What is 5G NSA network architecture.

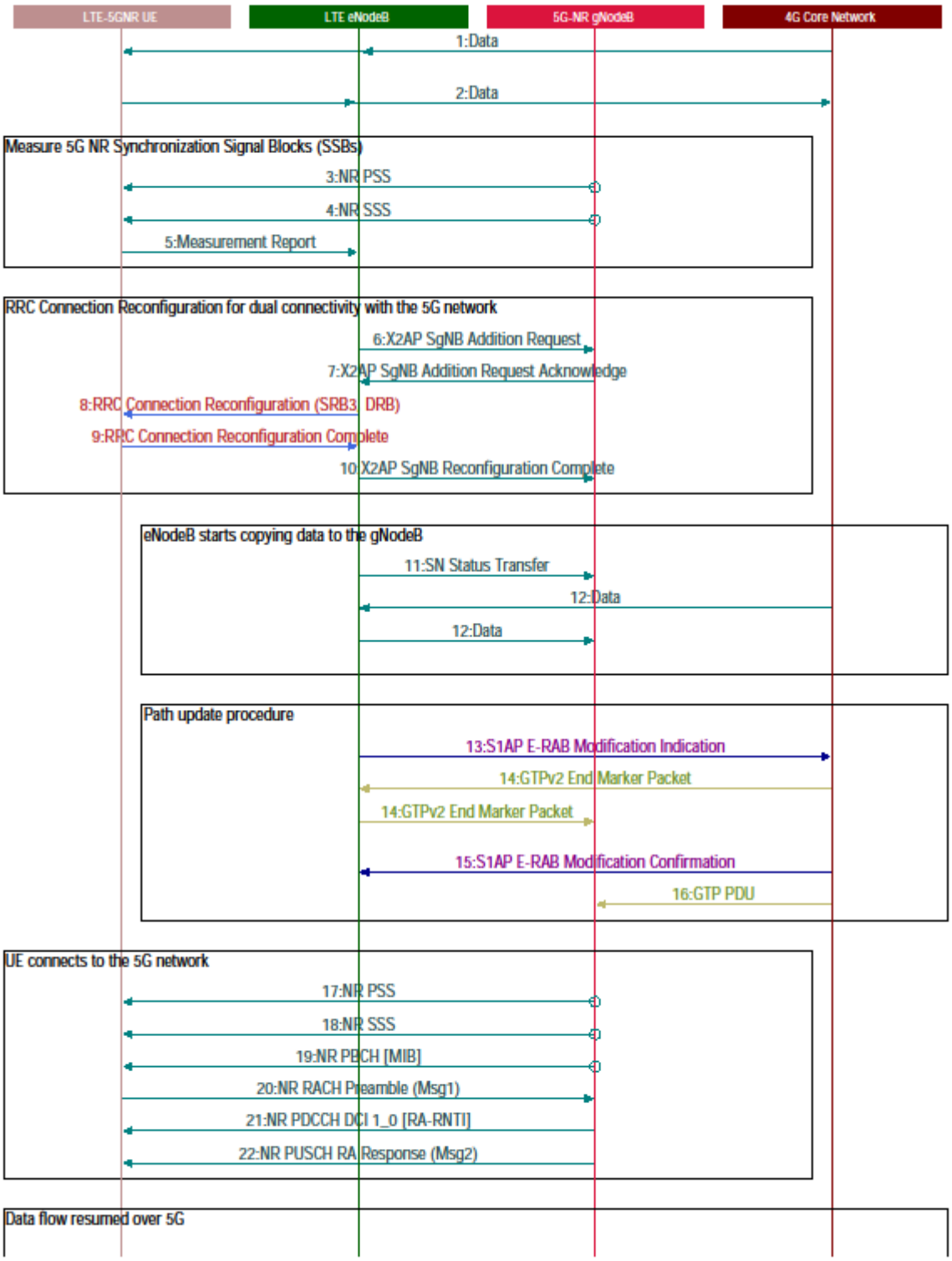
The 5G NSA (Non-Standalone) network architecture is a transitional approach where 5G radio access is supported by existing 4G LTE core networks. Here are the key components:

1. Radio Access Network (RAN)*: This includes the 5G NR (New Radio) base stations that connect user devices to the core network.

2. LTE Core Network*: The 4G LTE core network continues to handle user authentication, mobility management, and some control functions for 5G connections.

3. Dual Connectivity*: This enables simultaneous connections to both 4G LTE and 5G NR networks, allowing for faster data speeds and smoother transition between networks.

4. User Equipment (UE)*: Devices like smartphones and IoT devices that connect to the 5G NSA network via 5G NR and LTE.


LTE-5GNR UE
LTE eNodeB
5G-NR gNodeB
4G Core Network
1:Data
2:Data
Measure 5G NR Synchronization Signal Blocks (SSBs)
3:NR PSS
4:NR SSS
5:Measurement Report
RRC Connection Reconfiguration for dual connectivity with the 5G network
6:X2AP SgNB Addition Request
7:X2AP SgNB Addition Request Acknowledge
8:RRC Connection Reconfiguration (SRB3, DRB)
9:RRC Connection Reconfiguration Complete
10:X2AP SgNB Reconfiguration Complete
eNodeB starts copying data to the gNodeB
11:SN Status Transfer
12:Data
12:Data
Path update procedure
13:S1AP E-RAB Modification Indication
14:GTPv2 End Marker Packet
14:GTPv2 End Marker Packet
15:S1AP E-RAB Modification Confirmation
16:GTP PDU
UE connects to the 5G network
17:NR PSS
18:NR SSS
19:NR PBCH [MIB]
20:NR RACH Preamble (Msg1)
21:NR PDCCH DCI 1_0 [RA-RNTI]
22:NR PUSCH RA Response (Msg2)
Data flow resumed over 5G

5. Control and User Plane Separation (CUPS)*: This architecture feature separates the control plane (handling signaling and management) from the user plane (handling data traffic), improving flexibility and scalability.

6. Network Slicing*: Allows operators to create multiple virtual networks (slices) within a single physical network infrastructure, tailored to different service requirements.

This setup allows for quicker deployment of 5G services using existing LTE infrastructure while paving the way for full 5G standalone (SA) networks in the future.