



**Digital cellular telecommunications system (Phase 2+) (GSM);  
Universal Mobile Telecommunications System (UMTS);  
LTE;  
5G;  
Value-added Services for SMS (VAS4SMS);  
Interface and signalling flow  
(3GPP TS 23.142 version 16.0.0 Release 16)**



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# Foreword

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# 1 Scope

The present document describes the stage 2 of the VAS4SMS (Value Added Service for SMS). It includes:

- The logic architecture;
- The logic elements functionality;
- The signaling flows;
- The interaction with other features.

The service requirements of VAS4SMS are specified in 3GPP TS 22.142 [2].

The functionality and mechanism of SMS Service is defined in 3GPP TS 23.040 [4].

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 22.142: "Value Added Services (VAS) for Short Message Service (SMS) requirements".
- [3] 3GPP TS 22.041: "Operator Determined Barring (ODB)".
- [4] 3GPP TS 23.040: "Technical realization of the Short Message Service (SMS)".
- [5] 3GPP TS 23.204: "Support of Short Message Service (SMS) over generic 3GPP Internet Protocol (IP) access".

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# 3 Definitions

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [x] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [x].

**Loop prevention indication:** a indication set by VAS AS which indicates that a VAS service has been applied to generate this new message, e.g. message receipt, auto reply or message forwarding service. This indication is used by recipients VAS AS to check before also generating a new message to prevent loops.

**Message transfer:** this term is used for SM transfer between MS and SMS Node.

**Delivery report:** this term is used to deliver the status report of original SM between MS and SMS Node..

**VAS check:** this term is used for the SMS Node to inquire the VAS AS if the VAS of user has activated.

**VAS check response:** this term is used for the VAS AS to reply the result of VAS check.

**Submit short message:** this term is used for the VAS AS to submit a new message to the SMS Node.

**Submit short message response:** this term is used for the SMS Node to acknowledge the submit short message from the VAS AS.

**VAS delivery report:** this term is used for the SMS Node to deliver status report of the short message from the VAS AS.

**VAS submittal report:** this term is used for the VAS AS to submit a general status report of the short message which generated by the VAS AS based on VAS delivery report.

**Relay short message:** this term is used to transfer the short message between SMS Nodes.

**Delivery status notification:** this term is used to deliver VAS submittal report between SMS Nodes.

NOTE: Relay short message and Delivery status notification are functionally equivalent to Message transfer and Delivery report respectively. Different naming is used to allow different mapping in stage 3 protocols

---

## 4 VAS-SMS service requirements

### 4.1 General description of VAS-SMS service requirements

As defined in 3GPP TS 22.142[2], the VAS4SMS is an operator specific service by which an operator enables the subscriber to experience some value-added service features for SMS.

VAS4SMS features that were defined in stage 1 include:

- 1) Short Message Forwarding
- 2) Short Message Forwarding Multiple Subscriptions
- 3) Short Message Filtering
- 4) Short Message Receipt
- 5) Short Message Network Storage
- 6) Short Message to Multiple Destinations
- 7) Short Message Virtual Private Network (VPN)
- 8) Short Message Auto Reply
- 9) Short Message Personal Signature
- 10) Short Message Deferred Delivery

VAS4SMS should not negatively affect the normal SMS communication between calling and called parties.

The service subscriber is able to subscribe to the VAS4SMS service, activate (or de-activate) the service, and update the settings, e.g., to change by configure the personalized service related information. The personalized service information can consist of message signature, the forwarding destination address and message contents for auto reply, etc.

The VAS4SMS subscriber is able to refine the VAS4SMS behaviour with configured rules, e.g. time, the identity of the calling party, the SMS forwarding service is able to act according to the rules.

VAS4SMS is either a terminating network or originating network service. That is, VAS4SMS can be used by the calling and called subscribers.

In general, services offered by the sender's VAS4SMS occur prior to the SMS delivering to the recipient's operation.



## 4.2 Operational requirements

### 4.2.1 VAS-SMS Provision/withdrawal

#### 4.2.1.1 General

The VAS4SMS may be provided after prior arrangement with the service provider.

The VAS4SMS may be provided/withdrawn upon the subscriber's request or for administrative reasons.

#### 4.2.1.2 Requirements on the originating network side

A VAS4SMS application server in the originating network is required to be under the control of the SMS-SC that is serving a calling subscriber who has activated VAS4SMS.

#### 4.2.1.3 Requirements on the terminating network side

A VAS4SMS application server in the terminating network is required to be under the control of the SMS-Route that is serving a called subscriber who has activated VAS4SMS.

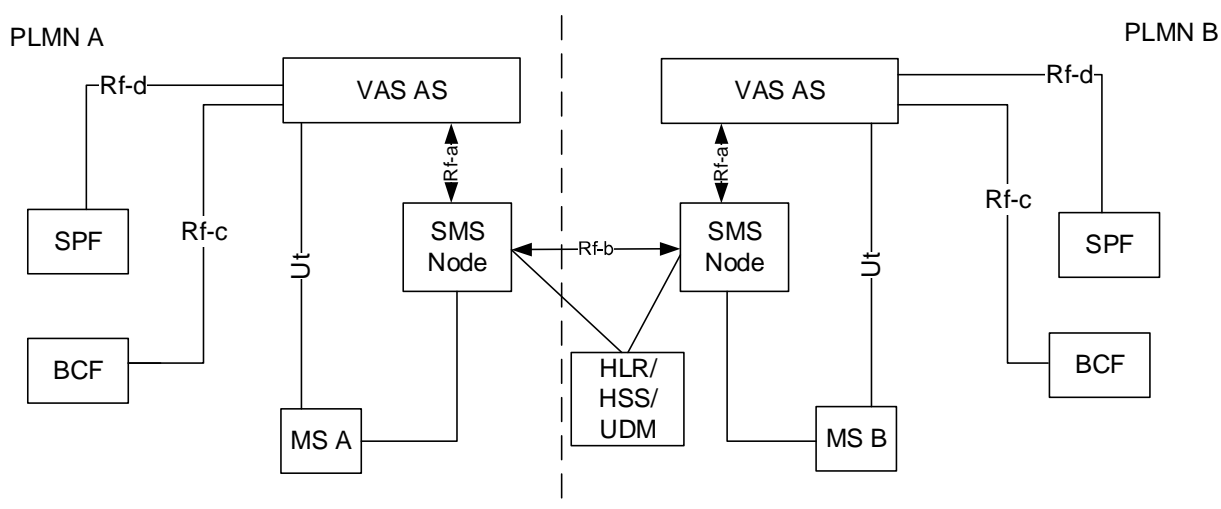
## 5 Architecture and Interface

### 5.1 Architectural requirements

The network architecture defined for VAS SMS should have less impact on pre-Rel 8 realization of short message service. The VAS SMS solution shall be able to be deployed independently of the pre-Rel 8 services. VAS SMS shall not break pre-Rel 8 services.

### 5.2 Reference model

#### 5.2.1 Logical network architecture



**Figure 5.2.1.1 Logical network architecture for VAS4SMS**

NOTE: Other SMS related elements (MSC/SGSN etc.) behavior is according to 3GPP TS 23.040[4].

## 5.2.2 Functional entities

The main functional entities involved in the VAS SMS services provisioning depicted in figure 5.2.1.1 are described as follows.

### 5.2.2.1 VAS AS (VAS SMS Application Server)

The VAS AS is an entity in user's HPLMN of which the main requirement with respect to handling of the VAS4SMS messages is the necessary service logic handling.

The VAS AS informs the SMS Node whether or not it takes over the handling of a short message. The VAS AS will use a SMS Node for delivery of new or modified messages.

The VAS AS informs the SMS Node about the outcome of its short message handling.

VAS AS may receive the delivery report of the VAS4SMS messages generated by it from SMS Node

If the delivery of SMS is failed, VAS AS may re-send/resubmit the VAS4SMS messages for several times, subject to operator's configuration

### 5.2.2.2 SMS node

SMS Node may be the integration of standard SMS Functional elements defined in 3GPP TS 23.040[4] depending on HPLMN (MO or MT): SMS-IW MSC, SMS-GMSC, SMS-SC or SMS Router.

Besides standard SMS functionalities described in TS 23.040 [4] the SMS Node may support:

- storage of the user subscription indication for the VAS4SMS
- triggering a short message to VAS AS, if a user has VAS4SMS subscription
- receiving a short message from VAS AS which is generated based on a previously triggered short message
- submitting a short message which comes from VAS AS to the PLMN
- receiving a report from PLMN and forwarding it to VAS AS
- receiving a report from VAS AS

In case the communication between the SMS Node and VAS AS fails, the SMS Node proceeds as if the user hasn't subscribed the VAS4SMS.

### 5.2.2.3 Service Portal Function (SPF)

The SPF provides the means to VAS SMS subscription, activation & deactivation, configuration. The detailed information for these operations is described in section 6. After a user subscribing a VAS4SMS, the portal should support the capability to synchronize the user setting information to VAS AS.

### 5.2.2.4 Billing and Charging Function (BCF)

BCF plays the role of receiving the call detail record (CDR) information from the VAS AS.

The other function entities in figure 5.2.1.1 shall follow 3GPP TS 23.040[4], which is outside the scope of this specification.

## 5.2.3 Interfaces

As illustrated in figure 5.2.1.1, following interfaces are defined:

- **Rf-a:** Rf-a is the interface between VAS AS and SMS Node. The VAS AS shall be able to influence and impact the SMS procedure on behalf of the services and it uses Rf-a interface to communicate with SMS Node. The SMS Node shall decide whether the information related to an incoming SMS is needed to send to the VAS AS

and VAS AS shall make the SMS Node aware of any resulting activity. Rf-a shall also support to transfer the delivery result between VAS AS and SMS Node.

- **Rf-b:** Rf-b is the interface between two SMS Nodes. The Rf-b interface is used for message transferring between two PLMSs.
- **Rf-c:** Rf-c is the interface between VAS AS and Charging and Billing Function (BCF). The Rf-c is used for the VAS AS to transfer the CDR information to the BCF.
- **Rf-d:** Rf-d is the interface between VAS AS and Service Portal Function (SPF). Rf-d is used to synchronize the user setting and subscription information from SPF to VAS AS

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## 6 VAS-SMS service provisioning, activation & deactivation, configuration

### 6.1 Activation/deactivation

The VAS-SMS service is activated at provisioning and deactivated at withdrawal.

A subscriber can subscribe all the VAS-SMS service features as a whole or make the subscription to every feature separately, which is subject to operator's policy. When a VAS-SMS service is activated, a subscriber can specify some configuration for each subscribed service feature, such as the destination address which short messages shall be forwarded to.

After a subscriber has activated their VAS-SMS service, all short messages related to him shall be handled according to his service configuration.

