5G Core and NAS

in the Indigenous 5G Test Bed

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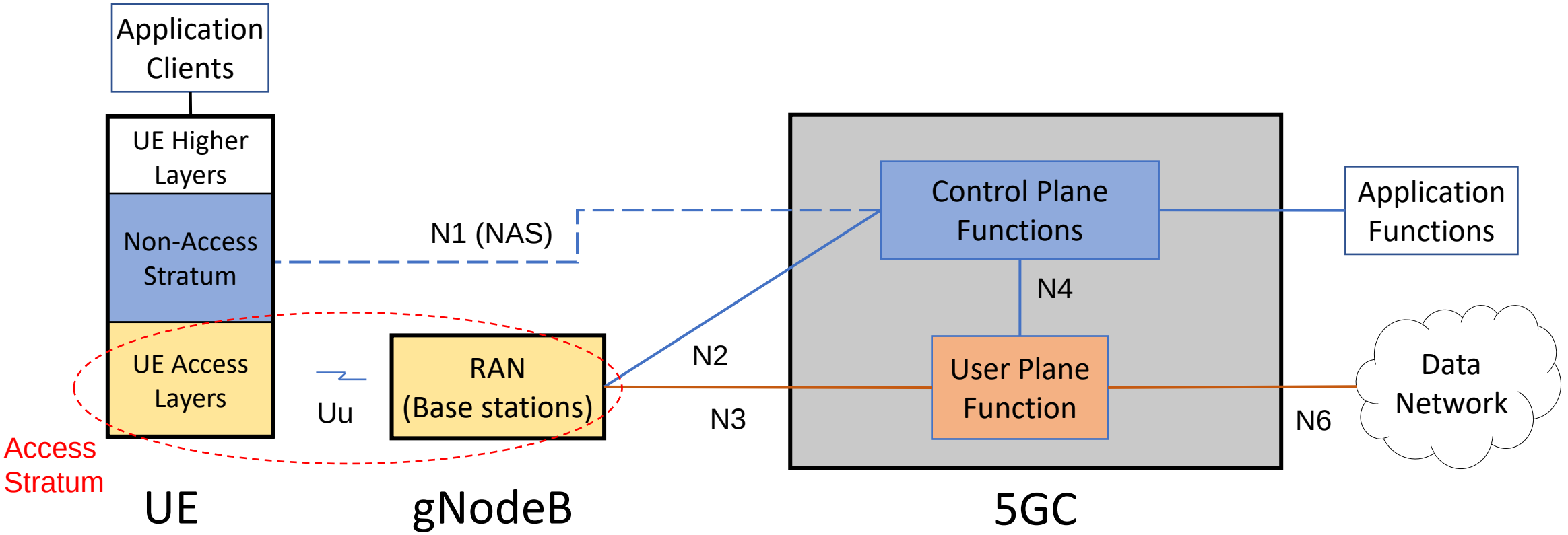
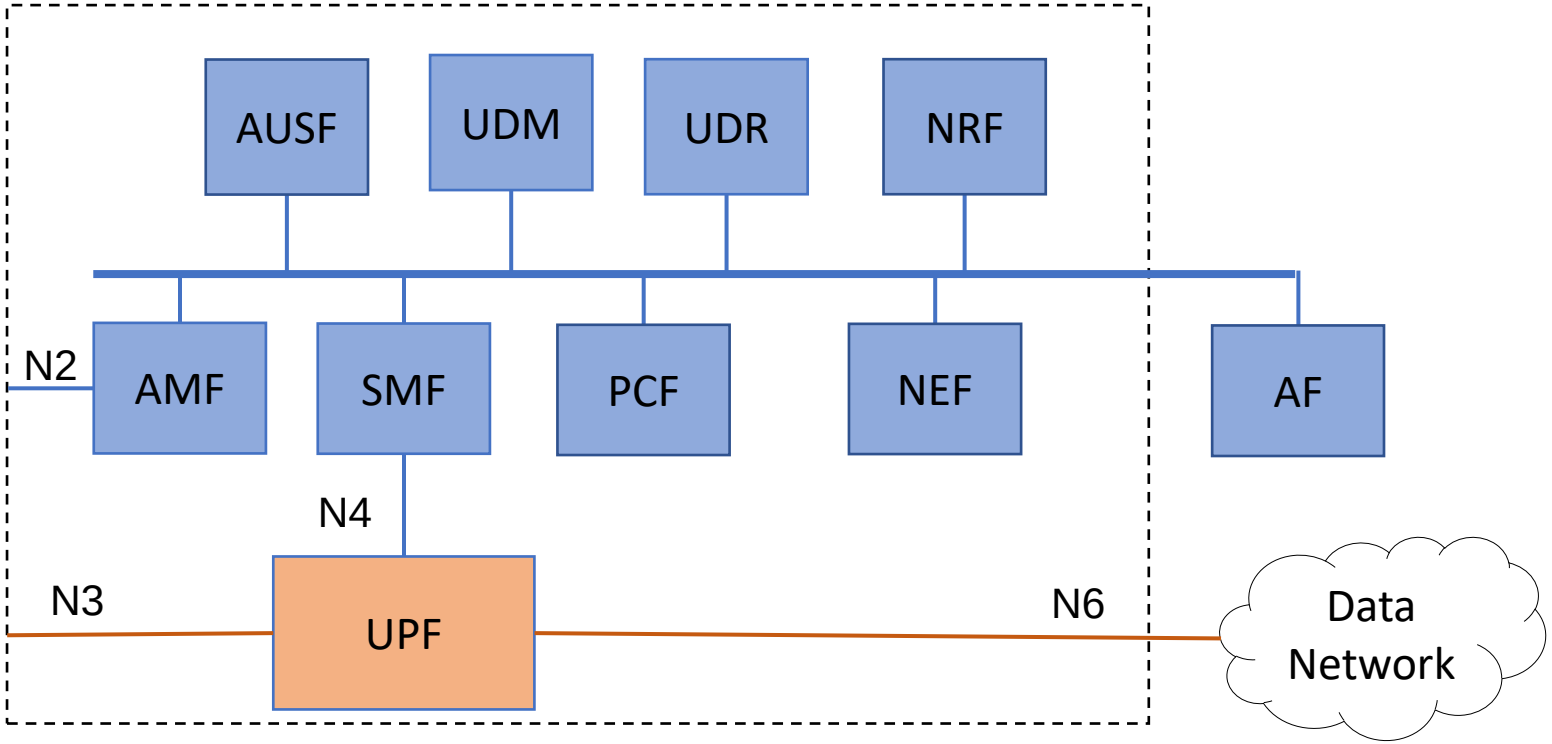
Context of 5G Core and NAS in 5G Networks



