Mms-Version: 1.0
X-Mms-Message-ID: MESSAGE-ID#1
X-Mms-Response-Status: ok

FIG 11

M-Notification.ind an einen "To-Empfänger":

X-Mms-Message-Type: m-notification-ind
X-Mms-Transaction-ID: TRANSACTION-ID#2
X-Mms-Version: 1.0
From: markus.trauberg@t-online.de
X-Mms-Message-Class: Personal
X-Mms-Message-Size: XXX (Attachments + Header)
X-Mms-Expiry: 3600
X-Mms-Content-Location: www.sal.siemens.de/mms-inbox/ABCD.1234
Subject: Urlaubsgruesse aus Spiekeroog
X-Mms-Content-ID: <000714.1412.1markus.trauberg >
Content-Type: text/plain
X-Mms-Content-Name: "Urlaubsgruesse.txt"
X-Mms-Content-Size: 212
X-Mms-External-Link-Flag: Yes
X-Mms-External-Link-Size: 8245
X-Mms-Content-ID: <000714.1412.2markus.trauberg >
Content-Type: image/jpeg
X-Mms-Content-Name: "unser Ferienhaus.jpg"
X-Mms-Content-Size: 1265
X-Mms-Content-ID: <000714.1412.3markus.trauberg >
Content-Type: presentation_description/smil
X-Mms-Content-Name: "Spiekeroog.smi"
X-Mms-Content-Size: 588
X-Mms-Content-Related-ID: <000714.1412.2markus.trauberg >
X-Mms-Content-Related-ID: <000714.1412.4markus.trauberg >
X-Mms-Content-Related-ID: <000714.1412.5markus.trauberg >
X-Mms-Content-ID: <000714.1412.4markus.trauberg >
Content-Type: audio/mp3
X-Mms-Content-Name: "Meeresrauschen .mp3"
X-Mms-Content-Size: 82345
X-Mms-Content-ID: <000714.1412.5markus.trauberg >
Content-Type: video/mpeg4
X-Mms-Content-Name: "Inselbahn .mpg"
X-Mms-Content-Size: 632564

FIG 12

M-Retrieve.conf (MMS Relay → MMS User Agent B):

X-Mms-Message-Type: m-retrieve-conf
 X-Mms-Transaction-ID: TRANSACTION-ID#3
 X-Mms-Version: 1.0
 Date: Fri, 14 Jul 2000 14:12:19 +0100
 From: markus.trauberg@t-online.de
 To: andreas.schmidt@sal.siemens.de
 To: josef.laumen@sal.siemens.de
 X-Mms-Message-ID: MESSAGE-ID#1
 X-Mms-Delivery-Report: Yes
 Subject: Urlaubsgruesse aus Spiekeroog
 Content-Type: Application/vnd.wap.multipart.related
 Start: <000714.1412.3markus.trauberg >
 nEntries: 5
 HeadersLen: XX
 DataLen: XX
 Content-Type: text/plain;
 X-Mms-Content-ID: <000714.1412.1markus.trauberg >
 X-Mms-Content-Name: "Urlaubsgruesse.txt"

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Falls ihr auf den Geschmack kommt, findet ihr hier mehr Info:

<http://www.spiekeroog.de>

Viel Spaß noch bei der Arbeit ;-)

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HeadersLen: XX

DataLen: 1265

Content-Type: image/jpeg

X-Mms-Content-Name: "unser Ferienhaus.jpg"

X-Mms-Content-ID: <000714.1412.2markus.trauberg >

...

HeadersLen: XX

DataLen: 588

Content-Type: presentation_description/smil,

X-Mms-Content-Name: "Spiekeroog.smi"

X-Mms-Content-ID: <000714.1412.3markus.trauberg >

...

HeadersLen: XX

DataLen: 82345

Content-Type: audio/mp3,

X-Mms-Content-Name: "Meeresrauschen .mp3"

X-Mms-Content-ID: <000714.1412.4markus.trauberg >

...

HeadersLen: XX

DataLen: 632564

Content-Type: video/mpeg4

X-Mms-Content-Name: "Inselbahn .mpg"

X-Mms-Content-ID: <000714.1412.5markus.trauberg >

FIG 13

M-Acknowledge.ind (MMS User Agent B → MMS Relay) :

X-Mms-Message-Type: m-acknowledge-ind
X-Mms-Transaction-ID: TRANSACTION-ID#3
X-Mms-Version: 1.0
X-Mms-Report-Allowed: Yes

FIG 14

M-Delivery.ind (MMS Relay → MMS User Agent A) :

X-Mms-Message-Type: m-delivery-ind
X-Mms-Transaction-ID: MESSAGE-ID#1
X-Mms-Version: 1.0
To: andreas.schmidt@sal.siemens.de
Date: Fri, 14 Jul 2000 16:45:00 +0100
X-Mms-Status: Retrieved

FIG 15

M-Retrieve.conf (MMS Relay → MMS User Agent B):

X-Mms-Message-Type: m-retrieve-conf
X-Mms-Transaction-ID: TRANSACTION-ID#4
X-Mms-Version: 1.0
Date: Fri, 14 Jul 2000 14:12:19 +0100
From: markus.trauberg@t-online.de
To: andreas.schmidt@sal.siemens.de
To: josef.laumen@sal.siemens.de
X-Mms-Message-ID: MESSAGE-ID#1
X-Mms-Delivery-Report: Yes
Subject: Urlaubsgruesse aus Spiekeroog
Content-Type: Application/vnd.wap.multipart.related
Start: <000714.1412.3markus.trauberg >
nEntries: 1
HeadersLen: XX
DataLen: XX
Content-Type: text/plain;
X-Mms-Content-ID: <000714.1412.1markus.trauberg >
X-Mms-Content-Name: "Urlaubsgruesse.txt"
Liebe Kollegen,
Schöne Grüße aus dem Urlaub. Spiekeroog ist mal wieder ganz
bezaubernd.
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Viel Spaß noch bei der Arbeit ;-)
MfG
Markus

FIG 16

M-Acknowledge.ind (MMS User Agent B → MMS Relay) :

X-Mms-Message-Type: m-acknowledge-ind
X-Mms-Transaction-ID: TRANSACTION-ID#4
X-Mms-Version: 1.0
X-Mms-Report-Allowed: Yes

FIG 17

M-Delivery.ind (MMS Relay → MMS User Agent A) :

X-Mms-Message-Type: m-delivery-ind
X-Mms-Transaction-ID: TRANSACTION-ID#1
X-Mms-Version: 1.0
To: josef.laumen@sal.siemens.de
Date: Fri, 14 Jul 2000 15:57:13 +0100
X-Mms-Status: Partly-retrieved

FIG 18

X-Mms-Content-ID (0x19)

X-Mms-Content-ID-value = Text-string | X-Mms-Content-general-form

X-Mms-Content-general-form = Value-length Text-string
* (Parameter)
(Codierungstypen gemäß [2] und [3])

FIG 19

Parametername	Binärer Wert des Parameternamens	Typ des Parameterwertes
Name als	0x00	Text-string (Textzeichen)
Type	0x01	Constrained-encoding (Gezwungene Code)
Size (Größe)	0x02	Integer-value (Ganze Zahl)
External-Link (Externer Hinweis)	0x03	Yes (ja) (<Octet 128>) No (nein) (<Octet 129>)
External-Link-Size (Größe des externen Hinweises)	0x04	Integer-value
Related-ID	0x05	Text-string
Original-Type (Original-Typ)	0x06	Constrained-encoding (Gezwungene Code)
Original-Size (Original-Größe)	0x07	Integer-value