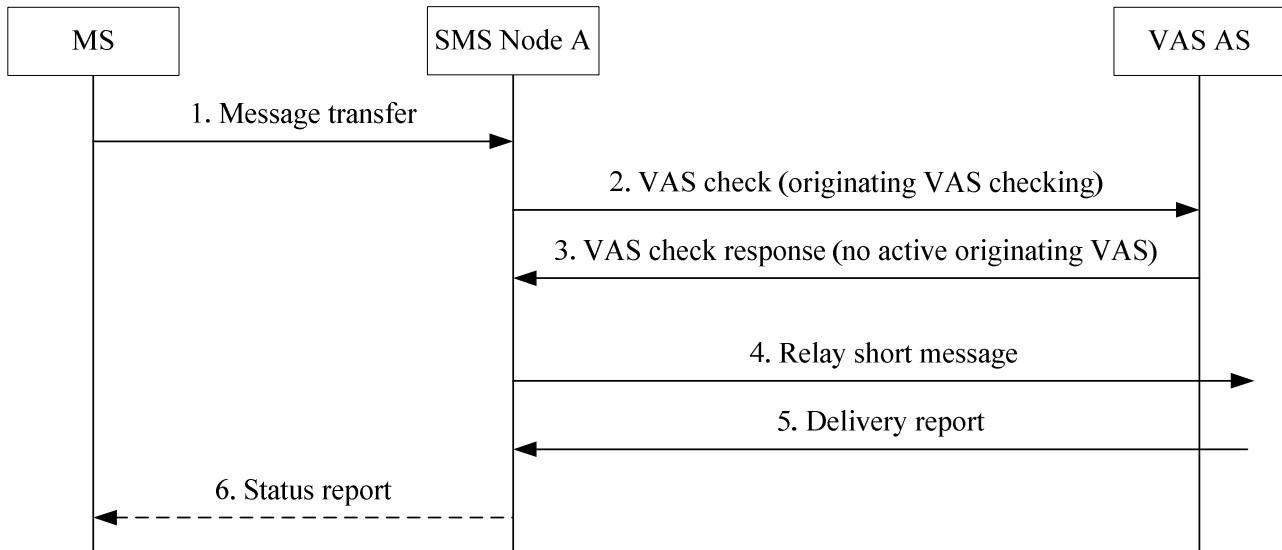
### 6.2 Configuration

Different methods may be provided for configuration of VAS-SMS service, e.g. such as short message, IVR and etc. It is out of the scope of this document to specify the configuration procedure itself.

## 7 VAS-SMS signalling procedure

### 7.0 General Signalling Procedure

#### 7.0.1 Originating Signalling flows



**Figure 7.0.1-1 General Short Message submittal procedures without active originating VAS**

1. MS successfully sends the short message to the SMS Node A via the originating user's serving node (e.g. MSC, SGSN, MME, SMSF, AMF). See 3GPP TS 23.040 [4] for details.

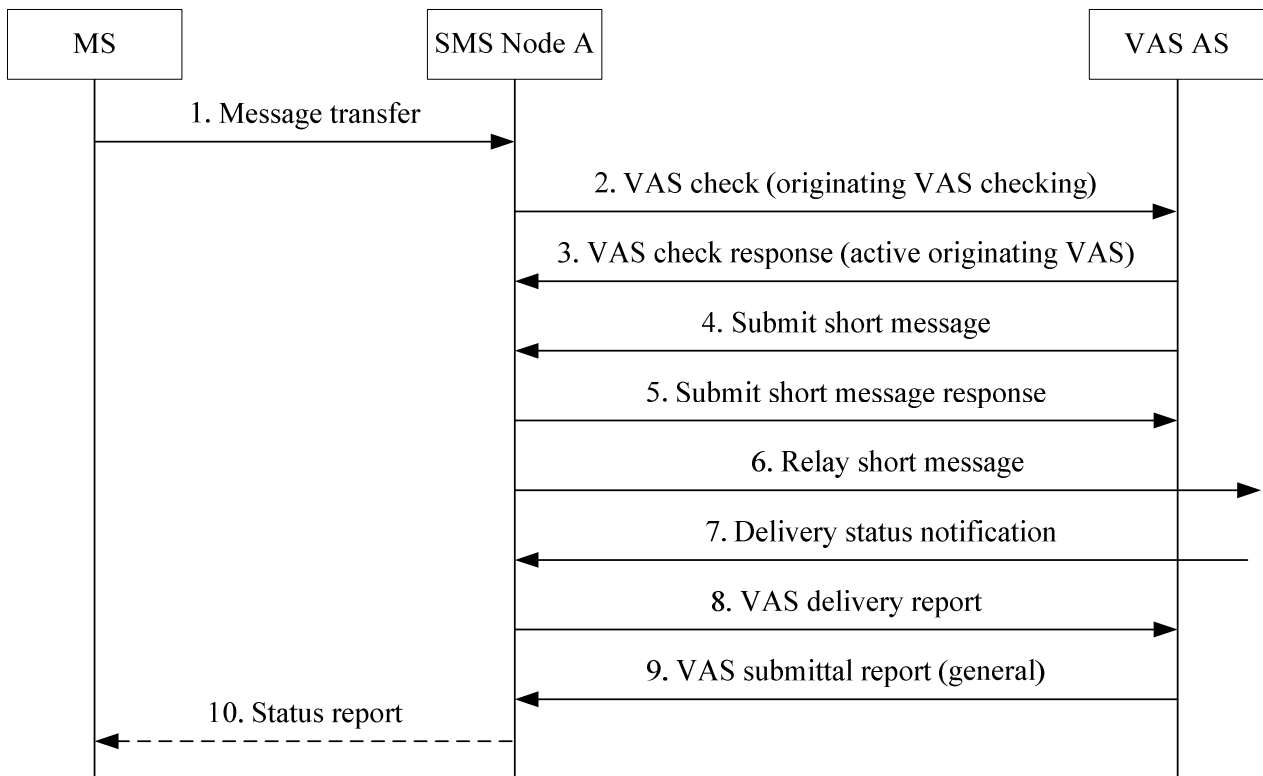
2. After checking that the originating user has subscribed VAS, the SMS Node A interacts with the VAS AS to interrogate whether the VAS of the originating user is active by sending an inquiring message including the message content received in step 1. In that case the SMS Node shall save the original short message.

3. The VAS AS indicates to the SMS Node A that there is no active originating VAS for the originating user.

4. The SMS Node A transfers the original short message to the termination side.

5. The termination side responds the delivery report to SMS Node A to notify that the short message has been delivered successfully. In this case the SMS Node A deletes the original short message which was saved in step 2.

6. The SMS Node A send the status report to the MS, which is optional depending on user's request.



**Figure 7.0.1-2 General Short Message submittal procedures with active originating VAS**

1. MS successfully sends the short message to the SMS Node A via the originating user's serving node (e.g. MSC, SGSN, MME, AMF, SMF). See 3GPP TS 23.040 [4] for details.

2. After checking that the originating user has subscribed VAS, the SMS Node A interacts with the VAS AS to interrogate whether originating VAS is active by sending an inquiring message including the message content received in step 1. In that case the SMS Node A shall save the original short message.

3. The VAS AS indicates to the SMS Node A that originating VAS is active.

4. The VAS AS performs originating VAS for the original user and generates a new short message by modifying the message content if necessary and submits the new short message to SMS Node A for transferring.

NOTE: It is assumed that after this step VAS AS A has executed the service logic for all originating services.

5. The SMS Node A sends a Submit short message response message to the Originating VAS AS.

6. The SMS Node A shall not check for VAS services for messages that are submitted by a VAS AS. The SMS Node A successfully transfer the new short message to the termination side.

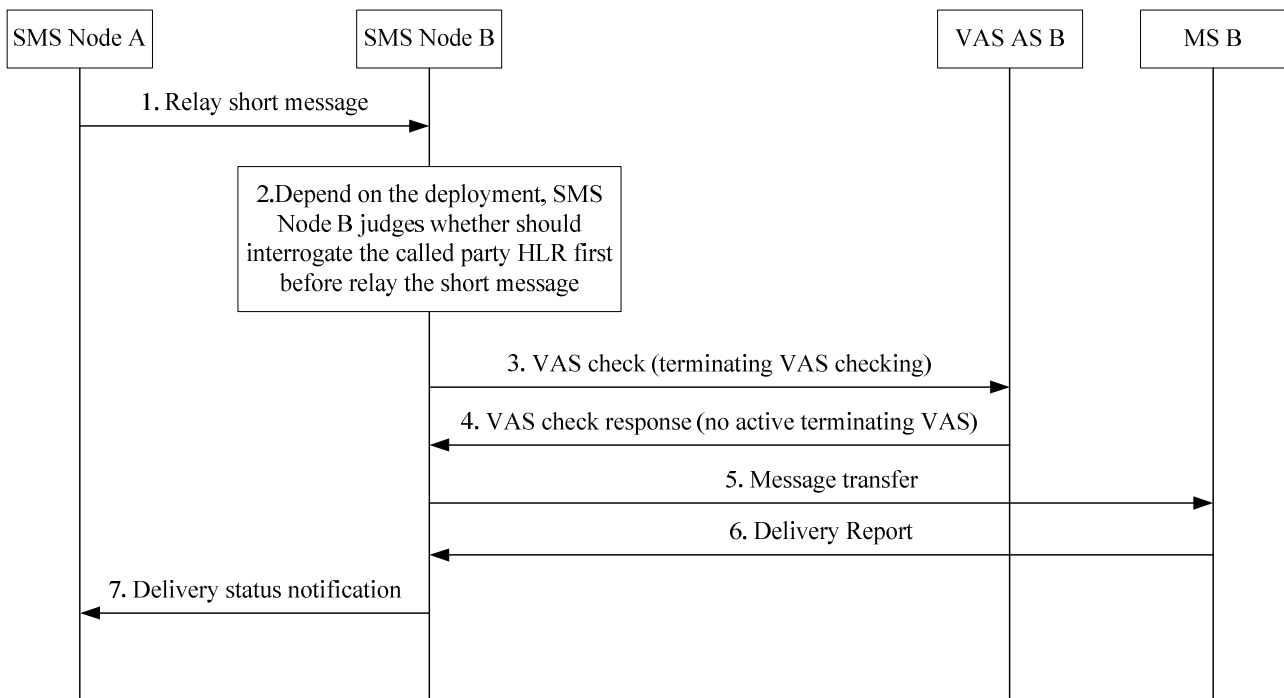
7. The termination side sends the delivery status notification to SMS Node A to notify the new short message has been delivered successfully.

8. The SMS Node A transfers the delivery status notification as the VAS delivery report to the originating VAS AS.

9. The originating VAS AS generates a general delivery report based on the report which received in step 8 and sends it to the SMS Node A. The SMS Node removes the original short message which was saved in step 2 when it receives the VAS submittal report from the VAS AS.

