NowSMS MMSC Training: MMSC Interconnection Protocol (MM4)

NOVEMBER 2015

MM4 – MMSC Interconnect

The MM4 protocol is used to interconnect MMSCs.

- SMTP based protocol defined by 3GPP TS 23.040
- Additional X-MMS SMTP headers are defined
- Different PDUs are mapped to SMTP headers

When a subscriber sends an MMS message to a subscriber on a different network, the MM4 protocol is used to transfer the message between MMSCs

MM4 – MMSC Interconnect

MM4 connections can exist directly between mobile operators.

Frequently a single MM4 connection to an interconnect provider is used.

MM4 is not used for roaming, only for interconnect.

MM4 Message Encoding

The **MMS Envelope** contains Routing Attributes (sender and recipient) for an instance of an in-transit message. In MM4, this envelope is represented by the standard SMTP MAIL FROM: and RCPT TO: commands.

The **MMS Headers** are represented as SMTP Headers, with MMS specific headers prefixed by X-MMS- (e.g., X-MMS-Message-Type:). These headers are defined in 3GPP TS 23.140.

The **MMS Content** is encoded as a standard SMTP MIME multipart object. Note that even if there is only a single content object (e.g., image only), many implementations still expect a MIME multipart with only 1 part.

Sample MM4 Transaction

SMTP AUTH is optional and rarely used

```
IN: 220 SMTP Ready
OUT: HELO client.name (or EHLO client.name)
IN: 250 OK (or a multiline response if EHLO was used)
OUT: AUTH LOGIN
IN: 334 VXNlcm5hbWU6
(NOTE: "Username:" BASE64 encoded)
OUT: dGVzdA==
(NOTE: "test" BASE64 encoded)
IN: 334 UGFzc3dvcmQ6
(NOTE: "Password:" BASE64 encoded)
OUT: dGVzdA==
(NOTE: "test" BASE64 encoded)
IN: 235 Ok
OUT: MAIL FROM: <+447779998888/TYPE=PLMN@mms.oper.com>
IN: 250 Ok
OUT: RCPT TO: <+447778889999/TYPE=PLMN@mms.domain.com>
IN: 250 Ok
OUT: DATA
IN: 354 Ok, end with "." on a new line...
OUT: (Transmit MIME encoded message, then end with a line with only the . character)
IN: 250 Message Accepted
OUT: QUIT
```

Sample MM4 Message

```
X-Mms-3GPP-MMS-Version: 5.9.0
X-Mms-Message-Type: MM4_forward.REQ
X-Mms-Transaction-ID: "60755231.94578772@mmsc"
X-Mms-Message-ID: "148478240@mmsc.hub"
X-Mms-Ack-Request: Yes
X-Mms-Originator-System: system-user@mmsc.hub
Message-ID: <60755231.94578772@mmsc>
Date: Tue, 8 May 2007 12:18:32 +0300
To: +447778889999/TYPE=PLMN@mms.domain.com
From: +447779998888/TYPE=PLMN@mms.oper.com
Subject: News for today
Content-Type: multipart/mixed; boundary="StoryParts-74526-8432-2002-77645"
Content-ID:<SaturnPics-01020930@news.tnn.com>

--StoryParts-74526-8432-2002-77645
Content-Type: text/plain; charset="us-ascii"

Science news, new Saturn pictures...
--StoryParts-74526-8432-2002-77645
Content-Type: image/gif
Content-ID:<saturn.gif>
Content-Transfer-Encoding: base64

R0lGODdhZAAwAOMAAAAAAIGJjGltcDE0OOfWo6Ochbi1n1pmcbGojpKbnP/lpW54fBMTE1RYXEFO
...
--StoryParts-74526-8432-2002-77645--
```

MM4 in NowSMS MMSC

In NowSMS, to define an MM4 interconnection, it is necessary to define two components.

The **outbound** connection to the other MMSC is defined under **“MMSC Routing”**.

The **inbound** connection from the other MMSC is defined under **“MMSC VASP”**.

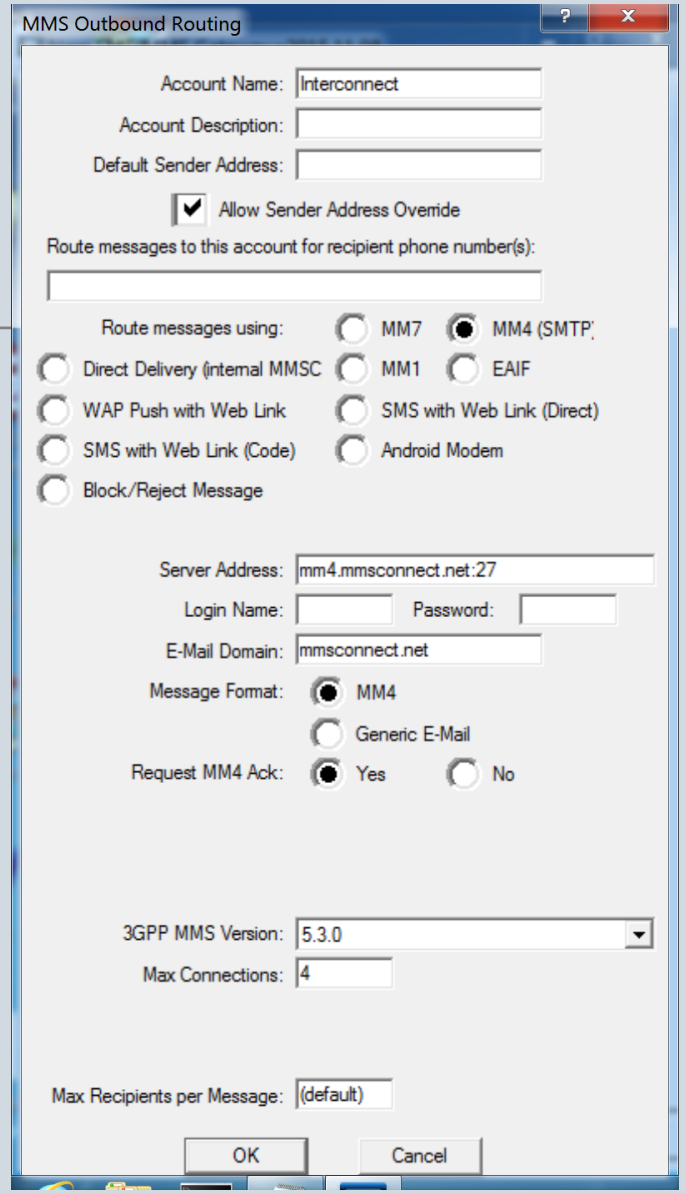
Outbound – MMSC Routing

Account Name is a name that is used to identify the connection within NowSMS only.

Account Description is a description that is used to identify the connection within NowSMS only.

Default Sender Address should be left blank.

Allow Sender Address Override should be checked.

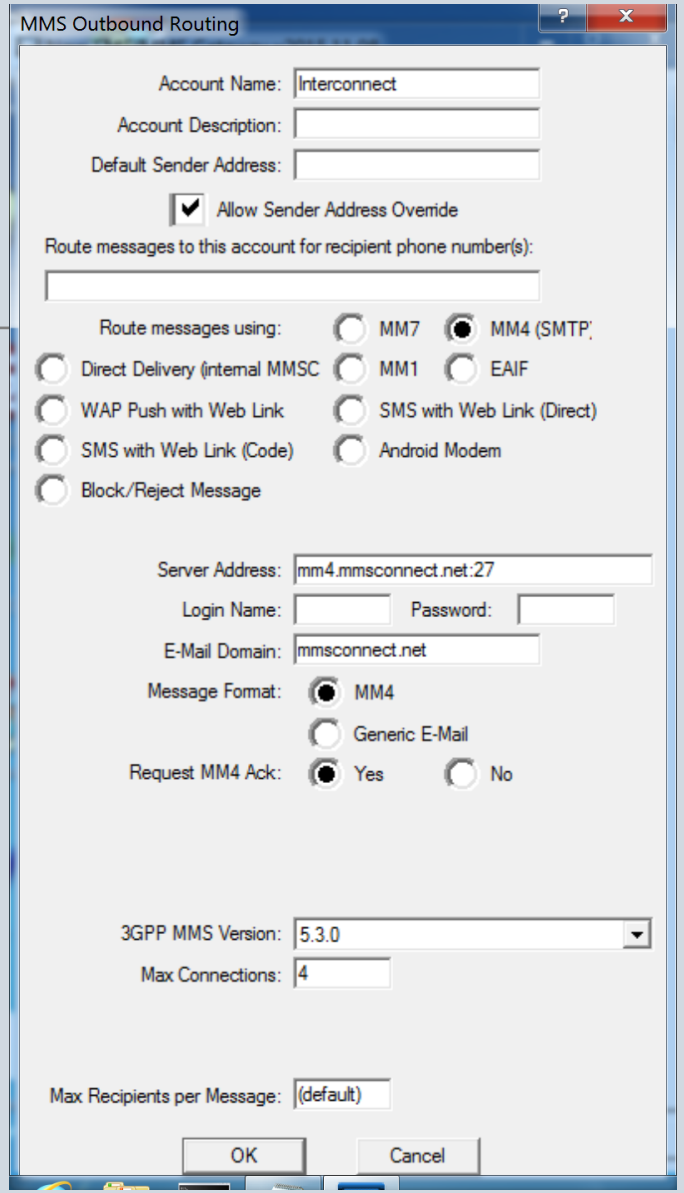


Outbound – MMSC Routing

“Route Messages to this account for recipient phone numbers” should have a list of phone number patterns to be routed to this other MMSC … e.g., +234*,+44*

