S2-144077
Necessity of further clarification for downlink packet delivery failure due to inter-MME/SGSN mobility

LG Electronics, LG Uplus

LG
Life's Good

Rel-11 CR 2620

UE-A | Old eNB | Old MME | New eNB | New MME | S-GW

TAU step 4. Context Request

Case A. MME Detects inter-MME mobility before receiving DDN

Packet Data arrived

DDN

DDN ack (cause: Temporarily rejected)

S-GW runs guard timer And buffering corresponding packet data

Modify Bearer Request

DDN

Paging

Paging

Paging

Downlink Data Delivery Success !!
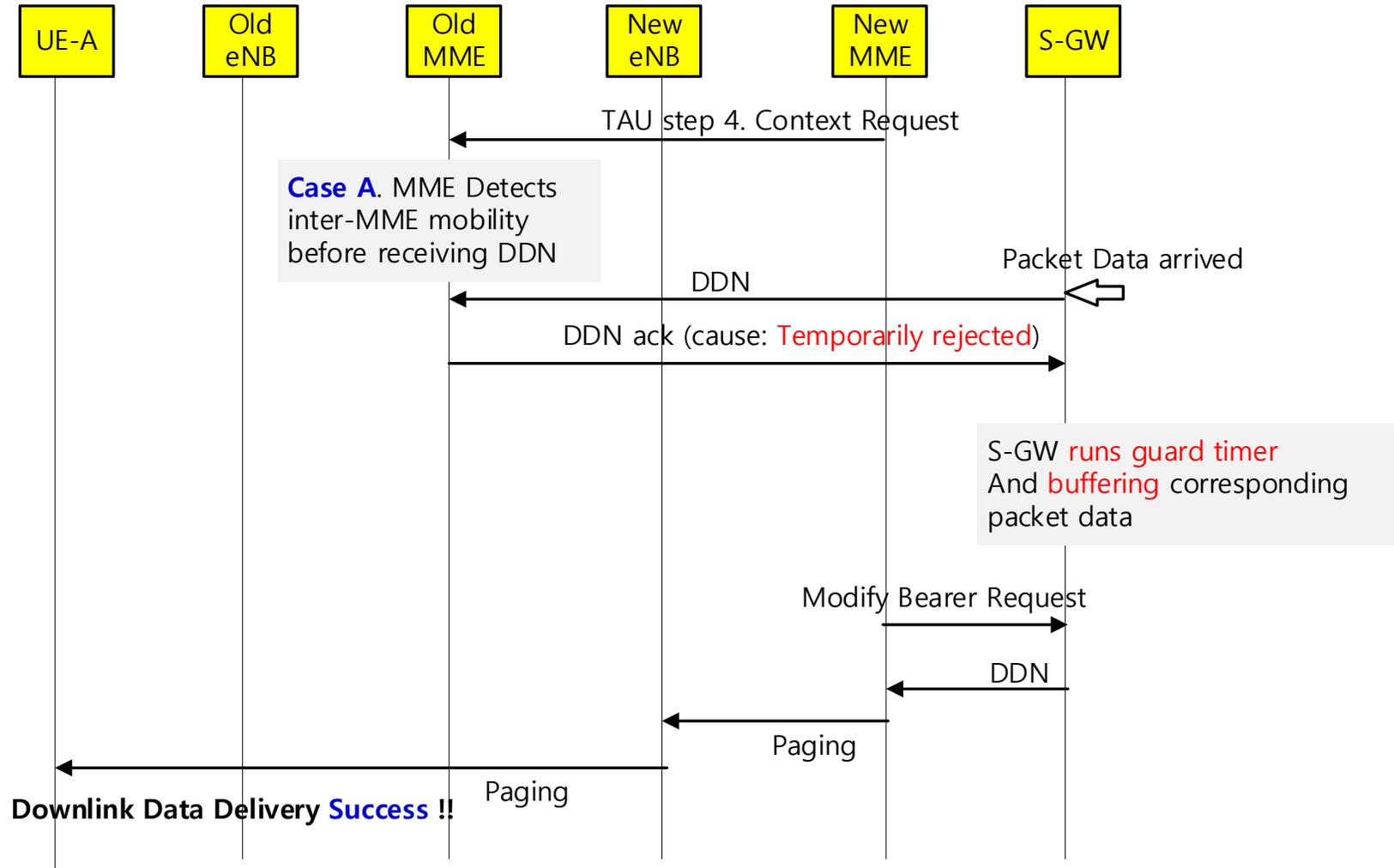
**Case A (MME detects inter-MME mobility before receiving DDN)**
is solved by Rel-11 clarification (CR 2620, 2621 for TS 23.401)

Problematic Scenario

UE-A | Old eNB | Old MME | New eNB | New MME | S-GW

Packet Data arrived

Old MME ← DDN ← S-GW

Old MME → DDN ack (Sucessful) → S-GW

Old MME ← TAU step 4. Context Request ← New MME

Case B. MME Detects inter-MME mobility After sending DDN ack

?

