

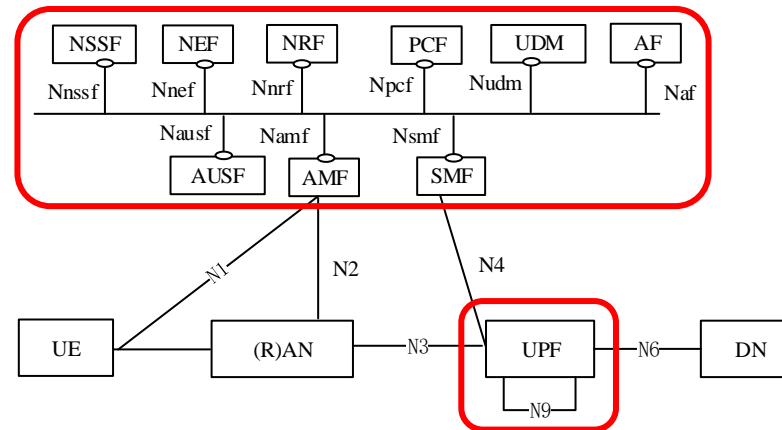
Comunicações Móveis

Lab3: 5G

2023

Free5GC summary

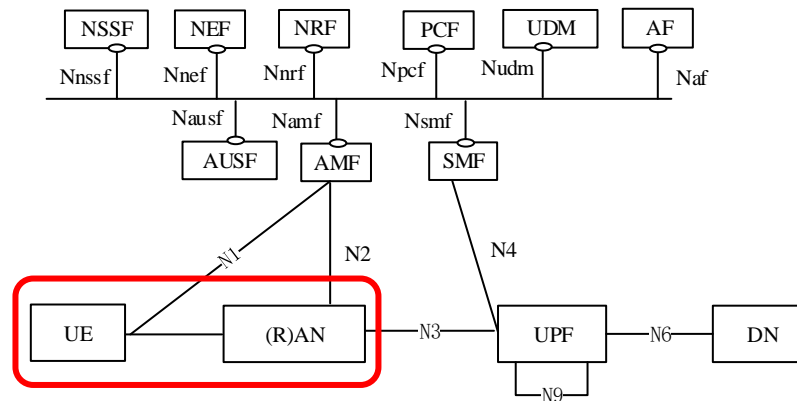
- <https://github.com/free5gc/free5gc/wiki>
- Main components of the 5GCore, Control and User Planes
- 3GPP Release 15 (R15)



- Each component is configured by a specific yaml file
 - E.g. amfcfg.yaml, nssfcfg.yaml and upfcfg.yaml