FIG 20

Name	Zugew. Nummer	laufende Nummer	Bemerkung
Bcc	0x01	1	Stand der Technik
Cc	0x02	2	
X-Mms-Content-Location	0x03	3	
Content-Type	0x04	4	
Date	0x05	5	
X-Mms-Delivery-Report	0x06	6	
X-Mms-Delivery-Time	0x07	7	
X-Mms-Expiry	0x08	8	
From	0x09	9	
X-Mms-Message-Class	0x0A	10	
Message-ID	0x0B	11	
X-Mms-Message-Type	0x0C	12	
X-Mms-MMS-Version	0x0D	13	
X-Mms-Message-Size	0x0E	14	
X-Mms-Priority	0x0F	15	
X-Mms-Read-Reply	0x10	16	
X-Mms-Report-Allowed	0x11	17	
X-Mms-Response-Text	0x12	18	
X-Mms-Response-Status	0x13	19	
X-Mms-Sender-Visibility	0x14	20	
X-Mms-Status	0x15	21	
Subject	0x16	22	
To	0x17	23	
X-Mms-Transaction-Id	0x18	24	
X-Mms-Content-ID	0x19	25	Veränderung durch diese Erfindungsmeldung

FIG 21A

M-Send.req



Name	Content	Comments
X-Mms-Message-Type	Message-type-value= m-send-req	Stand der Technik nach WAP
X-Mms-Transaction-ID	Transaction-id-value	
X-Mms-MMS-Version	MMS-version-value	
Date	Date-value	
From	From-value	
To	To-value	
Cc	Cc-value	
Bcc	Bcc-value	
Subject	Subject-value	
X-Mms-Message-Class	Message-class-value	
X-Mms-Expiry	Expiry-value	

FIG 21B

Name	Content	Comments
X-Mms-Delivery-Time	Delivery-time-value	
X-Mms-Priority	Priority-value	
X-Mms-Content-ID	Inhalts-Identifikator	Identifikation des MM-Elements

FIG 22

M-Modifikation.ind



Name	Content	Comments
X-Mms-Message-Type	m-notification-ind	Stand der Technik nach WAP
X-Mms-Transaction-ID	A unique identifier	
X-Mms-MMS-Version	Version number	
From	Sender address	
X-Mms-Content-ID	Inhalts-Identifikator	Identifikator des MM-Elements
X-Mms-Message-Class	Message-class-value	Stand der Technik nach WAP
X-Mms-Message-Size	Size of message	
X-Mms-Expiry	Expiry-value	
X-Mms-Content-Location	Content-location-value	

FIG 23

M-Sreq (M-UA A → M-SR):

X-Mms-Message-Type: m-send-req
X-Mms-Transaction-ID: TRANSACTION-ID#1
X-Mms-Version: 1.0
Date: Fri, 14 Jul 2000 14:12:19 +0100
From: markus.trauberg@t-online.de
To: andreas.schmidt@sal.siemens.de
Subject: Urlaubsgruesse aus Spiekeroog
X-Mms-Delivery-Report: Yes

X-Mms-Content-ID: <000714.1412.1markus.trauberg >; Name =
"Urlaubsgruesse.txt"; External-Link-Flag = Yes;
External-Link-Size = 8245
X-Mms-Content-ID: <000714.1412.2markus.trauberg >; Name = "unser Ferienhaus.jpg"
X-Mms-Content-ID: <000714.1412.3markus.trauberg >; Name = "Spiekeroog.smi"; Related-ID =
<000714.1412.2markus.trauberg >; Related-ID =
<000714.1412.4markus.trauberg >; Related-ID =
<000714.1412.5markus.trauberg >
X-Mms-Content-ID: <000714.1412.4markus.trauberg >; Name = "Meeresrauschen .mp3"
X-Mms-Content-ID: <000714.1412.5markus.trauberg >; Name = "Inselbahn .mpg"

Content-Type: Application/vnd.wap.multipart.related: Start = <000714.1412.3markus.trauberg >
nEntries: 5
HeadersLen: XX
DataLen: XX
Content-Type: text/plain;

X-Mms-Content-ID: <000714.1412.1markus.trauberg >

Liebe Kollegen,

Schöne Grüße aus dem Urlaub. Spiekeroog ist mal wieder ganz bezaubernd.

Falls ihr auf den Geschmack kommt, findet ihr hier mehr Info: <http://www.spiekeroog.de>

Viel Spaß noch bei der Arbeit ;-)

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HeadersLen: XX

DataLen: 1265

Content-Type: image/jpeg

X-Mms-Content-ID: <000714.1412.2markus.trauberg >

...

HeadersLen: XX

DataLen: 588

Content-Type: application/smil,

X-Mms-Content-ID: <000714.1412.3markus.trauberg >

...

HeadersLen: XX

DataLen: 82345

Content-Type: audio/mp3,

X-Mms-Content-ID: <000714.1412.4markus.trauberg >

...

HeadersLen: XX

DataLen: 632564

Content-Type: video/mpeg4

X-Mms-Content-ID: <000714.1412.5markus.trauberg >

...

FIG 24

M-Nind an einen "To-Empfänger":

X-Mms-Message-Type: m-notification-ind
X-Mms-Transaction-ID: TRANSACTION-ID#2
X-Mms-Version: 1.0
From: markus.trauberg@t-online.de
X-Mms-Message-Class: Personal
X-Mms-Message-Size: XXX (Attachments + Header)
X-Mms-Expiry: 3600
X-Mms-Content-Location: www.sal.siemens.de/mns-inbox/ABCD.1234
Subject: Urlaubsgruesse aus Spiekeroog

X-Mms-Content-ID: <000714.1412.1markus.trauberg >; Type =
text/plain; Name = "Urlaubsgruesse.txt"; Size = 212;
External-Link: Yes; External-Link-Size = 8245
X-Mms-Content-ID: <000714.1412.2markus.trauberg >; Type =
image/bmp; Name = "unser Ferienhaus.bmp"; Size =
5863; Original-Type = image/jpeg; Original-Size = 1265
X-Mms-Content-ID: <000714.1412.3markus.trauberg >; Type =
application/smil; Name = "Spiekeroog.smi";
Content-Size = 588; Related-ID =
<000714.1412.2markus.trauberg >; Related-ID =
<000714.1412.4markus.trauberg >; Related-ID =
<000714.1412.5markus.trauberg >
X-Mms-Content-ID: <000714.1412.4markus.trauberg >; Type =
audio/mp3; Name = "Meeresrauschen .mp3";
Size = 82345
X-Mms-Content-ID : <000714.1412.5markus.trauberg >; Type =
video/mpeg4; Name = "Inselbahn .mpg" ; Size = 632564

FIG 25

M-Rconf (M-SR → M-UA B):

X-Mms-Message-Type: m-retrieve-conf
 X-Mms-Transaction-ID: TRANSACTION-ID#3
 X-Mms-Version: 1.0
 Date: Fri, 14 Jul 2000 14:12:19 +0100
 From: markus.trauberg@t-online.de
 To: andreas.schmidt@sal.siemens.de
 X-Mms-Message-ID: MESSAGE-ID#1
 Subject: Urlaubsgruesse aus Spiekeroog
 X-Mms-Delivery-Report: Yes
 Content-Type: Application/vnd.wap.multipart.related; Start = <000714.1412.3.markus.trauberg >
 nEntries: 5
 HeadersLen: XX
 DataLen: XX
 Content-Type: text/plain;

X-Mms-Content-ID: <000714.1412.1markus.trauberg >; Name = "Urlaubsgruesse.txt"

Liebe Kollegen,

Schöne Grüße aus dem Urlaub. Spiekeroog ist mal wieder ganz bezaubernd.

Falls ihr auf den Geschmack kommt, findet ihr hier mehr Info: <http://www.spiekeroog.de>

Viel Spaß noch bei der Arbeit ;-)

MfG

Markus

HeadersLen: XX

DataLen: 5863

Content-Type: image/bmp

X-Mms-Content-ID: <000714.1412.2markus.trauberg >; Name =
 "unser Ferienhaus.bmp"; Original-Type = image/jpeg;
 Original-Size = 1265

...

HeadersLen: XX

DataLen: 588

Content-Type: application/smil,

X-Mms-Content-ID: <000714.1412.3markus.trauberg >; Name = "Spiekeroog.smi"

...

