



HLD

REDESIGN OF SIM - ACI SAP FOR CONFIGURATION OF SIM-UDP DTI CONNECTION

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Change History

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2004-Oct-27	Jacek Kwasnik		0.3	Draft	3

Notes:

1. Initial version

2. Pre-release for source implementation
3. Documents property updated.

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1 Introduction

This document describes the changes that are necessary to get a working solution for the SAT Class E OPEN CHANNEL command. Only ACI changes and changes regarding the SAP are outlined in the following.

2 General problem of current implementation

The MSC (see Chart 4.1) shows the communication as it is expected to be correct taken from respective ACI test document for an OPEN CHANNEL command for UDP “immediate” connection.

Unfortunately, the implementation causes massive problems to the state machine of UDP. It is not possible to set up the DTI connection between SIM and UDP (Phase F) after the configuration of IP and UDP (Phase E) has been performed. The actual connection of UDP with the higher layer (SIM) should take place before the UDP - IP DTI connection will be established (Phase A). This order is also used for the DTI channel set up between WAP, UDP and IP.

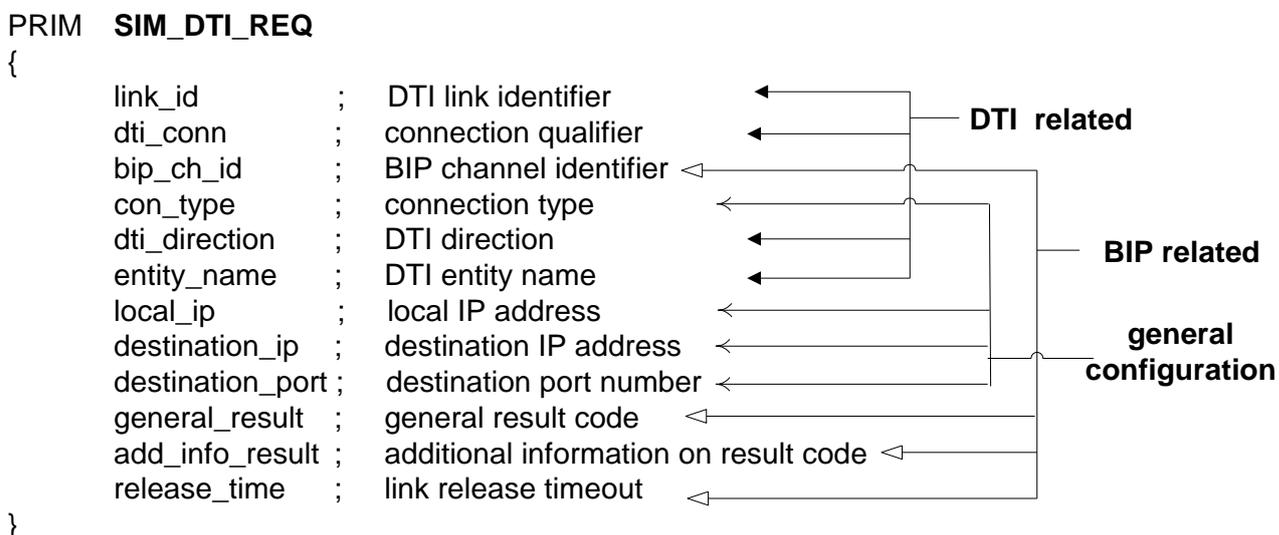
3 Proposed solution

Since the SIM_DTI_REQ primitive contains a large parameter set providing information about DTI, BIP and BIP connection configuration it can not be easily shifted to another position. For instance, the general information about the connection configuration is only available after the PPP connection has already been established. To get a more reasonable structure of the channel connection process there is the possibility to split the SIM_DTI_REQ into three primitives.

The SIM_DTI_REQ primitive triggers three independent functionalities:

- 1) SIM DTI connection / disconnection
- 2) BIP connection / disconnection
- 3) General configuration of the connection

The following scheme shows the parameter set of the SIM_DTI_REQ primitive and how they are related to the functionalities:



The split results in the following three primitives:

- 1) **SIM_DTI_REQ**: triggering the DTI-SIM channel connection / disconnection only
- 2) **SIM_BIP_REQ**: triggering the BIP channel connection / disconnection
- 3) **SIM_BIP_CONFIG_REQ**: providing information about configuration details of the channel

The structure of the new primitives:

```
PRIM  SIM_DTI_REQ
{
    link_id      ; DTI link identifier
    dti_conn     ; connection qualifier
    dti_direction ; DTI direction
    entity_name  ; DTI entity name
}
```

Since the dti_conn connection qualifier in the former SIM_DTI_REQ has been used to store both, BIP and DTI connection values, the new dti_conn only stores the respective DTI connection values. Therefore, a new connection qualifier holding the connection values for BIP has been introduced for SIM_BIP_REQ.

```
PRIM  SIM_BIP_REQ
{
    bip_ch_id    ; BIP channel identifier
    bip_conn     ; connection qualifier
    release_time ; link release timeout
    add_info_result ; additional information on result code
    general_result ; general result code
}
```

```
PRIM  SIM_BIP_CONFIG_REQ
{
    local_ip      ; local IP address
    destination_ip ; destination IP address
    destination_port ; destination port number
    con_type      ; connection type
}
```

The SIM_BIP_REQ primitive is used to set up the BIP channel. This has to be sent in the case of "immediate" and "on demand" channel establishment right after the SAT command OPEN CHANNEL has occurred.

The split allows to shift the pure DTI SIM-UDP channel set up to the requested position (see Section 4.2, Phase F1) before the UDP-IP DTI connection is set up, right after the bearer has been activated (Phase A). This is in line with the WAP implementation where this functionality is provided by sending a WAP_DTI_REQ primitive. The DTI channel has only to be set up in the case of a "immediate" OPEN CHANNEL / SEND DATA command received from SAT (see Charts in 4.2 and 4.4, Phase B+F2). Finally the SIM_BIP_CONFIG_REQ is sent for the configuration of the channel like it is done for the configuration of UDP and IP by using UDPA_CONFIG_REQ or IPA_CONFIG_REQ (see Chart 4.2, phase D+F3).

The respective three confirmation primitives will look like:

```
PRIM  SIM_DTI_CNF
{
    link_id      ; DTI link identifier
    dti_conn     ; connection qualifier
}

PRIM  SIM_BIP_CNF
{
    bip_ch_id   ; BIP channel identifier
    bip_conn    ; connection qualifier
}

PRIM  SIM_BIP_CONFIG_CNF
{
}
```

The introduction of the dti_conn and bip_conn connection qualifier implies a light modification of the SIM_DTI_IND. The new bip_conn connection qualifier has been added and the primitive has been renamed to SIM_DTI_BIP_IND.

```
PRIM  SIM_DTI_BIP_IND
{
    link_id      ; DTI link identifier
    dti_conn     ; connection qualifier
    bip_ch_id   ; BIP channel identifier
    bip_conn    ; connection qualifier
}
```

Please refer to the Chart 4.3 and 4.4 to see how the new primitives are used for "on demand" OPEN CHANNEL and SEND DATA "immediately" command.

The connection of the BIP channel is already performed at the receiving of an OPEN CHANNEL "on demand" command (see Chart 4.3; Phase F1).

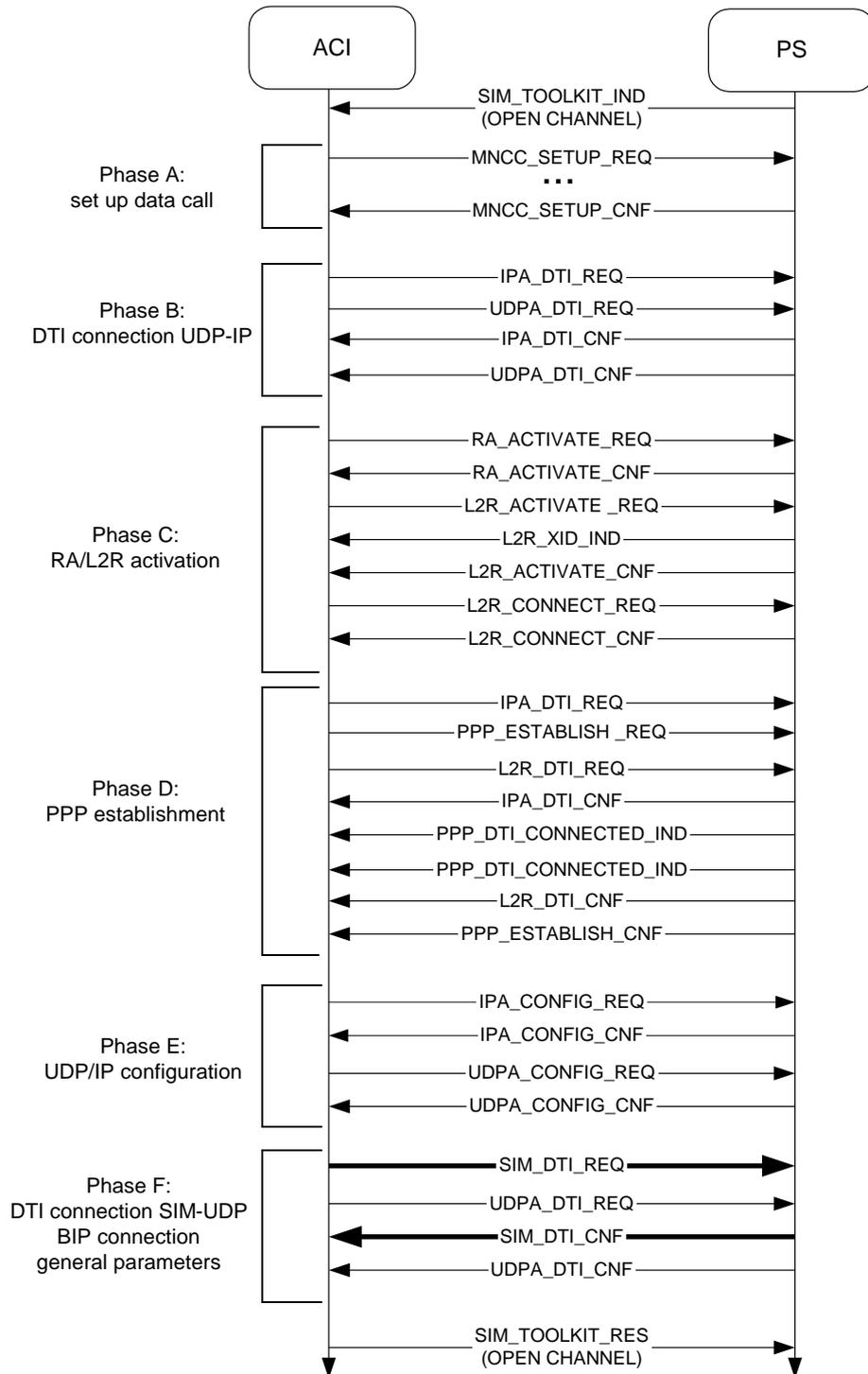
Later on, at receiving of a SEND DATA "immediately" command the CS data call has to be established (see Chart 4.4; Phase A) and thereon the DTI connections have to be set up (see Phase B+F2).

Since the BIP connection has already been set up after the reception of the OPEN CHANNEL "on demand" command, the SIM configuration has to be performed (see Phase D+F3) after the RA/L2R activation (see Phase C).

