http://5gtestbed.in/
https://5gtestbed.in/WebClient/common/content/5gintro2.mp4

Demonstration of 5G Core Software System in India's Indigenous 5G Test Bed

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5G Networks

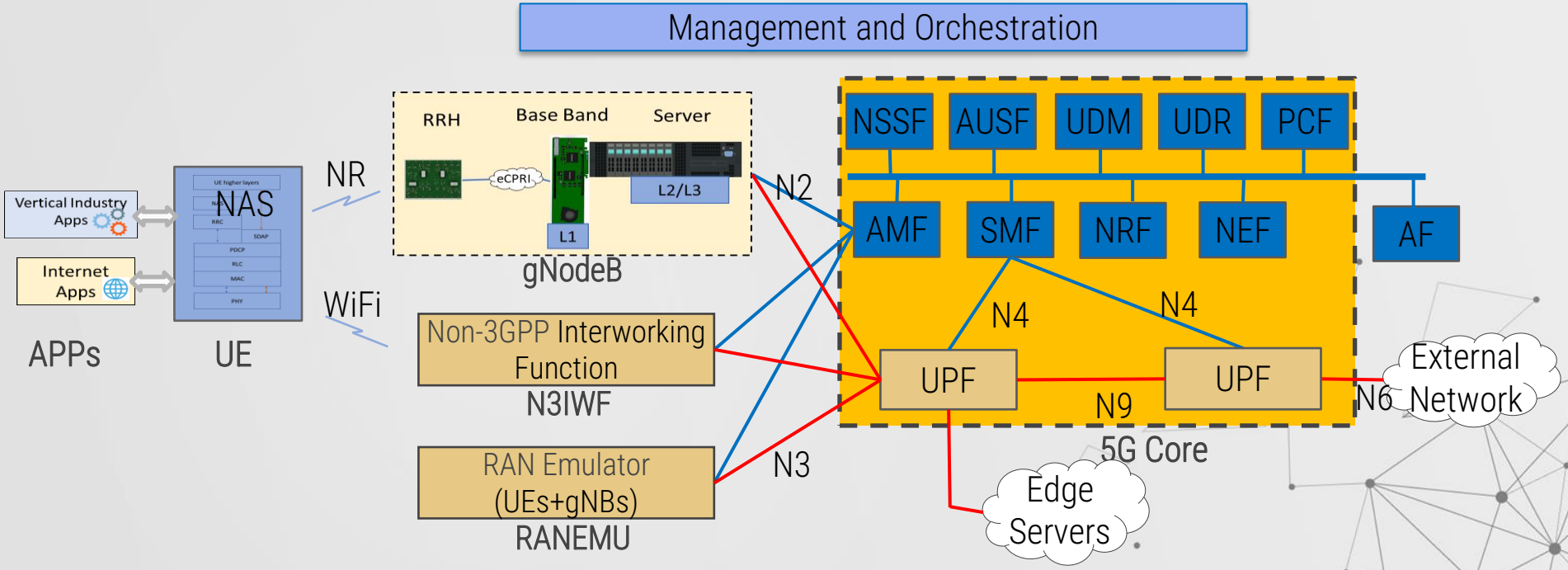
eMBB	URLLC	mMTC
➢ High Internet speed ➢ UHD Video ➢ Augmented Reality	➢ Self Driving Cars ➢ Remote Surgery ➢ Mission Critical Application	➢ Smart Cities ➢ Smart Home Building

5G = Services

Different Requirements

- Simultaneous
- Dynamical
- Scalable
- Secure
- Interoperable
- Energy efficient
- Cost effective

