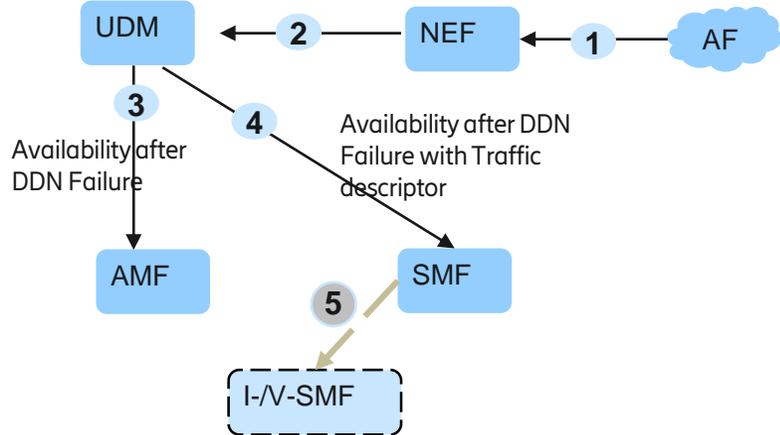


Source: Ericsson
Title: Availability after DDN Failure in 5GC
Document for: Discussion/Agreement
Agenda Item: 7.4
Work Item / Release: 5G_CIoT / Release 16

Provisioning

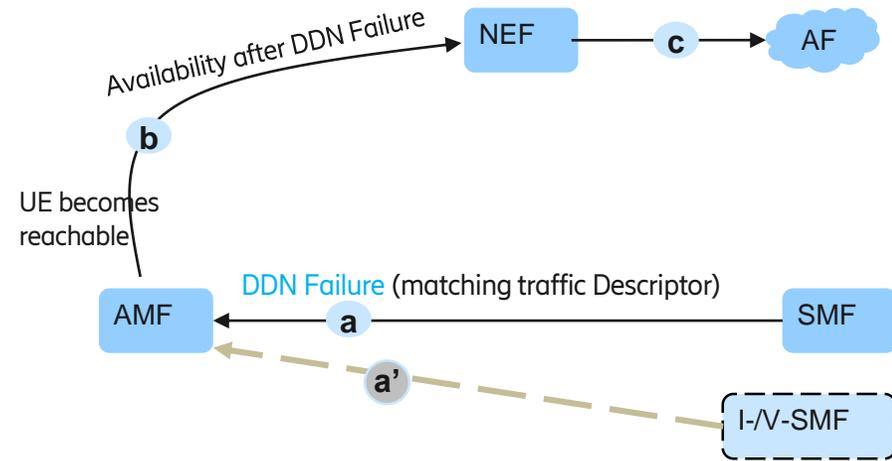


- 3** First UDM subscribes to AMF and AMF provides a notification endpoint;
- 4** UDM then subscribes to SMF providing AMF notification endpoint received in step 3;
- 5** If I-SMF/V-SMF is involved, the (H-)SMF further subscribes to I-SMF/V-SMF, providing also AMF notification endpoint received in step 4.

[Observation-1] UDM needs to wait for the result of one event subscription to one NF (i.e. AMF) in order to subscribe to another event in another NF (i.e. SMF). Such kind of strong dependency between two independent service operations are against SBI design.

[Observation-2] UDM subscribes to one event (i.e. Availability after DDN Failure) to SMF, but SMF notifies another event (i.e. DDN Failure) to AMF, which is confusing.

Reporting



a/a' SMF/I-SMF/V-SMF notifies "DDN Failure" (if detected) to the AMF;

b AMF detects UE reachable, and notifies "Availability after DDN Failure" to the NEF;

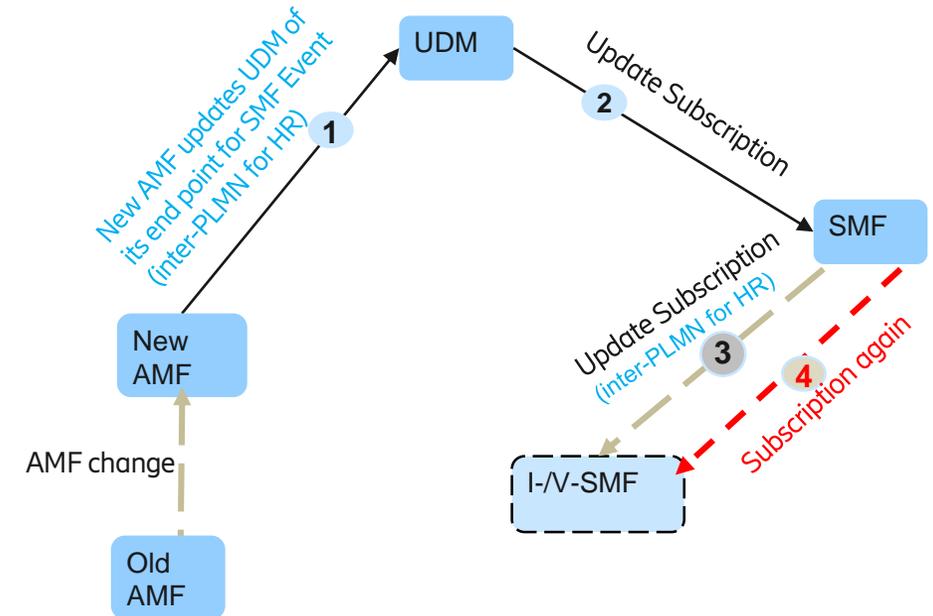
Current Situation in 23.502 v16.3.0

[Observation-3] At AMF change in step 1, the SMF event notification endpoint will be moved to new AMF, thus the SMF must be updated in step2 & step3, via path AMF->UDM->(H-)SMF->I/V-SMF,

- **New mechanism** is needed for AMF to inform UDM that endpoint of notification should be updated towards the SMF (and then I-/V-SMF);
- The **update path is quite long** and may **involve inter-PLMN** signaling.