HeadersLen: XX

DataLen: 82345

Content-Type: audio/mp3,

X-Mms-Content-ID: <000714.1412.4markus.trauberg >; Name = "Meeresrauschen .mp3"

...

HeadersLen: XX

DataLen: 632564

Content-Type: video/mpeg4,

X-Mms-Content-ID: <000714.1412.5markus.trauberg >; Name = "Inselbahn .mpg"

METHOD AND MOBILE TELECOMMUNICATIONS DEVICE FOR TRANSMITTING DATA IN A MOBILE RADIO NETWORK

[0001] The invention relates to a method for transmitting data in a mobile radio network in accordance with the preamble of Patent claim 1, as well as to a mobile telecommunications device in accordance with the preamble of claim 26, a computer program product in accordance with claim 30 as well as a radio communication system in accordance with claim 32. Current mobile radio networks, such as the one that operates in accordance with the GSM standard, provide only greatly restricted options for transmitting text data. This means that short messages of up to around 160 characters can typically be transmitted. This facility is called SMS (Short Message Service). The person sending the data has to pay for the costs of sending these types of text message.

[0002] In future it should be possible to transmit multimedia data, especially still or moving images with or without sound. This is likely to involve a significant expansion of volumes of data for transmission and of the data types within such transmissions which involves increased transmission time and increased costs.

[0003] The problem underlying the object of the invention is that of simplifying checking of data transmission for subscribers in a mobile radio network.

[0004] The invention achieves this object by a method with the features of claim 1 as well as by a mobile telecommunications device with the features of claim 26, a computer program product with the features of claim 30, as well as by a communications system in accordance with claim 32. As regards advantageous embodiments the reader is directed to claims 2 to 25, 27 to 29 and 31.

[0005] The method in accordance with the invention makes it possible to send information to the data recipient about the characteristics of the data ready to be received, which makes it easy to check this data.

[0006] The advance transmission of the characteristic or characteristics of the identification signal(s) specifying the data to be transmitted makes it possible to perform the check before the actual data is received, whereby in a particularly advantageous manner the recipient is given the opportunity on the basis of the information thus received of whether they wish to receive the existing data now or later or not at all. If the option of choosing a partial receipt of a Multimedia Message (MM) is provided, the recipient can for example only download the short information important to them that needs a short time to transmit and possibly associated memory-intensive image items or similar later or even not at all.

[0007] When the identification signal used for this purpose contains information about the size of a data record to be received the recipient can tell from this information how much time they need to receive and/or study the data and whether they wish to spend this time and now or later or not at all.

[0008] When the identification signal contains information about the name of a data record the recipient can tell from this information from which subject area the data originates.

He can also advantageously select whether he wishes to receive this data record or these data records now or later or not at all.

[0009] Of particular advantage is the fact that information can also be given in the identification signal about the data type so that the recipient knows whether for example this data is image data, text data and/or music data.

[0010] This decisively improves checking and transparency.

[0011] Further benefits and characteristics of the invention are produced by the exemplary embodiments of the object of the invention shown in the drawings and described below.

[0012] The drawings show:

[0013] FIG. 1 a schematic diagram of send operations assigned to a data transmission in accordance with the WAP (Wireless application protocol) standard between the level of the sender and that of the provider on the one hand and the level of the provider and that of the recipient on the other hand,

[0014] FIG. 2 the header fields of a message M-Send.req sent in accordance with the WAP standard shown in FIG. 1, whereby the newly inserted header fields in accordance with the invention are highlighted in gray,

[0015] FIG. 3 a specification of the type of information stored in the fields shown in FIG. 2 and highlighted in gray as well as the additional field which appears in the Status Report about the receipt of the sent data,

[0016] FIG. 4 a diagram of the assignment of the header fields from FIG. 2 to the binary codes, whereby the newly inserted header fields in accordance with the invention are highlighted in grey,

[0017] FIG. 5 a diagram similar to FIG. 2 of the message MNotification.ind (MNI) sent in accordance with the WAP Standard shown in FIG. 1,

[0018] FIG. 6 a diagram similar to FIG. 2 of the M-Retrieve.conf (MRC) message sent in accordance with the WAP Standard shown in FIG. 1,

[0019] FIG. 7 a diagram similar to FIG. 2 of the M-Acknowledge.ind (MAI) sent in accordance with the WAP Standard shown in FIG. 1,

[0020] FIG. 8 a diagram similar to FIG. 2 of the M-Delivery.ind message sent in accordance with the WAP Standard shown in FIG. 1,

[0021] FIGS. 9-17 and 23-25 examples in each case of the content of different information signals for the transmission of multimedia messages between a number of components of a radio communications system in accordance with the method defined in the invention,

[0022] FIG. 18 the encoding on a single header field name,

[0023] FIG. 19 encoding of the new parameter names and parameter values in an individual header field in accordance with FIG. 9,

[0024] FIG. 20 assignment of binary codes to the field names of the parameters in an individual header field in accordance with FIG. 9,

[0025] FIG. 21A, 21B the individual header fields of a Multimedia Service (MMS) send request (in WAP Message M-Send.req; and

[0026] FIG. 22 the header fields of the MMS recipient notification (M-Nind; in WAP Message M-Notification.ind;) of the MSreq belonging to the send inquiry in accordance FIG. 12A, 12B

[0027] Elements and with the same function and operation are provided with the same reference numbers in FIGS. 1 and 13.

[0028] The exemplary embodiment describes the application of the invention to a data transmission system 1 for the WAP standard, as would be used in the transmission of in particular image data and formatted text data in UMTS (Universal Mobile Telecommunication Standard). It is understood that the invention can also be transferred to other standards.

[0029] There is provision in the UMTS, in addition to the provision of the previous SMS standard, to provide what is known as an MMS (Multimedia Messaging Service) standard for a transmission of messages as well as Multimedia messages (MMs). This allows formatted texts and images with or without sound to be transmitted as well. The restriction which exists in SMS to a message length of 160 characters does not apply. Transmission of audio and video messages is possible.

[0030] MMS can be implemented by using WAP. In this case for radio transmission of data, such as of Multimedia Messages (MMs), the protocol scheme shown in FIG. 1 (WAP WSP: Wireless Session Protocol) is supplied. This comprises a layer 2 of a data sender (also known as an MMS User Agent A), a layer 3 of a provider (of which the network element which executes the service is also known as the MMS Relay) and a layer 4 of a recipient (also known as MMS User Agent B). Layer 2 of the data sender comprises at least one telecommunications device 5, likewise layer 4 of the recipient comprises a telecommunications device 6. These telecommunications devices 5,6 can for example be designed as normal handsets or as devices with a further input and display function, such as laptops for example.

[0031] A Multimedia message abbreviated (MM) entered in the telecommunications device 5 of the sender or to be forwarded in this device can contain one or more units (data records 7), for example individual images, film sequences, texts or similar. The MM is initially sent as inquiry 9 (this enters in the WAP protocol the name M-Send.req) to the provider (layer 3).

[0032] From there the transmission 9 that arrives with the acknowledgement 10 (M-send.conf) is acknowledged to the sender (layer 2).

[0033] Following on from this in time the information 11 (M-Notification.ind) is sent by the provider (layer 3) to the recipient (layer 4) with which the latter is informed that there is a message for them to download at provider 3.

[0034] For this the provider 3 typically automatically receives the response 12 (M-NotifyResp.req) from the telecommunications device 6 of the recipient (Layer 4).

[0035] Only on request by the recipient with the transmission 13 (WSP GET.req) is the MM with the transmission 14 (Mretrieve.com) forwarded to the recipient.

[0036] The message 15 (M-Acknowledge.ind) acknowledges the receipt of the he hooked a MM. The concluding message 16 (M-Delivery.ind) returns a receipt acknowledgement to the sender 2.

[0037] What are known as the header fields are used to administer the transmissions 9, 10, 11, 12, 14, 15, 16, that is the fields preceding the actual MM in which information about the origin, send time, file size and further details can be contained.

[0038] In accordance with the invention the number of the header fields is increased by least one further field 17, 18, 19, 20, 21, 22, 23 as information field(s) to enable the MM to be informed about characterizing parameters and to be able to send a one or identification signals for these parameters to recipient 4.