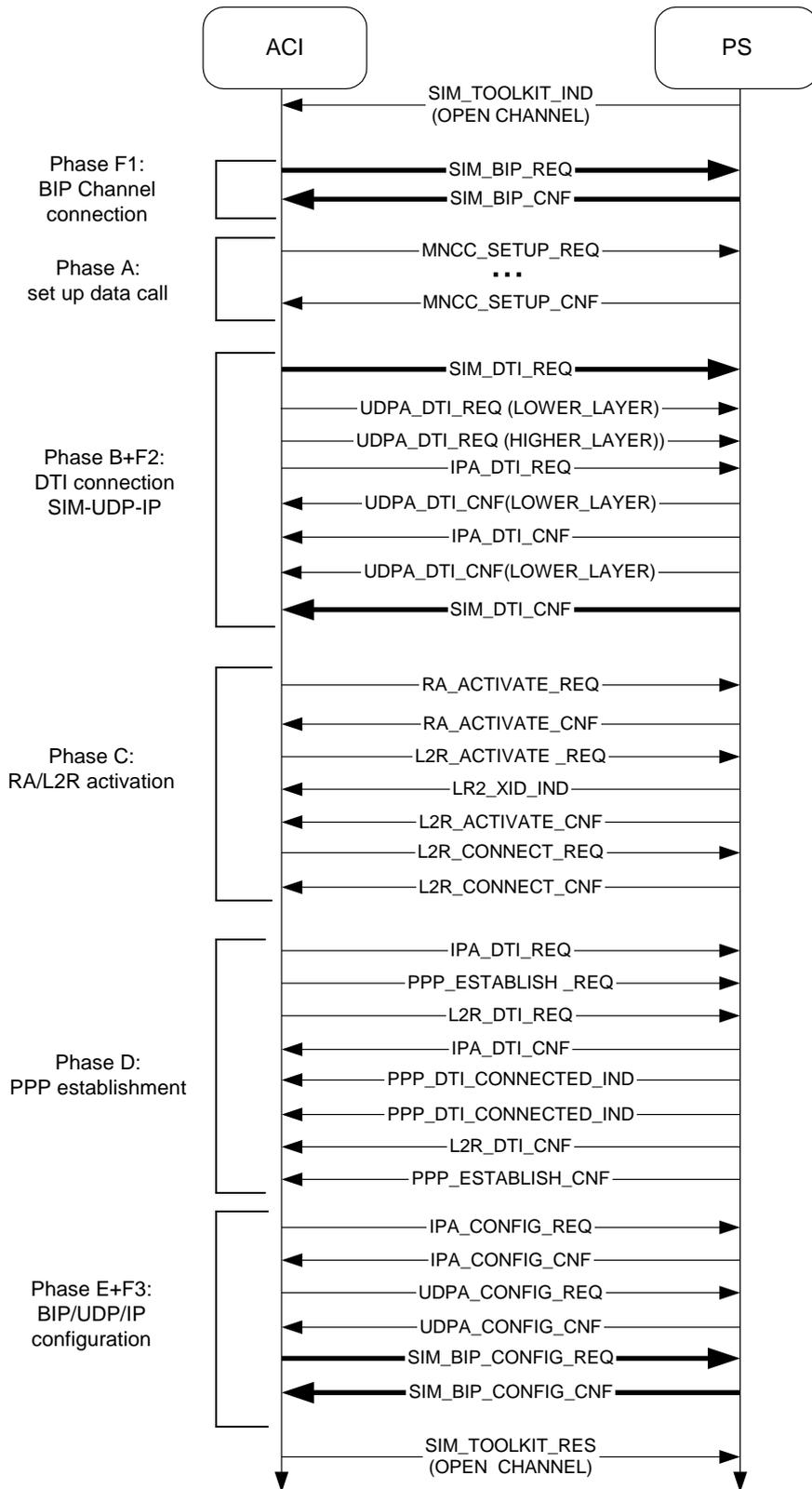
4 MSCs

4.1 OPEN CHANNEL CSD

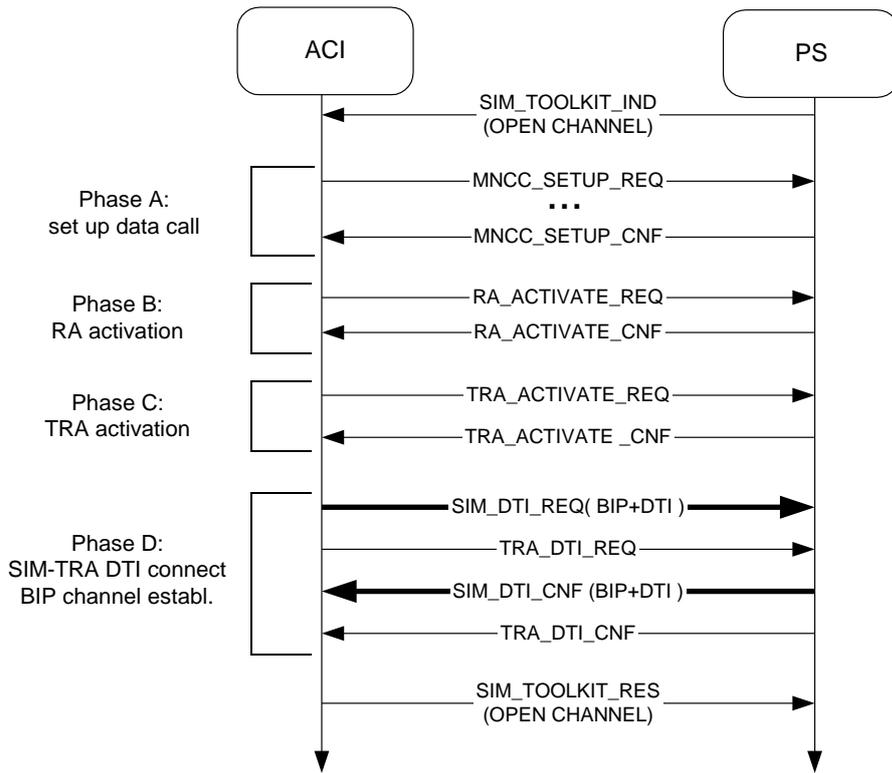
4.1.1 OPEN CHANNEL immediately for CSD over UDP (old behavior)



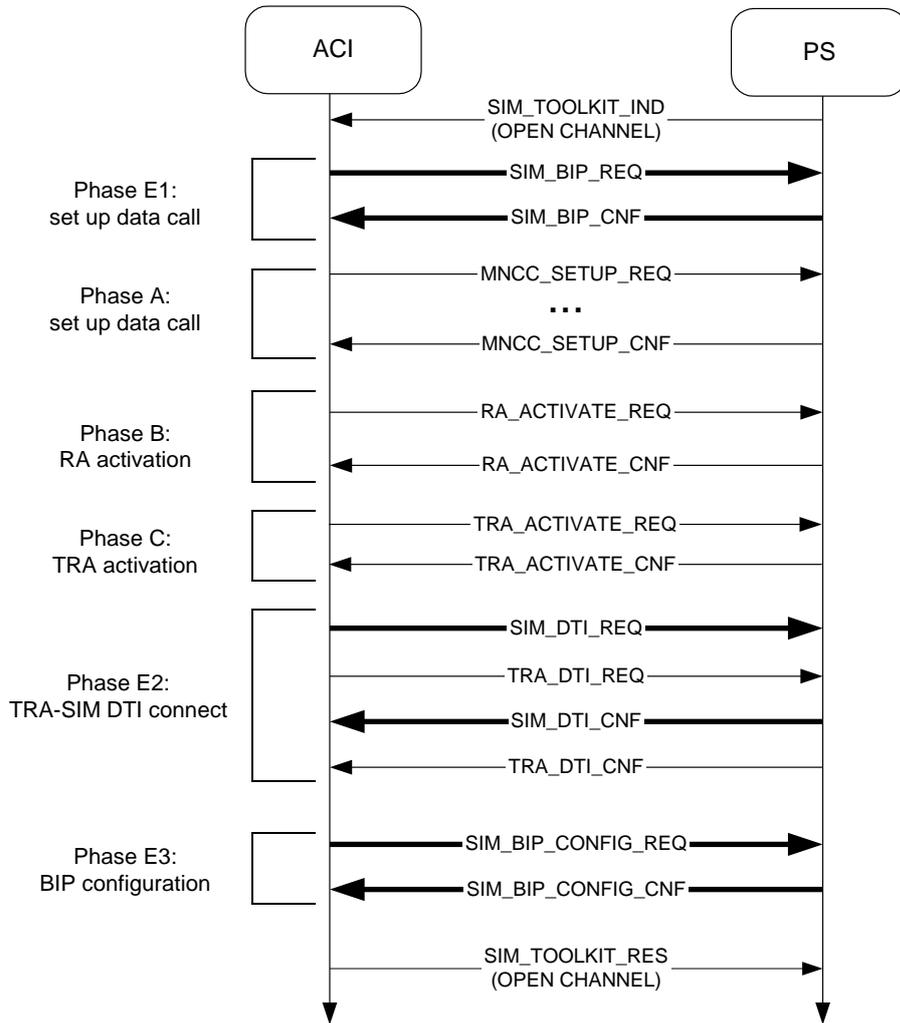
4.1.2 OPEN CHANNEL immediately for CSD over UDP (new behavior)



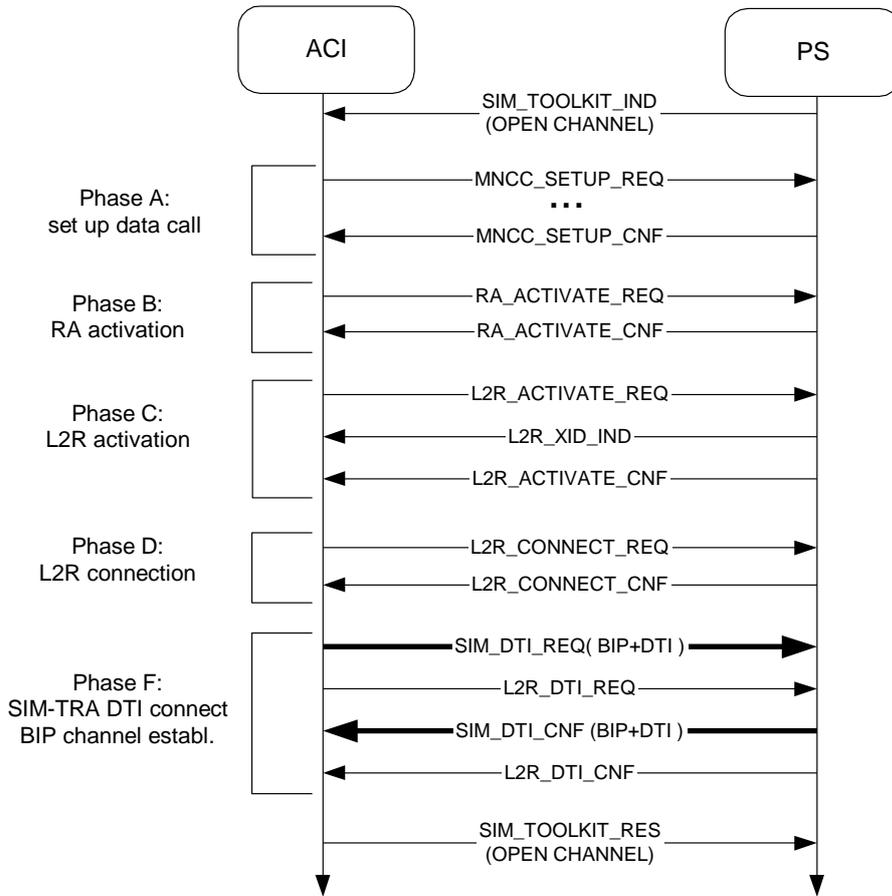
4.1.3 OPEN CHANNEL immediately for CSD over TRA (old behavior)



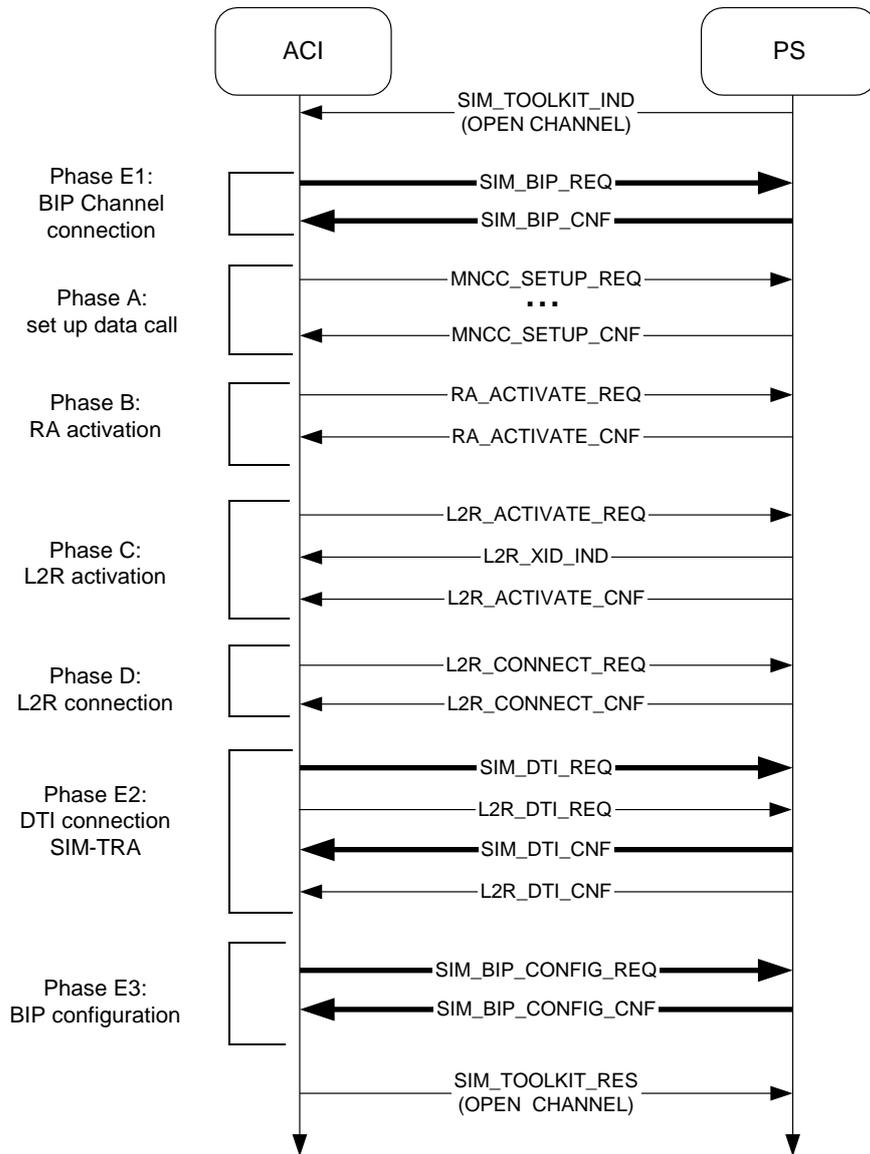
4.1.4 OPEN CHANNEL immediately for CSD over TRA (new behavior)



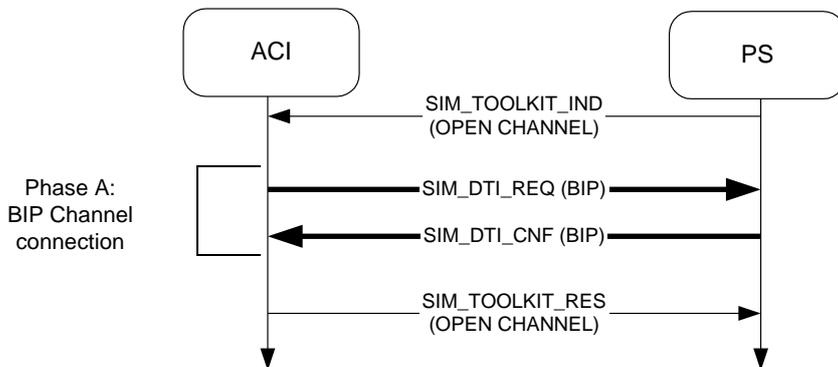
4.1.5 OPEN CHANNEL immediately for CSD over L2R (old behavior)