10. The SMS Node A delivers the status report to originating MS, which is optional depending on originating user's request.

## 7.0.2 Terminating signalling flows



**Figure 7.0.2-1 General Short Message delivery procedures without active terminating VAS**

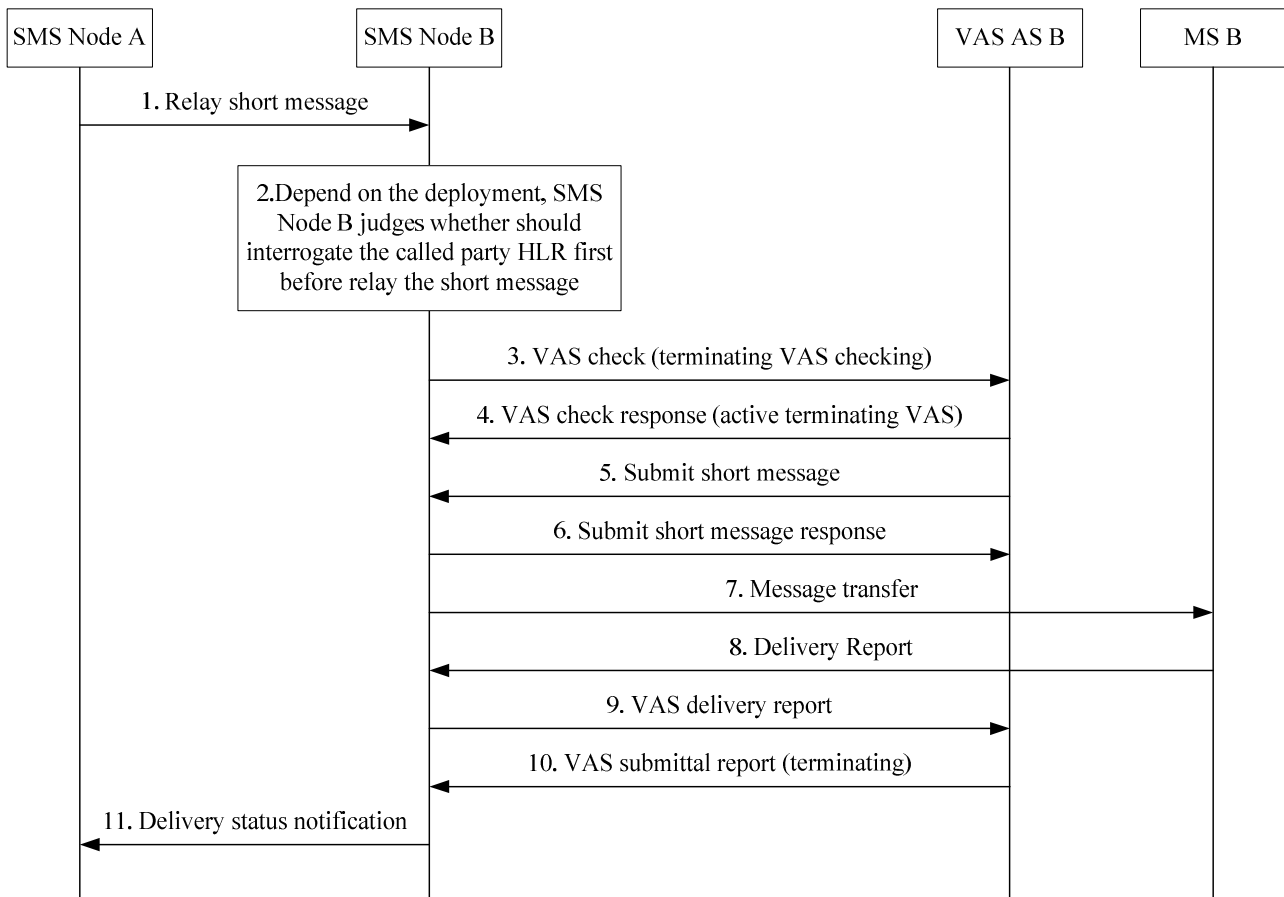
1-2. SMS Node B receives the relayed short message from the originating side and responds by sending an acknowledge message. See 3GPP TS 23.040 [4] for details.

3. After checking that the terminating user has subscribed VAS, the SMS Node B interacts with the VAS AS B to interrogate whether terminating VAS is active by sending an inquiring message including the short message content received in step 1. In that case the SMS Node B shall save the short message.

4. The VAS AS B indicates to the SMS Node B that there is no active terminating VAS for the terminating user.

5-6. The SMS Node B successfully transfers the short message to the terminating MS B and receives the Delivery Report message (see 3GPP TS 23.040 [4] for details). In this case the SMS Node B removes the short message which was saved in step 3.

7. The SMS Node B notifies the originating side of the delivery status.



**Figure 7.0.2-2 General Short Message delivery procedures with active terminating VAS**

1-2. SMS Node B receives the relayed short message from the originating side and responds by sending an acknowledge message. See 3GPP TS 23.040 [4] for details.

3. After checking that the terminating user has subscribed VAS, the SMS Node B interacts with the VAS AS B to interrogate whether terminating VAS is active by sending an inquiring message including the short message content received in step 1. In that case the SMS Node B shall save the short message.

4. The VAS AS B indicates to the SMS Node B that there is active terminating VAS for the terminating user.

5. The VAS AS B performs terminating VAS and generates a new short message by modifying the received short message content if necessary and submits the new short message to SMS Node B for transferring.

NOTE 1: It is assumed that after this step VAS AS B has executed the service logic for all terminating services.

6. The SMS Node B sends a response message to the VAS AS B.

7-8. The SMS Node B shall not check for VAS services for messages that are submitted by a VAS AS B. The SMS Node B delivers the short message to the MS and receives the ACK messages (see 3GPP TS 23.040 [4] for details).

9. The SMS Node B transfers the delivery report to the VAS AS B.

10. The VAS AS B generates a delivery report of the short message for the originating user based on the report received in step 9 and sends to SMS Node B.

11. The SMS Node B notifies the originating side of the delivery status. In that case the SMS Node B removes the short message which was saved in step 3.

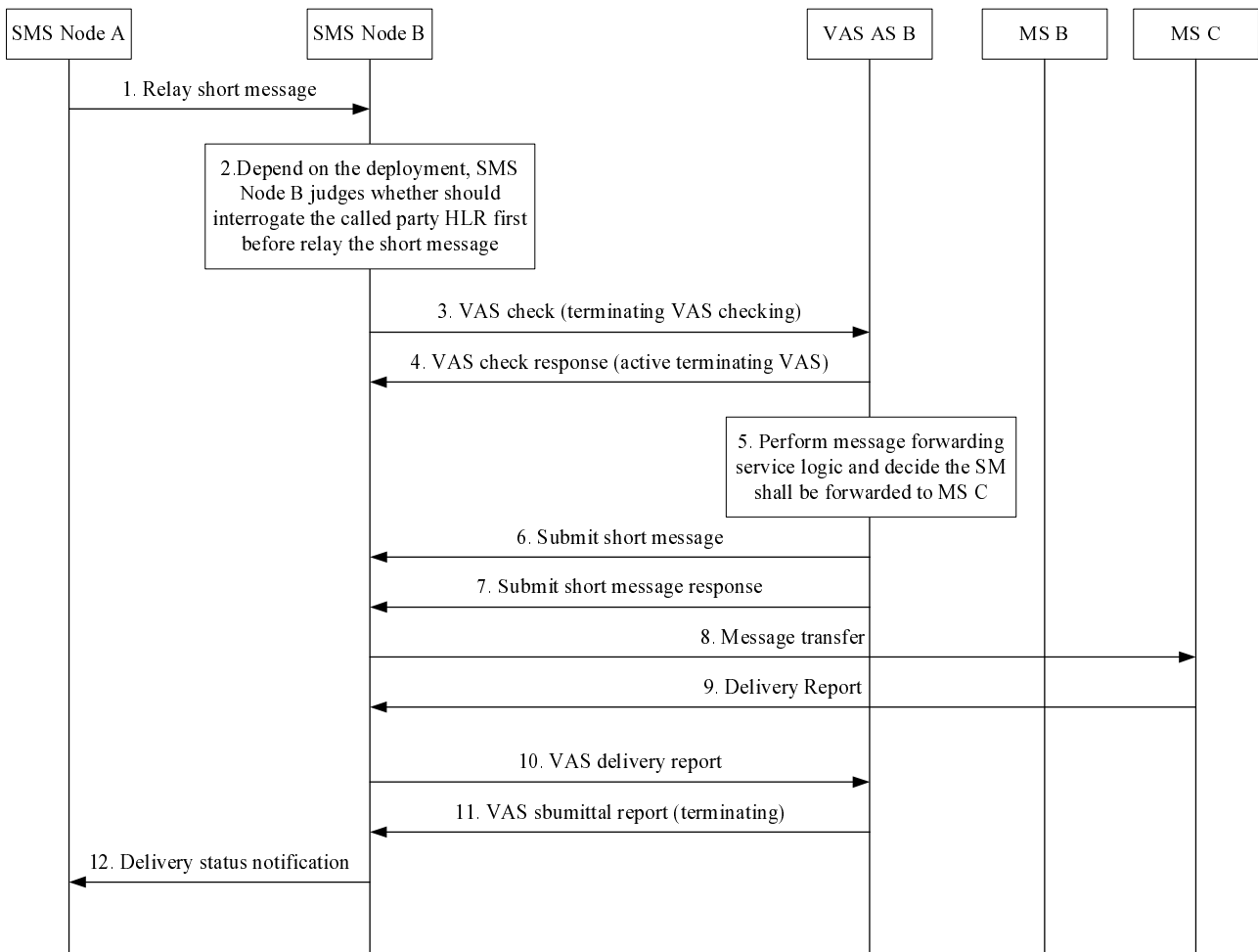
NOTE 2: Depending on the stage 3 protocol used, for VAS services where step 11 exceeds the allowed response time, a report of delivery status may be returned after step 4. This does not inform SMS Node A of the actual delivery outcome. Depending on the capabilities of the stage 3 protocol PLMN A may request a separate delivery report to be informed of the final delivery status.

## 7.1 Short Message forwarding

The short message forwarding shall be a service feature only active for terminating user. The signaling procedure in originating side network shall not be affected for whether the message forwarding is active or not.

The figures in this section describe the following possible scenarios when short message forwarding is active:

- a short message is forwarded to an address which is specified by terminating user other than called number.
- a short message is not forwarded subject to terminating user's configuration



**Figure 7.1-1 Terminating signaling flow - Short Message is forwarded**

NOTE1: The content of the VAS4SMS message in operation 5 is the same as the original SMS, only the destination address shall be changed to forwarded-to number.

1-4. See general flow described in the previous chapter 7.0. The VAS AS B checks that a terminating user has activated short message network forwarding service and indicates to the SMS Node B there is terminating VAS active.