[0039] In the exemplary embodiment (see FIG. 4) fields 17, 18, 19, 20, 21, 22, 23 addressed with 0x80 to 0x86 in the hexadecimal system are provided for this purpose to accommodate the information about the parameters which are described in more detail below. A different number and/or addressing of the additional header fields is also possible.

[0040] The additionally named header fields 17, 18, 19, 20, 21, 22, 23 are at least inserted into message 11 (M-Notification.ind), with which recipient for is informed about the availability of an MM. The message 9 (M-Send.req) can, if the additional parameters are generated by the sender 2, also contain the additional header fields 17, 18, 19, 20, 21, 22, 23 (FIG. 2), as well as the actual MM delivery 14 (M-Retrieve.conf) (see. FIG. 5) or further messages 10, 12, 13, 15, 16.

[0041] A data record 7 of an MM is taken below to mean an individual component of an MM which is defined by its type (e.g. still image) and its format (e.g. JPEG), whereby in MMS there is also provision for format conversion by the MMS Relay 3 which guarantees that telecommunications devices 6 of a recipient 4 which only support specific formats of a type can also only be operated with these formats. For example a telecommunications device 6 can only display still images in the JPEG format and it has notified the MMS Relay 3 about this in its registration. The MMS Relay 3 then converts all still images arriving for this recipient into the JPEG format, in which case the file size generally changes. This aspect is relevant for a later examination of the new header fields in accordance with this invention.

[0042] As an identification signal for example the following information can be included about a data record 7. Another amount of information, such as only a selection of that listed can also be provided. The information is provided to the recipient of an MM optionally when the WAP Standard is used (FIG. 1) in the notification 11 (M-Notification.ind) and thus before transmission of the actual data in the Multimedia Message.

[0043] Possible parameters of data to be transmitted, especially of an MM, via which the recipient is informed in advance, are as follows:

[0044] 1. the number of data records 7 that the MM contains (also implicitly through the description of the individual elements of the MM),

[0045] 2. the relevant size (in octets) of a data record 7,

- [0046] 3. the relevant type and the format of a data record 7,
 - [0047] 4. the relevant Content ID (Content Identification) of a data record possibly also relative to the Content ID/Message ID of the overall MM,
 - [0048] 5. the relevant name of a data record,
 - [0049] 6. the subject of the overall MM,
 - [0050] 7. the connection of an element to one or more other data records 7 of the MM,
 - [0051] 8. the connection of the overall MM or of one or more data records 7 to one or more URLs/URIs outside the MM and with an external link of this type, optionally the size of the data to be loaded of the resolved external link(s).
- [0052] With the aid of the new header fields 17, 18, 19, 20, 21, 22, 23 the method of "detailed notification" can be implemented in the MMS and the convenience of the MMS for the users markedly increased. Even before an MM is loaded and probably even before costs arise for the user, the latter is informed in detail about the contents and the composition of the MM and can act accordingly, so that for example he only downloads individual data records 7 of the MM and rejects further messages.
- [0053] An MM basically consists of a header and, depending on the type of MM, additionally of a data part (WAP: Body). The header comprises general information of the MM is made up of defined header fields. The data part of the message contains one or more elements of any type (e.g. texts, images, sounds . . .) that follow the header in any order. If the presentation description is contained in the data part there should be what is known as the start parameter pointing to this presentation description in a WAP message at the beginning of the data part.
- [0054] Each header field consists of a field name, followed by a field value which consists of at least one octet. The assignment of hexadecimal values to the field name is shown in FIG. 4.
- [0055] There are basically two options for supplementing the notification 11 to the recipient 4 with the desired information: Either the information is created by provider 3 or by sender 2. A mixed form is also possible. The following individual sequences are possible for this:
- [0056] The information is extracted from the MM arriving at the MMS Relay 3 with message 9, i.e. is partly accepted unchanged from header fields and partly calculated from the data part of the MM (e.g. the specification of the size of a data record 7).
- [0057] Of advantage with this process is the consistency to be expected between the descriptive header information of Message 11 and the actual content 14 (in WAP: MRetrieve.conf) which is transmitted at the request of the recipient 4 (User Agent B) to the latter. The implementation effort at sender 2 and thereby as a rule in the mobile terminal remains small. A further advantage exists with regard to the accuracy of the size specification when format conversion takes place. There is provision with MMS, before the data is delivered, for adaptation of the content to for example the capabilities of the receiving MMS User Agents 4 (such as supported codecs, display size of the terminal etc.) or requirements of

the recipient (such as automatic restriction to a maximum size) to be undertaken by the service provider 3. MMS Relay 3 can notify recipient 4 of the size of the content after data adaptation. This is information that sender 2 does not possess. The disadvantage is the additional effort at the MMS-Relay 3 for generating the information for this "detailed notification" arises here because of the necessary "parsing" of the MM and the extraction of corresponding information.

[0058] Instead the information can already be generated by sender 2 and be explicitly integrated in the header fields 17;18;19;20;21;22;23 in message 9 to send an MM (in WAP: M-Send.req). Of advantage is the unchanged processing of the MM in MMS Relay 3 that does not have to analyze the content of the MM. The implementation of the options opened up with the new header fields 17;18;19;20;21;22;23 in terminal 5 can be determined by the manufacturer. There is also the option of offering terminals with additional enhanced-convenience features. Furthermore the subscriber 2 sending the MM can impart their knowledge about the internal and external linkage of the MM elements to the MM recipient in the form of detailed information which is merely forwarded by MMS-Relay 3. A generation of the header fields in the MMS Relay 3 which requires knowledge of the internal and external linkage of data records 7 would only be possible there by using expensive parsing of the MM. A disadvantage is the expansion of header fields with information which is redundant in some cases.

[0059] Advantageously therefore the information is partly generated in the sending User Agent 2 and partly in MMS Relay 3, which on the MMS Relay 3 side also requires the updating of existing header fields generated by sender 2.

[0060] For this mixed form of the generation of additional information the information explained below can be divided up as follows:

[0061] Generation in the sending User Agent 2:

[0062] X-Mms-Content-ID: In the current WAP specification there are no options for assigning individual additional header fields to data records 7 (e.g. with relevant name and type) and for assigned a number of data records 7 hierarchically. For a transparent conversion of an MM into an Internet mail (format as per RFC 822 with extensions in accordance with MIME (Multipurpose Internet Mail Extensions)) the following requirements are proposed: The information possibly encoded in the data part of the e-mail for each extension of an e-mail (name, type, . . .) is also contained transparently in an MM. A Content-ID in the header of the MM which is uniquely assigned to each data record 7 can be used as a reference. The start parameter in the message body (data structure section which contains actual notification information) must be defined as a field that contains the Content-ID (=content identifier) CI of the presentation description object and thereby enables this object to be accessed. With these agreements a transparent transmission of an MM from an MMS Relay to any recipient both directly via another MMS relay as well as over the internet via e-mail is possible. A unique assignment to the data record or the data records 7 in the MM is a vital necessity for the first transmission from the sending User Agent 2 to MMS Relay 3.