Alternatively, instead of defining number patterns, it is possible to define this routing as the “Default Route” on the “MMSC Routing” page. This means that the route will be used as a default, unless a better match is found in another “MMSC Routing” definition. (For example, if another “MMSC Routing” was defined as the “Default Route”, but this route had the number patterns +234*,+44* … a message to +447777777777 would go this route instead of the “Default Route”.)

Or leave blank and use routing callbacks to control routing.

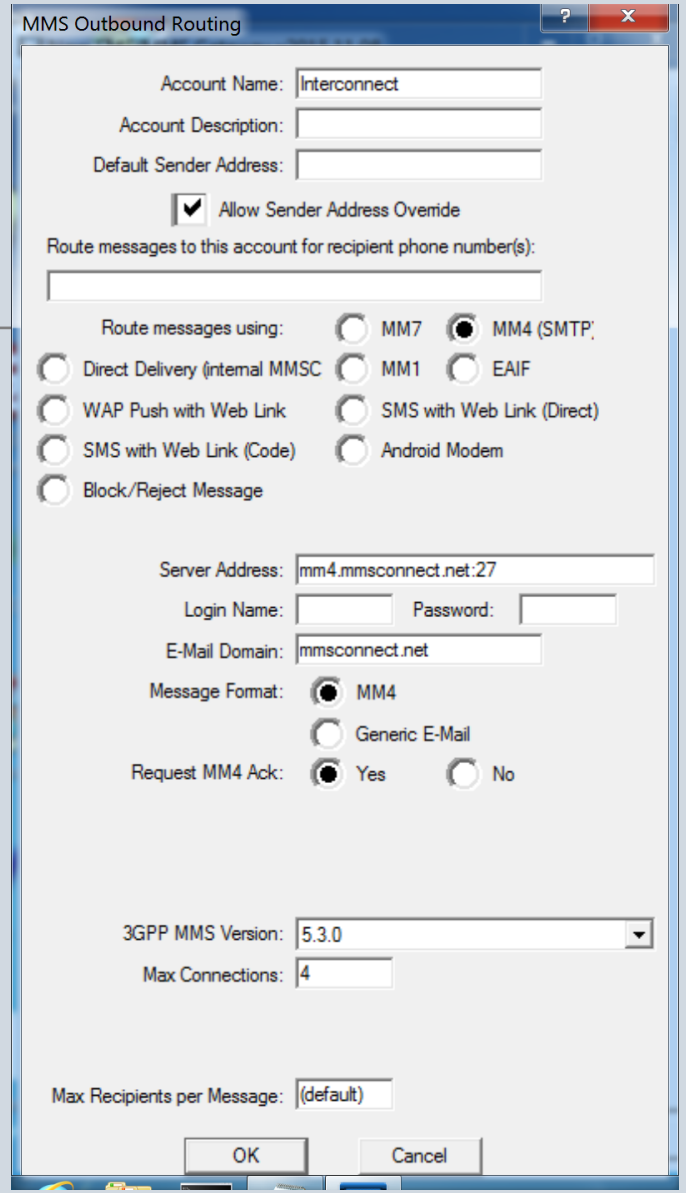


Outbound – MMSC Routing

“Route messages to VASP via” should be set to “MM4”.

“Server Address” is the DNS host name or IP address for the external MM4 connection. It can have the following format: host.name, ip.address, host.name:#### or ip.address:#### …. the #### is a port number, if a port number is not specified, 25 (the standard SMTP port) is assumed.

“Login Name” and **“Password”** specify a username and password to be used for SMTP basic authentication. Most MMSCs do not use any type of username authentication, and they authenticate based upon IP addresses only. In that case, these fields should be left blank.



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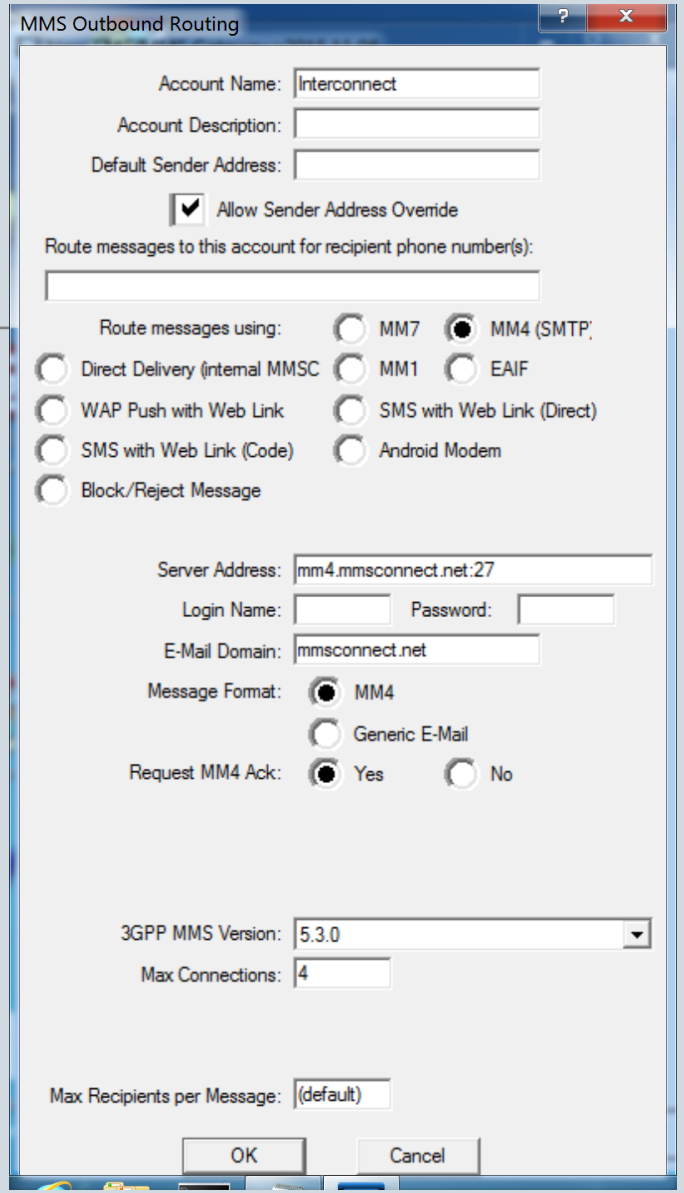
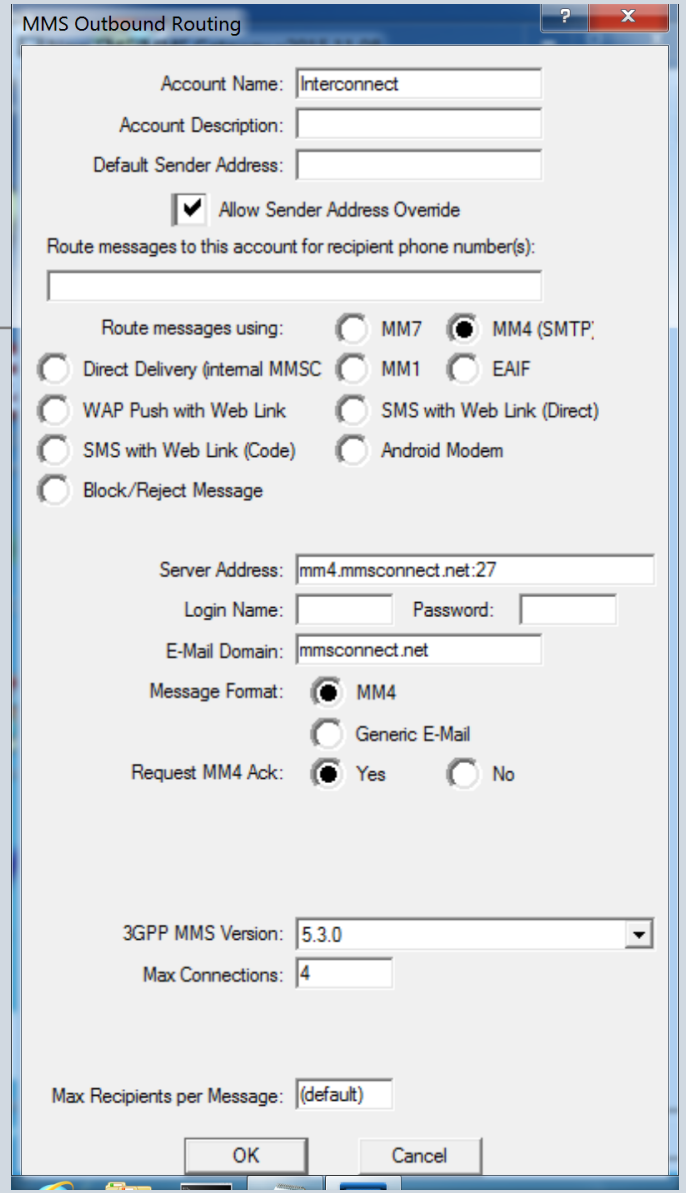