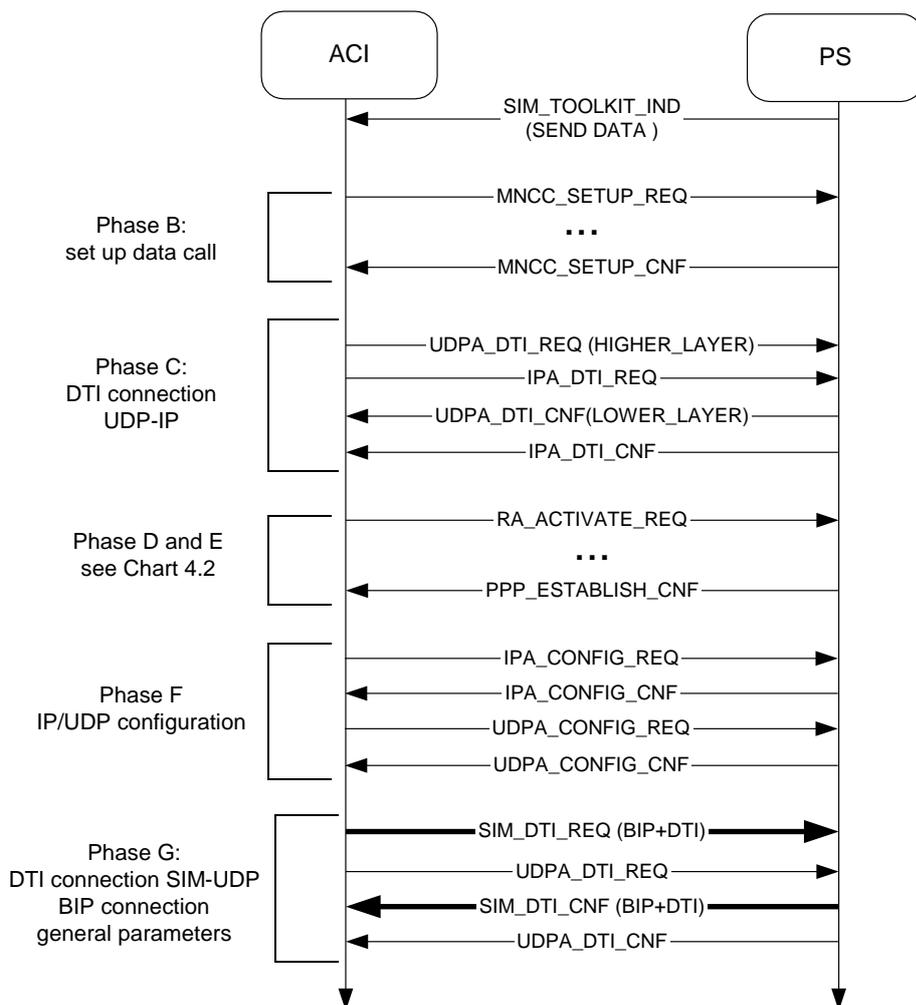
4.1.6 OPEN CHANNEL immediately for CSD over L2R (new behavior)



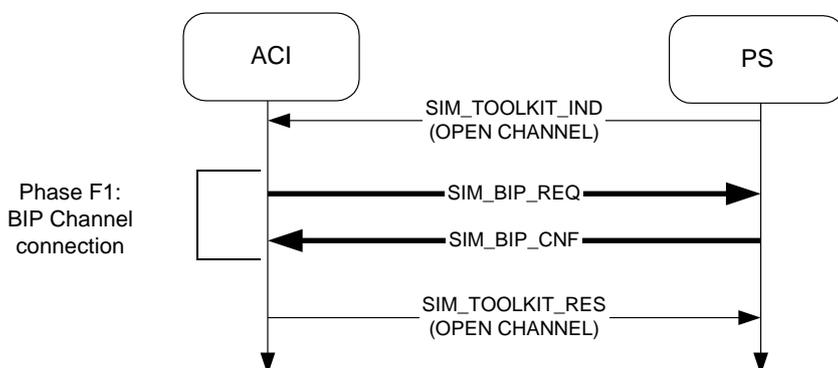
4.1.7 OPEN CHANNEL on demand for CSD over UDP (old behavior)



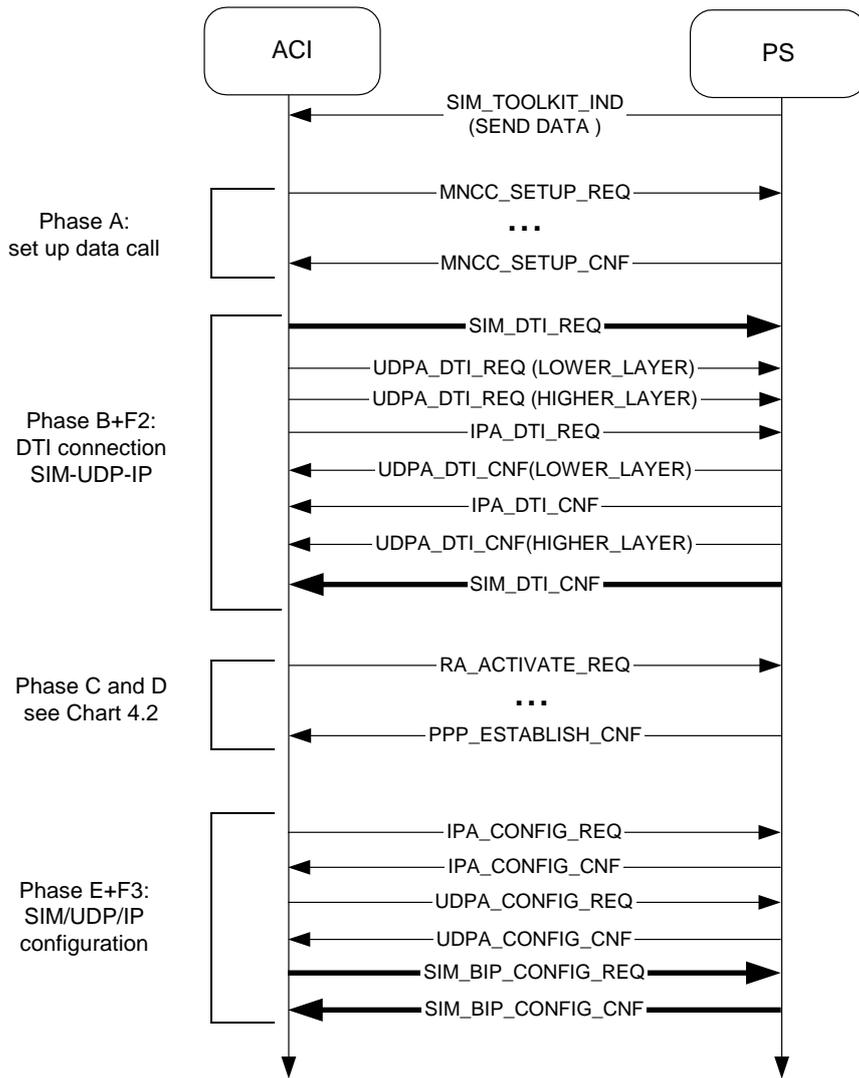
4.1.8 SEND DATA immediately for CSD over UDP (old behavior)



4.1.9 OPEN CHANNEL on demand for CSD over UDP (new behavior)



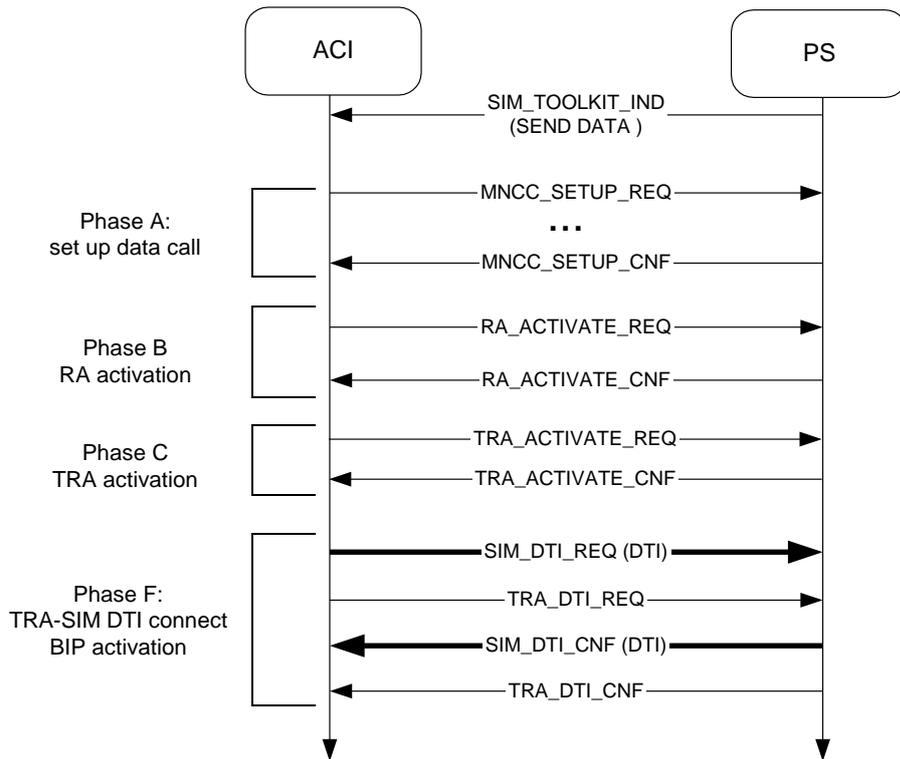
4.1.10 SEND DATA immediately for CSD over UDP (new behavior)



4.1.11 OPEN CHANNEL on demand for CSD over TRA (old behavior)

(see MSC 4.1.7)

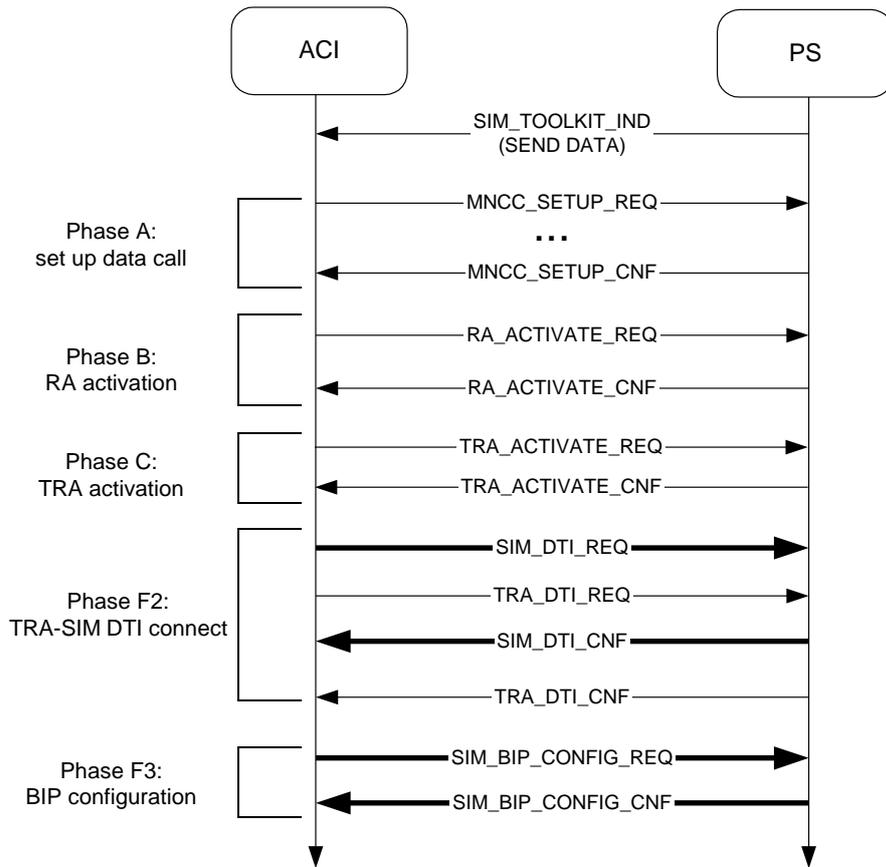
4.1.12 SEND DATA immediately for CSD over TRA (old behavior)



4.1.13 OPEN CHANNEL on demand for CSD over TRA (new behavior)

(see MSC 4.1.9)

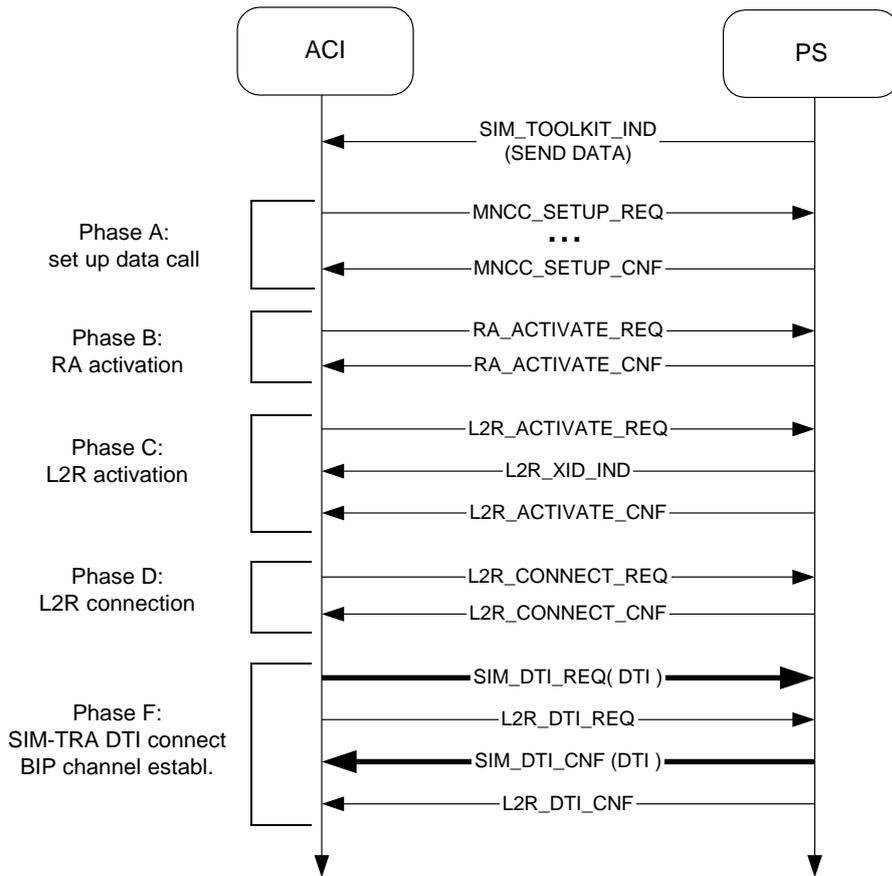
4.1.14 SEND DATA immediately for CSD over TRA (new behavior)