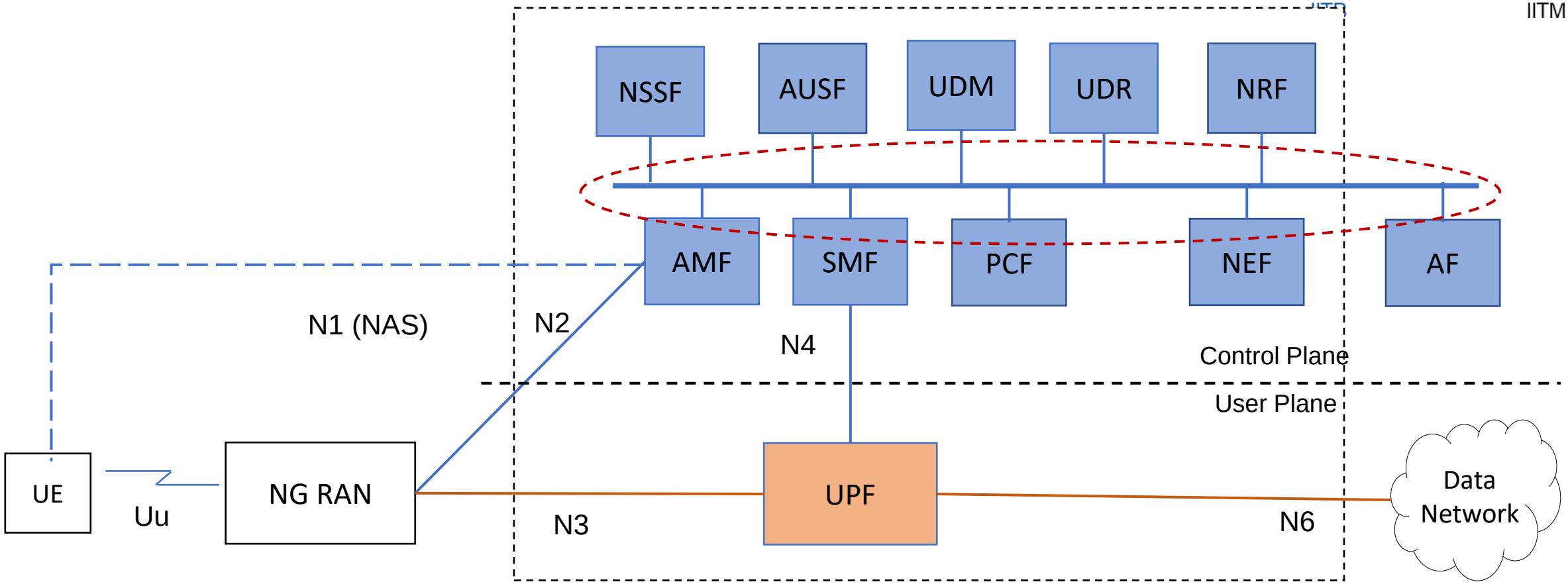
- 3GPP Standard Interfaces – N1, N2, N3, N4, N6