UERANSIM summary

- <https://github.com/aligungr/UERANSIM/wiki>
- Two main componentes: UE and gNB

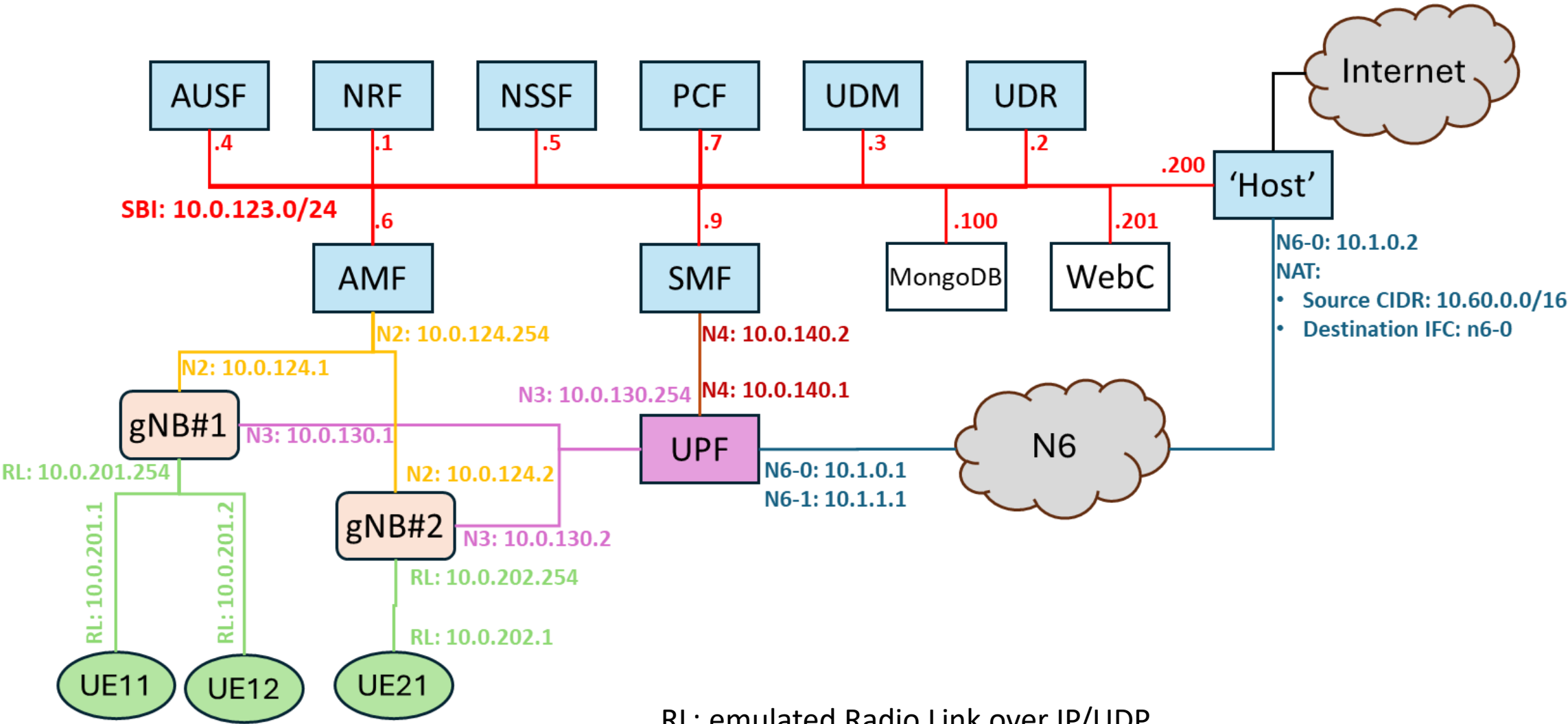


- Usage:

```
$ nr-ue -c myconfig1.yaml
$ nr-gnb -c myconfig2.yaml
```

<https://github.com/aligungr/UERANSIM/wiki/Configuration>

Network topology



Scripts to run the environment

- 5Gsetup.sh
- 5Gstart.sh
- 5Gcleanup.sh

- GNB1Start.sh
- GNB2Start.sh

- UE11Start.sh
- UE12Start-sl1.sh, UE12Start-sl2.sh
- UE21Start.sh

2.1.b

- i. MCC and MNC:
 - MCC: 001
 - MNC: 01
- ii. NR Cell Identities and TACs
 - gNB1: 2, 1
 - gNB2: 1, 2
- iii. Supported slices at gNB1 and gNB2
 - gNB1: 1/010203 and 2/112233
 - gNB2: 1/010203
- iv. Supported DNN:
 - internet
- v. List of SUPIs (UE11, UE12 and UE21)
 - 001 01 0000 0000 11/12/21

```
13 pem: config/TLS/
14 key: config/TLS/
15 serviceNameList: # t
16 - nssf-nselectio
17 - nssf-nssaiavail
18 nrfUri: http://10.0.
19 supportedPlmnList: #
20 - mcc: 001 # Mobil
21 mnc: 01 # Mobile
22 supportedNssaiInPlmn
23 - plmnId: # Public
24 mcc: 001 # Mob
25 mnc: 01 # Mobi
26 supportedSnsai
27 - sst: 1 # Sli
28 sd: 010203 #
29 - sst: 2 # Sli
30 sd: 112233 #
31 - sst: 1 # Sli
32 sd: 000003 #
33 - sst: 2 # Sli
34 sd: 000001 #
35 - sst: 2 # Sli
36 sd: 000002 #
37 nsList: # List of a
38 - snsai: # S-NSSA
39 sst: 1 # Slice
40 nsInformation
41
42 1 mcc: '001' # Mobi
43 2 mnc: '01' # Mobi
44 3
45 4 nci: '0x000000010' # NR C
46 5 idLength: 32 # NR C
47 6 tac: 1 # Trac
48 7
49 8 linkIp: 10.0.201.254 # C
50 9 ngapIp: 10.0.124.1 # gNE
51 10 gtpIp: 10.0.130.1 # gNE
52 11
53 12 # List of AMF address info
54 13 amfConfigs:
55 14 - address: 10.0.124.254
56 15 port: 38412
57 16
58 17 # List of supported S-NSSA
59 18 slices:
60 19 - sst: 0x1
61 20 sd: 0x010203
62 21 - sst: 0x2
63 22 sd: 0x112233
64 23
65 24 # Indicates whether or not
66
67 5 configuration:
68 6 amfName: AMF # the name
69 7 ngapIpList: # the IP l
70 8 - 10.0.124.254
71 9 sbi: # Service-based in
72 10 scheme: http # the pr
73 11 registerIPv4: 10.0.12
74 12 bindingIPv4: 10.0.123
75 13 port: 8000 # port use
76 14 tls: # the local path
77 15 pem: config/TLS/amf
78 16 key: config/TLS/amf
79 17 serviceNameList: # the
80 18 - namf-comm # Namf_Coi
81 19 - namf-exts # Namf_Ev
82
83 1 mcc: '001'
84 2 mnc: '01'
85 3
86 4 nci: '0x000000010'
87 5 idLength:
88 6 tac: 2
89 7
90 8 linkIp: 10
91 9 ngapIp: 10
92 10 gtpIp: 10.
93