- [0063] X-Mms-Content-Type: Designates the type and the format of data record 7. These should already be entered on sending since data record 7 does not absolutely receive a file name such as in an e-mail and can then not be assigned to a format via a file extension. This field only needs to be updated by MMS Relay 3 for a format and/or type conversion. The X-Mms-Content-Type is displayed and identified by the value of the signal CTV.
- [0064] X-Mms-content-Size: Size of the data record 7. This is displayed and identified by value or content CSV.
- [0065] X-Mms-Content-Name: Name of the data record 7. This name is only known to the sending User Agent 2 and must therefore be used by the latter. It is assigned the content CNV.
- [0066] X-Mms-External-Link-Flag: indicates that data record 7 has a link to contents outside the MM. When this information is used by the sending User Agent 2 an analysis of the content of data record 7 by the MMS Relay 3 can be dispensed with. The value or the character string ELF is assigned to it as contents.
- [0067] X-Mms-External-Link-Size: This specifies the size of linked content outside the MM. This is indicated by the content ELS. Since the data scope of an internal content cannot be read from link itself this information is of great interest for a user. It can be created directly on generation of the MM in the sending MMS User Agent 2. Alternatively generation by the MMS-Relay 3 is possible, but in addition to the analysis of the entire MM also requires access to the object listed in the reference to determine size.
- [0068] X-Mms-Content-Related-URI: The information CRV of this field specifies the location of another element to which data record 7 refers. For example a data record 7 as a presentation description which refers to other elements with audio, video or other content of the MM. The generation of this information requires on the one hand knowledge about the internal references of the elements of an MM which is present on the side of the sending MMS User Agent 2 and on the other hand knowledge relating to the positions of the MM elements for MMS-Relay/Server 3 or at recipient 4. The information can be encoded on the sending MMS User Agent 2 side in header fields and is to be corrected/updated by MMS-Relay 3 on the basis of the then current positions and is subsequently to be evaluated in the receiving MMS User Agent 4.
- [0069] Generation or updating in MMS Relay 3:
- [0070] X-Mms-Content-ID: Is adapted by the MMS Relay when the Content ID changes.
- [0071] X-Mms-Content-Type: If the MMS Relay 3 changes the type and/or the format of a data record 7, the Content Type is updated accordingly.
- [0072] X-Mms-Content-Size: Size of the data record 7, specified in octets. Only if the MMS Relay 3 changes the type and/or format of the data record is the information relating to the content size updated.
- [0073] With the differentiated information which a user 4 has received with the message 11 (WAP: M-Notification-ind), access to individual data records 7 is possible via the selection switch 25 which is typically implemented on the software side in a menu and operated via a means of input such as a keyboard. Thus a partial download can be initiated by a download request with the Content ID of a relevant required data record 7 (for example of a photo without simultaneous transmission of the accompanying text) in WAP with command 13: WSP GET.req.
- [0074] To enable this to be done the basic problem to be resolved is that the additional header fields must under some circumstances be used a number of times in an MM (WAP: e.g. X-Mms-Content-Name for each data record 7 of the MM). If there are a number of header fields in a content relationship, as is the case for the description of a data record, a syntactical assignment must be defined.
- [0075] Basically, in the WAP Standard, the sequence of the header fields is of no significance. A change of the sequence of information name, size, type and/or URI of a number of data records 7 thus cause a change or corruption of the description of data record 7 if the assignment of the information was to be made dependent on the sequence of the header elements, which is the only viable way since there is no provision for a hierarchical structure of the header elements in WAP.
- [0076] On the other hand the statement about the irrelevance of the header element sequence contradicts the statement that HTTP headers which include lists of to be converted into a number of WSP headers each with only a single element, in which case the sequence of the entries should be retained. To resolve this contradiction a system will be designed for which a requirement is the significance of the sequence of header elements.
- [0077] To restrict the descriptions of individual data records 7 a defined header field must begin the description of a data record 7 to which all subsequent header fields are assigned until either the end of the header of the message is reached or a next header field of the defined type marks the beginning of the description of further data record 7.
- [0078] Field 17: X-Mms-Content-ID serves as a defined header field for the description of a data record 7, since it contains the unique address of the element. The description of a data record 7 is basically initiated by this field, after which the other fields can appear optionally and in any sequence.
- [0079] Alternatively to the system with unique markers for the message elements—the Content-IDs—and the corresponding references in the header, it is also possible to have a system which operates by specifying an offset to the described data record in the data part of the MM. The disadvantage here however is the danger of not calculating the offset correctly or of not adapting it correctly for a possible format conversion in MMS Relay 3, and on the other hand the lack of an option for establishing a logical relationship between a description of a data record 7 in the notification 11 and in the actual transmission 14 of the MM. The information must then be contained once more in the Multimedia Message delivered.
- [0080] The sender (layer 2) can activate an input facility implemented by hardware or especially by software and

operated via the keyboard which is always available at their telecommunications device 5 to enable them to store in the header fields 17, 18, 19, 20, 21, 22, 23 the additional information or a part of this information (see above). This will be sent as a component of an identification signal for one or more data records 7 of the MM with the transmission 9 (in WAP: M-Send.req) (FIG. 1) to the provider (layer 3). The send confirmation by MMS-Relay 3 (in WAP with message 10: M-Send.conf) remains unchanged since the only essential information is the message ID issued optionally by MMS-Relay 3.

[0081] Recipient 4 then receives message 11 (in WAP M-Notification.ind) indicating that there is an MM for him with one or more data records 7 for downloading. This notification 11 in its turn contains all additional header fields 17, 18, 19, 20, 21, 22, 23 to describe the data record 7 from the header of message 9 for sending the message (in WAP: M-Send.req). This information can be notified to the recipient visually (via display means 24, for example the display) or audibly.

[0082] The response 12 (WAP: M-NotifyResp.ind) confirming receipt of notification 11 remains unchanged.

[0083] After the recipient 4 of the MM is given detailed information about its contents he can download the entire MM (in WAP: by command 13: WSP Get.req). Alternatively in accordance with this invention access to an individual element of the MM is also possible. For this purpose for example the content ID of a data record 7 of the MM is used as a URI in the command for download. Without the agreement of the recipient 4 downloading of the MM (sending a transmission 14 to the recipient) is not enabled. It is also possible that the recipient 4 only wishes to receive the MM at the later, cheaper point in time.

[0084] The actual data transmission 14 can contain the descriptive header fields 17, 18, 19, 20, 21, 22, 23. This is not mandatory however, as shown in FIG. 7.

[0085] Finally the MMS-Relay 3, if the sender 2 so desires, sends the report 16 about the status of the delivery of the MM (in WAP: M-Delivery.ind) to the latter. As well as the options already known "Expired", "Retrieved", "Rejected", "Deferred", "Partly-retrieved" can also occur in the status field in accordance with the invention the indicator shows which data record 7 was retrieved. The corresponding section of message 16 could be as follows:

[0086] >>>>

[0087] 7.2.22 Status field

[0088] Status-value=
Expired|Retrieved|Rejected|Deferred|Partly-retrieved

[0089] Expired=<Octet 128>

[0090] Retrieved=<Octet 129>

[0091] Rejected=<Octet 130>

[0092] Deferred=<Octet 131>

[0093] Partly-retrieved=<Octet 132>

[0094] <<<<

[0095] Fields 22, 23 X-Mms-External-Link-Flag (optional) and X-Mms-External-Link-Size (optional) which are also new can display the links and contained in the MM

to content outside the MM in the messages 9 or sending the MM (WAP: MSend.req) and in the message 11 the recipient 4 (WAP: MNotification.ind). Depending on its position in the MM header field 22: X-Mms-External-Link-Flag specified as a link to external contents within the entire MM or within a specific data record 7 of the MM. Field 23: X-Mms-External-Link-Size optionally describes the size of the content in octets. This allows the recipient of the notification to already estimate the volume of data in addition to the MM itself that is still to be downloaded.

[0096] The procedure presented can be integrated into software for operating the relevant communications standards, such as UMTS. The telecommunications devices 5,6 are then provided with corresponding software.

[0097] Illustrated below is a concrete sequence according to the invention of the transfer of an MM as per the WAP standard (FIG. 1):

[0098] The following typical scenario is assumed: Sender 2 (Markus Trauberg) sends an MM with the text with the number of data records 7, namely an MP3 audio, a JPEG image, an MPEG-4 video and an SMIL-presentation description to two recipients 4 (Andreas Schmidt and Josef Laumen). For convenient and differentiated use by the recipient 4, he inserts descriptions of parameters of the data records 7 of the MM in their header. The data is transferred in the messages 9 (M-Send.req) and 11 (M-Notification.ind) to the recipients. Recipient 4 Andreas Schmidt loads the complete MM onto his terminal 6, whereas recipient 4 Josef Laumen is only interested in the text and only loads this onto his terminal 6. The following MMs will be transferred between the units:

[0099] MM is sent to two addressees. The message protocol can then be depicted as shown in FIG. 9.