Network Functions available in 5G Core



AMF	Access and Mobility Function	NRF	Network Repository Function
SMF	Session Management Function	NEF	Network Exposure Function
UPF	User Plane Function	PCF	Policy Control Function
AUSF	Authentication Server Function	UDSF	Unstructured Data Storage Function
UDM	Unified Data Management	UDR	Unified Data Repository

Service Based Architecture of 5GCore



- All Control plane Network Functions are based on Service Based Architecture
- Internal or External Applications (AF) can interface over SBA. SBA Library can be reused for interfacing such AFs and other NFs.

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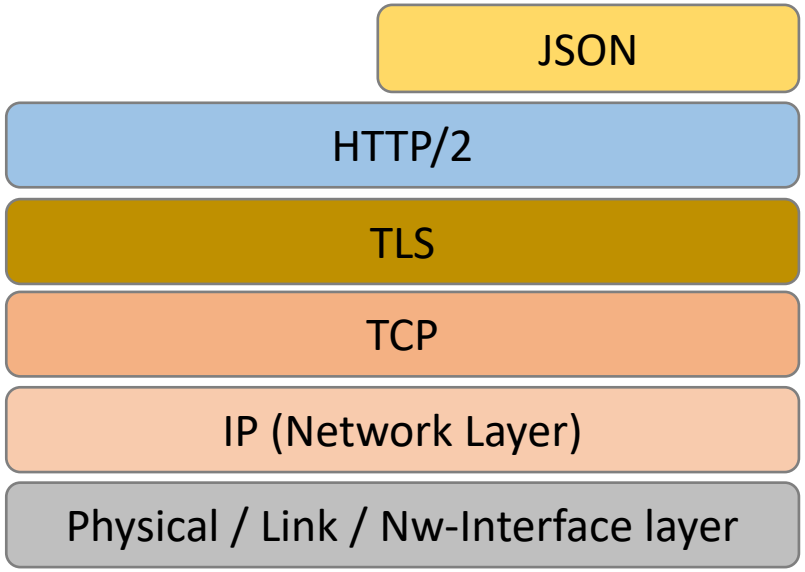
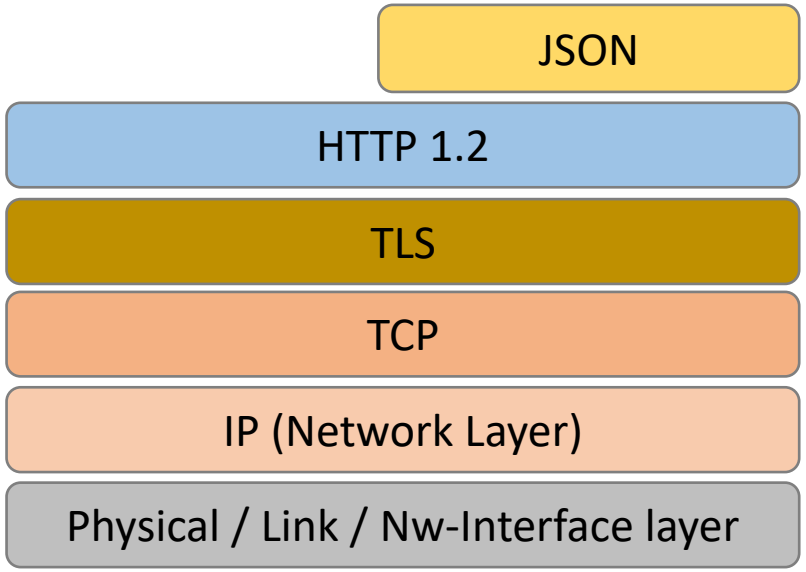
SBA stacks in 5GCore