4.1.15 OPEN CHANNEL on demand for CSD over L2R (old behavior)

(see MSC 4.1.7)

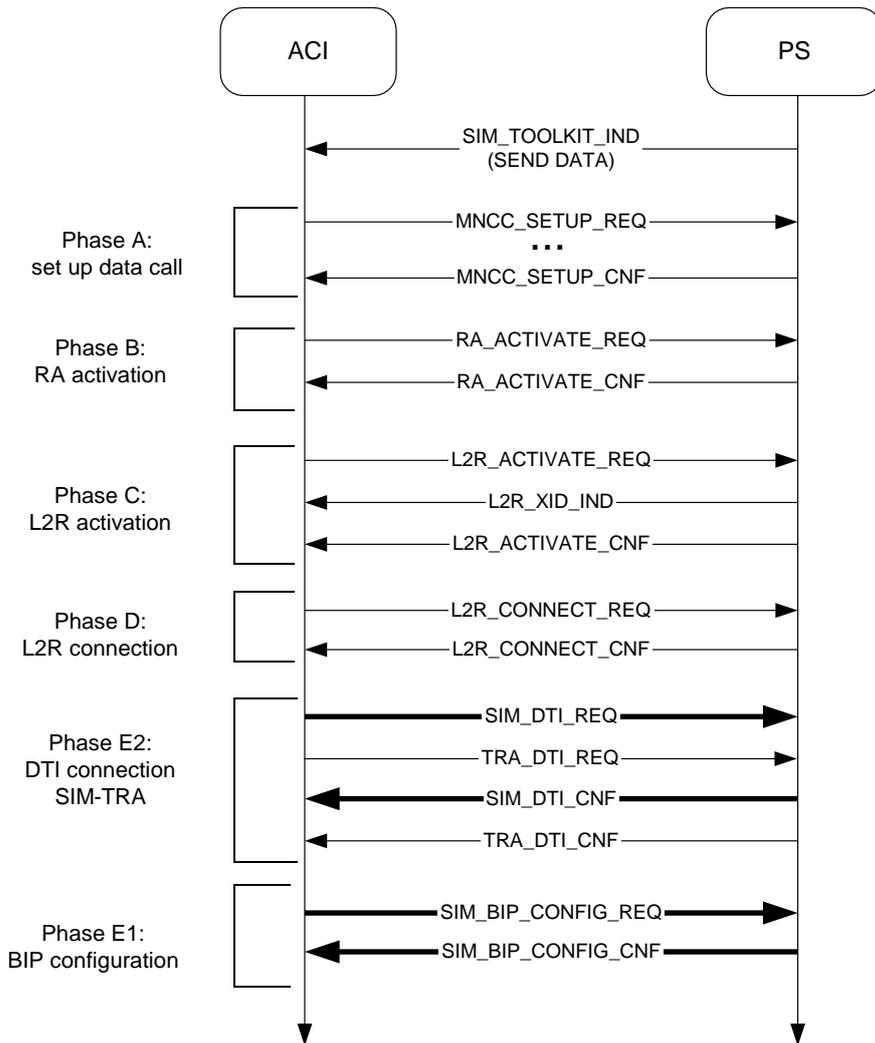
4.1.16 SEND DATA immediately for CSD over L2R (old behavior)



4.1.17 OPEN CHANNEL on demand for CSD over L2R (new behavior)

(see MSC 4.1.9)

4.1.18 SEND DATA immediately for CSD over L2R (new behavior)

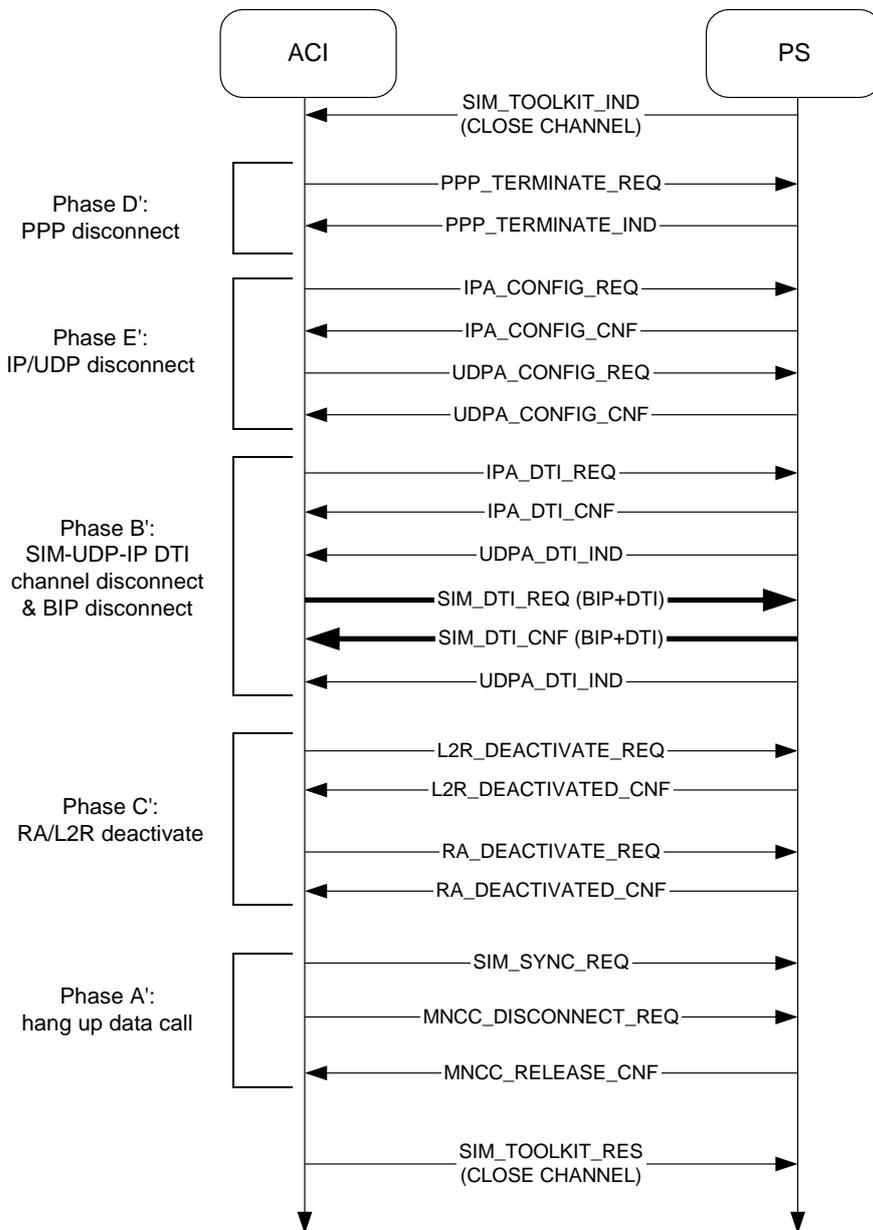


4.2 CLOSE CHANNEL CSD

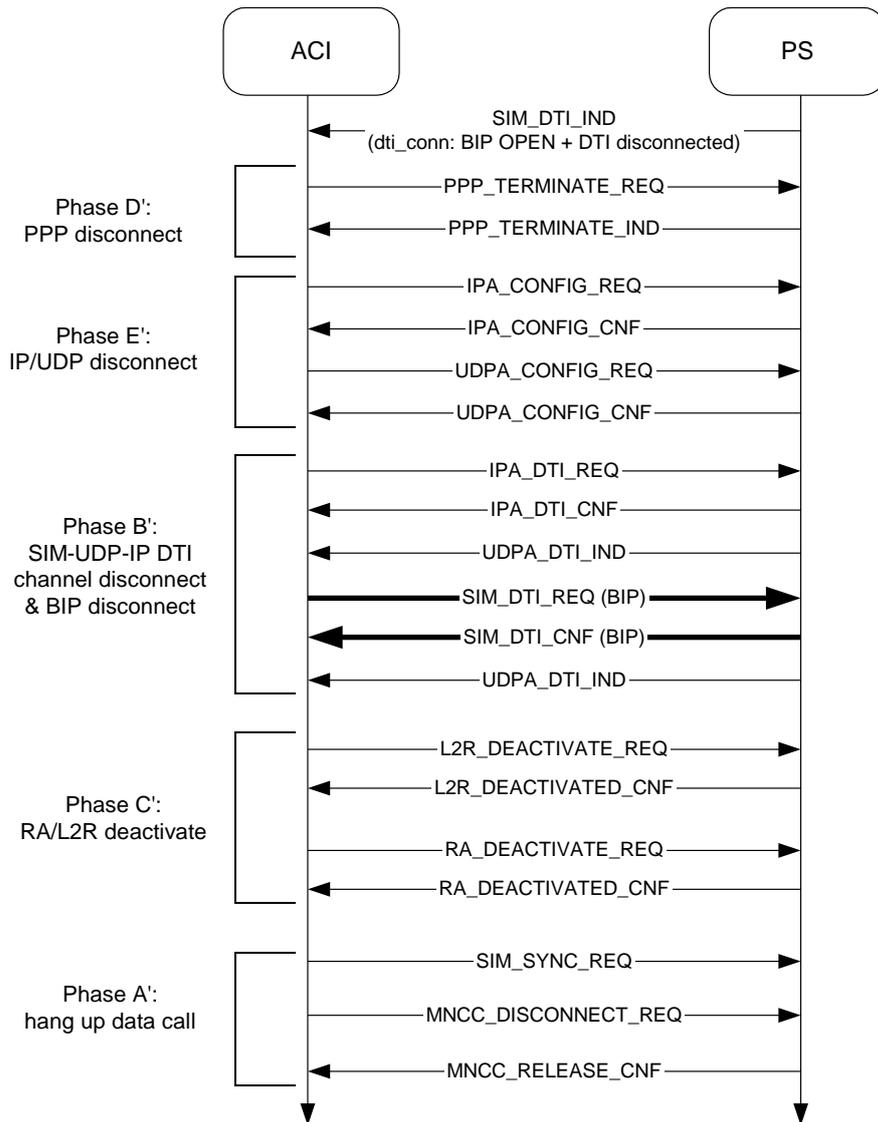
NOTE: There are more causes for channel disruption, e.g. initiated by the user or the entities involved in the transmission chain, which result in an analogous deactivation primitive sequence as shown for following SAT initiated charts. This sequence would be triggered by the respective primitive sent by involved entities below ACI or from the user (AT interface).

Following charts assume completely established connection chains for SAT class e data transmission.

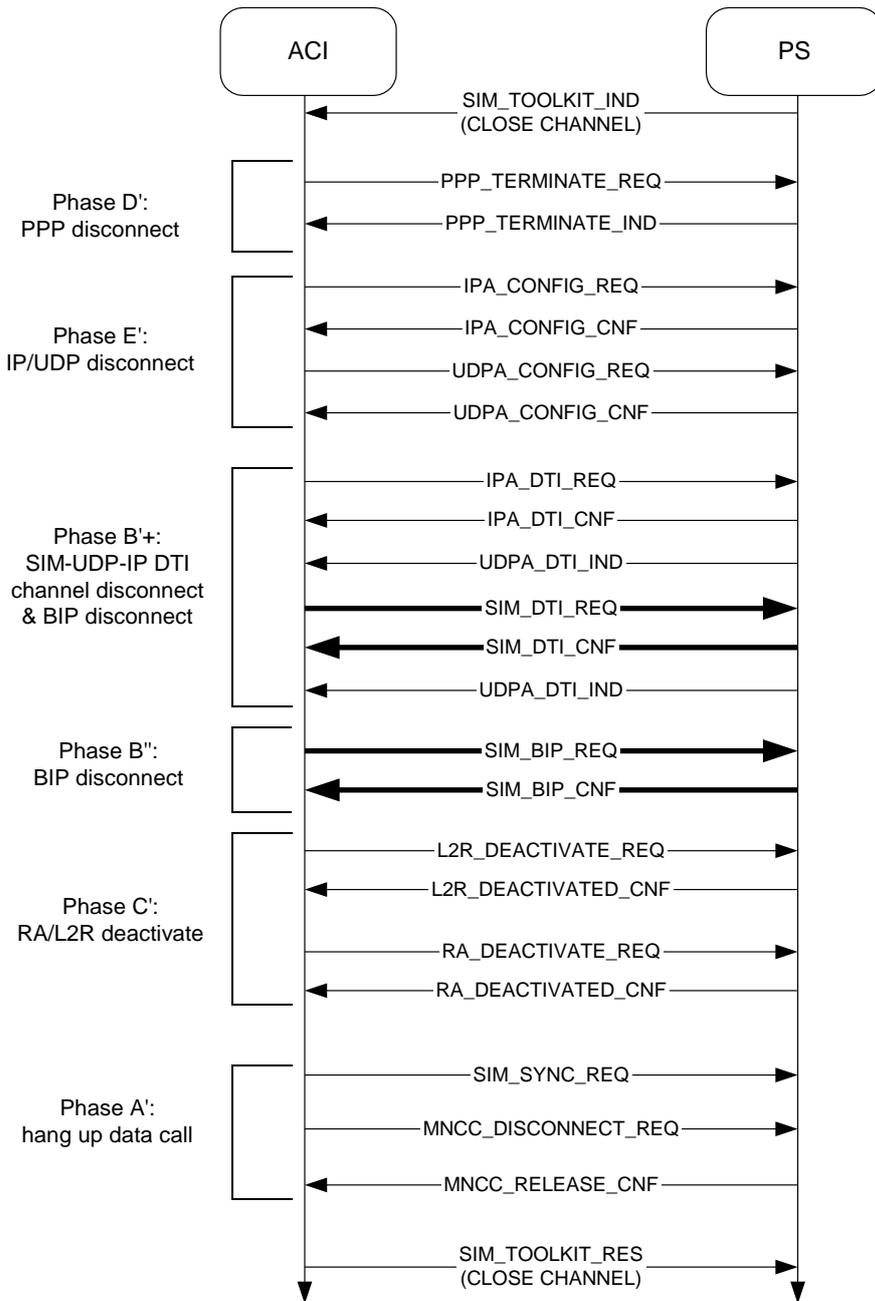
4.2.1 SAT initiated for CSD over UDP (old behavior)



