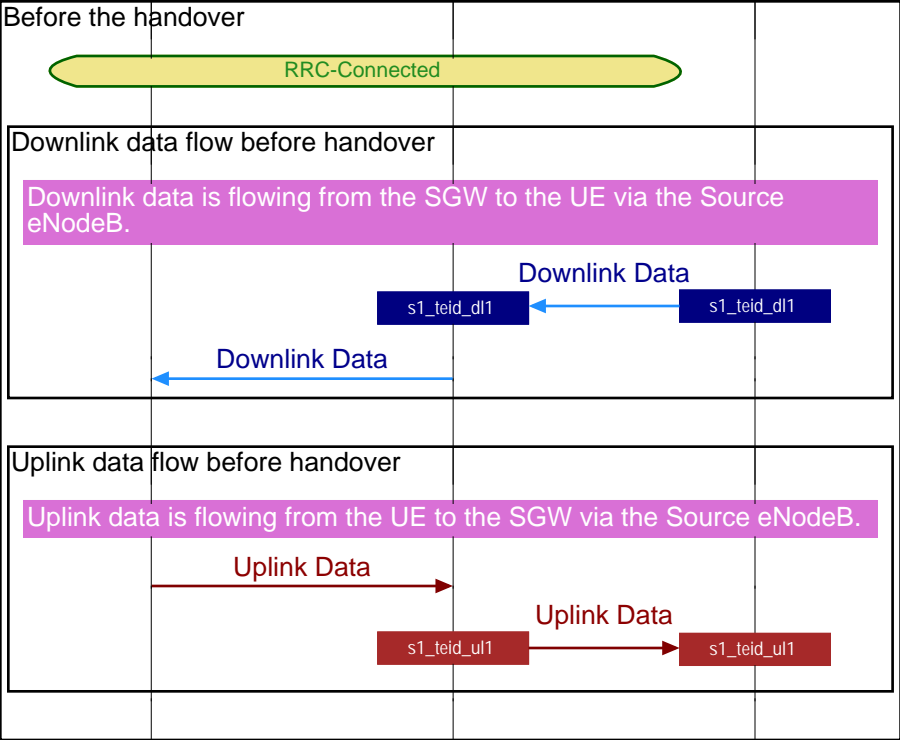
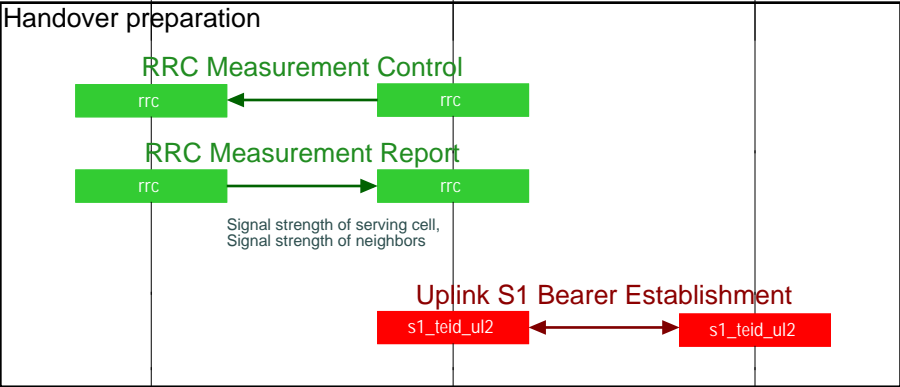


This sequence diagram was generated with EventStudio System Designer - <http://www.EventHelix.com/EventStudio/>

eNodeBs in LTE are interconnected with the X2 interface. If two eNodeBs are served by the same MME, handover from the source to the target eNodeB will take place over the X2 interface.



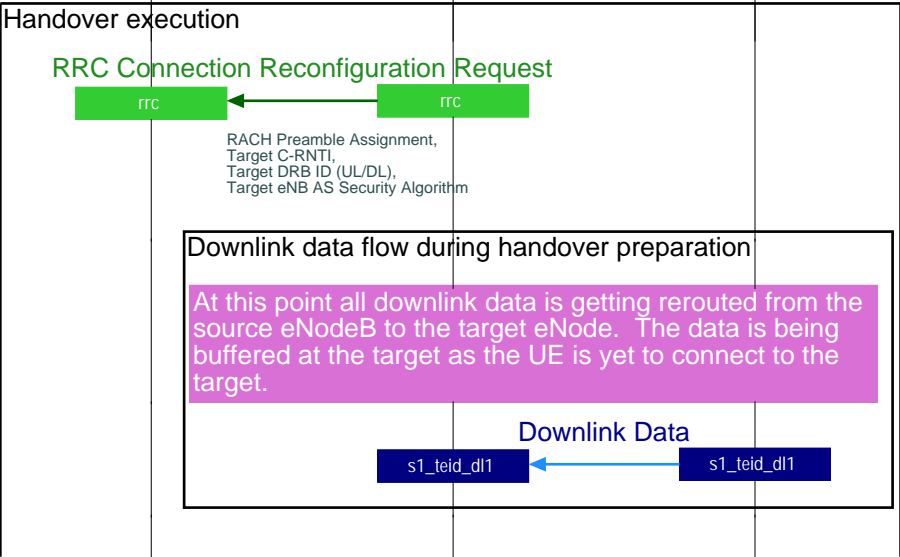
The UE and Source eNodeB are in RRC Connected state.



The network sets the measurement thresholds for sending measurement reports.

Neighboring cell signal quality is now better than the serving cell.

GTP connect for the uplink side is established between the Target eNodeB and the serving SGW.