94 # List of
95 amfConfigs
96 - address
97 port:
98
99 # List of
100 slices:
101 - sst: 0
102 sd: 0x
103
104 # Indicate
105 ignoreStre
106
107 # IMSI
108 supi:
109 # Mobil
110 mcc: '0
111 # Mobil
112 mnc: '0
113 # Perma
114 key: '8
115 # Opera
116 op: '8e
117 # This
118 opType:
119 # Auth
120 amf: '8
121 # IMEI
122 imei:
123 # IMEIS
124 imeiSv:
125 # List
126 gnbSear
127 - 10.
128 # UAC A
129 uacAic:
130 mps:
131 mcs:
132 # UAC A
133 uacAcc:
134 norma
135 class
136 class
137 class
138 class
139 # Init
140 session
141 - typ
142 apr
143 sli
144 s
145 s
146
147 # Confi
148 config
```

3.3 ~/**5GLab/netns5G**\$ *sudo ./5Gsetup.sh*

```
ubuntu@ubuntu-VirtualBox:~/5GLab/netns5g$ sudo ./5Gsetup.sh
net.ipv4.ip_forward = 1
create namespace mongodb
create_interface: if_local mongodb-sbi, if_bridge v-mongodb-sbi, namespace mongodb
configure_interface mongodb-sbi v-mongodb-sbi mongodb 10.0.123.100
disableIpv6IfRequested: interface mongodb-sbi, namespace mongodb
create namespace nrf
create_interface: if_local nrf-sbi, if_bridge v-nrf-sbi, namespace nrf
configure_interface nrf-sbi v-nrf-sbi nrf 10.0.123.1
disableIpv6IfRequested: interface nrf-sbi, namespace nrf
create namespace udr
create_interface: if_local udr-sbi, if_bridge v-udr-sbi, namespace udr
configure_interface udr-sbi v-udr-sbi udr 10.0.123.2
disableIpv6IfRequested: interface udr-sbi, namespace udr
create namespace udm
create_interface: if_local udm-sbi, if_bridge v-udm-sbi, namespace udm
configure_interface udm-sbi v-udm-sbi udm 10.0.123.3
disableIpv6IfRequested: interface udm-sbi, namespace udm
create namespace ausf
create_interface: if_local ausf-sbi, if_bridge v-ausf-sbi, namespace ausf
configure_interface ausf-sbi v-ausf-sbi ausf 10.0.123.4
disableIpv6IfRequested: interface ausf-sbi, namespace ausf
create namespace nssf
create_interface: if_local nssf-sbi, if_bridge v-nssf-sbi, namespace nssf
configure_interface nssf-sbi v-nssf-sbi nssf 10.0.123.5
disableIpv6IfRequested: interface nssf-sbi, namespace nssf
create namespace amf
create_interface: if_local amf-sbi, if_bridge v-amf-sbi, namespace amf
configure_interface amf-sbi v-amf-sbi amf 10.0.123.6
disableIpv6IfRequested: interface amf-sbi, namespace amf
create_interface: if_local amf-n2, if_bridge v-amf-n2, namespace amf
configure_interface amf-n2 v-amf-n2 amf 10.0.124.254
disableIpv6IfRequested: interface amf-n2, namespace amf
```