Outbound – MMSC Routing

“E-Mail Domain” refers to the e-mail domain name for MMS messages that is used by the other system (e.g., phonenumber@domain.name).

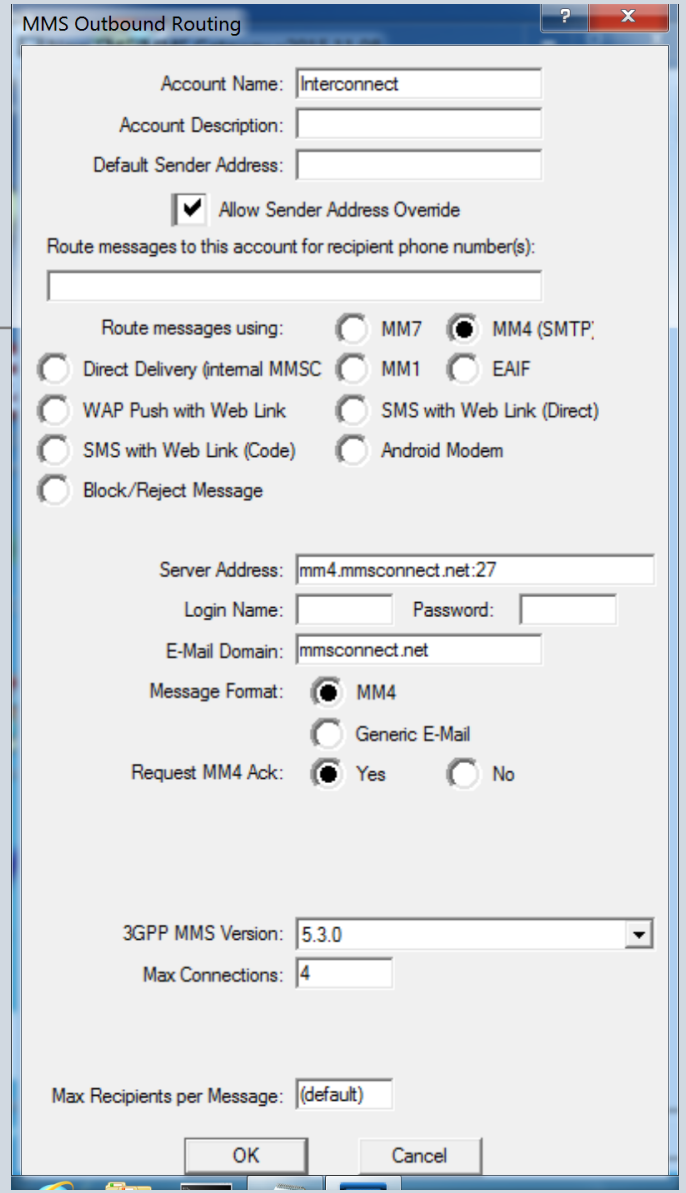
“Message Format” is normally set to MM4, which means that standard MM4 headers are used in the messages. For special circumstances, the SMTP setting will avoid the use of MM4 specific headers.



Outbound – MMSC Routing

“Request MM4 Ack” can be set to “Yes” or “No”, depending on the requirements of the partner. It is usually best to start with “Yes”, but some partners may reject messages unless this parameter is set to “No”.

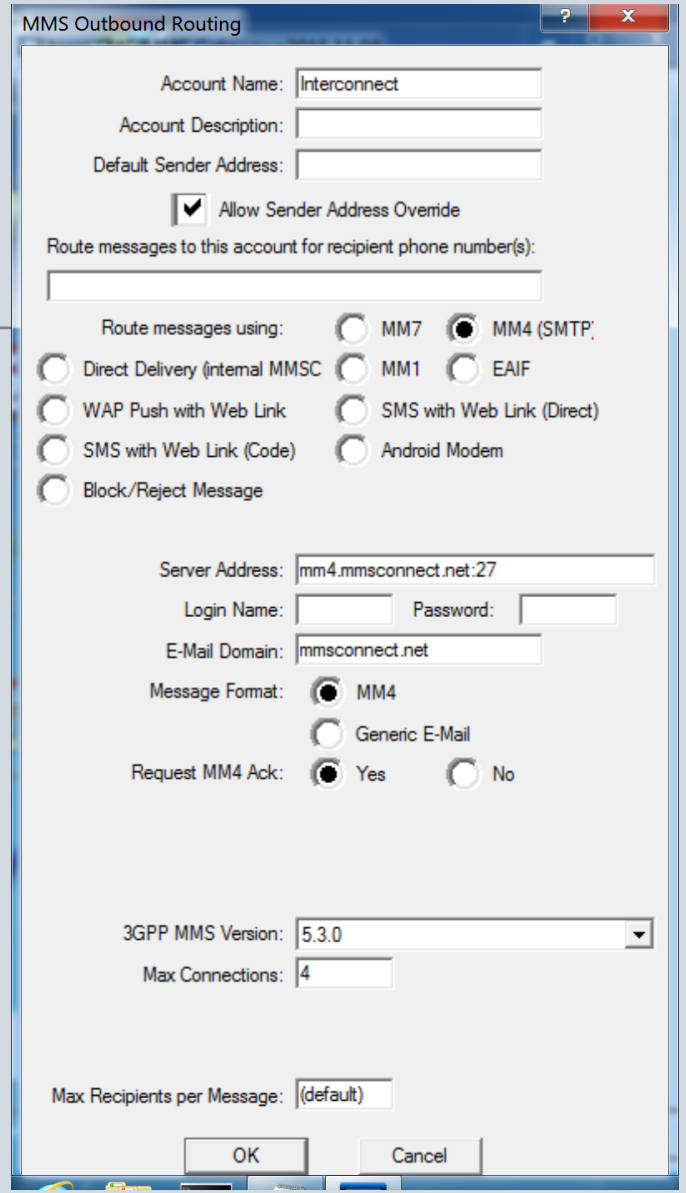
“3GPP MMS Version” should only be changed if a specific version is required by the partner..



