1. What is 5G NSA Network Architechture

Answer:

5G NSA (Non-Standalone) network architecture is an initial step towards full 5G deployment, relying on existing 4G LTE infrastructure. Here's an overview of its key components and how they work together:

1**. LTE eNodeB (eNB)**: The existing 4G base station that handles control plane functions and some user plane functions. It maintains communication with the core network and the user equipment (UE).

1. **5G New Radio (NR) gNodeB (gNB)**: The new 5G base station that provides high-speed data services. It primarily handles user plane functions, leveraging the increased capacity and lower latency of 5G NR.
2. **Evolved Packet Core (EPC)**: The existing 4G core network that manages control and user plane functions. In NSA, it is enhanced to support 5G NR, maintaining the connection between the LTE eNB and the 5G gNB.
3. **User Equipment (UE)**: Devices like smartphones that connect to both the LTE eNB and the 5G gNB. The UE must support dual connectivity to utilize both 4G and 5G networks simultaneously.
4. **Dual Connectivity (DC)**: A feature that allows the UE to connect to both LTE eNB and 5G gNB simultaneously. This improves data rates and reliability by aggregating the bandwidth from both networks.
5. **X2 Interface**: The interface between LTE eNB and 5G gNB, facilitating coordination and data transfer between the two base stations. This is crucial for dual connectivity.

**How It Works:**

* **Control Plane**: Managed by the LTE eNB, which handles tasks like signaling, mobility management, and session establishment. This ensures backward compatibility with existing 4G networks and devices.
* **User Plane**: Primarily managed by the 5G gNB, delivering high-speed data services. The user plane traffic can also be split between LTE eNB and 5G gNB for better performance.