SBA as per 3GPP Specs



SBA in 5G Core



- REST API based SBA implemented as Libraries
- Currently HTTP/1.2 based. HTTP/2 library ready
- TLS and OAuth 2.0 can be integrated

Major Features of 5G Core

Key features in 5G

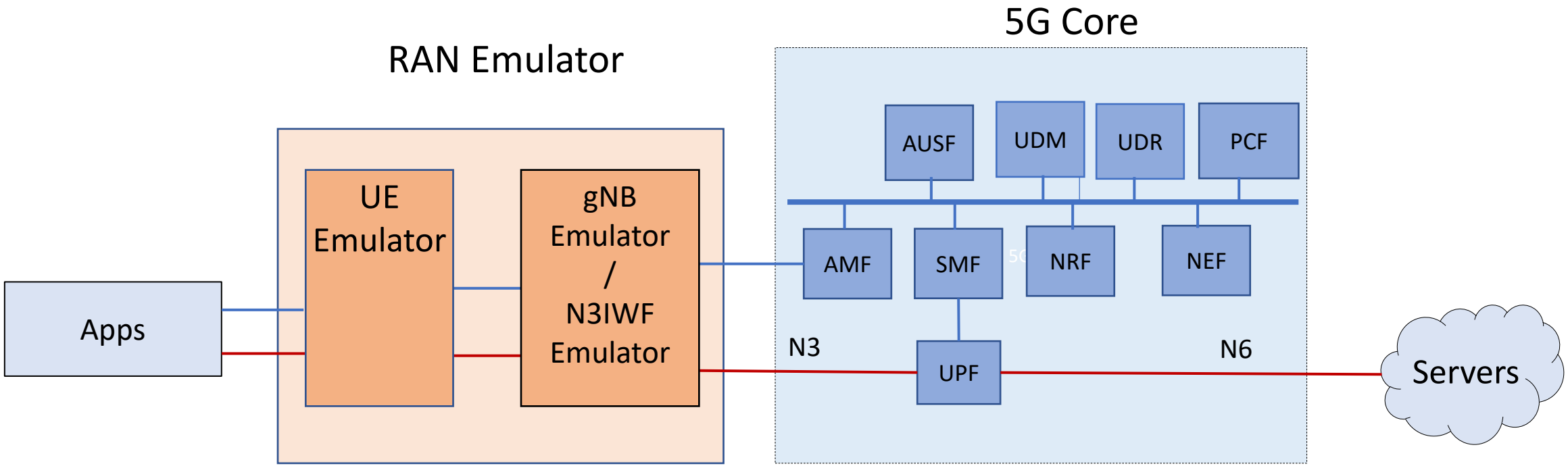
- 5G QoS
  - Quality of Service in 5G is more extensive than 4G
  - 5G QoS covers eMBB (enhanced Mobile Broadband), URLLC (Ultra Reliable Low Latency Communications) and MMTC (massive Machine Type Communications) requirements
- Slices in 5G
  - Slice is a virtual network using shared physical resources
  - Slices supported in 5GCore
- Service Based Architecture
- Clear segregation of Control and User planes
- Non-3GPP support in 5G networks
  - WiFi as another Access Type like NR (New Radio)
  - Dual Access
- Network Exposure
  - Application functions can access Network data and Influence network behaviour