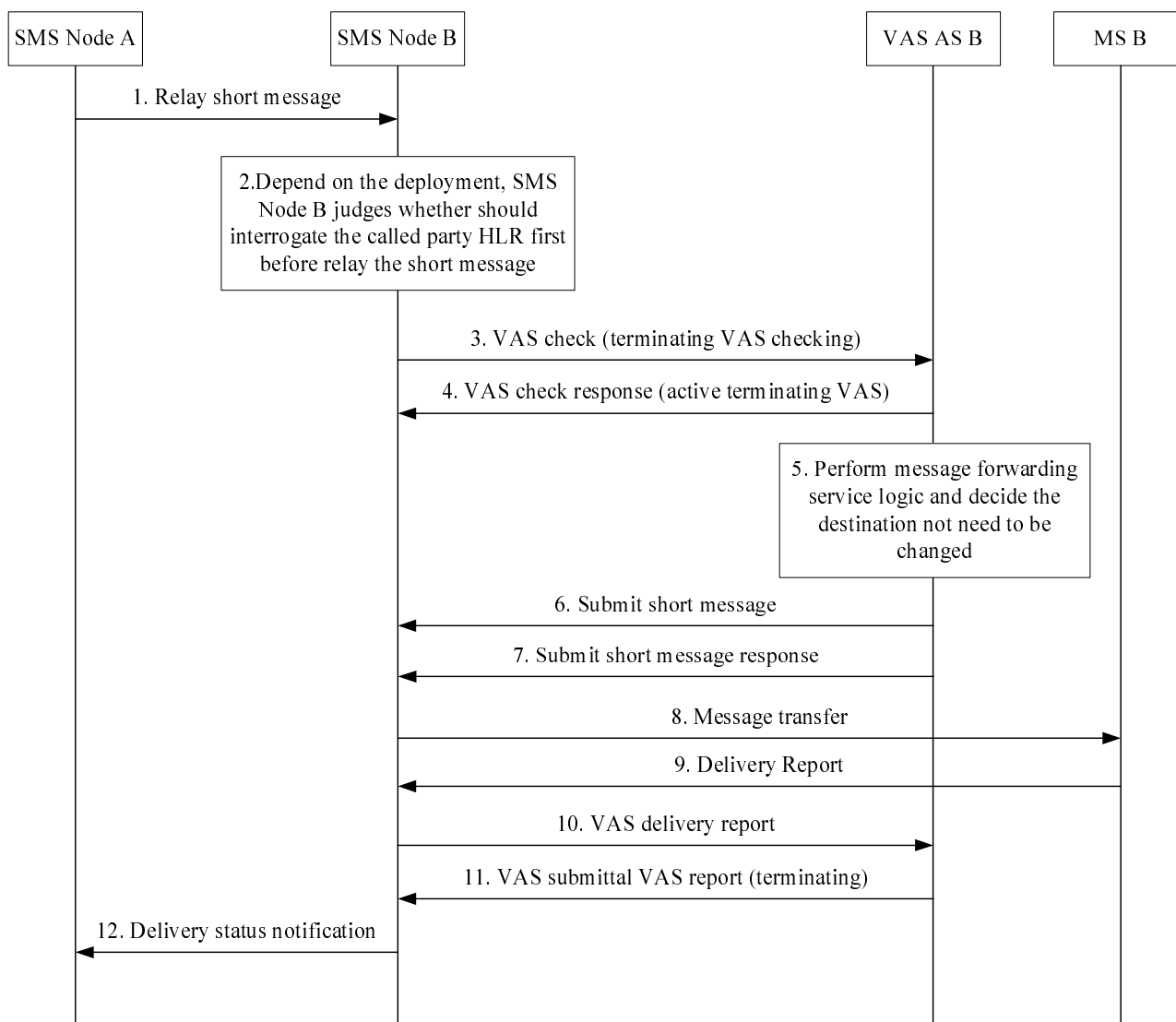
5. According to user B's preferences, the VAS AS B decides the message needs to be forwarded to MS C. The VAS AS B takes a loop check for original SM. If there is a loop prevention indication set in the SM, the VAS AS B shall not apply short message forwarding service and do not go to following steps.

6-10. The VAS AS B delivers the original short message to the MS C after including a loop prevention indication.

11. The VAS AS B generates a report of the short message and sends it to SMS Node B.

12. The SMS Node B notifies the originating side of the delivery status.





**Figure 7.1-2 Terminating signaling flow - Short Message is not forwarded**

NOTE2: The VAS4SMS message in operation 5 is the same as the original SM.

1-4. See general flow described in the previous chapter 7.0. The VAS AS B checks that a terminating user has activated short message forwarding service and indicates to the SMS Node B there is terminating VAS active.

5. According to user B's preferences, the VAS AS B decides the message needs not to be forwarded.

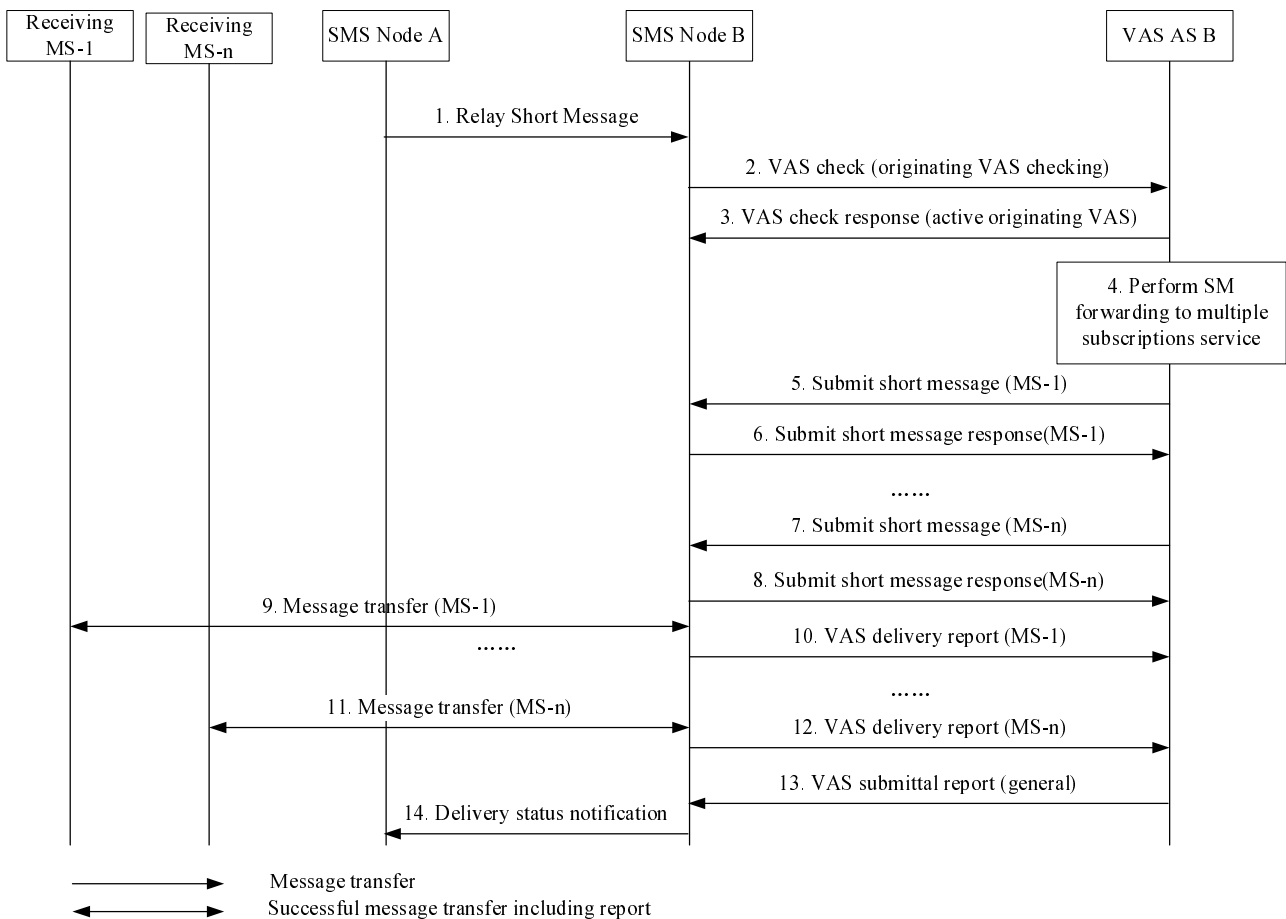
6-10. The VAS AS B delivers the original short message to the terminating user. See general flow described in the previous chapter 7.0.

11. The VAS AS B generates a report of the short message and sends it to SMS Node B.

12. The SMS Node B notifies the originating side of the delivery status.

## 7.2 Short Message forwarding multiple subscriptions

Short Message Forwarding Multiple Subscriptions is applicable for the terminating user. In this case, the VAS AS checks that the terminating user has activated the Short Message Forwarding Multiple Subscriptions service and shall send the original short message to multiple receivers based on the subscription information. The procedure of Short Message Forwarding Multiple Subscriptions described in the following figure 7.2-1.



**Figure 7.2-1 Short Message forwarding to multiple subscriptions procedure**

1.-3. The short message is transferred from the originating user to terminating sides' SMS Node B. After checking out that the terminating user has subscribed VAS, the SMS Node B interacts with the VAS AS to interrogate whether the VAS of the terminating user is active by sending an inquiring message including the message content received in step 1. In that case the SMS Node shall save the original short message.

4. The VAS AS performs the short message forwarding to multiple subscriptions service and generates new short messages based on the original short message for each subscription.

5-6. The SMS Node B receives a short message to MS-1 and sends the Submit short message response to the VAS AS B.

7-8. The SMS Node B receives a short message to MS-n and sends the Submit short message response to the VAS AS B.

9-10. The SMS node B delivers the short message to MS-1 and relay the delivery report received from MS-1 to the VAS AS. These steps can happen at any time after step 6.

11-12. The SMS node B delivers the short message to MS-n and relay the delivery report received from MS-n to the VAS AS. These steps can happen at any time after step 6. There is no sequence requirement of sending short message for SMS Node, i.e. the SMS Node can send the short message in parallel.

13. The VAS AS generates a general delivery report based on all the delivery reports it receives and sends it to SMS Node B.