Outbound – MMSC Routing

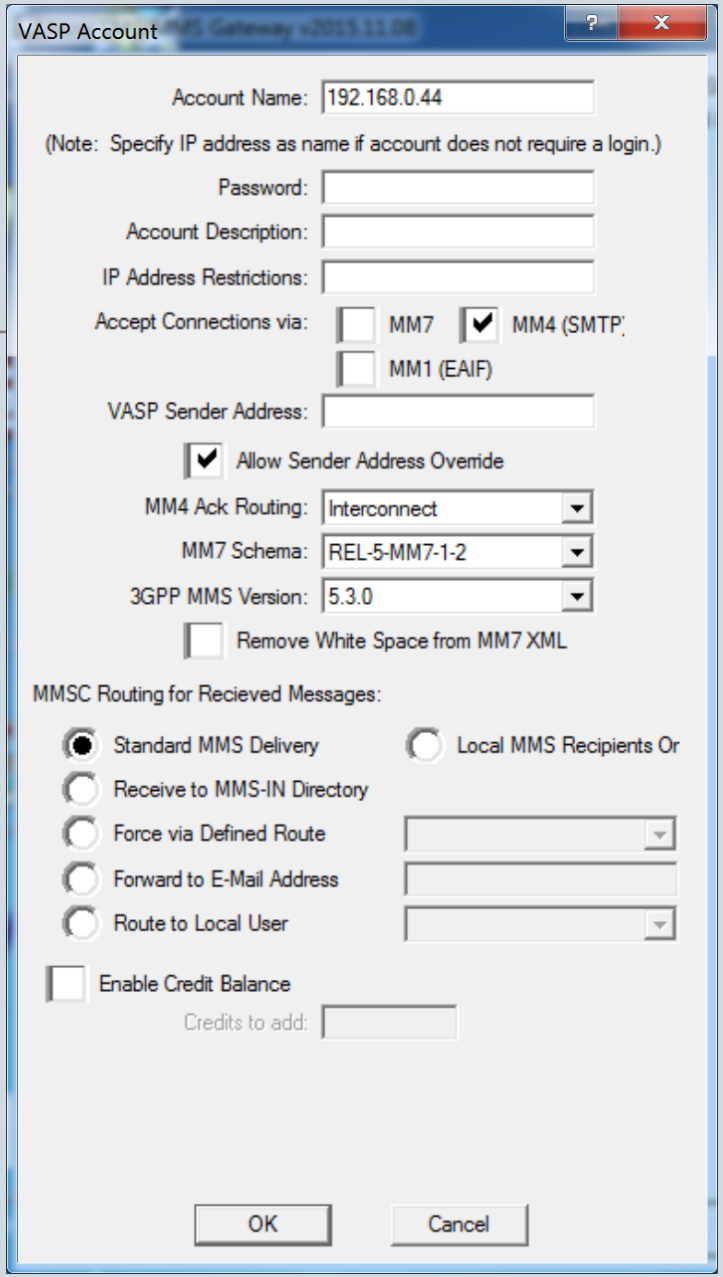
“Max Connections” can be set to allow multiple concurrent connections to the partner for higher throughput. In most situations, this field can be left blank, where it defaults to 1.

Once this “MMSC Routing” definition is in place, any MMS messages that are addressed to a phone number that matches one of the patterns defined in “Route Messages to this account for recipient phone numbers” will be routed via this connection.



Inbound – MMSC VASP

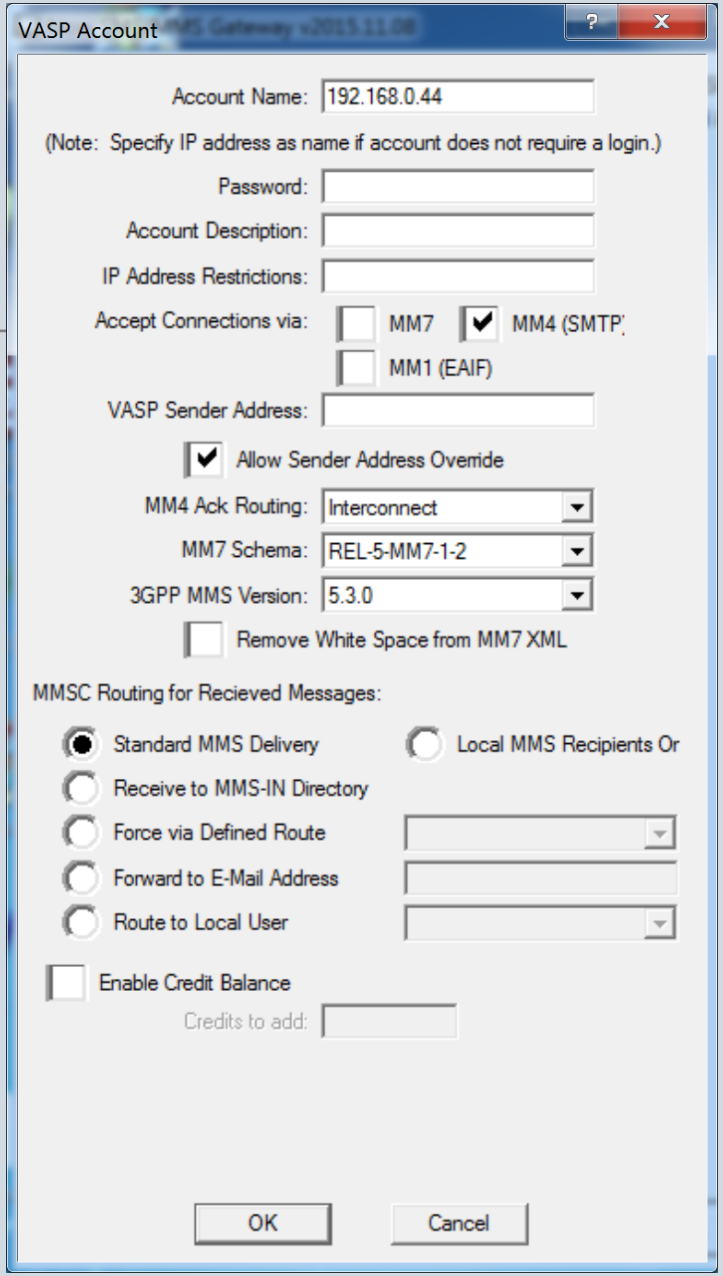
The next step is to define an inbound connection to allow your MMSC to accept messages from the other MMSC. This is done by defining an “MMSC VASP” account.



Inbound – MMSC VASP

The **“Account Name”** and **“Password”** fields are used to define authentication parameters that allow the partner to submit messages to your MMSC. Most MMSCs do not support user-based authentication. In this case, you need to define the external IP address of the other MMSC as the “Account Name” and leave the “Password” field blank. If the MMSC has multiple IP addresses from which it will connect to you, then multiple “MMSC VASP” definitions must be defined.

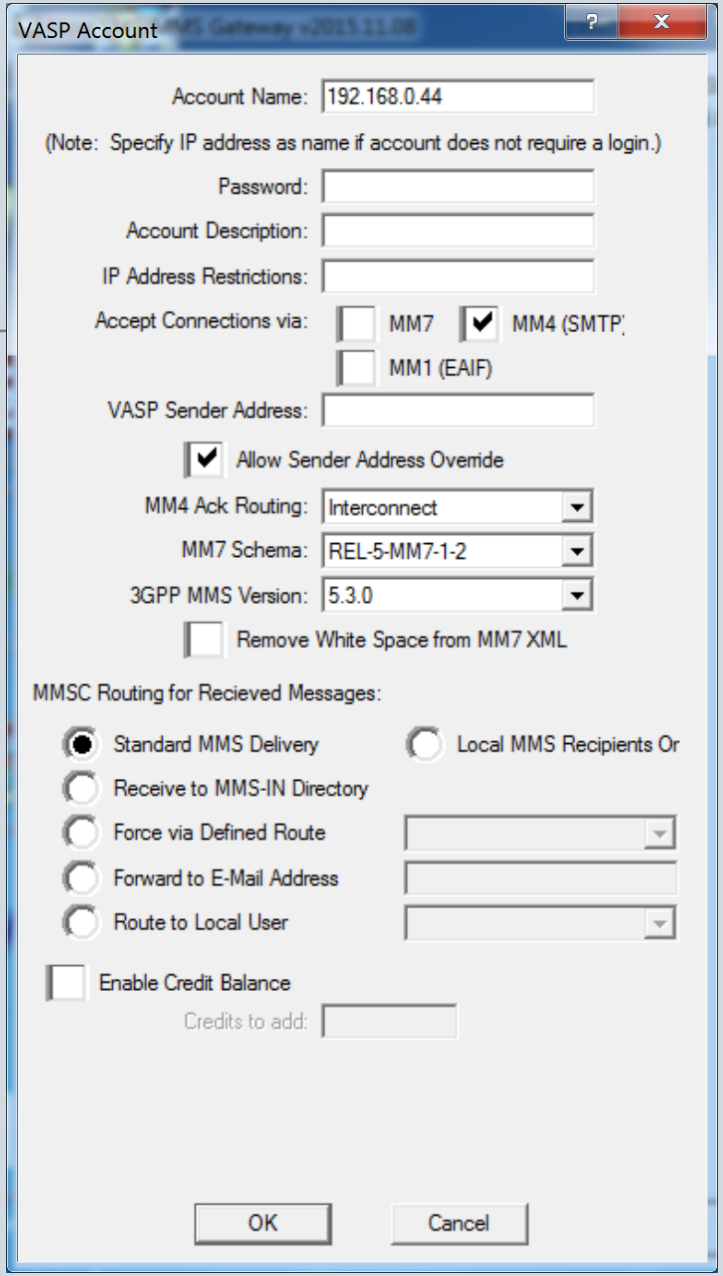
“Account Description” is a description that is used only within NowSMS itself.



Inbound – MMSC VASP

“IP Address Restrictions” is a comma delimited list of IP addresses from which the partner is allowed to connect. (This setting is somewhat redundant if the “Account Name” is an IP address.)

“Accept Connections via” should be set to MM4 for an MM4 connection.