3.4

~/5GLab/netns5G\$ *sudo ip netns*
~/5GLab/netns5G\$ *sudo ip link*

```
ubuntu@ubuntu-VirtualBox: ~/5GLab/netns5G
ubuntu@ubuntu-VirtualBox:~/5GLab/netns5G$
ubuntu@ubuntu-VirtualBox:~/5GLab/netns5G$
ubuntu@ubuntu-VirtualBox:~/5GLab/netns5G$
ubuntu@ubuntu-VirtualBox:~/5GLab/netns5G$
ubuntu@ubuntu-VirtualBox:~/5GLab/netns5G$ sudo ip netns
ue21 (id: 15)
gnb2 (id: 14)
ue12 (id: 13)
ue11 (id: 12)
gnb1 (id: 11)
webc (id: 10)
smf (id: 9)
upf (id: 8)
pcf (id: 7)
amf (id: 6)
nssf (id: 5)
ausf (id: 4)
udm (id: 3)
udr (id: 2)
nrf (id: 1)
mongodb (id: 0)
ubuntu@ubuntu-VirtualBox:~/5GLab/netns5G$
```

```
ubuntu@ubuntu-VirtualBox: ~/5GLab/netns5G
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group default qlen 1000
   link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP mode DEFAULT group default qlen 1000
   link/ether 08:00:27:9f:81:d6 brd ff:ff:ff:ff:ff:ff
3: enp0s8: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc fq_codel state DOWN mode DEFAULT group default qlen 1000
   link/ether 08:00:27:5e:ae:91 brd ff:ff:ff:ff:ff:ff
4: br1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP mode DEFAULT group default qlen 1000
   link/ether 12:33:6e:f7:ed:46 brd ff:ff:ff:ff:ff:ff
5: v-mongodb-sbi@if6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether c6:67:5e:e4:6c:75 brd ff:ff:ff:ff:ff:ff link-netns mongodb
7: v-nrf-sbi@if8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 56:52:fc:ec:66:8e brd ff:ff:ff:ff:ff:ff link-netns nrf
9: v-udr-sbi@if10: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 8a:ec:a3:ff:26:db brd ff:ff:ff:ff:ff:ff link-netns udr
11: v-udm-sbi@if12: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 46:54:14:f3:af:b0 brd ff:ff:ff:ff:ff:ff link-netns udm
13: v-ausf-sbi@if14: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 9e:b5:bf:ca:e5:06 brd ff:ff:ff:ff:ff:ff link-netns ausf
15: v-nssf-sbi@if16: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 22:77:a4:18:ac:f7 brd ff:ff:ff:ff:ff:ff link-netns nssf
17: v-amf-sbi@if18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 1e:c5:a7:bf:e4:a5 brd ff:ff:ff:ff:ff:ff link-netns amf
19: v-amf-n2@if20: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether ce:21:42:88:d1:6c brd ff:ff:ff:ff:ff:ff link-netns amf
21: v-pcf-sbi@if22: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 7a:83:07:39:f4:e1 brd ff:ff:ff:ff:ff:ff link-netns pcf
23: v-upf-n3@if24: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether aa:2c:34:05:17:20 brd ff:ff:ff:ff:ff:ff link-netns upf
25: v-upf-n4@if26: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 12:f6:d7:87:b1:83 brd ff:ff:ff:ff:ff:ff link-netns upf
27: v-upf-n6-0@if28: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether ba:22:62:58:c6:f7 brd ff:ff:ff:ff:ff:ff link-netns upf
29: v-upf-n6-1@if30: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether de:7e:49:22:37:27 brd ff:ff:ff:ff:ff:ff link-netns upf
31: v-smf-sbi@if32: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 86:fa:75:42:8e:d9 brd ff:ff:ff:ff:ff:ff link-netns smf
33: v-smf-n4@if34: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether de:2e:91:af:72:6e brd ff:ff:ff:ff:ff:ff link-netns smf
35: v-webc-sbi@if36: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether aa:a6:81:5f:45:89 brd ff:ff:ff:ff:ff:ff link-netns webc
37: v-host-sbi@host-sbi: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 26:64:79:64:96:3f brd ff:ff:ff:ff:ff:ff
38: host-sbi@v-host-sbi: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP mode DEFAULT group default qlen 1000
   link/ether f2:2b:47:0d:08:49 brd ff:ff:ff:ff:ff:ff
39: v-host-n6@host-n6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether fe:f3:13:a8:9f:42 brd ff:ff:ff:ff:ff:ff
40: host-n6@v-host-n6: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP mode DEFAULT group default qlen 1000
   link/ether 16:e9:c6:27:6e:f1 brd ff:ff:ff:ff:ff:ff
41: v-gnb1-r1@if42: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 46:92:85:14:90:15 brd ff:ff:ff:ff:ff:ff link-netns gnb1
43: v-gnb1-n2@if44: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 32:0d:d2:16:4e:59 brd ff:ff:ff:ff:ff:ff link-netns gnb1
45: v-gnb1-n3@if46: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether ae:32:21:e7:52:ac brd ff:ff:ff:ff:ff:ff link-netns gnb1
47: v-ue11-r1@if48: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether fe:81:5e:16:e5:b2 brd ff:ff:ff:ff:ff:ff link-netns ue11
49: v-ue12-r1@if50: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether ca:52:db:6f:38:d4 brd ff:ff:ff:ff:ff:ff link-netns ue12
51: v-gnb2-r1@if52: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether fe:3a:8d:65:a6:10 brd ff:ff:ff:ff:ff:ff link-netns gnb2
53: v-gnb2-n2@if54: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether de:e0:9e:7d:34:58 brd ff:ff:ff:ff:ff:ff link-netns gnb2
55: v-gnb2-n3@if56: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 12:33:6e:f7:ed:46 brd ff:ff:ff:ff:ff:ff link-netns gnb2
57: v-ue21-r1@if58: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br1 state UP mode DEFAULT group default qlen 1000
   link/ether 3a:28:b1:27:68:2d brd ff:ff:ff:ff:ff:ff link-netns ue21
```