14. The SMS Node B notifies the originating side of the delivery status.

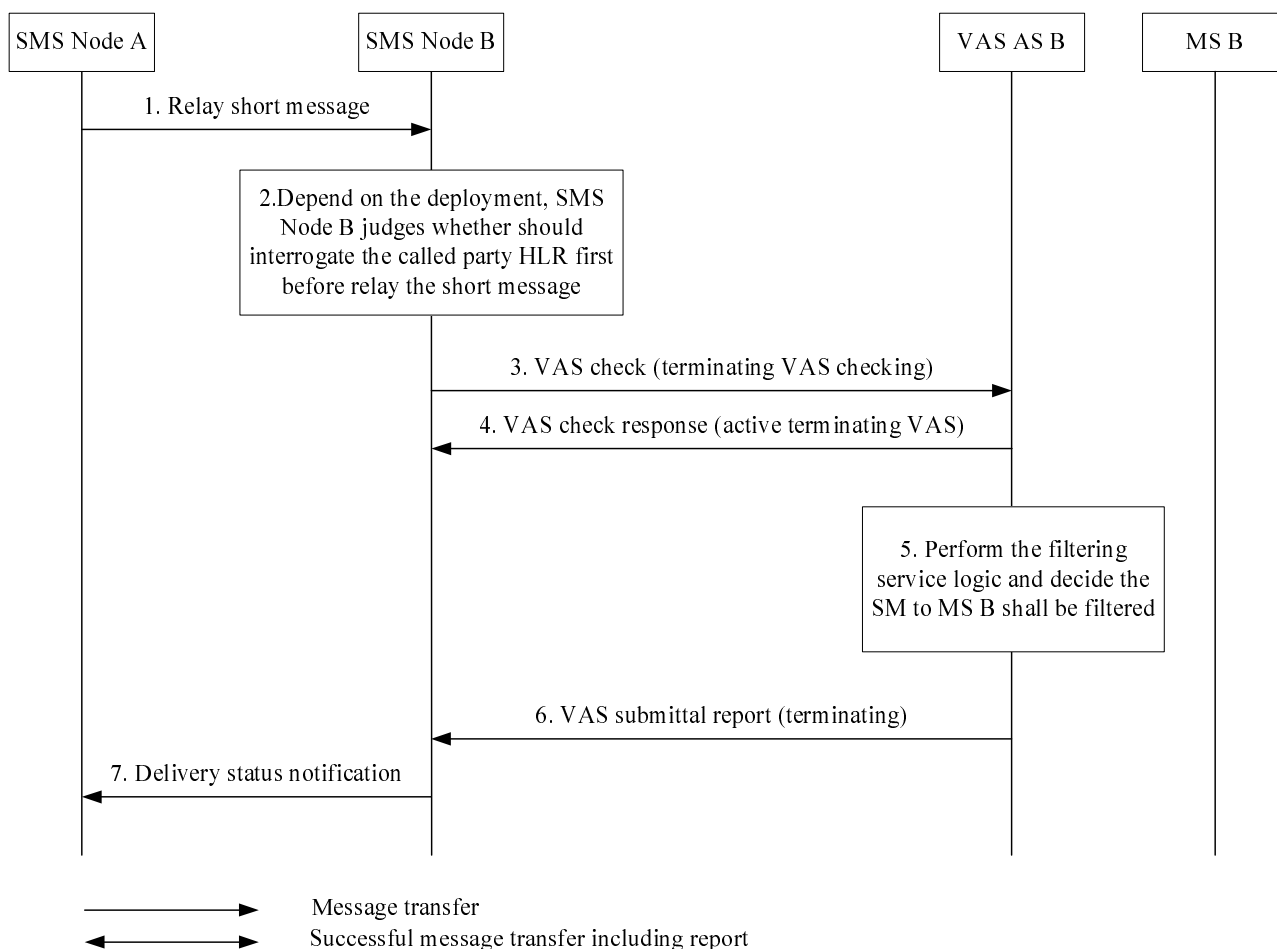
### 7.3 Short Message filtering

The short message filtering shall be a service feature only active for terminating user. The signaling procedure in originating side network shall not be affected for whether the message filtering is active or not.

The figures in this section describe the following possible scenarios when short message filtering is active:

-a short message is filtered subject to terminating user's configuration, such as a terminating user would not like to receive the message coming from a certain user.

-a short message is not filtered subject to terminating user's configuration.



**Figure 7.3-1 Terminating signaling flow - Short Message is filtered**

NOTE 1: In step 6, whether the delivery result is failure or success is subject to operator's configuration

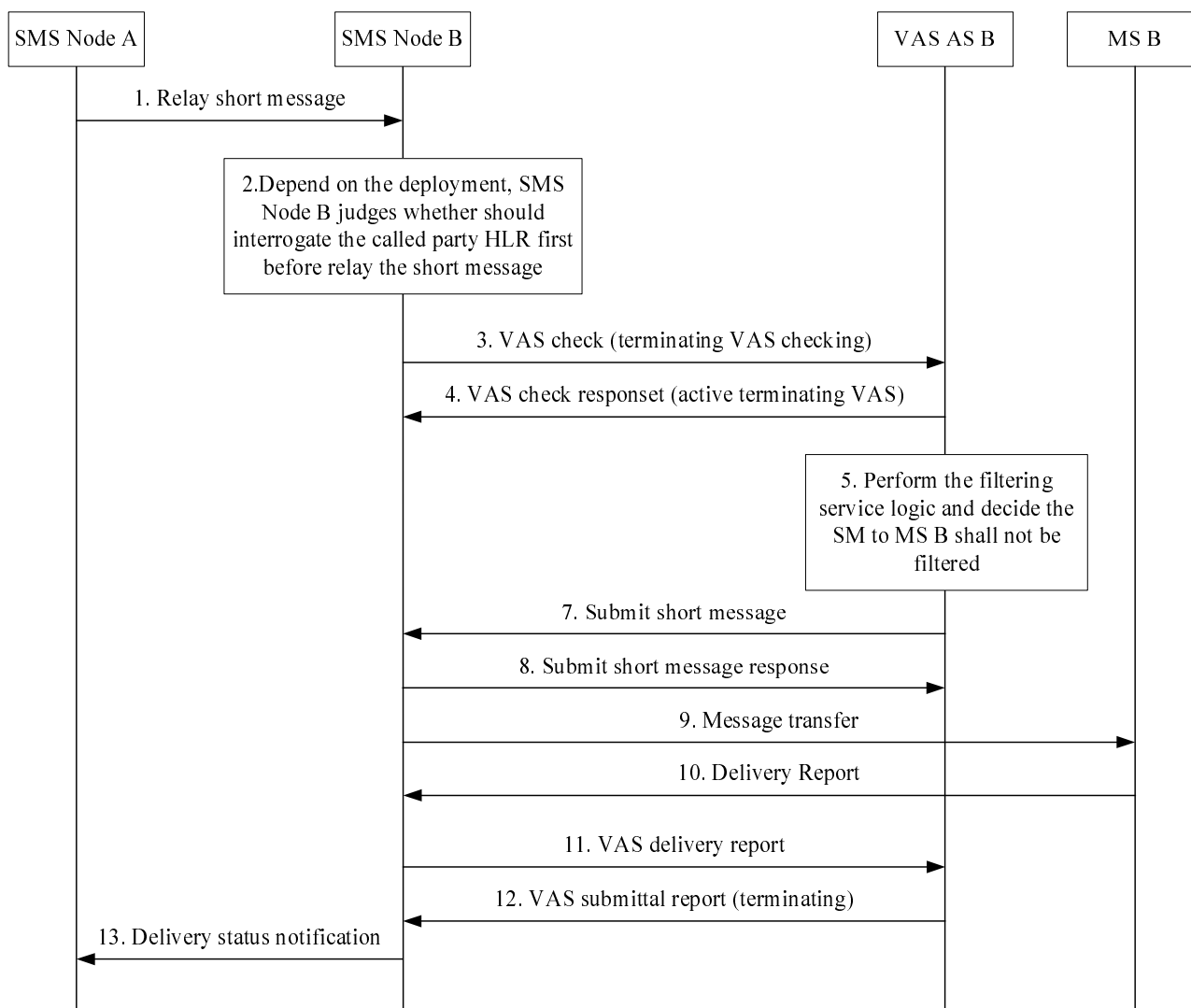
NOTE 2: Appropriate failure codes for the status notification have to be selected carefully to avoid the unnecessary retries.

1-4. See general flow described in the previous chapter 7.0. The VAS AS B checks that a terminating user has activated short message filtering service and indicates to the SMS Node B there is terminating VAS active.

5. According to user B's preferences, the VAS AS B decides the message needs to be filtered.

6. The VAS AS B generates a report of the short message and sends it to SMS Node B. The delivery result in report is based on the configuration of user B or operator.

7. The SMS Node B notifies the originating side of the delivery status.



**Figure 7.3-2 Terminating signaling flow - Short Message is not filtered**

NOTE: The VAS4SMS message in step 5 is the same as the original SM.

1-4. See general flow described in the previous chapter 7.0. The VAS AS B checks that a terminating user has activated short message filtering service and indicates to the SMS Node B there is terminating VAS active.

5. According to user B's preferences, the VAS AS B decides the message needs not to be filtered.

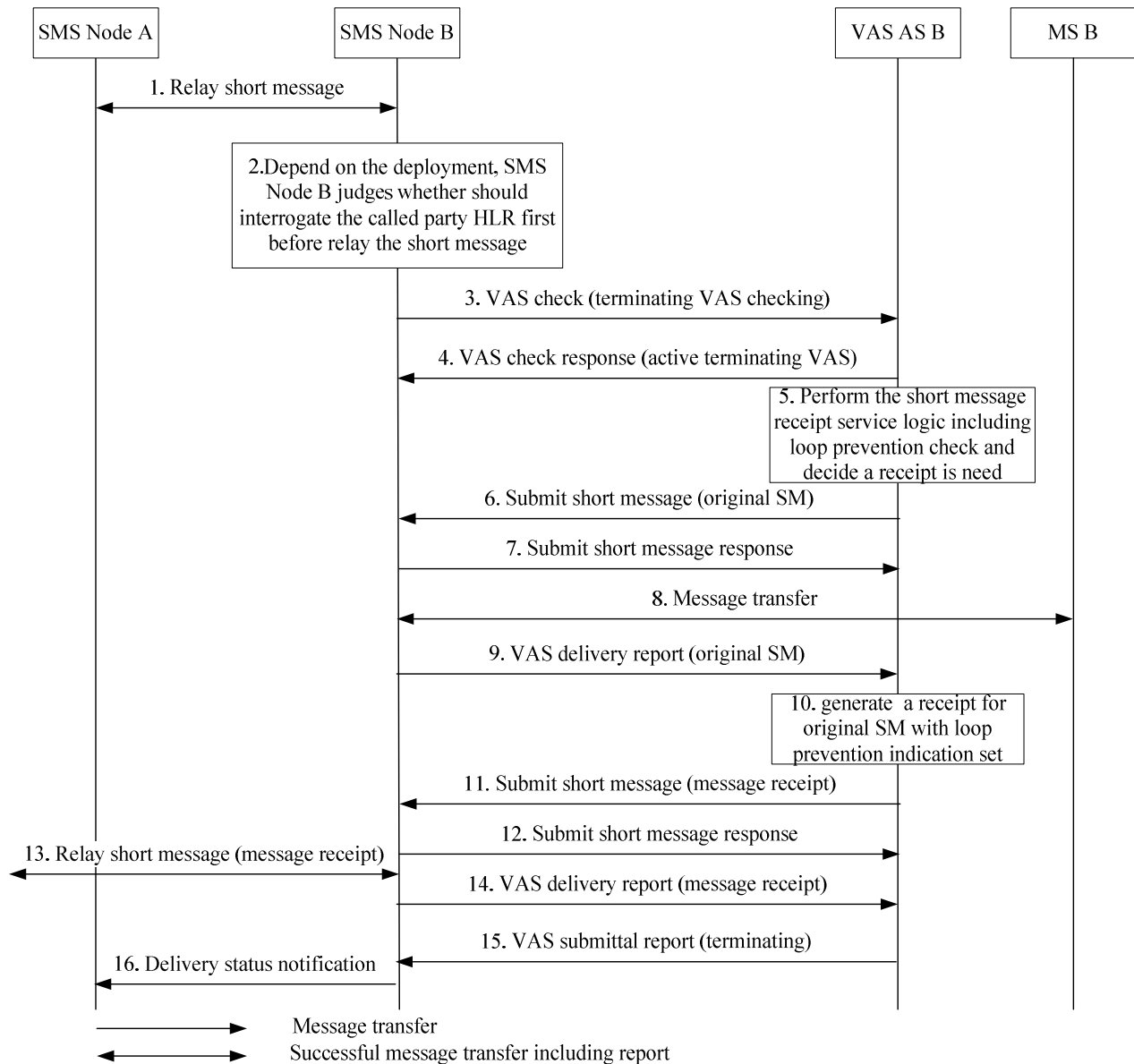
6-10. The VAS AS B delivers the original short message to the terminating user. See general flow described in the previous chapter 7.0.