Indigenous End-to-End 5G Test Bed



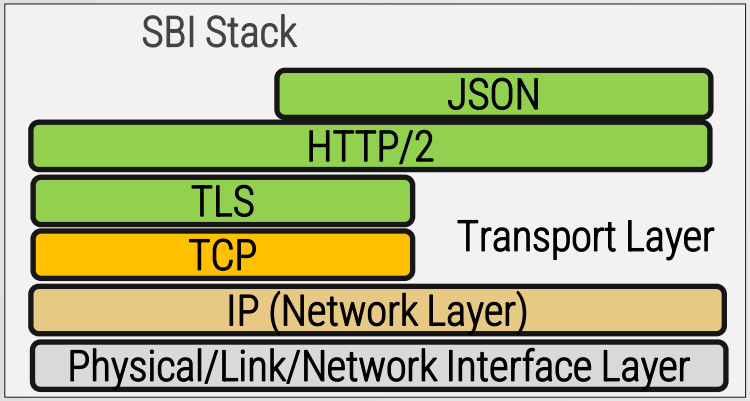
Importance of 5G Core in 5G Networks

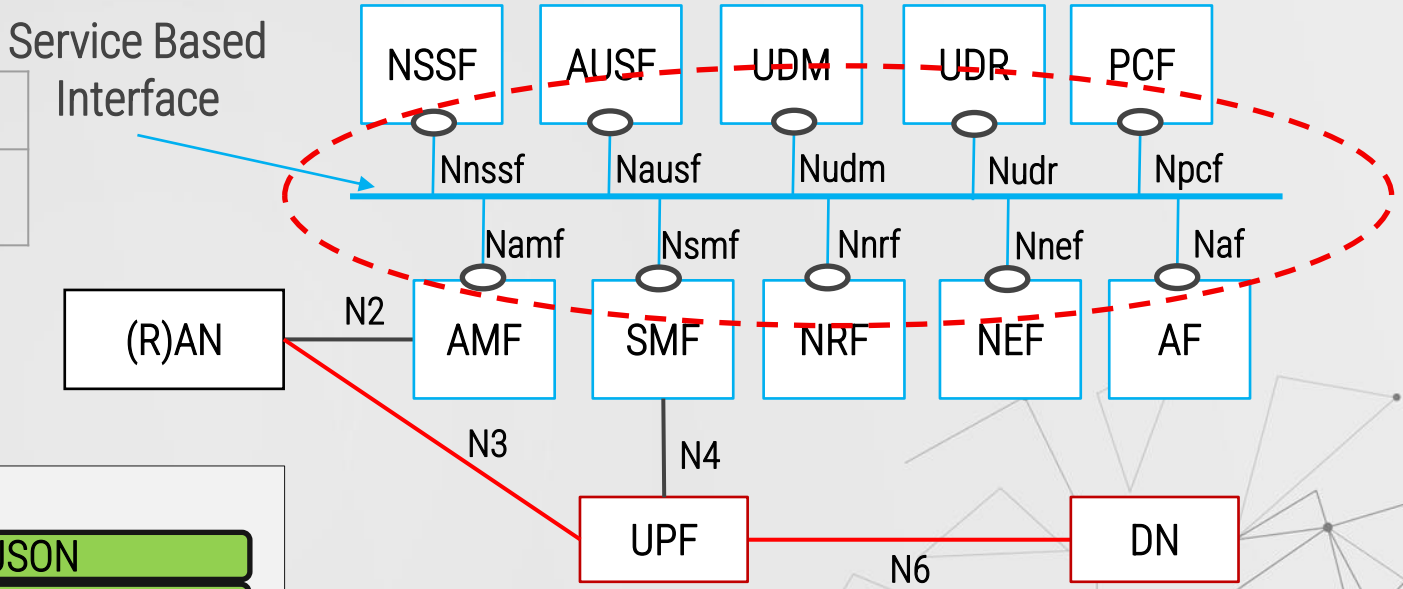
- 5G Core is the Control center of the 5G system
  - 5G Core provides data connectivity from UEs/devices to the data network
  - External servers and applications securely access the network via 5G Core
- 5G Core handles the following significant functions:
  - Authenticating and Authorizing the UEs
  - Establishing and modifying the PDU sessions
  - Mobility management
  - Making Policy decisions
  - Managing QoS across the network
  - Creating Charging records for billing

Service Based Architecture for 5G Core

AF	AMF	AUSF
Application Function	Access and Mobility Function	Authentication Service Function