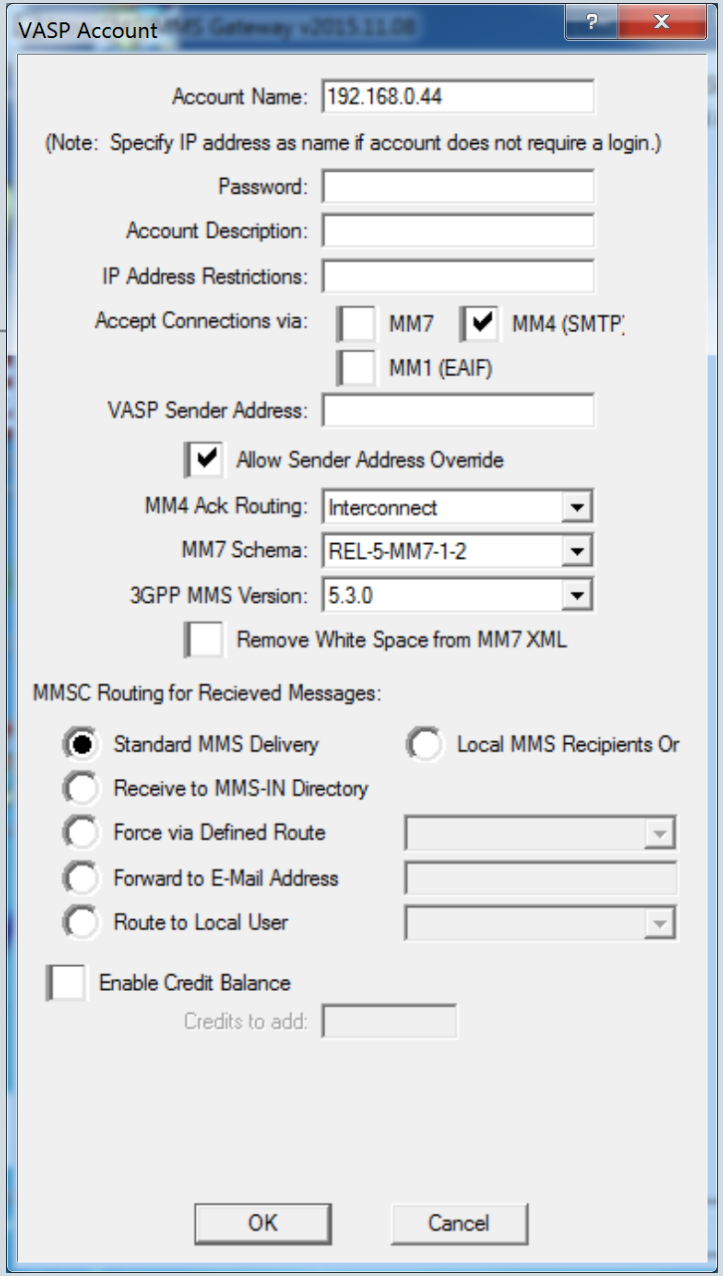


Inbound – MMSC VASP

“VASP Sender Address” should be left blank.

“Allow Sender Address Override” should be checked.

“MM4 Ack Routing” should be set to the name of the outbound “MMSC Routing” definition that you defined for routing messages to the other MMSC. (This ensures that acknowledgments are sent back to the correct server.)

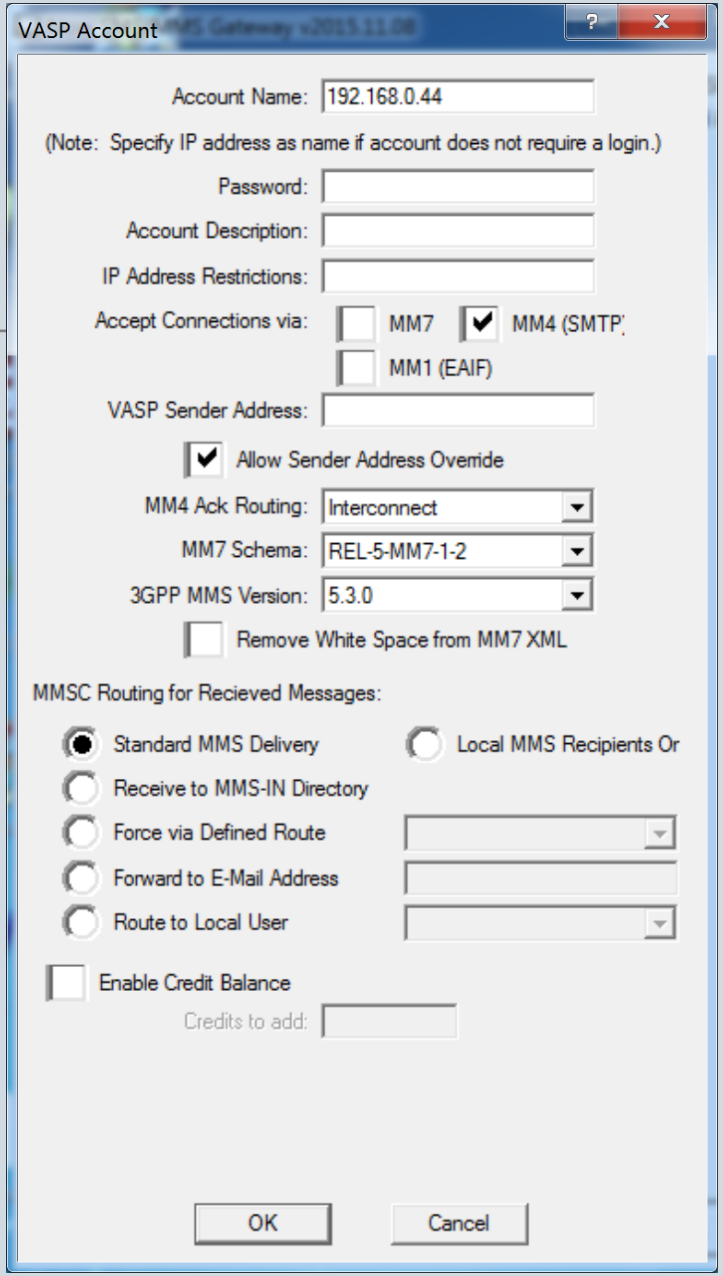


Inbound – MMSC VASP

“3GPP MMS Version” should be changed only if a specific version is required by your partner.

“MM7 Schema” is not used for MM4 connections.

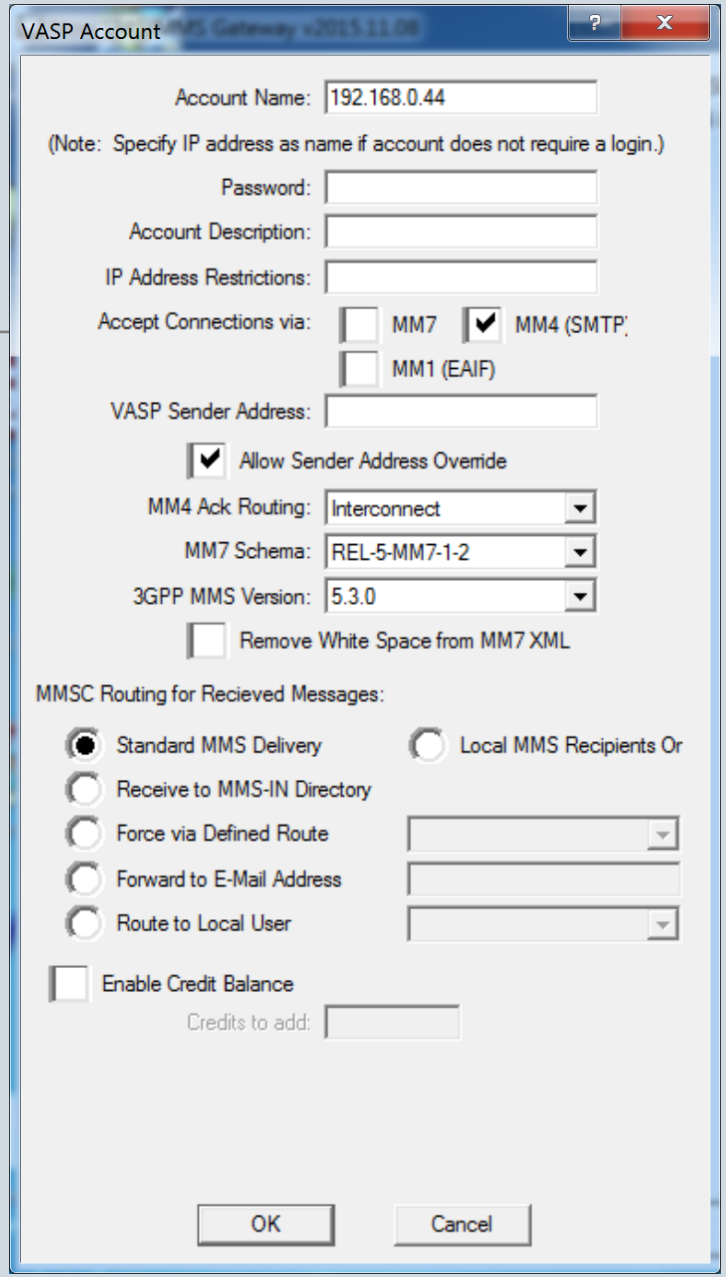
“Remove White Space from XML” is not used for MM4 connections.