[0100] In the MM the additional information blocks about the MM elements are encoded into the header. The relationships between the data record 7 of the MM are also described in the header: Thus the description of the presentation description contains references to the external elements within it Image/jpeg, audio/mp3 and video/mpeg4 in the form of a corresponding Content IDs. The description of the text contains the information that a reference to an external object is included, comprising 8245 bytes of data.

[0101] The above send request 9(MSend.req) of sender 2 is confirmed with message 10 (MSend.conf) from MMS Relay 3. This message 10 does not contain any additional new fields as can be seen from its subsequent version, which is depicted in FIG. 10.

[0102] MMS Relay 3 confirms with message 10 that request 9 has been transmitted error-free to MMS Relay 3. Transaction-ID#1 is used to uniquely assign message 10 at sender 2 to the associated request 9 (M-Send.req) and thereby to the sent MM. Because a delivery report was requested in message 9 in field X-Mms-Delivery-Report, MMS Relay 3 of the MM assigns a Message-ID and transfers this here to sender 2.

[0103] Message 11 is Subsequently Transferred to Recipient 4:

[0104] M-Notification.ind (MMS Relay~MMS User Agent B):

[0105] There is provision in MMS for informing a recipient of an MM about new messages that are available for them. Message 11 (M-Notification.ind) serves to notify the addressee about the MM available for download. Consequently in this example there exist two notifications to recipients Andreas Schmidt and Josef Laumen. Each includes its own Transaction-ID. The information about the memory location of the MM is in the field X-Mms-Content-Location in both the notifications.

[0106] FIG. 11 reflects the typical content of M-Notification-ind.

[0107] As well as the normal fields that the beginning of Message 11 all descriptive elements of message 9 can now be transferred to message 11. In addition, as described above using the mixed form, MMS Relay 3 also generates the information X-Mms-Content-Type and X-Mms-Content-Size from the information of the body of message 9. Recipient 4 knows after receiving message 11 both the address of the MM (as previously) as well as the composition from the individual data records 7 and their content IDs. Access to separate data records 7 of the MM is thus also possible.

[0108] The correct receipt of the notification is subsequently confirmed by the recipient 4 of the MM with message 12 (MNotifyResp.ind) by the corresponding transaction ID of Message 11 together with a status message being returned to MMS Relay 3.

[0109] The download of the MM is initiated by command 13 (WSP GET.req). The MM is then sent by MMS Relay 3 in message 14 (M-Retrieve.conf) to recipient 4.

[0110] Since the information about the individual elements was already transferred with message 11, the download of the entire MM can be undertaken as previously with message 14 without additional fields having to be inserted into the header of this message 14. The additional information in the headers of the individual data records 7 on the other hand should also be contained in Message 14 since they contain important information about the MM data records 7.

[0111] Shown below are two possible typical reactions of recipient 4:

[0112] Recipient Andreas Schmidt loads the entire MM.

[0113] Recipient Josef Laumen only loads the text part of the MM onto his terminal 6.

[0114] In the first case Message 14 is encoded as depicted in FIG. 12:

[0115] Recipient 4 Andreas Schmidt confirms the successful receipt of the MM with subsequent message 15 (M-Acknowledge.ind). The TransactionID contained in the message allows assignment to the sent MM in accordance with the information signal M-Acknowledge.ind from FIG. 13 at MMS Relay 3.

[0116] As a last step of the transaction, message 16 (M-Delivery.ind) is finally delivered from MMS Relay 3 to sender 2 in accordance with FIG. 14:

[0117] The second recipient Josef Laumen on the other hand decides to only load the text part of Message 14. To do this he uses the Content ID of the text part in message 13 (WSP GET.req): "000714.1412.1markus.trauberg". He receives this text part with message 14 (M-Retrieve.conf), which unlike the version to Andreas Schmidt is clearly changed and of which the typical content is shown in FIG. 15.

[0118] Message 14, compared to its complete version, as was sent to Andreas Schmidt, is reduced by the data records 7 that are not required. In addition the field nEntries has been adapted accordingly.

[0119] Message 15 (M-Acknowledge.ind), which is shown in FIG. 16, corresponds almost completely to the version sent to Andreas Schmidt, but contains a separate Transaction-ID;

[0120] As the last stage sender 2 is again notified about the status of the delivery. The message contains the status of the partial delivery ("Partly-retrieved") and its contents are shown in FIG. 17.

[0121] As well as the previously described options for detailed notification of recipients of multimedia messages (MMs) in the Multimedia Messaging Service (MMS) there is a further useful option that has advantages over the variants already presented. This advantageous option is described below.

[0122] The core of this modification is the realization of the idea of informing the relevant recipient in detail about the contents of the corresponding MM, in which case only a single newly-defined header field is used, for which new parameters will be introduced. The new header field in this case contains all parameters, i.e. information about the element of the MM to be described. Element or data record of an MM is taken in this invention disclosure to mean an individual component of an MM which is defined especially by its type (e.g. still image) and by its format (e.g. JPEG (=Joint photography expert group)).

[0123] The following list contains the information already proposed for the previous variants which can be made available to the recipient of an MM optionally in a recipient notification in MMS (M-Nind; in WAP: MNotification.ind). This includes:

[0124] the number of elements that the MM contains (also implicitly through the description of the individual elements of the MM),

[0125] the size (in octets) of an element,

[0126] the type and the format of an element

[0127] the Content ID (Content Identification) of an element (=Name or identifier of the relevant header field of the relevant identification signal),

[0128] the name of an element,

[0129] the connection of an element to one or more other elements of the MM,

[0130] the connection of the entire MM or of one/a number of elements to one or more URLs/URIS (uniform resource link/identifier) outside the MM

and for such an external reference optionally the size of the objects of the resolved external reference(s) to be loaded.

[0131] The definition of the corresponding header fields for the optional expansion of the MMS recipient notification (M-Nind; in WAP: M-Notification.ind) and where necessary also the send request (M-Sreq; in WAP: M-Send.req) and the MMS delivery confirmation (M-Rconf; in WAP: M-Retrieve.conf) are described in the subsequent exemplary embodiment.

[0132] An MM basically consists—as shown in the previous exemplary embodiments—of a header and, depending on the type of message, if necessary of a data part (WAP: Body) as well. A header comprises general information of the message and is made up of one or more defined header fields. Any data part of the message contains one or more elements of any given type which follow the header in any given sequence. If a presentation description is contained in the data part, what is known as the start parameter should preferably refer to this presentation description at the beginning of the data part, in a WAP message for example.

[0133] FIG. 1 shows a message flow diagram of the basic sequence of a transmission of a message from the user application of the sending user 2 (User Agent A=M-UA_A) the MMS connection unit and 3 (MMS Relay=M-SR) to the user application of the receiving user 4 (User Agent B=M-UA_B).

[0134] The header fields in a WAP which are possible or required depending on the message type are shown for the message types here in the tables corresponding to FIGS. 21A/21B und 22. These have been taken from WAP-209-MMSEncapsulation, Release 2000; Wireless Application Protocol; WAP Multimedia Messaging Service; Message Encapsulation; MMS Proposed SCD 1.0. According to WAP-203-WSP, Version 4-May-2000; Wireless Application Protocol, Wireless Session Protocol Specification; Chapter 8.4: “Header Encoding” each header field consists of a field, followed by a field value which consists of at least one octet. The assignment of hexadecimal values to the field names of the WAP Message is shown in the table corresponding to FIG. 20.

[0135] This further option is based on the definition of a header field for unique identification of an element of an MM introduced for the previous exemplary embodiments, the header field X-Mms-Content-ID that in the body of the MM precedes the element of the MM as a header field and uniquely identifies the element.

[0136] The description of an element of the MM here differs from the previous proposals in that it is based on a single header field X-Mms-Content-ID that is integrated into the header of the MM to notify the recipient and that the necessary information (for the notification of the recipient, e.g. about number, type, size, and format of the data records of the MM provided for them) is described by one or more parameters from the following list.

