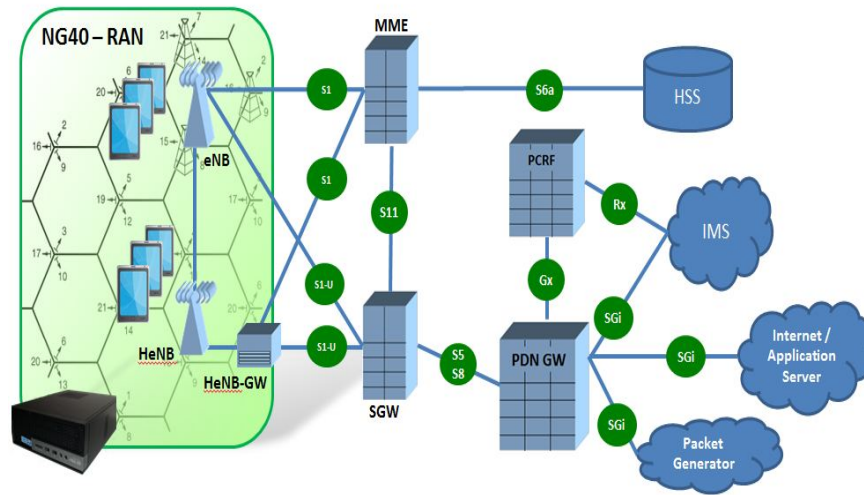


NG40-RAN-S1-X2-DT



RAN side demonstration test emulator for Multiple eNBs with S1/S1-U and X2 functionality

- eNB and HeNB support
- FDD and TDD support
- Mobility function as seen on the S1 interface is included
- X2 can be internally activated between emulated eNBs

Features

- S1-AP/NAS Release 8+9+10
- ATTACH/DETACH/TAU/ServiceRequest/S1-Release
- Integrity protection/Ciphering (snow-3g/LTE)
- NAS piggyback (DEF+DED bearer during ATTACH)

Session

- Default bearer creation/modification/deletion (UE/Network initiated)
- Dedicated bearer creation/modification/deletion (UE/Network initiated)
- 11 simultaneous bearer/sessions
- Session creation/deletion

Services

- Authentication (XOR/Milenage) for 3G USIM's
- SMS including concatenated (long) SMS
- UserPlane: S1-U + SGi interface
- Integrated user plane packet generator
- IPv4/IPv6 Application + Transport
- NITZ (display Network Identity and Time Zone)
- Bridge to external servers (SGi interface)

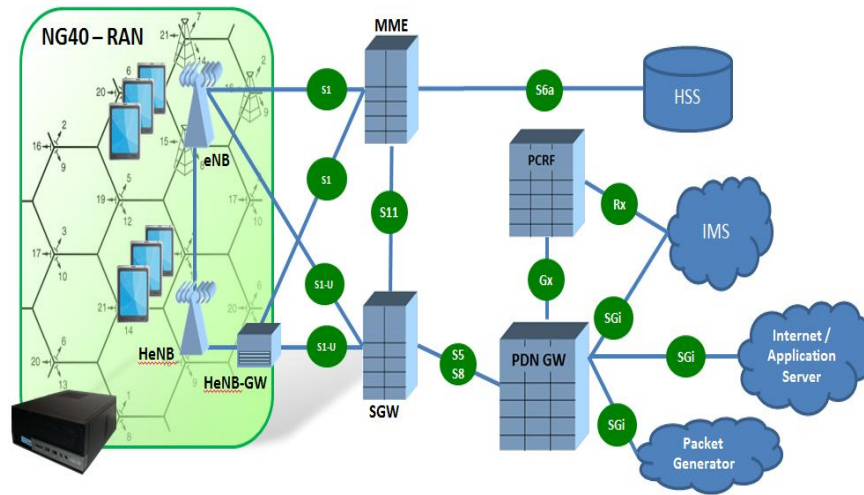
Mobility

- Tracking Area Update
- Pathswitch(x2)
- Handover 4G (with and w/o MME/SGW relocation)
- idle mode PS Paging during DL data transfer
- CS fallback 3G incl. CS paging
- handover 3G <-> 4G

Demonstration test performance limitation:

- 10 procedures/sec
- 15 Mbps rx and 15 Mbps tx
- 200 UEs
- 15 eNBs
- 5 ePCs

NG40-RAN-S1-X2-FT



RAN side functional test emulator for multiple eNBs with S1/S1-U and X2 functionality.