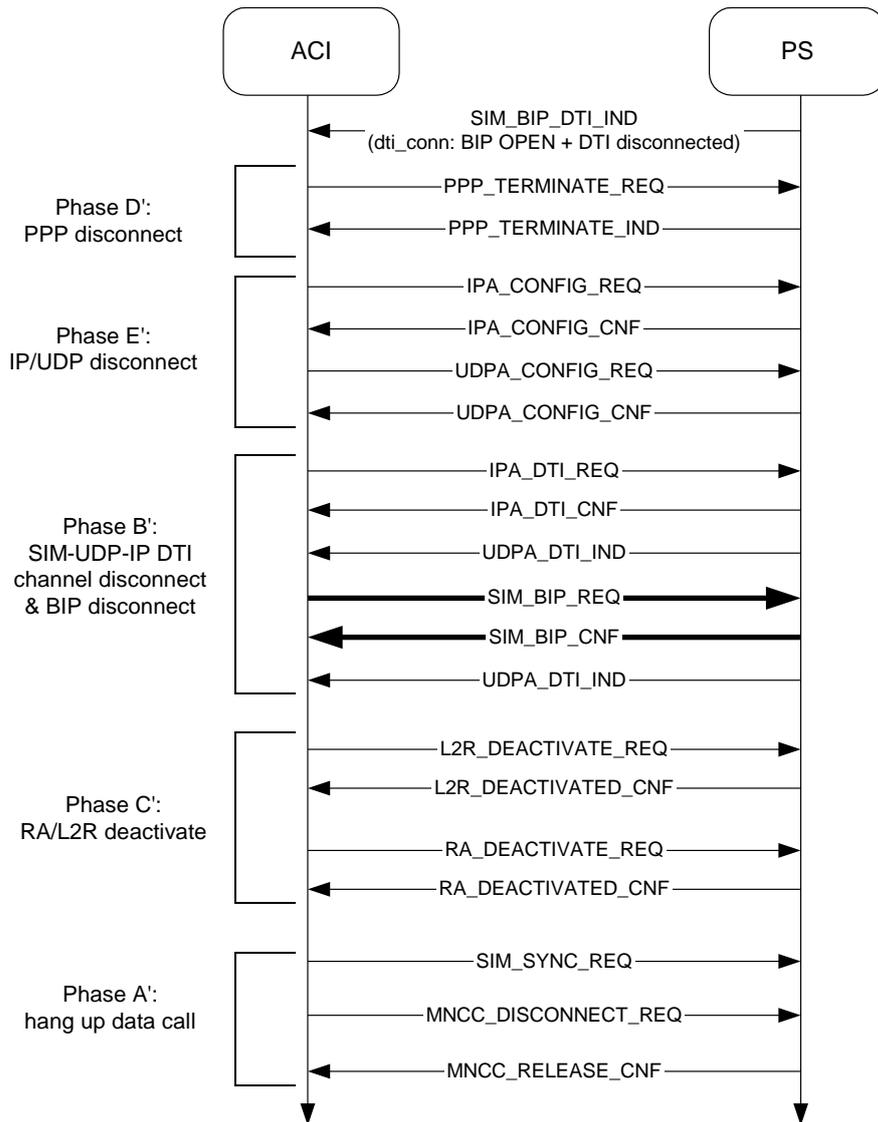
4.2.2 SIM entity initiated for CSD over UDP (old behavior)



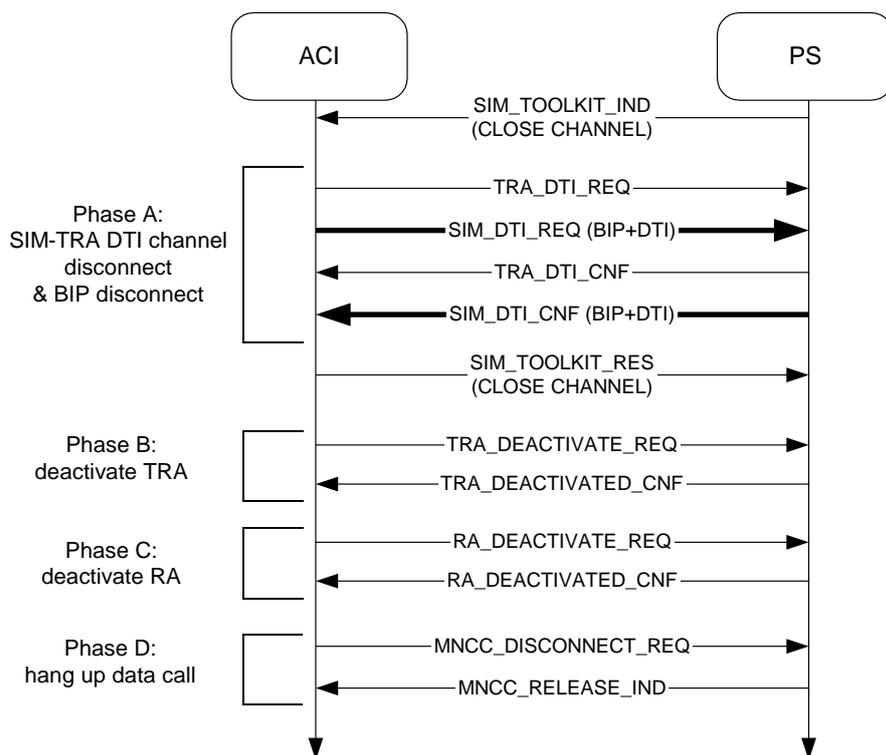
4.2.3 SAT initiated CSD over UDP (new behavior)



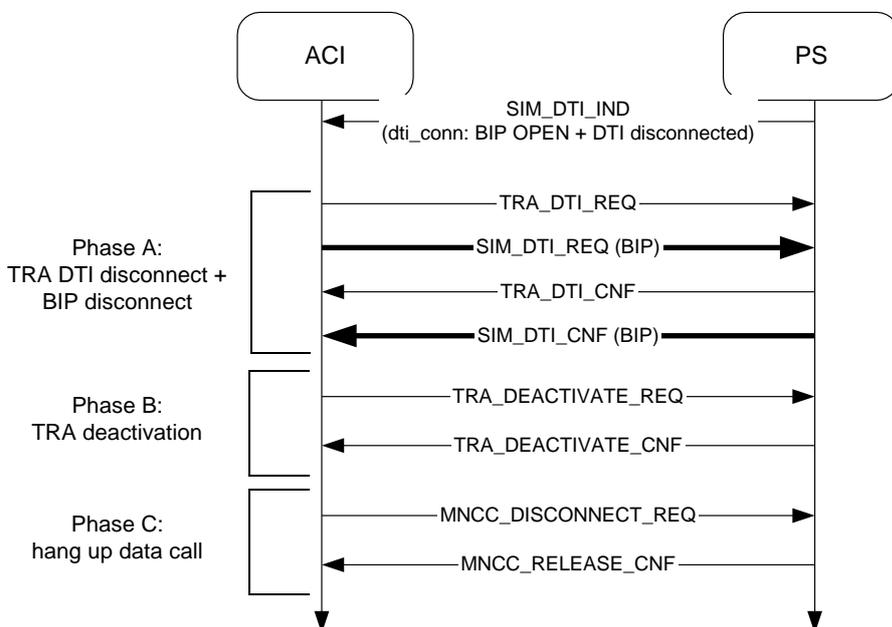
4.2.4 SIM entity initiated CSD over UDP (new behavior)



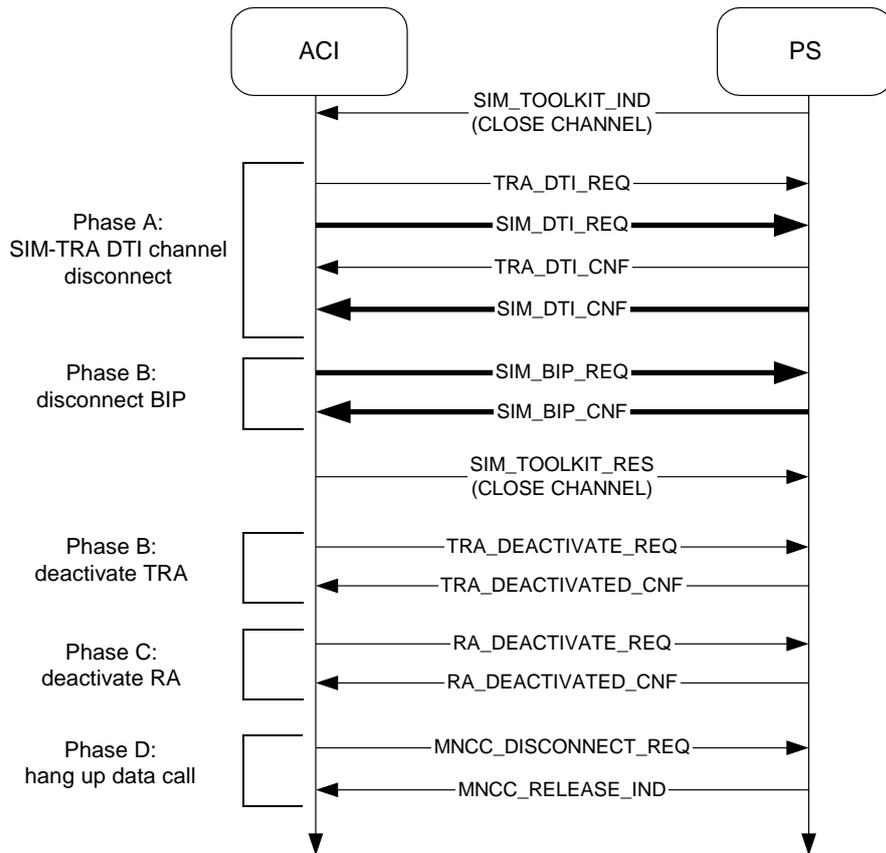
4.2.5 SAT initiated CSD over TRA (old behavior)



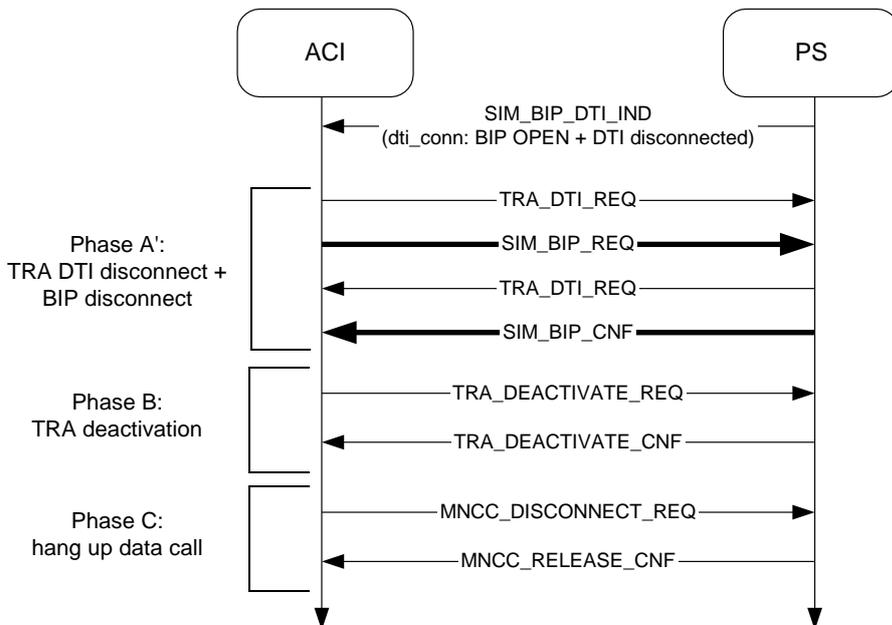
4.2.6 SIM initiated CSD over TRA (old behavior)



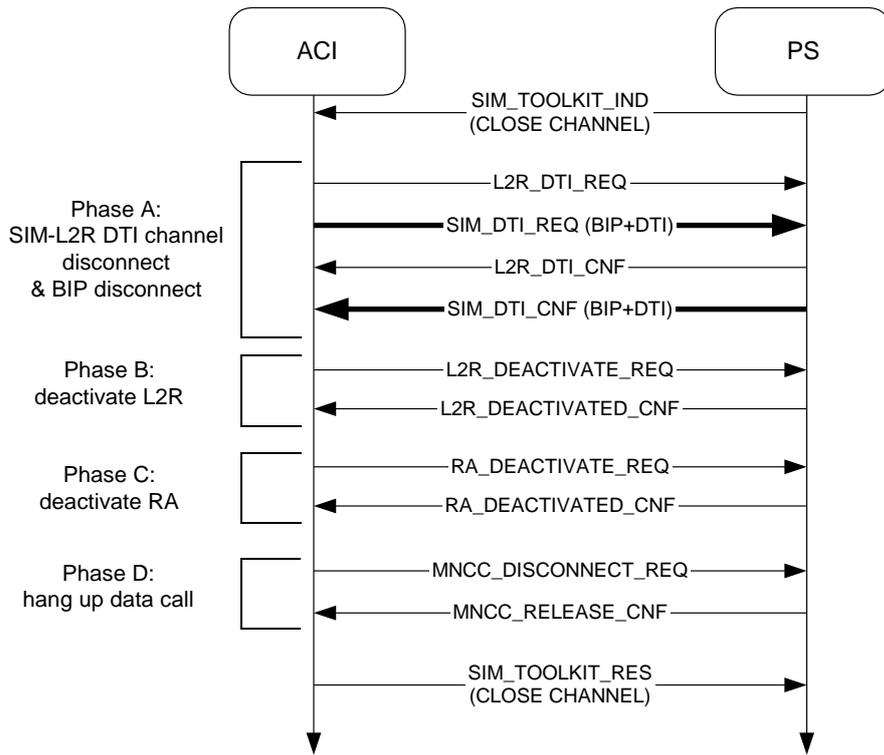
4.2.7 SAT initiated CSD over TRA (new behavior)