The Source eNodeB sends a handover command to the UE. The message contains a new C-RNTI and new DRB IDs. A RACH preamble is also included for contention free RACH access.

Component Interfaces (Successful Handover)

LTE Mobile

eNodeB Network

Core Network

20-Apr-13 22:03 (Page 2)

Uplink data flow during handover preparation

The uplink data is still being sent from the UE to the SGW via the Source eNodeB.

Uplink Data

s1_teid_ul1

Uplink Data

s1_teid_ul1

Synchronizing with target cell

RACH Preamble

rrc

rrc

Random Access Response

rrc

rrc

Timing Advance,
Target C-RNTI,
Uplink grant

RRC Connection Reconfiguration Complete

rrc

rrc

Target C-RNTI

AS layer security procedure

Transmit transmission of queued downlink data

The UE is now connected to the target eNodeB. All the queued messages are now transmitted towards the UE.

Downlink Data

Downlink Data

Downlink Data

Downlink data flow during handover execution

During handover execution the data being routed from the SGW to the UE via the source and the target eNodeBs.

Downlink Data

s1_teid_dl1

s1_teid_dl1

Downlink Data

Uplink data flow during handover execution

The uplink data is now being transmitted from the UE to the SGW via the target eNodeB.

Uplink Data

s1_teid_ul2

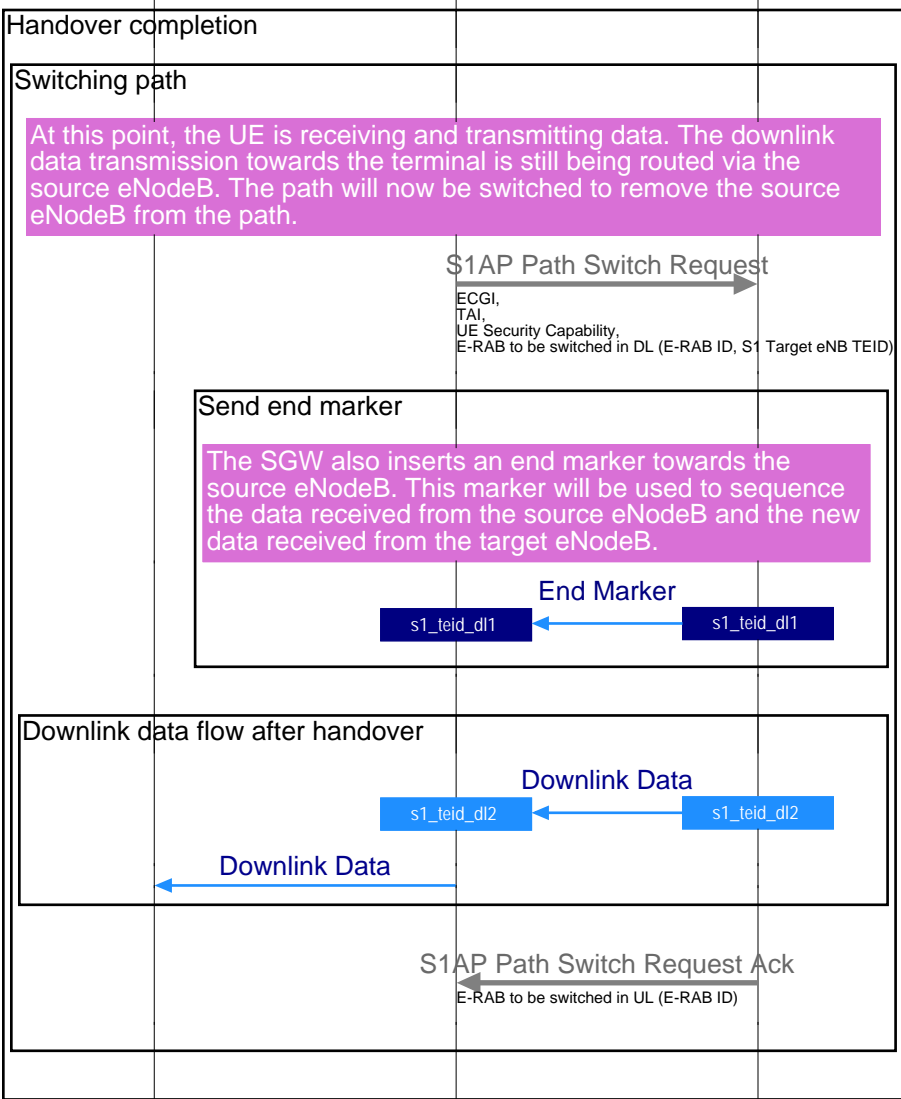
Uplink Data

s1_teid_ul2

UE uses the preamble assigned in the handover command to send a RACH to the target eNodeB.

The target eNodeB accepts the request and responds back with a timing adjustment and an uplink resource grant.

The UE uses the assigned resources to transmit the Handover Confirm message (RRC Connection Reconfiguration Complete).



At this point, the UE is receiving and transmitting data. The downlink data transmission towards the terminal is still being routed via the source eNodeB. The path will now be switched to remove the source eNodeB from the path.

The target eNodeB requests the MME to switch the path from the source eNodeB to the target eNodeB. (Click on the message name above the arrow to see message details)

The SGW also inserts an end marker towards the source eNodeB. This marker will be used to sequence the data received from the source eNodeB and the new data received from the target eNodeB.

SGW is now sending the data using the target eNodeB TEID.

MME responds back to signal the completion of the path switch. (Click on the message name above the arrow to see message details)