Inbound – MMSC VASP

“MMSC Routing for Received Messages” should be set to “Standard MMS Delivery”.

Credit balances and message sending limits are normally not used for MM4 interconnection partners.



MM4 PDU Kinds

There are two kinds of MM4 PDUs:

1. **Request**: Denoted as MM4_type-name.REQ
2. **Response**: Denoted as MM4_type-name.RES
   (Often referred to as ACKs or acknowledgments)

MMS Accounting Callbacks

When external MMSC Routes exist, such as these MM4 connections, there are additional parameters in the MMS Accounting Callbacks, beyond the parameters defined in http://www.nowsms.com/support/bulletins/tb-nowsms-001.htm.

The following additional parameters may be present in both the MMSSend PreAuth Callback and the MMSSend Accounting Callback:

VASPIN=xxxxxxx – This parameter is present if the message was received via an inbound connection defined in the “MMSC VASP” list.

VASP=xxxxxxx – This parameter is present if the NowSMS MMSC is routing the message to an outbound connection defined in the “MMSC Routing” list.

MMS Routing Callbacks

Sometimes the “Route Messages to this account for recipient phone numbers” parameter setting in an “MMSC Routing” definition is not flexible enough for real world environments with Mobile Number Portability (MNP).

The NowSMS MMSC implements a dynamic MMS routing callback facility for environments where more advanced MMS routing capabilities are required.

The standard NowSMS MMSC configuration allows for MMS routing based upon phone number prefixes. However, in MNP environments, it may be necessary to query a database to determine how to properly route an MMS message.

Dynamic MMS routing callbacks also allow for MMS routing control based upon who submitted the MMS message. For example, it may be desirable to block MMS sending to international destinations for some or all MMS VASP accounts.

More information on these routing callbacks can be found at the following link:

http://www.nowsms.com/tag/mnp

MMS Routing Callbacks

The NowSMS MMSC implements a dynamic MMS routing callback facility for environments where more advanced MMS routing capabilities are required.

The standard NowSMS MMSC configuration allows for MMS routing based upon phone number prefixes. However, in MNP environments, it may be necessary to query HLR or a database to determine how to properly route an MMS message.

When the MMS Routing callback is enabled in NowSMS, each time the MMSC receives a message, it will connect to a configurable customer-provided routing callback URL, passing the message recipient to the URL. The customer provided URL can return a response to indicate that the message should be routed via a specific route defined in the “MMSC Routing” page of the NowSMS configuration dialog, or the response can indicate that the message should be rejected.

MMS Routing Callbacks (continued)

The MMS routing callback URL is defined in the MMSC.INI file, under the [MMSC] section header:

MMSRoutingURL=http://server.name/path

The variables listed below will be added to the MMSRoutingURL when the URL is executed by the gateway as HTTP GET (CGI-style) parameters.

Type=MMSRouteCheck (Note: Future “Type” values may be added in the future.)

From=SenderPhoneNumber or e-mail addressVASPIN=VASPname (present if the message was received via a specific account defined in the “MMSC VASP” list)

To=RecipientPhoneNumber

MMS Routing Callbacks (continued)

Example:

http://server.name/path?Type=MMSRouteCheck&From=%2B1234567&VASPIN=test&To=%2B9999999999

(Note: The “%2B” in the above examples is standard URL escaping for the “+” character.)

To specify which of the routes defined in the “MMSC Routing” list should be used to route this message, the URL must return a standard HTTP 200 OK response, and include the following text somewhere in the response:

Route=xxxxxxx

“xxxxxxx” should match an “Account Name” defined in the “MMSC Routing” list, or it can use the predefined values of “Direct” (signifying MMSC Direct Delivery), “WAPPush” (signifying “Convert to Multimedia WAP Push”), or “BlockMessage” (signifying the MMSC should reject the message).

MM4 PDU Transmission

MM4 PDUs are sent using SMTP.

Because the SMTP protocol is uni-directional and contains limited status report capability, requests and their associated response can never be transmitted over the same connection,

When an MMSC has a request to transmit to another MMSC over MM4, it initiates an SMTP connection to that MMSC to transfer the request PDU.

The receiving MMSC must then initiate an SMTP connection back to the requesting MMSC to transfer the response PDU.

MM4 PDUs

Transaction	PDU Type Name
Send Message	MM4_forward.REQ
	MM4_forward.RES
Delivery Report	MM4_delivery_report.REQ
	MM4_delivery_report.RES
Read Report	MM4_read_reply_report.REQ
	MM4_read_reply_report.RES

MM4 Transaction: Simplified

Step 1

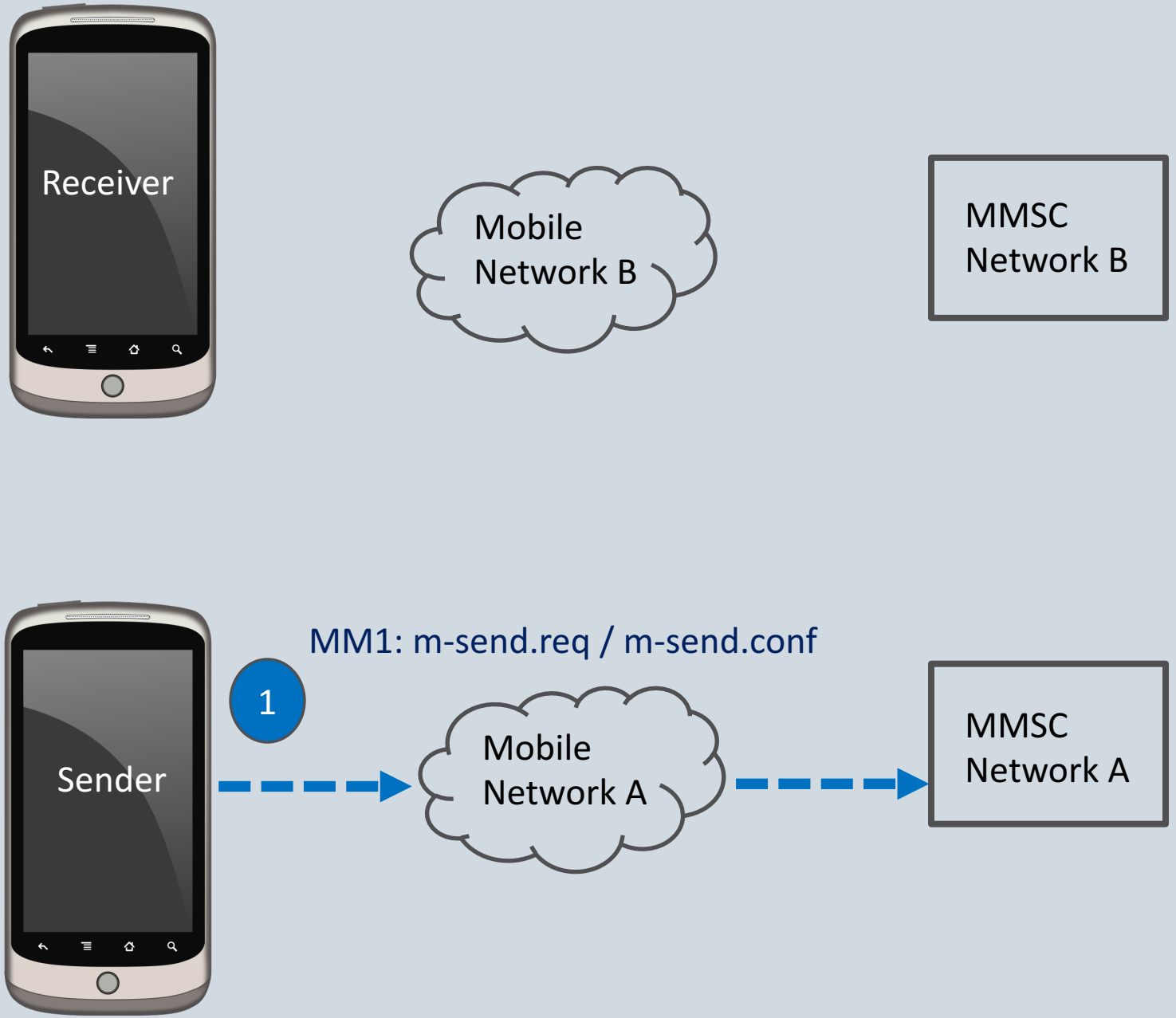
Standard MM1 MMS MO Logic Flow

MM1 m-send.req from sending client to their operator MMSC

Accounting callback checks whether message should be accepted.