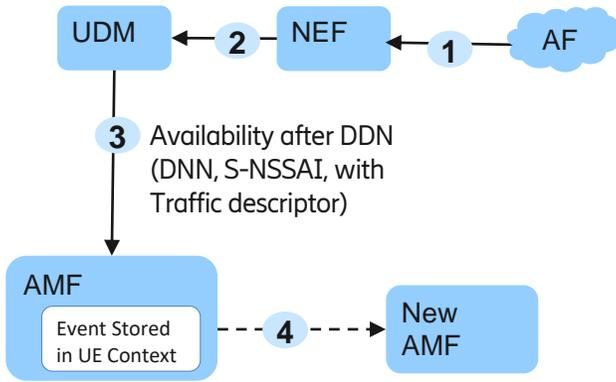
[Observation-4] At I-SMF/V-SMF change or insertion (in step 4), the (H-)SMF needs to subscribe to the new I-/V-SMF to provide the notification endpoint of AMF.

[Observation-5] During mobility with AMF change, and with I-SMF/V-SMF Change or Insertion, the (H-)SMF may have to subscribe to the I-/V-SMF **twice** to update the notification endpoint, **leading to inefficient N16/N16a signaling**.



Proposals (see 23.502 CR1983 (S2-2000292))

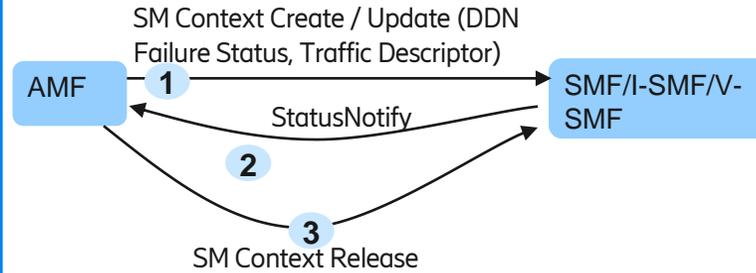
Provisioning/Update/Unsubscribe of event "Availability after DDN Failure"



1-3 "Availability after DDN Failure" event is provisioned via NEF → UDM → AMF, with all information available (Traffic descriptor, DNN and S-NSSAI) The event configuration is stored and managed in UE context

4 UE context is transferred from old AMF to new AMF when AMF changes

Subscribe / Update / Unsubscribe of "DDN Failure" Status



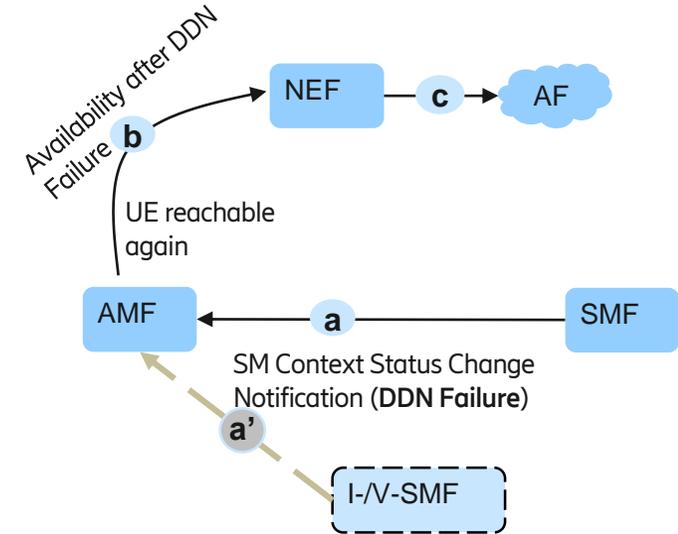
Option-1 is reflected in the CR

Option-1 AMF implicitly subscribes to "DDN Failure"

1. AMF subscribes to event "DDN Failure" in Create SM Context, or update SM Context, e.g.
 - At PDU session establishment,
 - At I-/V-SMF change/insertion/removal;
 AMF invokes Update SM Context (Existing) to
 - Update endpoint of new AMF, or
 - Update the event subscription if any change.
2. SMF reports "DDN Failure" to AMF using Nsmf_PDUSession_SMContextStatusNotify.
3. When an SM Context resource is released (due to any reason), the associated DDN Failure Status reporting is ended.

Option-2 (not shown) AMF explicitly subscribe a new SMF event "DDN Failure"

Reporting



a/a' When DDN Failure is detected, (I-/V-)SMF sends SM Context Status Change Notification to AMF, with indication that DDN Failure occurs.
b AMF set the flag and report the Availability after DDN failure event when UE reachability is detected later

Thank You!