- eNB and HeNB support
- FDD and TDD support
- Mobility function as seen on the S1 interface is included
- X2 can be internally activated between emulated eNBs

Features

- S1-AP/NAS Release 8+9+10
- ATTACH/DETACH/TAU/ServiceRequest/S1-Release
- Integrity protection/Ciphering (snow-3g/LTE)
- NAS piggyback (DEF+DED bearer during ATTACH)

Session

- Default bearer creation/modification/deletion (UE/Network initiated)
- 11 simultaneous bearer/sessions
- Dedicated bearer creation/modification/deletion (UE/Network initiated)
- Session creation/deletion

Services

- Authentication (XOR/Milenage) for 3G USIM's
- SMS including concatenated (long) SMS
- UserPlane: S1-U + SGi interface
- Integrated user plane packet generator
- IPv4/IPv6 Application + Transport
- NITZ (display Network Identity and Time Zone)
- Bridge to external servers (SGi interface)

Mobility

- Tracking Area Update
- Pathswitch(x2)
- Handover 4G (with and w/o MME/SGW relocation)
- idle mode PS Paging during DL data transfer
- CS fallback 3G incl. CS paging
- handover 3G <-> 4G

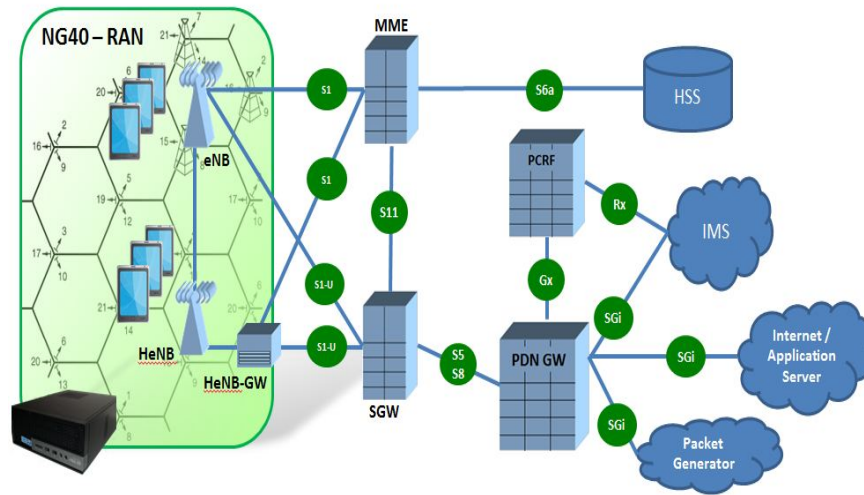
Functional test feature:

- Message modification, deletion and insertion with commreplace emulation and Python scripts

Functional test performance limitation:

- 100 procedures/sec
- 150 Mbps rx and 150 Mbps tx
- 20.000 UEs / 150 eNBs / 50 ePCs

NG40-RAN-S1-X2-LT



RAN side load test emulator for multiple eNBs with S1/S1-U and X2 functionality.

- eNB and HeNB support
- FDD and TDD support
- Mobility function as seen on the S1 interface is included
- X2 can be internally activated between emulated eNBs

Features

- S1-AP/NAS Release 8+9+10
- ATTACH/DETACH/TAU/ServiceRequest/S1-Release
- Integrity protection/Ciphering (snow-3g/LTE)
- NAS piggyback (DEF+DED bearer during ATTACH)

Session

- Default bearer creation/modification/deletion (UE/Network initiated)
- 11 simultaneous bearer/sessions
- Dedicated bearer creation/modification/deletion (UE/Network initiated)
- Session creation/deletion

Services

- Authentication (XOR/Milenage) for 3G USIM's
- SMS including concatenated (long) SMS
- UserPlane: S1-U + SGi interface
- Integrated user plane packet generator
- IPv4/IPv6 Application + Transport
- NITZ (display Network Identity and Time Zone)
- Bridge to external servers (SGi interface)

Mobility

- Tracking Area Update
- Pathswitch(x2)
- Handover 4G (with and w/o MME/SGW relocation)
- idle mode PS Paging during DL data transfer
- CS fallback 3G incl. CS paging
- handover 3G <-> 4G

Load test performance limitation:

Tested on 12 Core Intel dual Xeon Server with 2 Scenarios and can be extended with licenses for additional scenarios:

- 20,000 Attaches/sec with real authentication and default bearer creation
- 200,000 S1-AP Messages/sec
- 4,000,000 UEs
- 8,000,000 EPS-Bearer (PDPCs)
- 4500 eNBs
- 500 EPCs