Overall Procedures and Functionalities

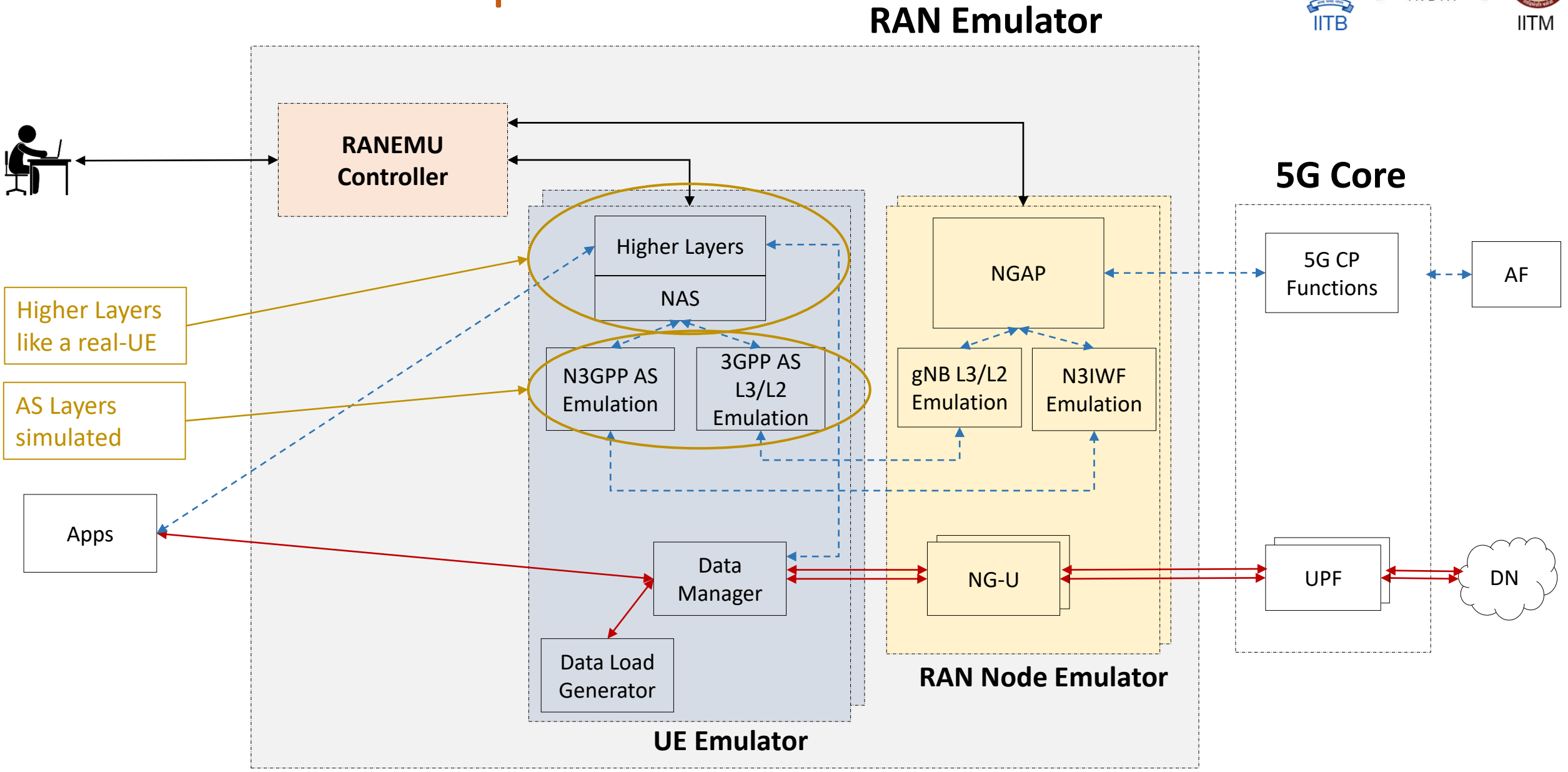
- User/UE Registration – Initial, Periodic, Mobility
- Deregistration
- PDU Session Establishment
- PDU Session Modification
- PDU Session Release
- Kernel based and DPDK based User Plane Function
- Core Network Paging
- Service Request
- Access Network Release procedures
- Idle Mobility
- Connected mode Mobility and Handover

RAN-UE Emulator

RAN-UE Emulator for Emulated Setup



RAN Emulator Setup



Thank You

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