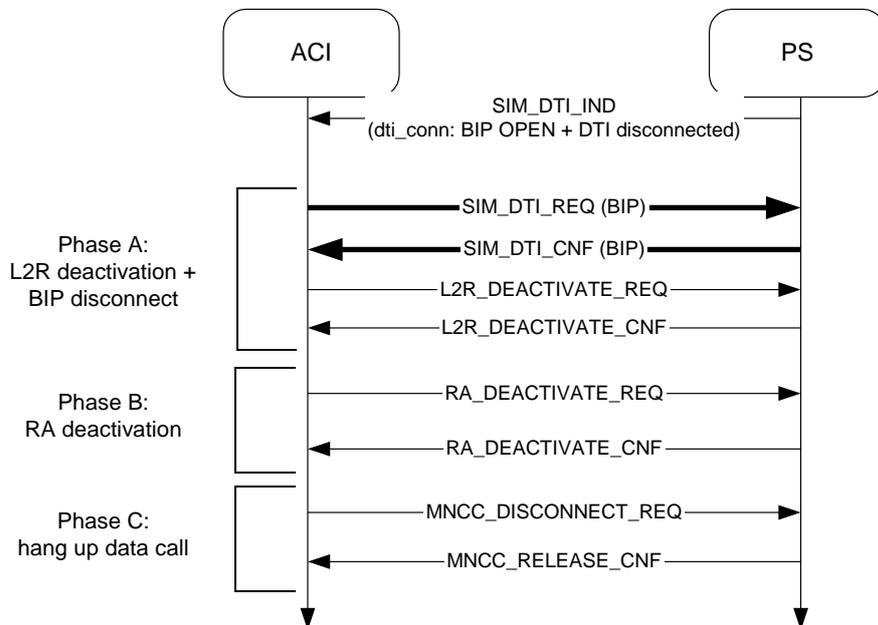
4.2.8 SIM initiated CSD over TRA (new behavior)



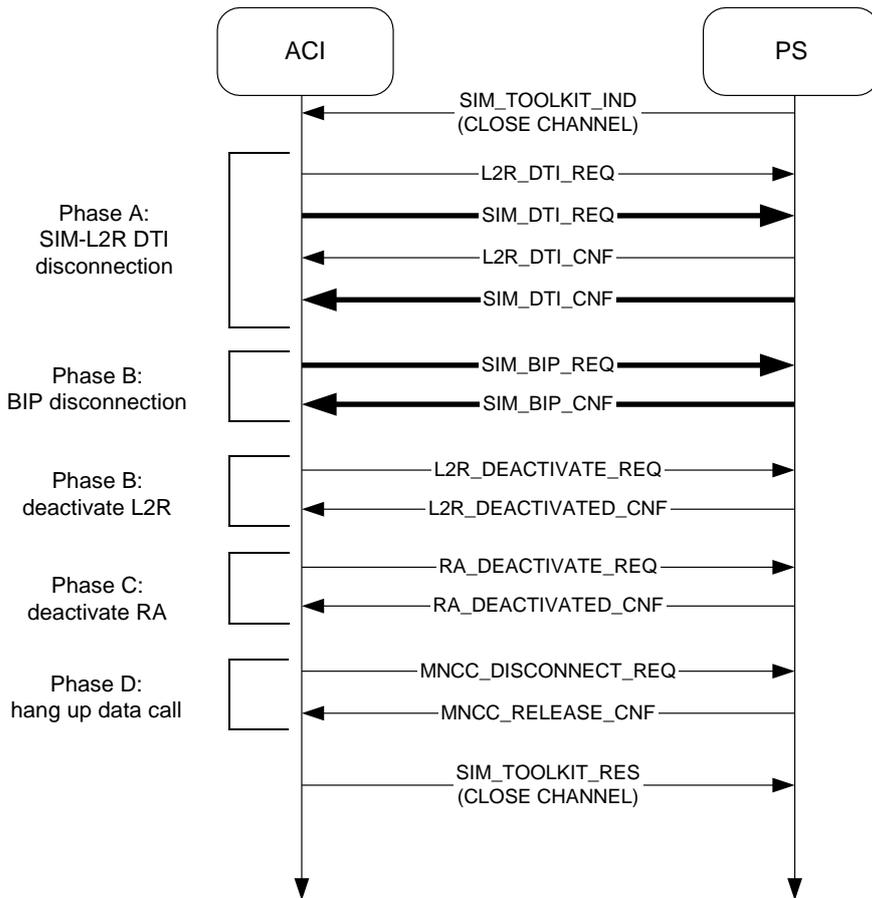
4.2.9 SAT initiated CSD over L2R (old behavior)



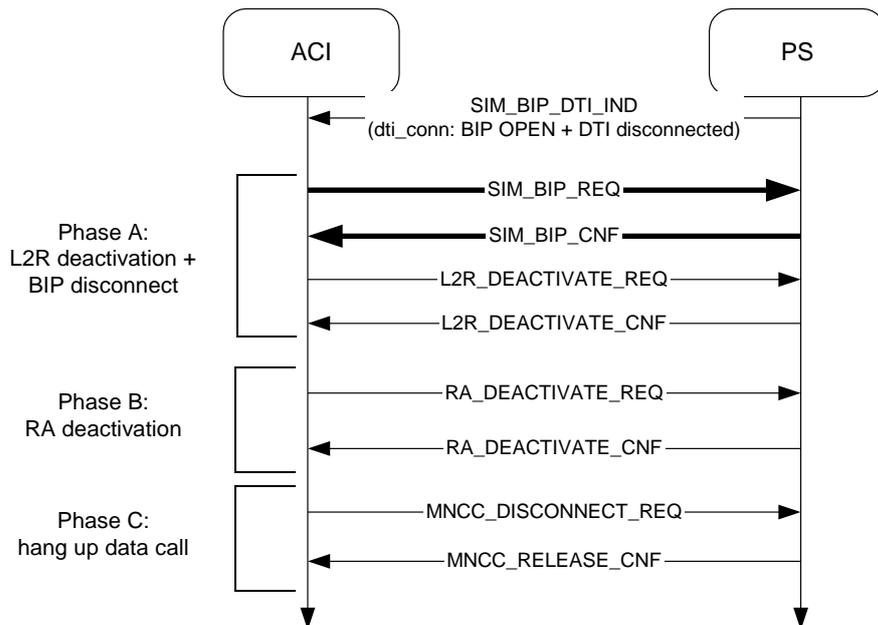
4.2.10 SIM initiated CSD over L2R (old behavior)



4.2.11 SAT initiated CSD over L2R (new behavior)

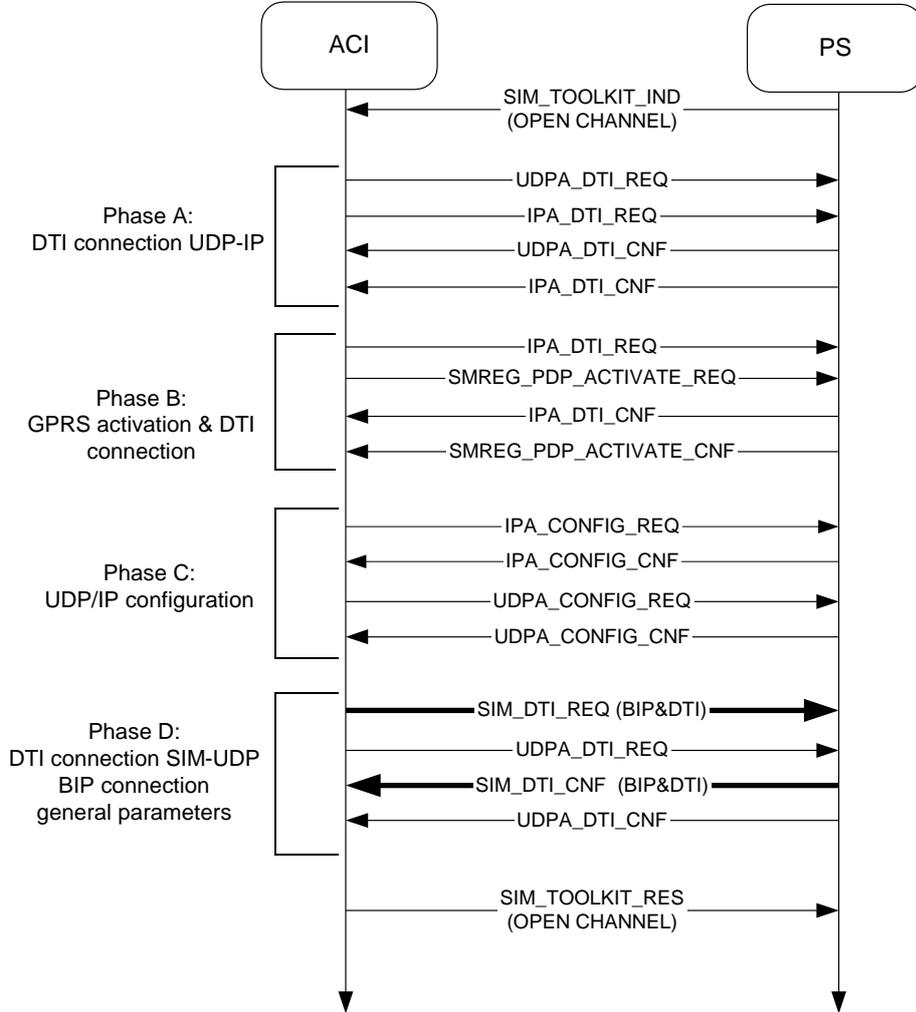


4.2.12 SIM initiated CSD over L2R (new behavior)

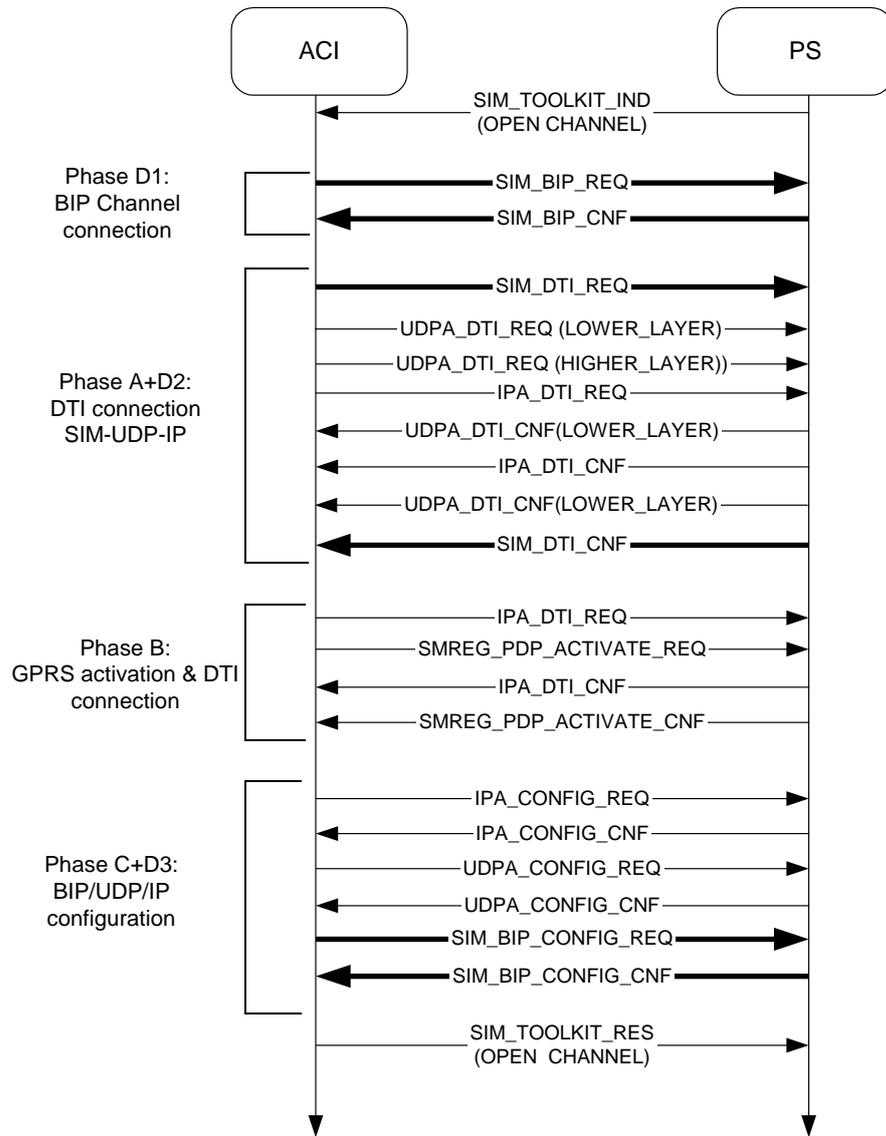


4.3 OPEN CHANNEL GPRS

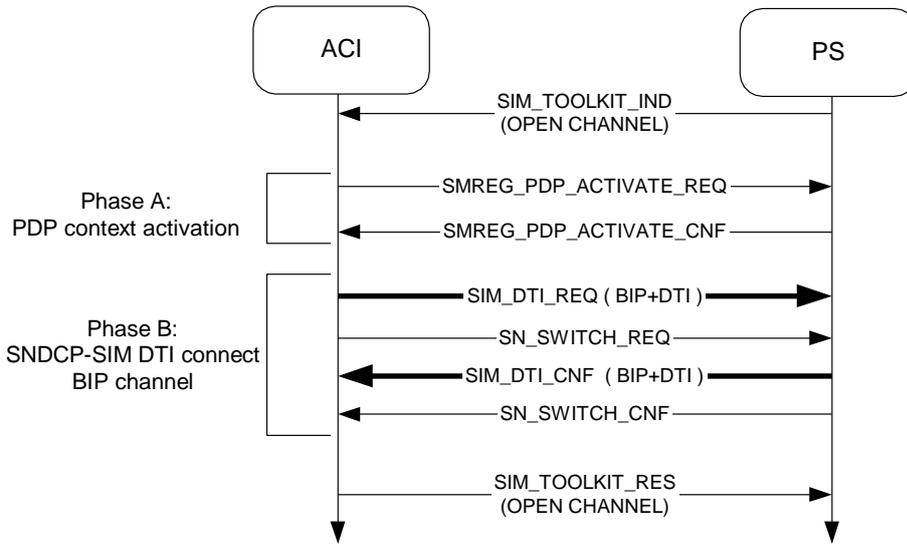
4.3.1 OPEN CHANNEL immediately for GPRS over UDP (old behavior)