[0137] Name describes the name of the MM element;

[0138] Type describes the type and the format of the MM element;

[0139] Size describes the size of the MM element in bytes;

[0140] External-Link indicates that the element includes a link to content outside the MM;

[0141] External-Link-Size specifies how much data must additionally be downloaded to resolve the external reference;

[0142] Related-ID specifies which element of the MM is related to the element and the loaded should also be loaded for a partial download of the MM (multiple use possible).

[0143] Thus, expressed in general terms the identification signal for one or more assigned data records is transmitted encoded in a single additional header field from the relevant sender such as for example a first mobile radio device and/or relevant server in an MMS recipient notification to the recipient such as for example a second mobile radio device. This avoids right from the start sequencing and assignment problems such as could occur with the use of a number of header fields between these fields themselves and/or the assigned data records.

[0144] Furthermore in addition to the information already described for the previous exemplary embodiments, the following information should also be able to be encoded as parameters:

[0145] 1. Original-Type describes the type of MM element before the transcoding by the MMS relay (MSR);

[0146] 2. Original-Size describes the size of the MM element before transcoding by the MMS relay (MSR) in bytes;

[0147] Combining all the relevant information for an MM element into a single header field removes the need to adhere to the header sequence as is required with the previous exemplary embodiments.

[0148] FIG. 18 shows the newly introduced header field for the purposes of detailed notification of the recipient of an MM in accordance with WAP, including the encoding of field name and field value. The Table according to FIG. 20 contains the assignment of hexadecimal values to the field name. The table in accordance with FIG. 19 contains the assignment of hexadecimal values to the parameter names and furthermore the types to be used for encoding the parameter values. The messages as expanded by the corresponding header fields are listed in Tables 21A/21B and 22. All changes and expansions to the prior art in the tables are enclosed within a frame.

[0149] Exemplary Embodiment:

[0150] In the exemplary embodiment which now follows, which is based on the definition of the described messages by the WAP Forum, there is a detailed examination of the header fields used in the WAP messages. The embodiment assumes the following example scenario: M-UA A (Markus Trauberg) sends a Multimedia Message MM_A consisting of a text, an MP3 audio, a JPEG image, an MPEG-4 video and an SMIL (synchronized multimedia Integration language) presentation description to a recipient M-UA_B (Andreas Schmidt). For convenient and differentiated use by the recipient descriptions of the elements of the MM are added to the MM header in accordance with this invention disclosure. The data is transferred in messages M-Sreq and

M-Nind to the recipient. Recipient Andreas Schmidt loads the complete MM onto his terminal. The following messages are transmitted between the units.

[0151] MM_A is sent to an addressee. Its content is depicted by way of example in FIG. 23.

[0152] The additional information blocks, i.e. in general terms the one or more parameters about the MM elements are encoded into the message. In these blocks the relationships between the elements of the MM are also described: Thus the description contains the presentation description (*.smil) pointers to the elements referenced within it Image/jpeg, audio/mp3 and video/mpeg4 in the form of the corresponding Content-IDs.

[0153] The description of the text contains the information that a pointer to an external object which comprises 8245 bytes of data is included.

[0154] According to the prior art the send request (WAP: M-Send.req) of MMS User Agent A will be confirmed with a message (in WAP:M-Send.conf) from M-SR. This message is not modified as part of this EM and thus not listed here.

[0155] M-Nind (M-SR->M-UA-B)

[0156] In MMS (multimedia services) corresponding to 3G TS 23.140 version 3.0.1, Release 1999; Third Generation Partnership Project; Technical Specification Group Terminals; Multimedia Messaging Service (MMS); Functional Description; Stage-2 and WAP-209 MMS Encapsulation, Release 2000; Wireless Application Protocol WAP Multimedia Messaging Service; Message Encapsulation; MMS Proposed SCD 1.0 there is provision for informing a recipient of an MM about new messages that are available for them. The message M-Nind (in WAP: M-Notification.ind) serves to notify the addressee about MMs that are ready for them to download. Their typical content is depicted in FIG. 24. There therefore exists in this example a recipient notification to recipient Andreas Schmidt. The information about the memory location of MMA is in field X-Mms-Content-Location here.

[0157] As well as the usual fields at the beginning of the message all descriptive elements of message M-Sreq that are new for this variant can be transferred into message M-Nind. In addition the M-SR also generates the information type and size from the information of the body of message M-Sreq or the image of type image/jpeg that it contains is converted into the type image/bmp since the terminal cannot display JPEG images. The corresponding information about the original type and the original size have been supplemented in the corresponding header field. The recipient knows after receiving the detailed notification both the address of the MM (as previously) and also the composition of the individual elements and their Content-IDs. An access is thus also possible separately to the individual elements of the MM.

[0158] The correct receipt of the notification can subsequently be confirmed by the recipient of MMA with the message M-NRind, by returning of the corresponding Transaction-ID of the M-Nind together with a status report to the MMS Relay. The downloading of MMA is then initiated by the command W-Greq. The MM will then be sent by MSR in the message M-Rconf to MM-UA A.

[0159] Subsequently the message will be completely downloaded by the recipient Andreas Schmidt onto his terminal. The message M-Rconf is for example encoded as depicted in FIG. 25.

[0160] Recipient M-UA B subsequently confirms the successful receipt of MMA in accordance with the prior art with message.

[0161] Viewed in overall terms this provides a procedure for transmitting additional information for detailed description of a Multimedia Message and the MM elements contained within it in the Multimedia-Messaging-Service (MMS). This information is especially transmitted with the individual or with a number of additional header fields in the relevant MMS recipient notification by the server responsible as M-SR to the receiving User Agent. The necessary information is preferably generated by the sending User Agent and transferred to the server responsible encoded by the latter in the MMS send request. In addition to this or independently the information needed can also be extracted by the responsible switching/provision server from the data part of the relevant MM to be sent and transmitted encoded to the receiving User Agent in the MMS recipient notification. Preferably one or more of the following items of information about the content or individual elements of the content of the message which is for example ready for delivery in the Server responsible can be notified to the receiving User Agent:

- [0162] number of elements contained in the MM
- [0163] size of the element of the MM (in octets)
- [0164] Type format of the element of the MM
- [0165] identification of the element (Content-ID or URI)
- [0166] Name of the element
- [0167] the connection of one or more elements to one or more other elements within the MM (e.g. between presentation description and presentation element)
- [0168] the connection of one or more elements to content of any nature outside the MM (e.g. to HTML/GHTML pages)
- [0169] the relevant size of the linked external elements (in octets) that can be loaded in addition to the MM itself
- [0170] the type and the format of the element before transcoding by the M-SR
- [0171] the size of the element before Trans coding by the M-SR (in octets)

[0172] The identification of the element (Content-ID or URI) in particular forms the first entry in the individual header field or the content of the first header fields if the number of header fields are used per element or data record.

[0173] The description of an element of an MM can preferably be executed with an individual field in each case which uses a unique identification number identifier or to point to the element in the data part of the Multimedia message and which also contains the further information as parameters and not in separate header fields.

[0174] The recipient of an MM can preferably, after he has received a detailed Notification, also load only individual elements of the MM onto his terminal. In just the same way it is also possible that the additional information of the MMS recipient notification in accordance with this invention (M-Nind) is also expanded in the header of the MMS delivery message (M-Rconf). Preferably the additional header fields—if only a single header field is used per data record—can be encoded in WAP as follows:

[0175] Coding of the field named X-Mms-Content-ID in range of values between 00x00 and 0X7F, especially as 0x19 in accordance with the table shown in FIG. 20.

[0176] Encoding of the field value of X-Mms-Content-ID in accordance with FIG. 9.

[0177] The information as pa3.rameters in this single header field can be especially encoded in accordance with the table shown in FIG. 19.