NEF	NRF
Network Exposure Function	Network Repository Function





5G Core

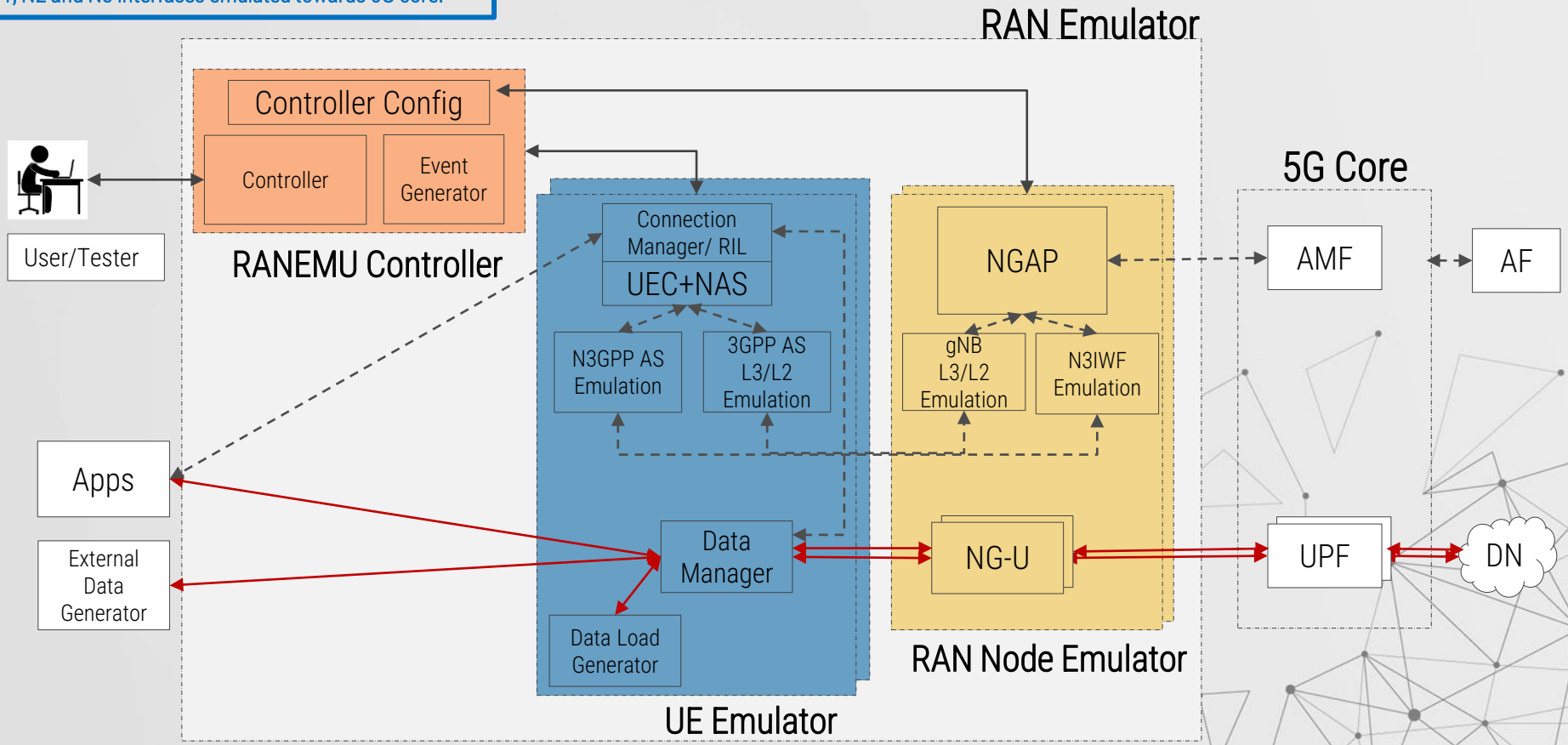
NSSF	PCF	SMF	UDM	UDR	UPF
Network Slice Selection Function	Policy Control Function	Session Management Function	Unified Data Management	Unified Data Repository	User Plane Function

Key Technologies of 5G Test Bed

- Service Based Architecture and Microservices
- Software Defined Networking
- Network Function Virtualization
- Cloudification and Orchestration
- Network Slicing

RAN Emulator – a tool that emulates multiple UEs and AN nodes (gNodeBs /N3IWFs etc) with complete UE NAS functionality and limited AS behaviour. Standard N1, N2 and N3 interfaces emulated towards 5G core.

RANEMU Architecture



Stress Testing Performance: Indicative Results

- 200 Registrations per second per CPU core
- Data plane load of 10’s of Gbps at UPF
- 10,000 UEs are able to simultaneously access the 5GC

How can you leverage this?

5G Core along with Base station and UE can be used to setup an end-to-end test bed that you can use for R&D or academic purposes.

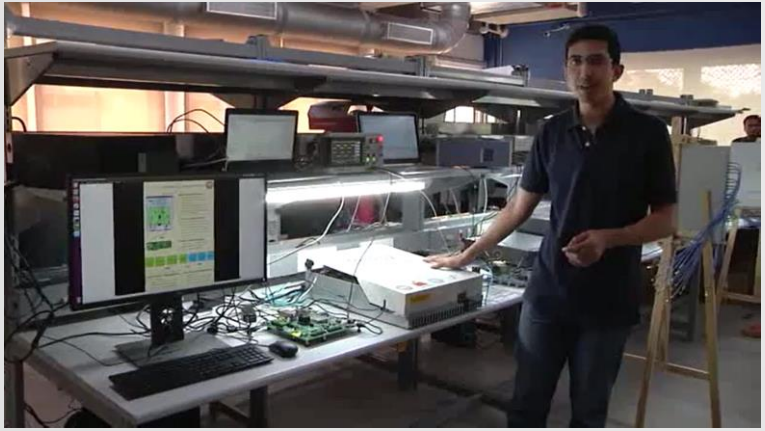
5G Core along with the RAN Emulator can be licensed to simulate an end-to-end test bed for studies and demos.

5GCore or RANEMU software IPs can be licensed for building 5G products or solutions

RANEMU can be licensed for testing 5G Core subsystems

5G Project Lead

At NCC 2019 Demo Booth IISc



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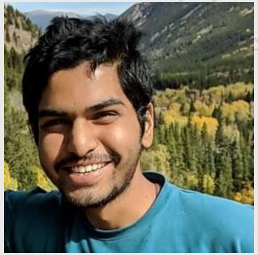


THANK YOU!

If anyone have any questions?

Feel free to ask in Q&A Session!

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