12. The VAS AS B generates a report of the short message and sends it to SMS Node B.

13. The SMS Node B notifies the originating side of the delivery status.

## 7.4 Short Message receipt

Short Message Receipt is a terminating VAS. The procedure of the short message receipt refers to the general flow for VAS SMS described in the sub-clause 7.0.2. The VAS AS checks that the terminating user has activated the Short Message Receipt service and generates a new short message as the receipt of original message.



**Figure 7.4-1 Short Message receipt procedure**

1-4. See general flow described in the previous chapter 7.0. The VAS AS B checks that a terminating user has activated short message receipt service and indicates to the SMS Node B there is terminating VAS active.

5. According to user B's preferences, the VAS AS B decides a message receipt is needed and shall be sent to user A. The VAS AS B takes a loop check for original SM. If there is a loop prevention indication set in the SM, the VAS AS B shall not apply short message receipt service and do not go to following steps.

6-9. The VAS AS B delivers the original short message to the terminating user. See general flow described in the previous chapter 7.0.

10. The VAS AS B generates a receipt short message, based on the report received in step 9 and terminating user's preferences. The receipt message shall include a loop prevention indication that indicating it is a message generated for message receipt service of user B.

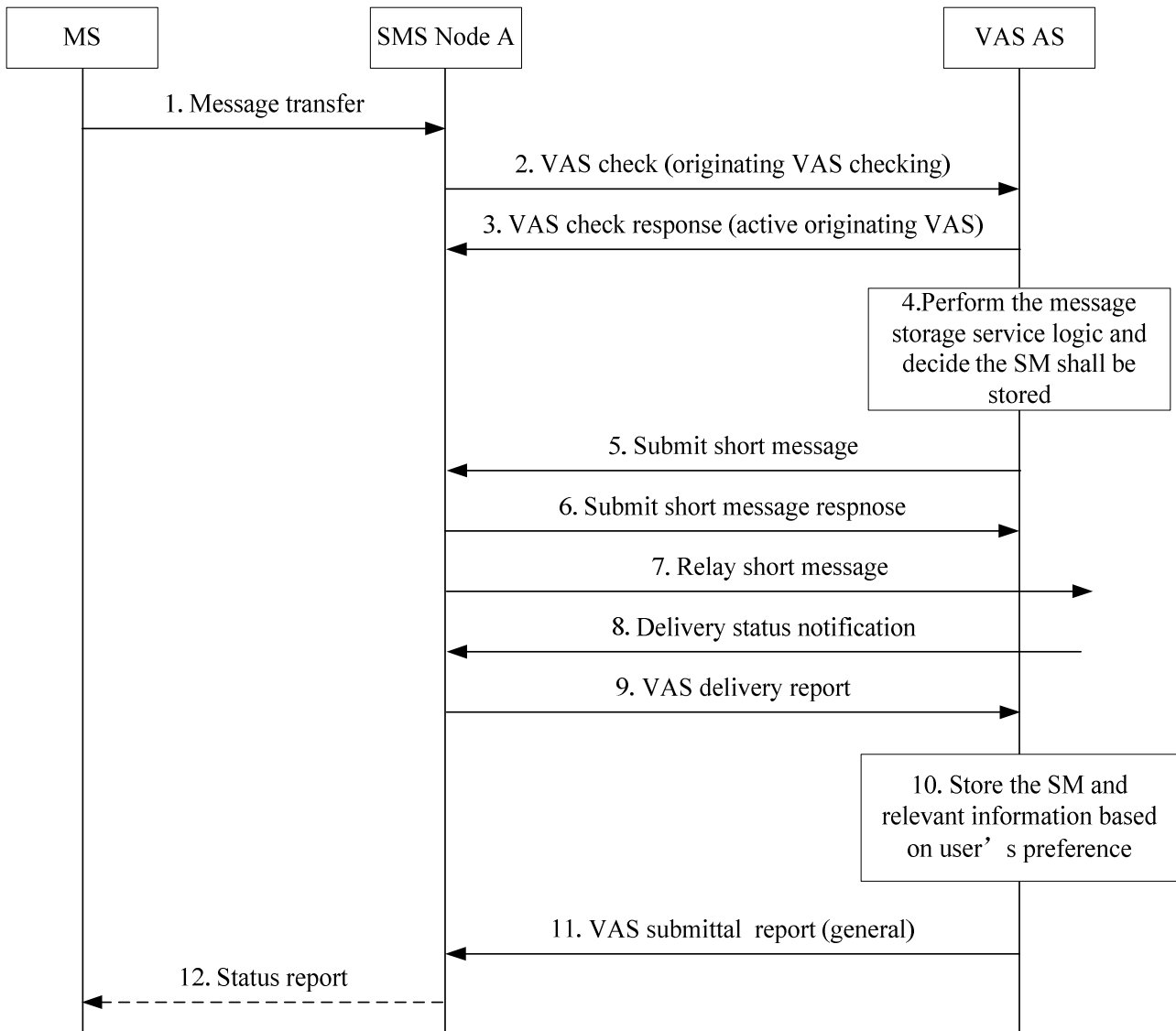
11-14. The VAS AS B delivers the message receipt to the originating user. See general flow described in the previous chapter 7.0.

15. The VAS AS B generates a report of the short message and sends it to SMS Node B.

16. The SMS Node B notifies the originating side of the delivery status.

## 7.5 Short Message network storage

The short message storage can be active to both originating and terminating user.



**Figure 7.5-1 Originating signaling flow - Short Message storage**

NOTE: The VAS4SMS message in operation 4 is the same as the original SM.

1-3. See general flow described in the previous chapter 7.0. The VAS AS A checks that a originating user has activated short message network storage service and indicates to the SMS Node A there is originating VAS active.

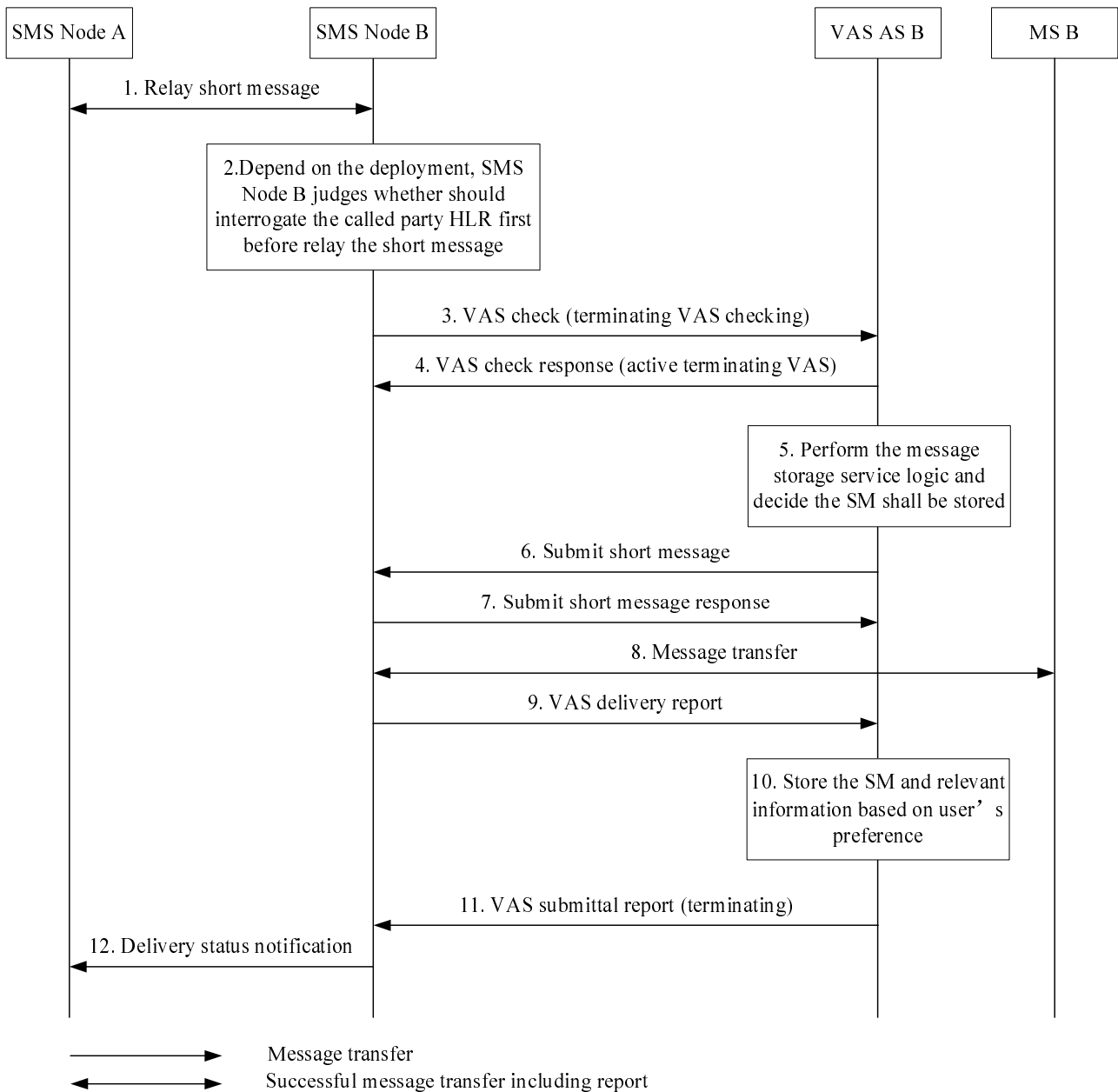
4. The VAS AS A decides that the original SMS shall be stored based on originating user's preferences.