[0178] You can obtain background information about WAP and MMS, especially the relevant literature concerning the standards, from the following sources:

[0179] [1] 3G TS 23.140 version 3.0.1, Release 1999; Third Generation Partnership Project; Technical Specification Group Terminals; Multimedia Messaging Service (MMS); Functional Description; Stage 2

[0180] [2] WAP-209-MMS Encapsulation, Release 2000; Wireless Application Protocol; WAP Multimedia Messaging Service; Message Encapsulation; MMS Proposed SCD 1.0

[0181] [3] WAP-203-WSP, Version 4-May-2000; Wireless Application Protocol, Wireless Session Protocol Specification; Chapter 8.4: "Header Encoding".

[0182] [4] WAP-Forum: "WAP MMS Interworking with Internet Email; WAP207-MmsInetInterworking"; Draft Version 01-Jun.-2000.

[0183] [5] 3G TS 22.140 v.4.0.1 (July 2000): 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Service Aspects; Stage 1 Multimedia Messaging Service.

[0184] [6] RFC822: "Standard for the Format of ARPA Internet Text Messages", Crocker D., August 1982. URL: <ftp://ftp.isi.edu/in-notes/rfc822.txt>.

[0185] [7] RFC2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", Freed N., November 1996. URL: <ftp://ftp.isi.edu/in-notes/rfc2045.txt>.

[0186] [8] RFC2046: "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", Freed N., November 1996. URL: <ftp://ftp.isi.edu/in-notes/rfc2046.txt>.

[0187] [9] RFC2047: "MIME (Multipurpose Internet Mail Extensions) Part Three: Message Header Extensions for NonASCII Text", Moore K., November 1996. URL: <ftp://ftp.isi.edu/in-notes/rfc2047.txt>.

[0188] Within a context of the description of the invention reference has been made within the context, for the sake of

easier notation, to the following widely-used acronyms and to aid understanding the full versions of these acronyms are listed below:

[0189] GSM Global System for Mobile Communication

[0190] MM Multimedia Message

[0191] MMS Multimedia Messaging Service

[0192] SMS Short Message Service

[0193] UMTS Universal Mobile Telecommunication System

[0194] WAP Wireless Application Protocol

[0195] WSP Wireless Session Protocol

[0196] MMS Specific Abbreviations:

[0197] M-UA MMS User application

[0198] M-SR MMS Relay

[0199] M-Sreq MMS Send request

[0200] M-Sconf MMS Send confirmation

[0201] M-Nind MMS Recipient notification

[0202] M-Nrind MMS Recipient notification confirmation

[0203] W-Greq MMS delivery request

[0204] M-Rconf MMS delivery message

[0205] M-Rind MMS delivery confirmation

[0206] M-bind MMS delivery status notification

1. Method of transmitting data in a mobile radio network, in particular of text and/or image data with and without sound, characterized in that the data is assigned an identification signal for a data record or a number of data records and that this identification signal or these identification signals is or are transmitted to the recipient of the data.

2. Method in accordance with claim 1, characterized in that the identification signal or identification signals are transmitted before the transmission of the data record or data records characterized by this signal and can be indicated visually or audibly.

3. Method in accordance with claim 2, characterized in that the recipient of the identification signal or signals can select whether to allow all or part of the data characterized by this/these signal(s) to be transmitted.

4. Method in accordance with one of claims 1 to 3, characterized in that an identification signal contains information about the type of the data record, especially its data format.

5. Method in accordance with one of claims 1 to 4, characterized in that an identification signal contains information about the name of a data record.

6. Method in accordance with one of claims 1 to 5, characterized in that an identification signal contains information about the content of a data record.

7. Method in accordance with one of claims 1 to 6, characterized in that an identification signal contains information about the size of a data record.

8. Method in accordance with one of the claims 1 to 7, characterized in that an identification signal contains information about the number of data records within transmitted data.

9. Method in accordance with one of the claims 1 to 8, characterized in that an identification signal contains information about a link with at least one data record within the sent data.

10. Method in accordance with one of the claims 1 to 9, characterized in that an identification signal contains information about a link with at least one data record outside the sent data.

11. Method in accordance with one of the claims 9 or 10, characterized in that an identification signal contains information about the size of that data record or those data records to which a transmitted data record is linked.

12. Method in accordance with one of the claims 1 to 11, characterized in that an identification signal contains information about the identification of a data record.

13. Method in accordance with one of the claims 1 to 12, characterized in that the method in the Mobile Messaging Service (MMS) is applied and the transmitted data takes the form of Mobile Messages (MM).

14. Method in accordance with one of the claims 1 to 13, characterized in that the method in the transmission standard UMTS (Universal Mobile Telecommunication System), in GSM (Global system for mobile communication), in GPRS (General packet radio Service) and/or in EDGE (Enhanced Data Rates for GSM environments) is used.

15. Method in accordance with one of the claims 1 to 14, characterized in that the identification signal or signals are assigned to one or more header fields of the transmitted data.

16. Method in accordance with one of the claims 1 to 15, characterized in that an identification signal is stored in at least one additional header field.

17. Method in accordance with one of the claims 1 to 16, characterized in that the identification signal or signals are at least partly generated by the sender and are transmitted on transmission of a multimedia message from the sender (MMS user agent A) to the service provider (MMS relay).

18. Method in accordance with claim 17, characterized in that the sender generates one or more of the header fields, X-NINIS-Content-ID, X-MMS-Content-Name, X-MMS-Content-Type, XNINIS-External-Link-Flag, X-MMS-External-Link-Size.

19. Method in accordance with one of the claims 1 to 18, characterized by the fact that the identification signal(s) will be generated at least partly from the data record received from the service provider (MMS Relay)

20. Method in accordance with claim 19, characterized in that the MMS Relay generates or updates one or more of the header fields X-MMS-Content-ID, X-MMS-Content-Size, X-MMS-Content-Type.

21. Method in accordance with one of the claims 1 to 20, characterized in that the identification signal or signals will be transmitted in each case in the notification to the recipient (MMS user agent B) by the MMS Relay of the service provider about the presence of one or more new data records of a multimedia message.

22. Method in accordance with one of the claims 1 to 21, characterized in that the telecommunications device of the

recipient is assigned to a selection facility through which the latter, after at least partly noting the identification signal or signals, can give a confirmation that they are ready to receive the message and that transmission to the recipient is not enabled until after the selection facility has been initiated.

23. Method in accordance with claim 22, characterized in that the readiness to receive only relates to a part of the data and that the transmission of only this part of the data record is enabled.

24. Method in accordance with one of the claims 1 to 23, characterized in that the notification about the availability of data (MNotification.ind) and of the actual sending of the data (MRetrieve.conf) is added to the additional identification signal or signals.

25. Method in accordance with one of the claims 1 to 24, characterized in that the readiness for at least partial receipt of the available data is assigned to be message WSP Get.req sent by the recipient to the provider.

26. Mobile telecommunications device (5;6) to execute the method in accordance with one of the claims 1 to 25, characterized in that the mobile telecommunications device (5;6) is assigned to a selection switch (25) for complete or partial confirmation or rejection of readiness to receive one wall more identified data record or data records (7).

27. Mobile telecommunications device in accordance with claim 26, characterized in that the mobile telecommunications device (5;6) he is assigned a means of display (24) for visual or audible indication of the identification signal or signals of one or more data records (7).

28. Mobile telecommunications device in accordance with one of claims 26 or 27, characterized in that the selection switch (25) is implemented on the software side and can be selected via a means of input.

29. Mobile telecommunications device (5;6), characterized in a that this device is assigned software for occupying header fields (17;18;19;20;21;22;23) of data transmissions with the least one identification signal.

30. Computer program product that includes a computer-readable storage medium on which a program is stored that, once it has been loaded into the memory of the computer, allows a computer within a data transmission in a mobile radio network, to forward to the relevant recipient (4) at least one identification signal for the data it to be transmitted with characterizing information about data record (7) or a number of data records (7).

31. Computer program product in accordance with claim 30, characterized in that this executes a method in accordance with one of the claims 1 to 25 for sending data in a mobile radio network.

32. Radio communications system in which had least one component operates according to a method of the previous claims.

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