Routing callback checks recipient routing.

MM1 m-send.conf confirms MMSC acceptance of message

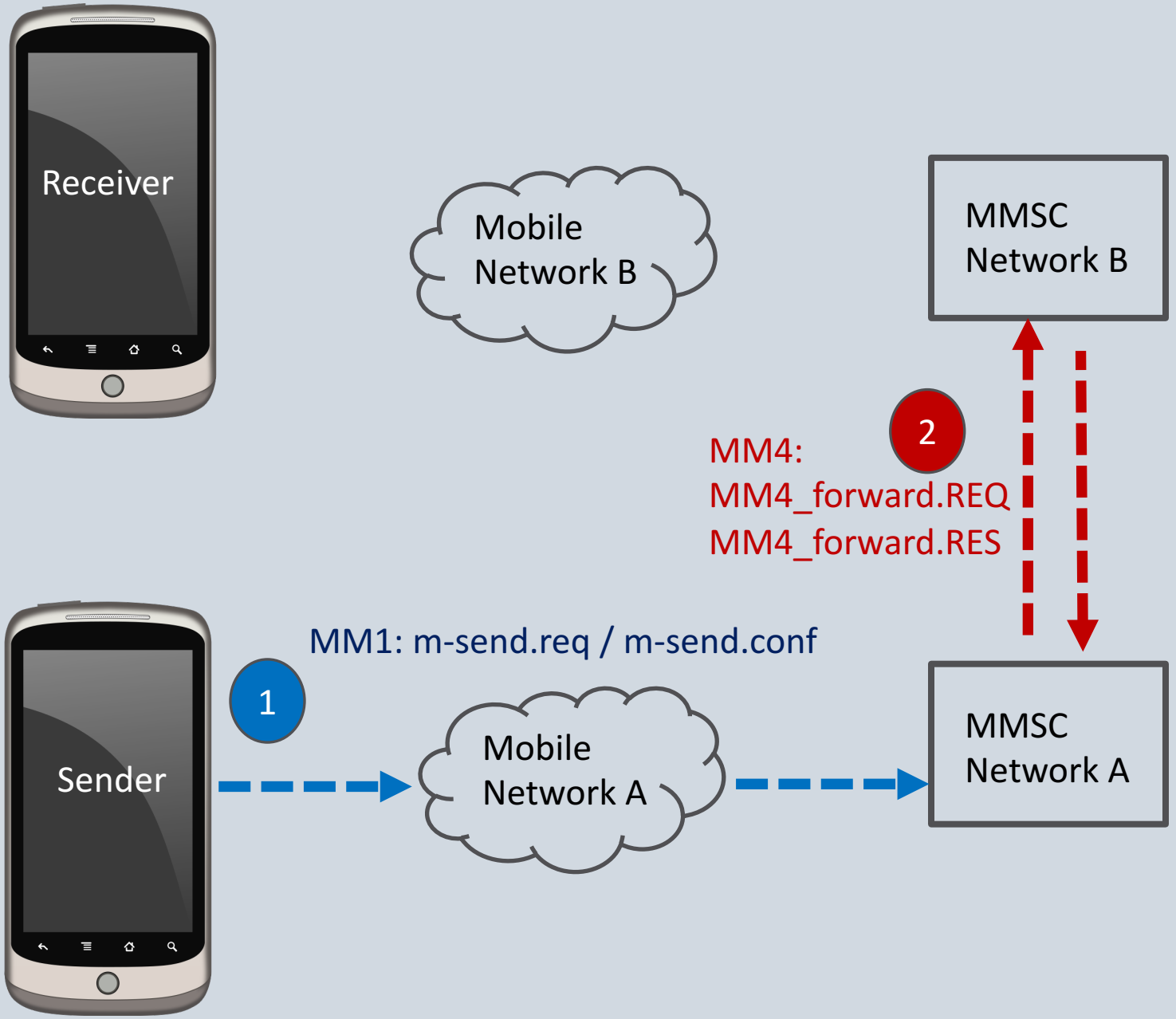


MM4 Transaction: Simplified

Step 2

MMSC initiates MM4 connection to other operator MMSC and uses MM4_forward.REQ transaction to transfer message.

Other MMSC initiates MM4 connection back to originator MMSC and uses MM4_forward.RES transaction to confirm MMSC acceptance of message

