

LAB: 5G NSA and SA trace analysis

In this lab, you will consolidate the concepts seen in the 5G lecture by analyzing 5G NSA and SA traces.

1. Lab warmup

To run this lab, you need Wireshark. To recall, the made available VM includes Wireshark. All the traces of 5G-NSA and 5G-SA are available in Moodle.

2. 5G NSA

Open the file “eNB.pcapng” and “gNB.pcapng”. Locate in the files the messages related to the addition of the 5G base station as a Slave.

- Which filter can you use?
- Deduce the IP addresses of the gNB, eNB, MME?
- Fill the following table:

Message description	Trace file (gNB or eNB)	Message (frame) number	Message name
The MeNB requests the addition of the SgNB			
S1 Bearer modification request			
DL traffic starts to be received by the SgNB			
End marker packet for the EPC to MeNB			
UL traffic starts to be sent via the SgNB			

3. Part: 5G SA

Open the file “5G-without-AUSF.pcap”

- Deduce the IP addresses of gNB, AMF, SMF, and UPF?
- What is the value of SUCI? Which message includes this information? Can we deduce the IMSI value?
- What is the equivalent protocol of S1AP in 5G? What are the entities using this protocol to communicate?
- What is the security capability of the UE? What is new by report to 4G?
- What are the identifiers of the UE at the gNB and AMF?
- What are the values of RAND and AUTN? What are the components of the latter? Why?

Locate the first HTTP message (message number 71)

- What is the purpose of this message? Does it include a NAS message? If yes, which type: NAS-EM or NAS-SM?
- Do messages 72 and 75 related to message 71? Please elaborate.
- Message 72 is a PFCP message, including a PDR and FAR, what is their role?
- What is the role of message 77? What is the meaning of two encapsulated messages N1 and N2?
- Does message 79 related to message 77? Why?
- Which component generates message 81? Why?
- Does message 83 related to message 81?
- In message 84, another PFCP message is sent to UPF? What is its objective? What are the differences in the PDR and FAR compared to message 72?