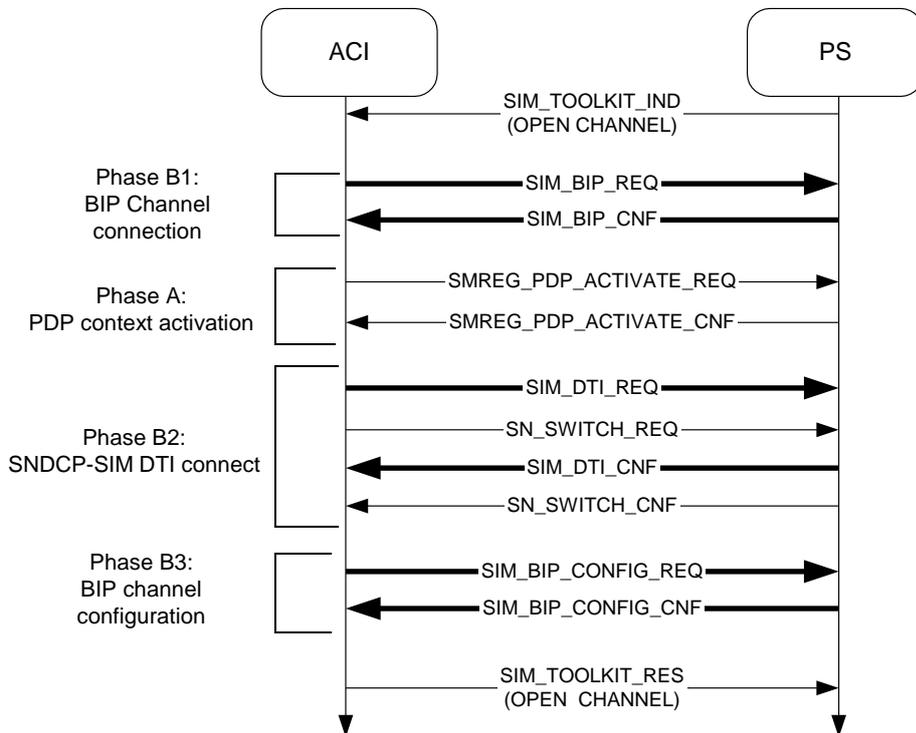
4.3.2 OPEN CHANNEL immediately for GPRS over UDP (new behavior)



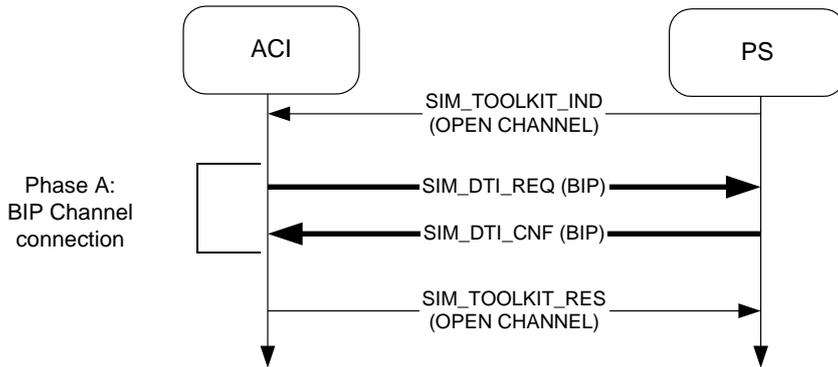
4.3.3 OPEN CHANNEL immediately for GPRS over SMDCP (old behavior)



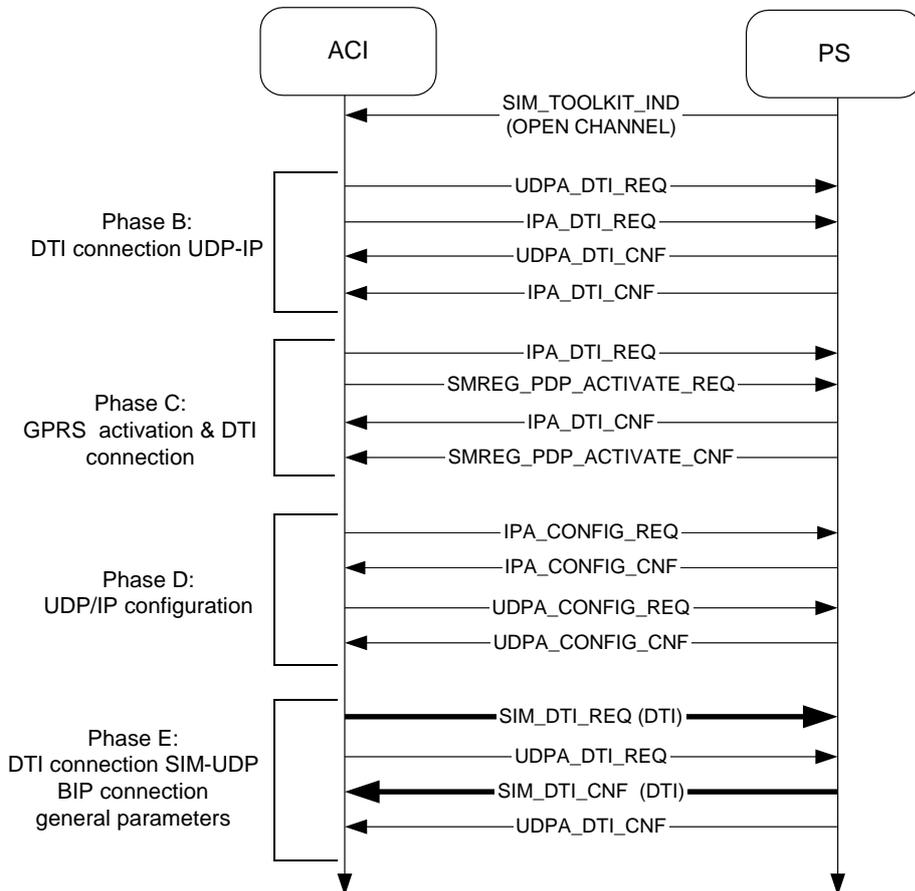
4.3.4 OPEN CHANNEL immediately for GPRS over SMDCP (new behavior)



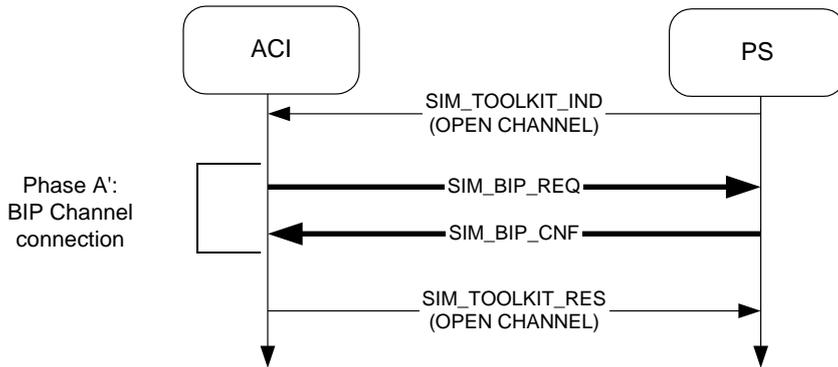
4.3.5 OPEN CHANNEL on demand for GPRS over UDP (old behavior)



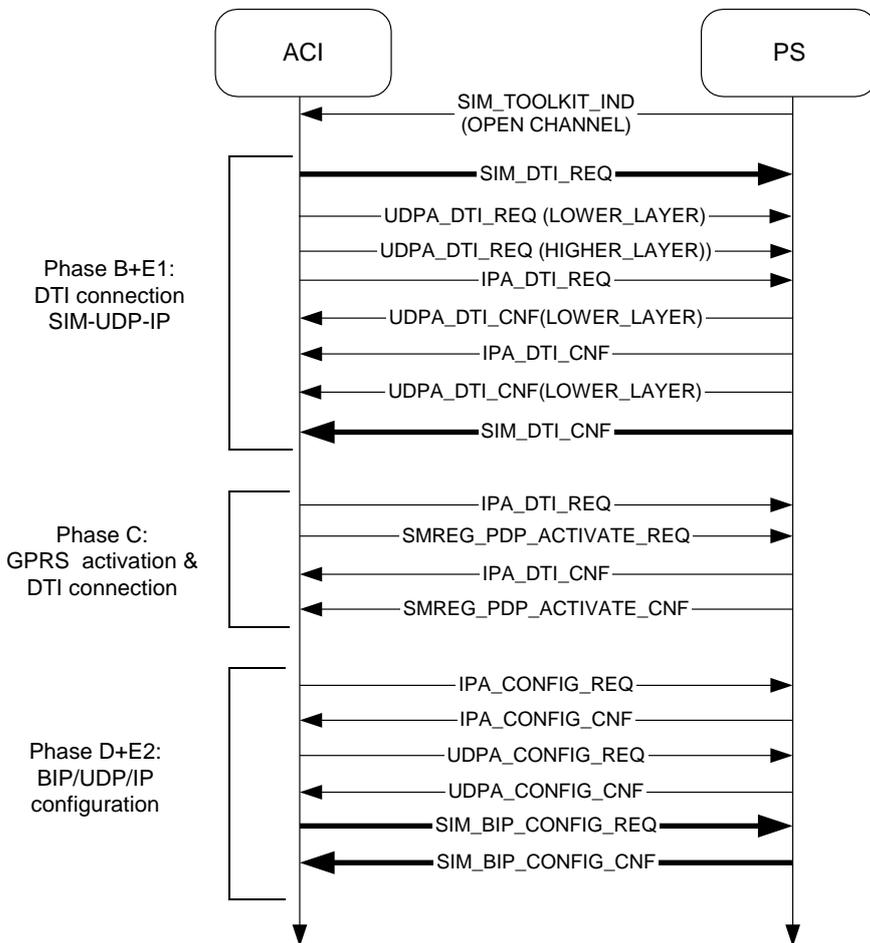
4.3.6 SEND DATA immediately for GPRS over UDP (old behavior)



4.3.7 OPEN CHANNEL on demand for GPRS over UDP (new behavior)



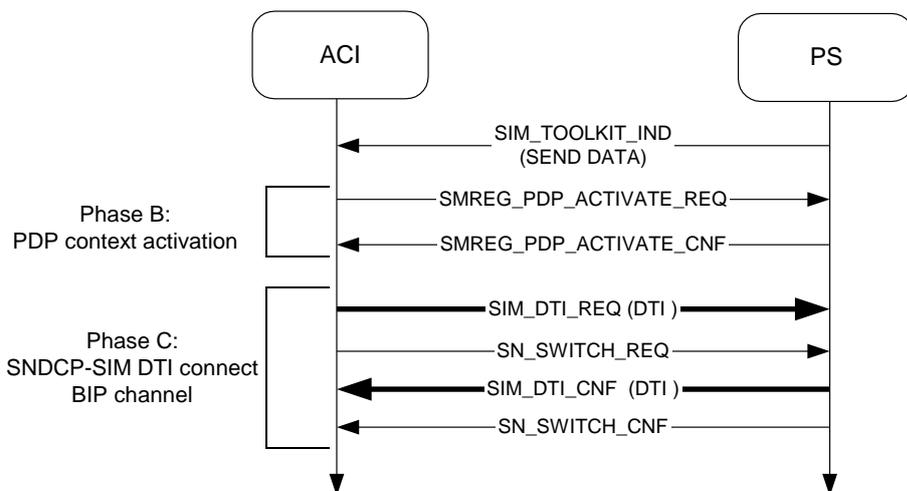
4.3.8 SEND DATA immediately for GPRS over UDP (new behavior)



4.3.9 OPEN CHANNEL on demand for GPRS over SMDCP (old behavior)

(see MSC 4.3.5)

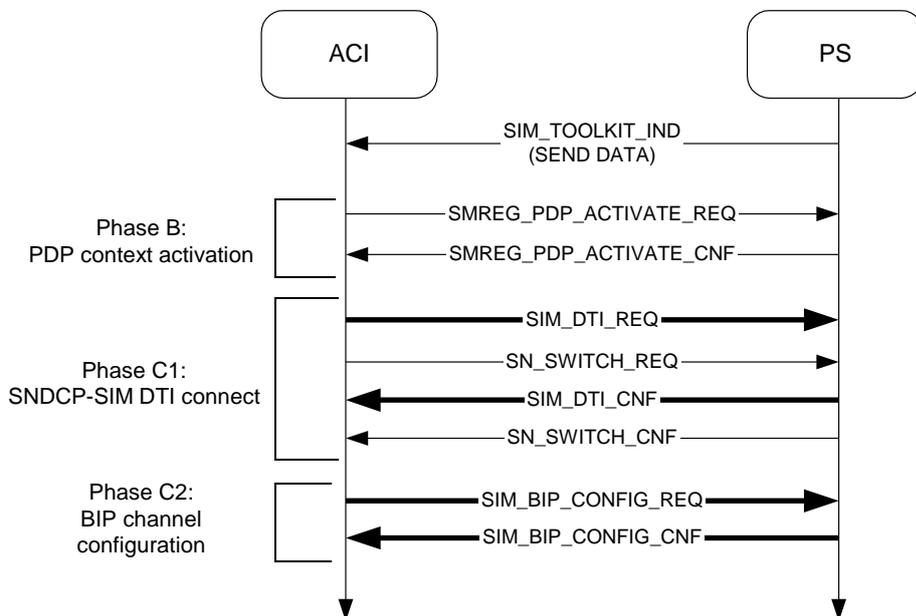
4.3.10 SEND DATA immediately for GPRS over SNDCP (old behavior)