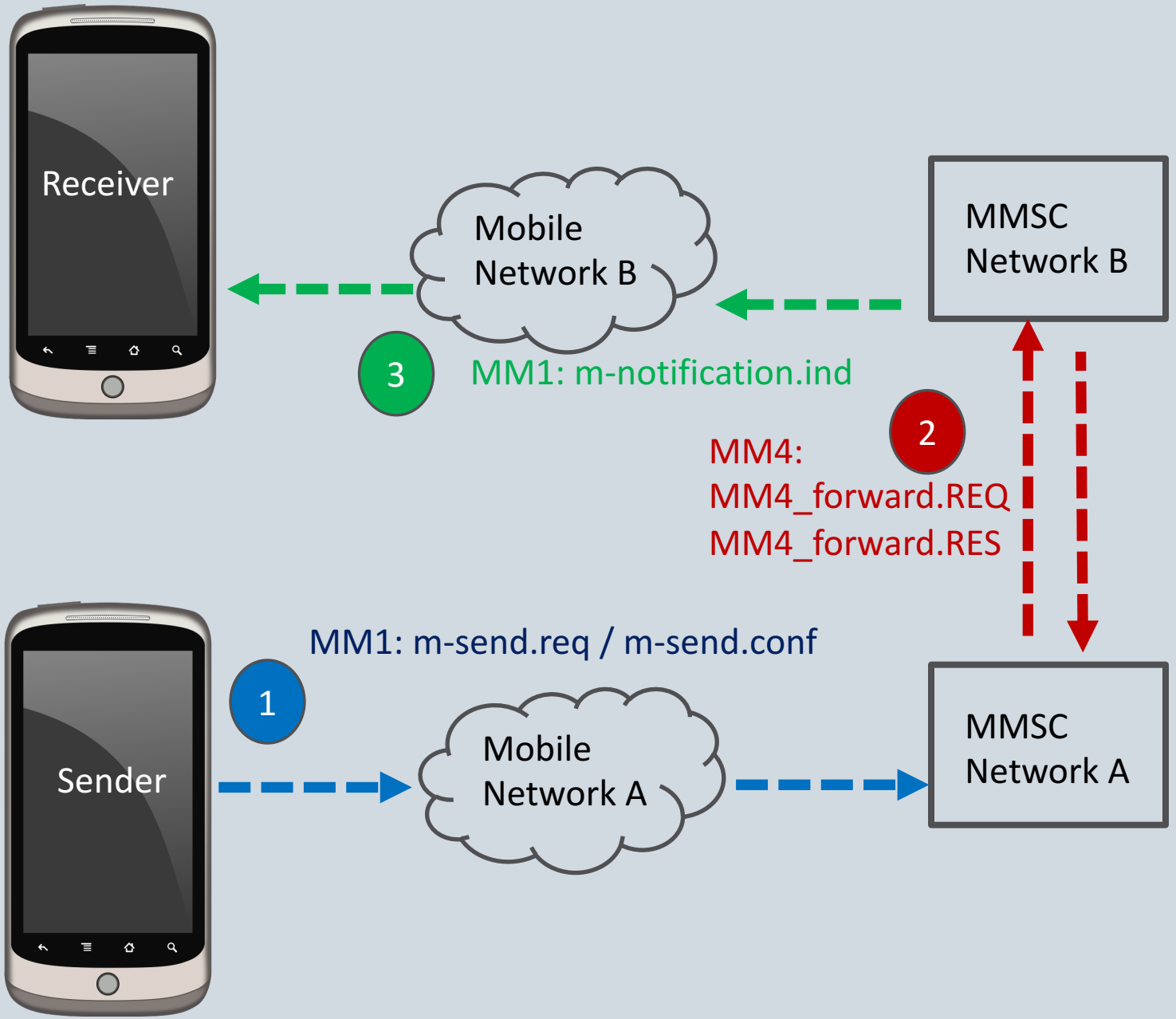


MM4 Transaction: Simplified

Step 3

Standard MM1 MMS MT Logic Flow

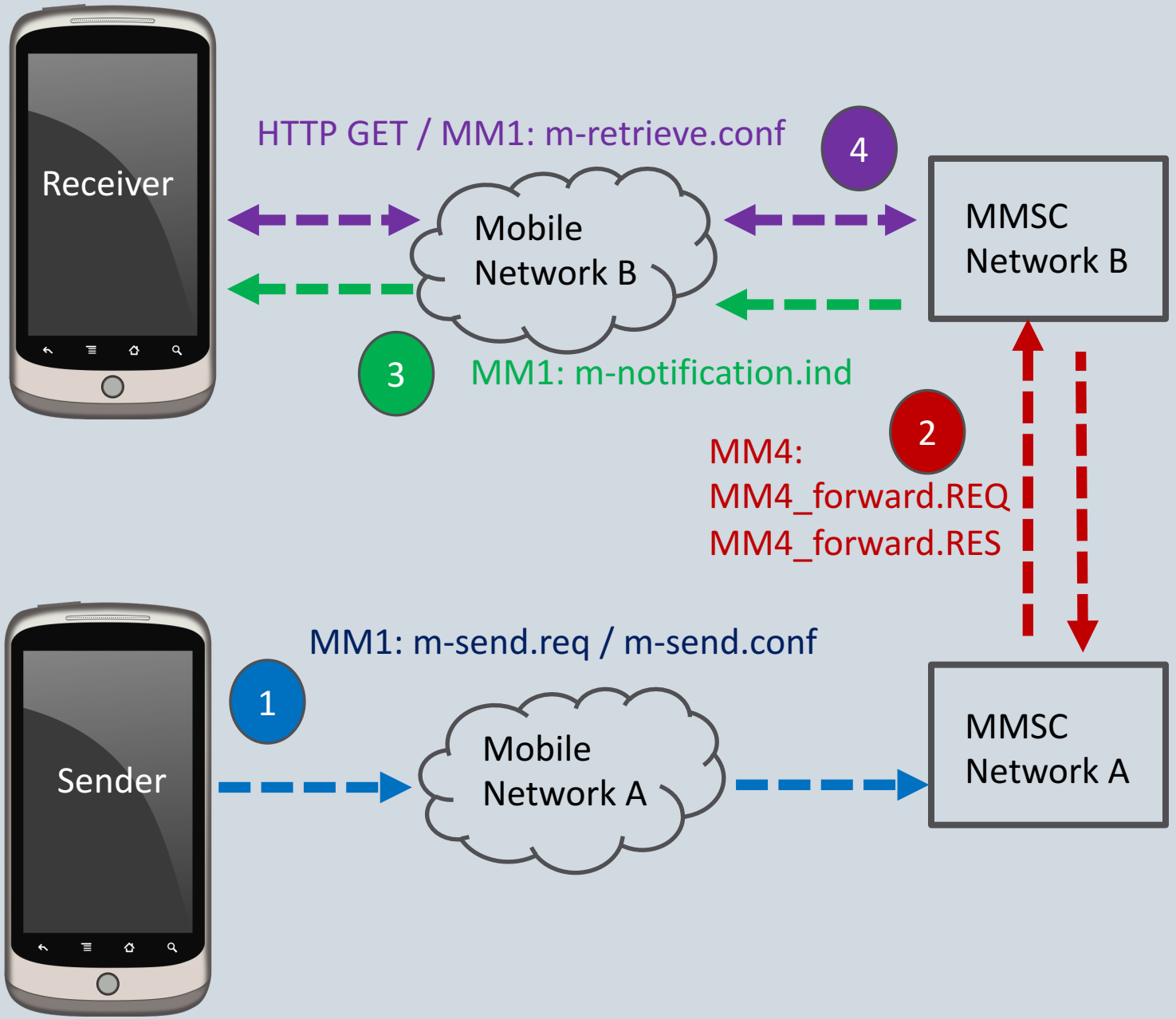
Receiver MMSC posts MM1 m-notification.ind to receiving device over WAP Push



MM4 Transaction: Simplified

The recipient phone performs an HTTP (or WSP) GET to retrieve the MMS message content URL from the MMSC.

The HTTP response is the MMS message in an m-retrieve.conf PDU.



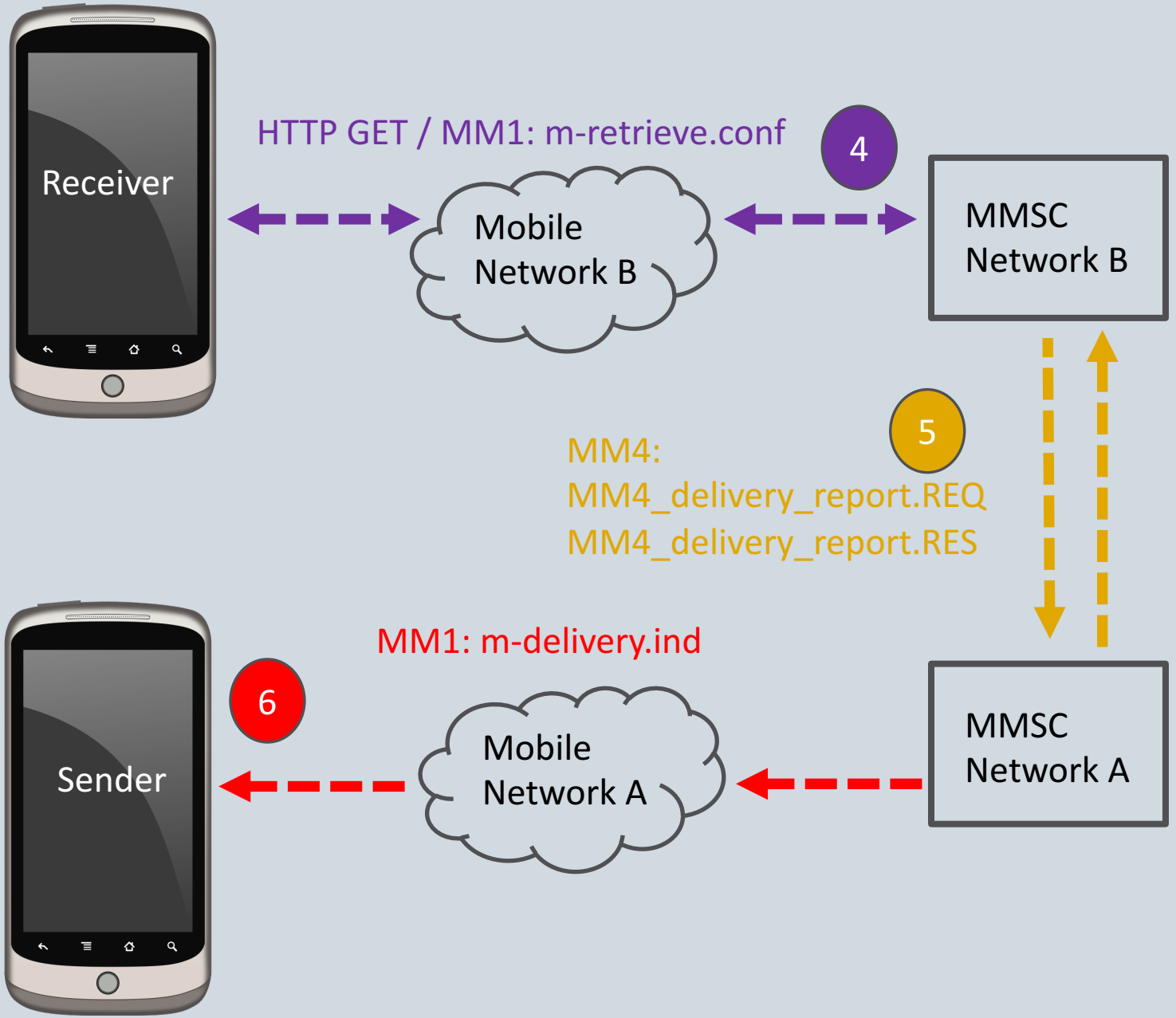
MM4 Transaction: Simplified

After MMS delivery, if a delivery report was requested:

Receiver MMSC initiates MM4 connection to originator MMSC and issues MM4_delivery_report.REQ.

Originator MMSC initiates MM4 connection back to receiver MMSC and uses MM4_delivery_report.RES transaction to confirm MMSC acceptance of delivery report.

MM1 delivery report is pushed to sender.



MM4 Transaction: Simplified

After MMS is read, if a read report was requested and receiver allows read reports:

Receiver posts an MM1 m-read-rec.ind to their MMSC

Receiver MMSC initiates MM4 connection to originator MMSC and issues MM4_read_reply_report.REQ.

Originator MMSC initiates MM4 connection back to receiver MMSC and uses MM4_read_reply_report.RES transaction to confirm MMSC acceptance of delivery report.

MM1 read report (m-read-orig.ind)fs is pushed to sender.