Old MME → Paging ? → Old eNB

Old eNB → Paging ? → UE-A

Old MME → DDN Reject (cause: UE not responding?) → S-GW

S-GW discards corresponding packet data

Downlink Data Delivery Fail !!
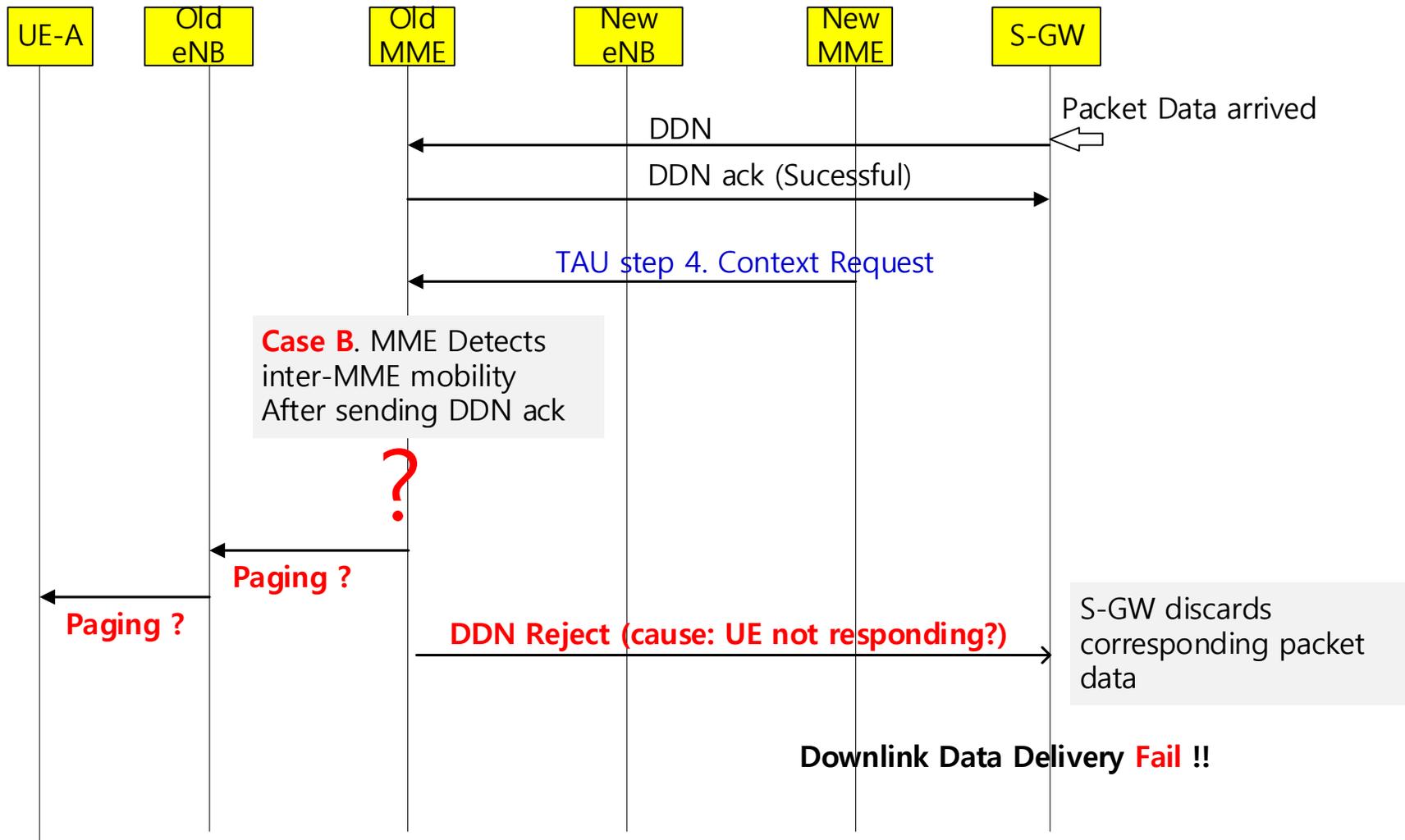
In Case B (MME detects inter-MME mobility after receiving DDN), there is still possibility of downlink data delivery failure if inter-MME/SGSN is in progress (bad user experience especially for voice service)

Proposal

UE | Old eNB | Old MME | New eNB | New MME | S-GW

Packet Data arrived

S-GW → Old MME: DDN

Proposal:
Introducing cause (temporarily rejected) to DDN reject message

Old MME → S-GW: DDN ack (Successful)

Old MME → Old eNB: Paging

Old eNB → UE: Paging

✗

New MME → Old MME: TAU step 4. Context Request

Case B.
MME Detects inter-MME mobility after receiving DDN

Stop paging

✔

DDN Reject (cause: temporarily rejected)

S-GW runs guard timer and Buffering corresponding packet data

New MME → S-GW: Modify Bearer Request

S-GW → New MME: DDN

New MME → New eNB: Paging

New eNB → UE: Downlink Data Delivery (Success)

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→**With this proposal**
: Downlink Packet will be successfully delivered even the inter-MME mobility is detected after the MME sent back DDN ack to S-GW.