4.3.11 OPEN CHANNEL on demand for GPRS over SNDCP (new behavior)

(see MSC 4.3.7)

4.3.12 SEND DATA immediately for GPRS over SNDCP (new behavior)

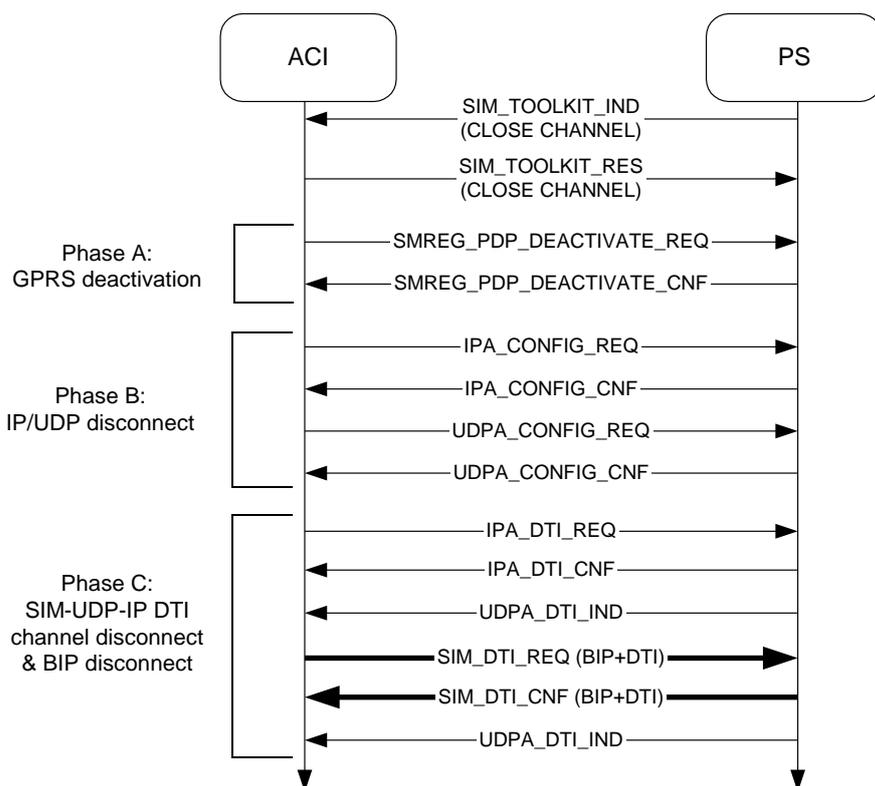


4.4 CLOSE CHANNEL GPRS

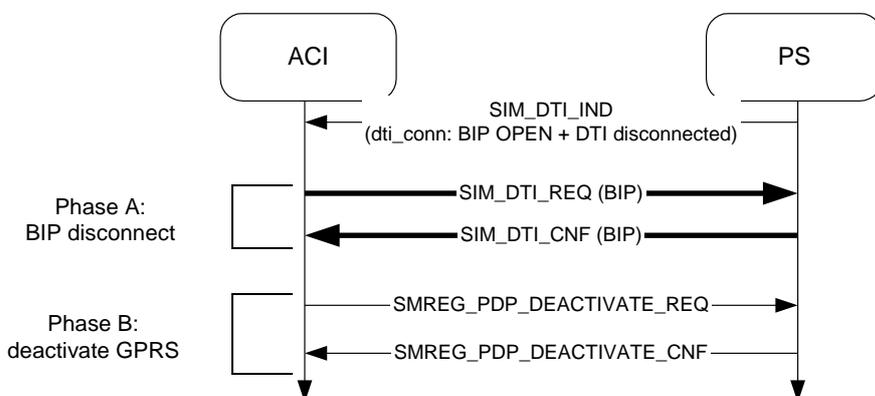
NOTE: There are more causes for channel disruption, e.g. initiated by the user or the entities involved in the transmission chain, which result in an analogous deactivation primitive sequence as shown for following SAT initiated charts. This sequence would be triggered by the respective primitive sent by involved entities below ACI or from the user (AT interface).

Following charts assume completely established connection chains for SAT class e data transmission.

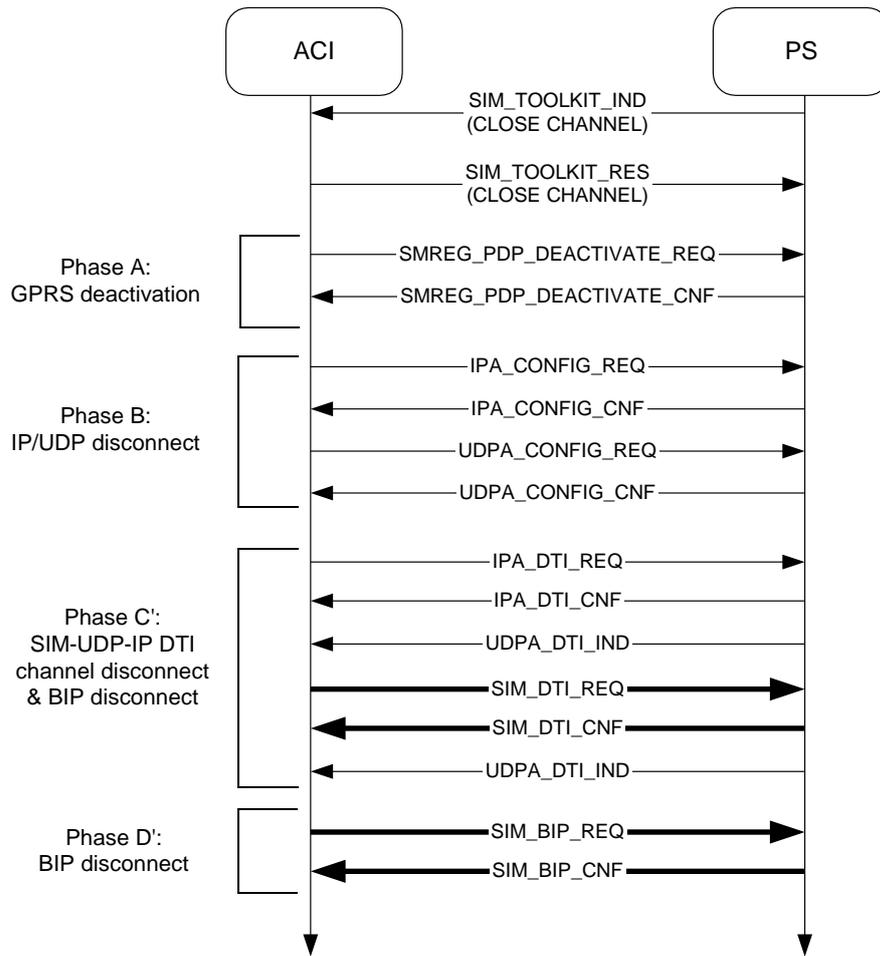
4.4.1 SAT initiated for GPRS over UDP (old behavior)



4.4.2 SIM entity initiated for GPRS over UDP (old behavior)

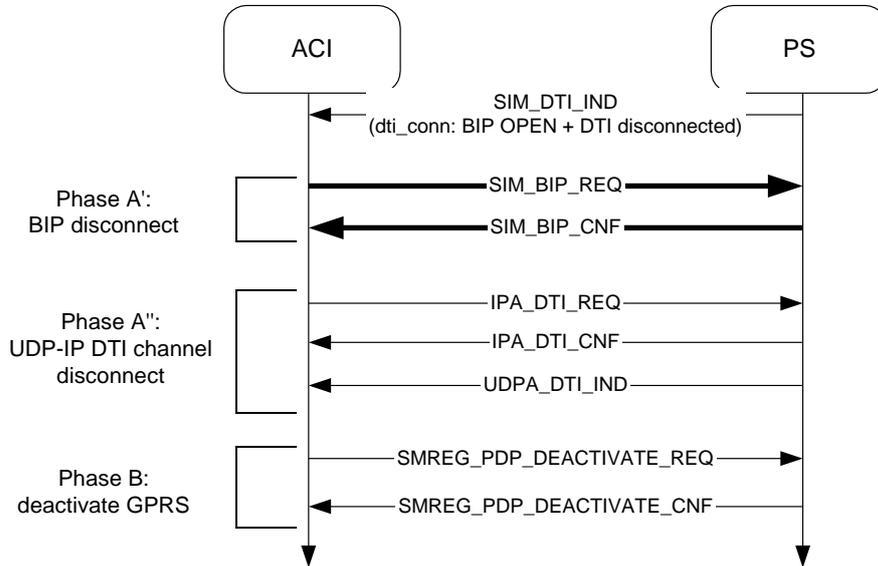


4.4.3 SAT initiated for GPRS over UDP (new behavior)

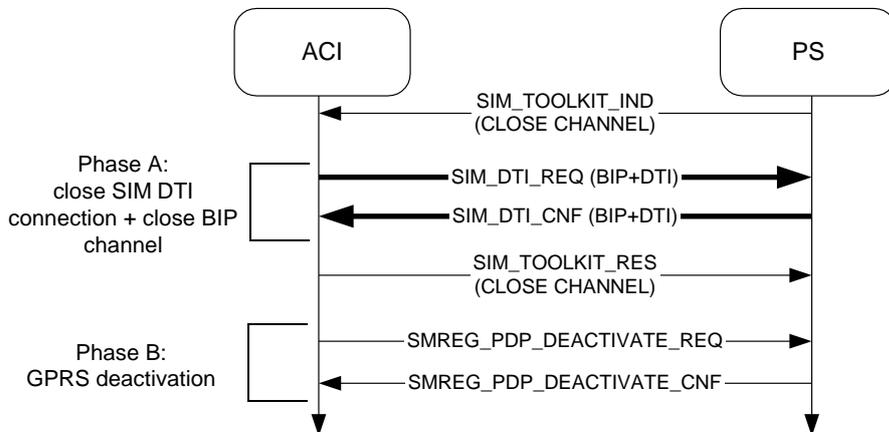


4.4.4 SIM entity initiated for GPRS over UDP (new behavior)

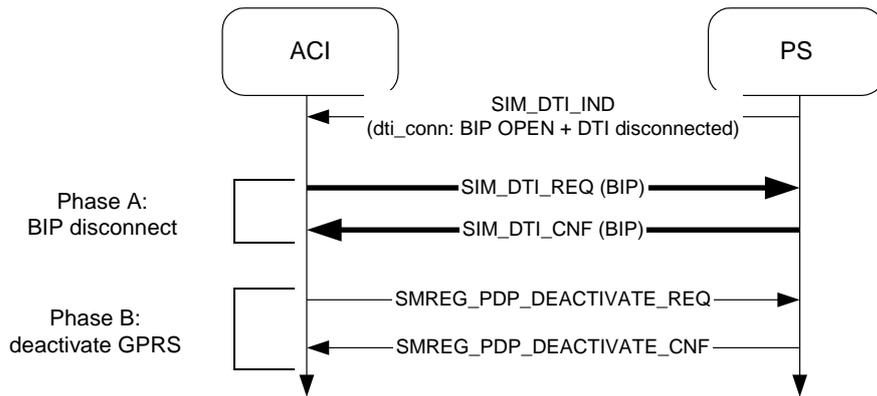
Assumptions result in the thesis that the message IPA_DTI_REQ has also to be sent for closing the pending IP DTI channel. This primitive is not documented for the old behavior in this case.



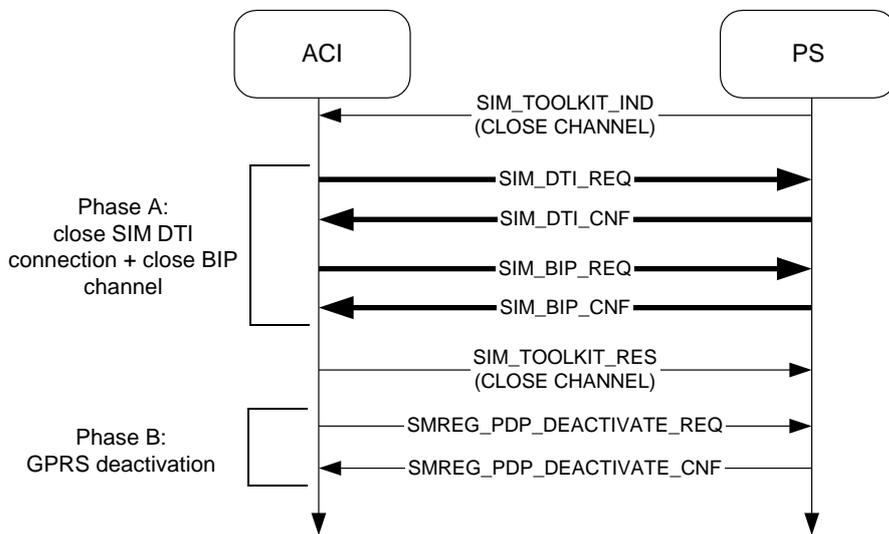
4.4.5 SAT initiated for GPRS over SMDCP (old behavior)



4.4.6 SIM entity initiated for GPRS over SNDCP (old behavior)



4.4.7 SAT initiated for GPRS over SNDCP (new behavior)



4.4.8 SIM entity initiated for GPRS over SNDCP (new behavior)