5-9. The VAS AS A delivers the original short message to the terminating user. See general flow described in the previous chapter 7.0.

10. VAS AS A stores the original SMS and relevant information for originating user.

11. The VAS AS A generates a delivery report for the original short message based on the report which received in step 9 and sends to SMS Node A.

12. The SMS Node A sends the status report to UE, which is optional depending on user's request.



**Figure 7.5-2 Terminating signaling flow - Short Message storage**

NOTE 1: The VAS4SMS message in operation 5 is the same as the original SM.

NOTE 2: Depending on the stage 3 protocol used, for VAS services where step 12 exceeds the allowed response time, a report of delivery status may be returned after step 4. This does not inform SMS Node A of the actual delivery outcome. Depending on the capabilities of the stage 3 protocol PLMN A may request a separate delivery report to be informed of the final delivery status.

1-4. See general flow described in the previous chapter 7.0. The VAS AS B checks that a terminating user has activated short message network storage service and indicates to the SMS Node B that the terminating VAS is active.

5. The VAS AS B decides that the original SMS shall be stored based on terminating user's preferences.

6-9. The VAS AS B delivers the original short message to the terminating user. See general flow described in the previous chapter 7.0.

10. The VAS AS B stores the SMS and relevant information for terminating user.

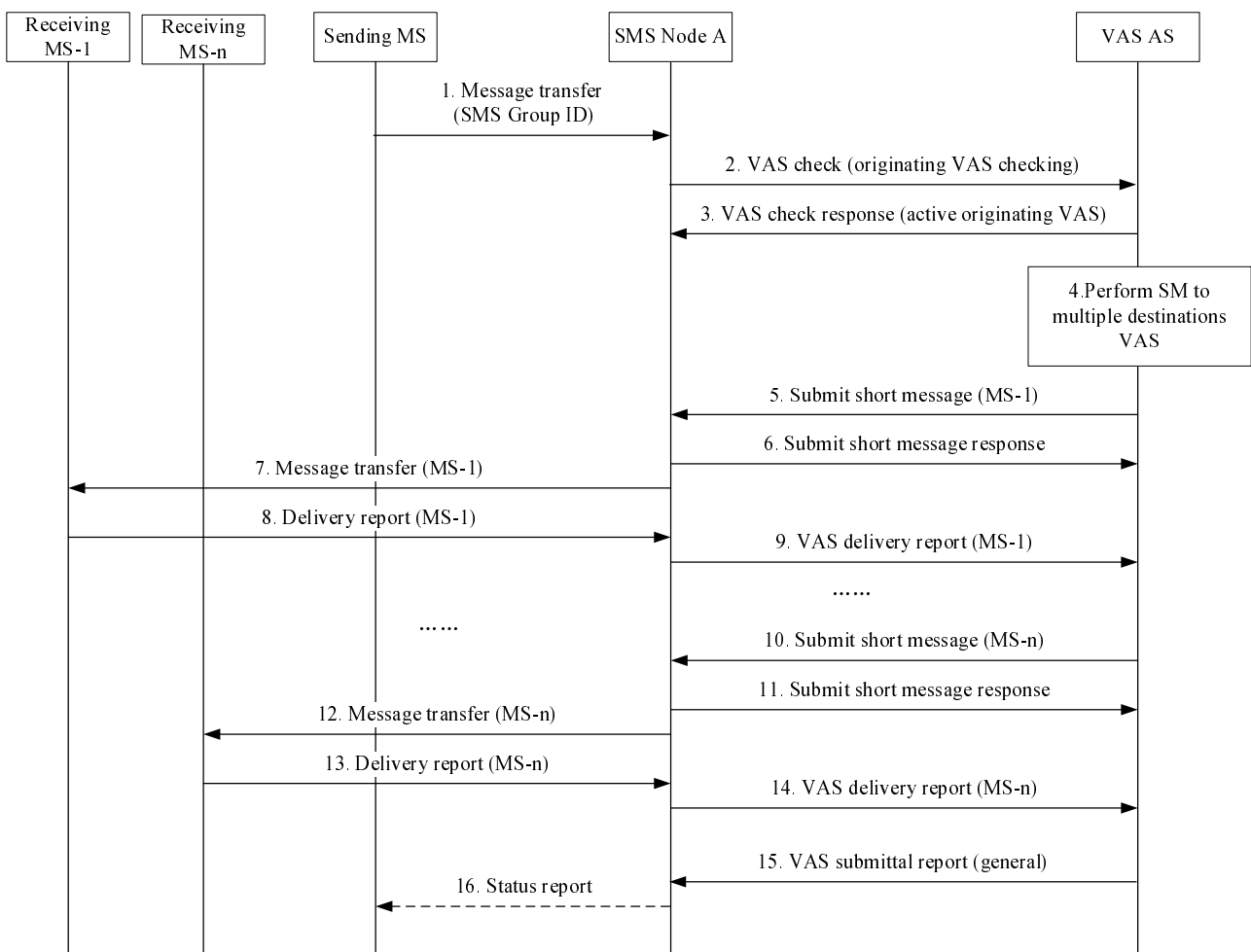
11. The VAS AS B generates a report of the short message and sends it to SMS Node B.

12. The SMS Node B notifies the originating side of the delivery status.

## 7.6 Short Message to multiple destinations

In order to support short message to multiple destinations service it is needed for one user to establish a SMS group which is identified by a unique identifier in the VAS AS firstly. The SMS Group ID shall be allocated by VAS AS uniquely and be known by all the members of the SMS group. A SMS group also can be deleted by creator. There may be many ways to manage a SMS group, i.e. create or delete or query a SMS group which is out of the scope of this specification.

When the SMS group is established, every group member can send the short message to all other members in this group by setting the destination to the unique identifier of the SMS group. The procedure of sending message to multiple destinations is described in the following figure 7.6-1.



**Figure 7.6-1 Short Message to multiple destinations service procedure**

1.-3. These steps are identical to step 1 to 3 of the general message flow described in sub-clause 7.0. SMS Group ID shall be included in the short message and identified by recipient address.

4. The VAS AS performs a short message to multiple destinations service and generates new short messages with the same content as the original short message.

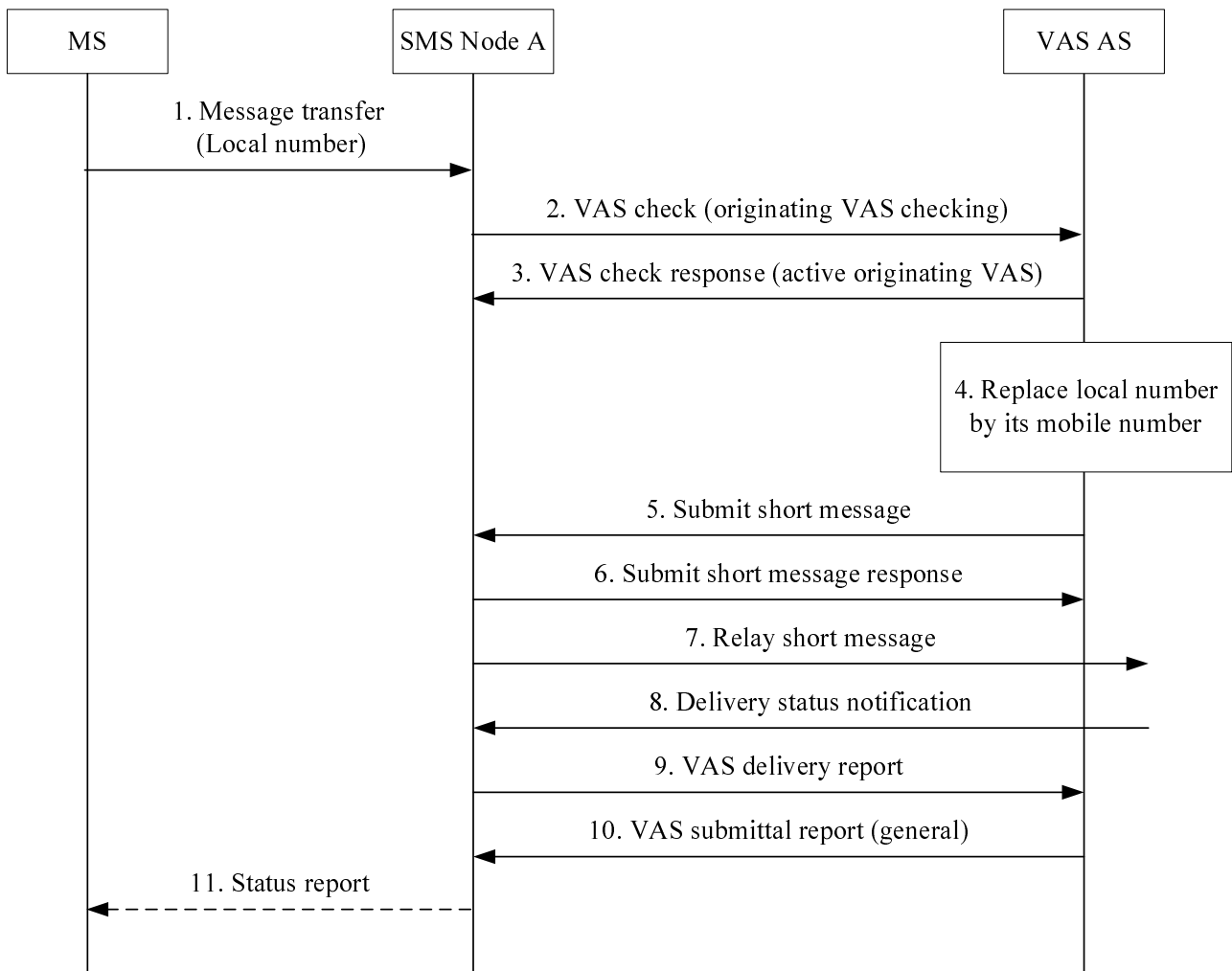
5.-14. The VAS AS separately submits the short message to the SMS Node A with different destination address. These destinations should be all other recipients within the SMS group. There is no sequence requirement of sending short message for VAS AS, i.e. the VAS AS can send the short message in parallel. The SMS Node A receives a delivery report from each receiving MS and relays it to the VAS AS. The VAS AS generates a general delivery report based on the results of the delivery reports from each recipient.



15.-16. The general delivery report is sent from VAS AS to SMS Node A and transferred to the sending MS by SMS Node if possible.

## 7.7 Short Message Virtual Private Network (VPN)

The originating user and the terminating user are in the same VPN and support sending messages to local numbers in the VPN. The local number may be a short number which is bound to mobile number. The mapping table with local number to mobile number shall be stored in the VAS AS. The VAS AS receiving a checking message from SMS Node checks that the originating user activating VPN service, then replace local number by terminating user's mobile number.



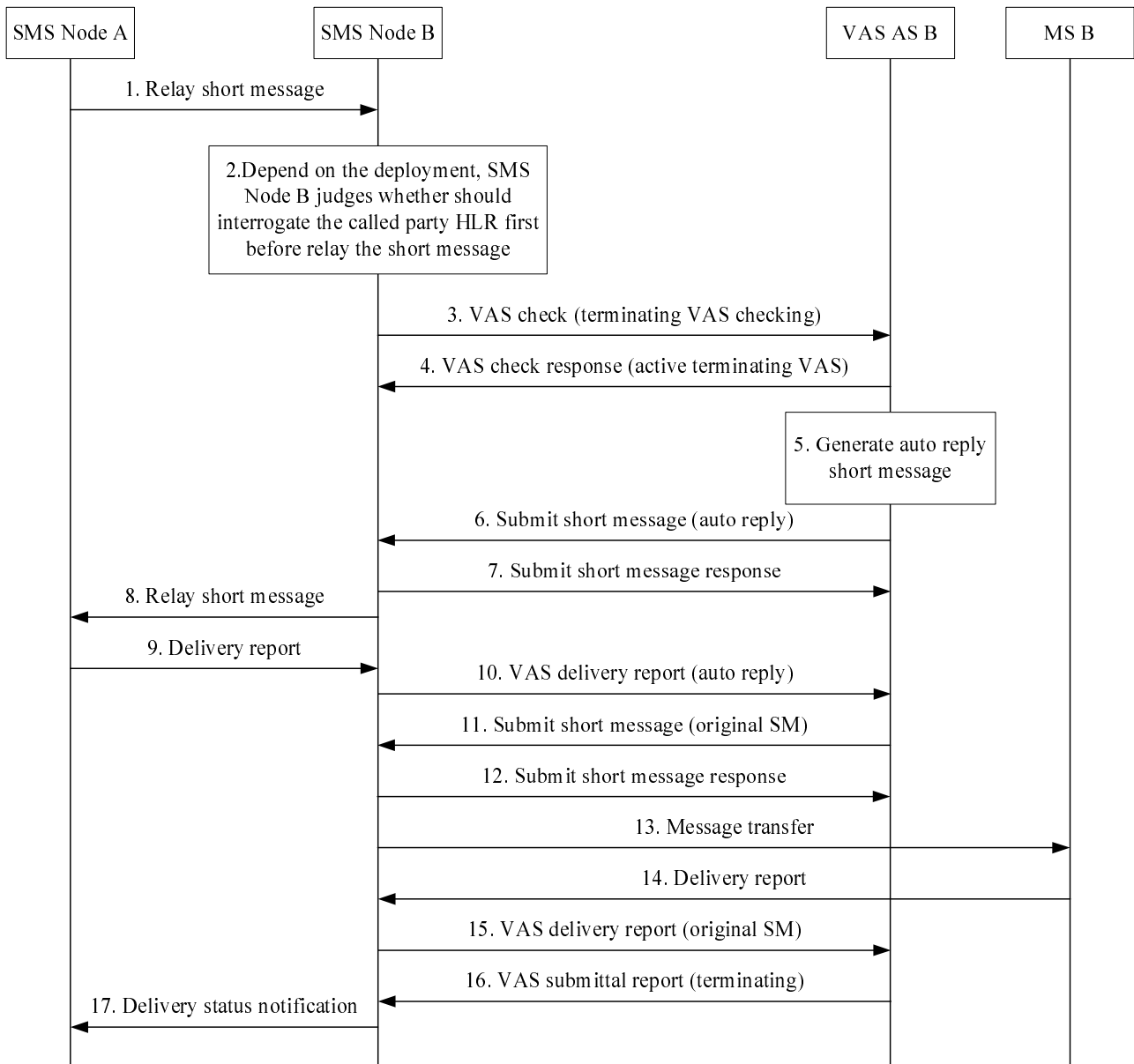
**Figure 7.7-1 Short Message Virtual Private Network procedure**

1. The SMS Node A receives a short message to local number from MS and need ask the VAS AS to check whether the originating user has activated VAS.
- 2.-3. The VAS AS checks that the originating user has activated VPN service and the destination is a local number. The VAS AS indicates the SMS Node there is active originating VAS for originating user.
4. The VAS AS replaces the local number by its mobile number and continues according to the general procedure described in sub-clause 7.0 step 4 and following.

## 7.8 Short Message auto reply

Short Message Auto Reply is a terminating VAS. The procedure of the short message auto reply refers to the general flow for VAS SMS described in the previous sub-clause 7.0. The VAS AS checks that the terminating user has

activated the Short Message Auto Reply service and generates an auto reply short message which contents have been defined in advance, then deliver it to the originating user.



**Figure 7.8-1 Short Message auto reply procedure**

**NOTE:** There is no requirement of the sequence for which one of auto reply message or original SM should be sent firstly in the VAS AS, i.e. auto reply message can be sent before or after original SM.

1.-4. See general flow described in the previous chapter 7.0. The VAS AS checks that a terminating user has activated short message auto reply service and indicates to the SMS Node B there is terminating VAS active.

5. The VAS-AS B checks a loop prevention indication within the message. If the loop prevention indication is not set, then the VAS AS B generates an auto reply short message and set the loop prevention indication within the auto reply short message to indicate a spawned message. Otherwise an auto reply short message shall not be generated. The VAS AS B stores the original short message for next delivery.

6.-7. The VAS AS B delivers a short message which is indicated as an auto reply message to the SMS Node B.

8.-9. The auto reply short message is delivered to the originating user. See 3GPP TS 23.040[4] for details.

10. The VAS AS B receives a delivery report for auto reply message delivery.

11.-17. The VAS AS B continues to deliver the original short message to the terminating user. See general flow described in the previous chapter 7.0.

## 7.9 Short Message personal signature

Short Message Personal Signature service is applicable for the originating user. In this case, the VAS AS checks that the originating user has activated the Short Message Personal Signature service and shall append the user's personal signature to the short message. The Short Message Personal Signature procedure refers to the general procedure for VAS SMS which described in the previous chapter 7.0.

Short message personal signature should be appended in the last concatenated message for a large message need to be separated into concatenated messages.

## 7.10 Short Message deferred delivery

Short Message Deferred Delivery service allows the user to set the short message delivery time. In this case the VAS AS checks that the originating user has activated the short message deferred delivery service. The VAS AS shall store the short message and set the timer to deferred delivery time. The short message should be sent when the timer times out. The deferred delivery time should be determined by the originating user. The service procedure refers to the general flow for VAS SMS which described in the previous chapter 7.0.

NOTE 1: Short message deferred delivery time can be set in many ways by the originating user, e.g. via Ut interface.

NOTE 2: Deferred delivery capability may be provide in SMS Node, however it is out of the scope of this specification.

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# 8 Interaction with other features

## 8.1 Interaction with barring services

Barring services described in 3GPP TS 23.040[4] are prior to VAS-SMS services. Any related VAS-SMS service to Operator Determined Barring (see 3GPP TS 22.041 [3]) is not applicable when Operator Determined Barring applies to the Short Message Service. For example, if an originating service for SMS is barred by ODB and a terminating service for SMS is not barred, all the related originating services for VAS-SMS service are also barred, but terminating services (e.g. SMS forwarding) for VAS-SMS are not impacted.

## 8.2 Interaction with multiple Short Message transfer

There is no direct conflict between the VAS-SMS service and the multiple short message transfer service described in 3GPP TS 23.040[4]. VAS-SMS services shall not impact the implementation of the multiple short message transfer service when the SMS-SC indicates to the SMS-GMSC that there are more messages to send for each message waiting in the service centre.

## 8.3 Interaction with SMS COMPRESSION

VAS-SMS services should be applicable for the SMS COMPRESSION described in 3GPP TS 23.040[4]. If the VAS-SMS service does not support SMS COMPRESSION (for example for VAS-SMS services that modify the content of a SM), then it shall guarantee the compressed SMS message delivery as normal.

## 8.4 Interaction with Enhanced Messaging Service

For the enhanced messaging service described in 3GPP TS 23.040[4], VAS-SMS services should be applicable. If the VAS-SMS service does not support the enhanced messaging service (for example for VAS-SMS services that modify the content of a SM), then it shall guarantee enhanced message delivery as normal.

## 8.5 Interaction with SM delivery report

If a Short Message Receipt service is applied the SMS Node shall not send SM delivery report message to the user.

## 8.6 Interaction with charging

VAS-SMS services are required to produce billing of extra fee (e.g. monthly based function fee).

## 8.7 Interaction between VAS-SMS services

VAS-SMS services should be classified by priority and triggered according to priority order based on operator's policy.

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# 9 Interworking with other networks

The network architecture defined for VAS SMS is based on cellular networks. 3GPP TS 23.204 [5] specifies how to deliver SMS over generic 3GPP IP access. The theory of interworking with IP based network for VAS SMS is the same as normal SMS; refers to 3GPP TS 23.204 [5].

NOTE: Application of VAS services is triggered from either an SMS-SC or an SMS Router. As a consequence, for interworking in the originating side, both originating and terminating VAS services can be applied. For interworking in the terminating side the terminating VAS services can be applied subject to an SMS Node being involved in the message flow.

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## Annex A: Change history

Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	New
2009-12	CT#46	CP-090824			3GPP TS Presented for approval in CT#46	9.0.0
2009-12					Editorial tidy-up	9.0.1
2011-03	-	-	-	-	Update to Rel-10 version (MCC)	10.0.0
2012-09	-	-	-	-	Update to Rel-11 version (MCC)	11.0.0
2014-09	-	-	-	-	Update to Rel-12 version (MCC)	12.0.0
2015-12					Update to Rel-13 version (MCC)	13.0.0
2017-03	CT#75	-	-	-	Update to Rel-14 version (MCC)	14.0.0
2018-06	-	-	-	-	Update to Rel-15 version (MCC)	15.0.0
2019-06	CT#84	CP-191058	000 1	1	Addition of 5GS support	15.1.0
2020-07	CT#88e	-	-	-	Update to Rel-16 version (MCC)	16.0.0

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# History

<b>Document history</b>		
V16.0.0	July 2020	Publication