33 links are listed, numbered 0 to 57

3.7

- Ordem: NRF, UDR, UDM, AUSF, NSSF, AMF, PCF, UPF e SMF
- NRF é o primeiro para que os outros se registem
- Depois vem o repositório, depois os componentes de autenticação dos UE (UDR, UDM, AUSF)
- Depois a componente de controlo de registo de UE (NSSF, AMF)
- Depois a componente de sessões (PCF, UPF, SMF)

3.8

- All the dialogs are with the NRF (10.0.123.1) and MongoDB (10.0.123.100), except for the PFCP (between SMF and UPF)

3.8

- Entre components 5G para funções 5G: HTTP2; PFCP
- Outros: ARP, TCP; ICMPv6; MDNS, MONGO
- Apenas há dialogos dos vários components com o NRF, MongoDB e WebConsole
 - Excepção é o arranque do PFCP entre o SMF e o UPF

No.	Time	Source	Destination	Length	Protocol	Info
2	0.229756...	10.0.123.200	224.0.0.251	183	MDNS	Standard query 0x0000 PTR _nfs._1
464	32.24427...	10.0.123.200	224.0.0.251	183	MDNS	Standard query 0x0000 PTR _nfs._1
3	0.311544...	10.1.0.2	224.0.0.251	183	MDNS	Standard query 0x0000 PTR _nfs._1
465	32.30489...	10.1.0.2	224.0.0.251	183	MDNS	Standard query 0x0000 PTR _nfs._1
418	27.42592...	SMF-N4	UPF-N4	72	PFCP	PFCP Association Setup Request
419	27.42648...	UPF-N4	SMF-N4	72	PFCP	PFCP Association Setup Response
1	0.000000...	fe80::9462:5...	ff02::fb	203	MDNS	Standard query 0x0000 PTR _nfs._1
293	22.96788...	fe80::9462:5...	ff02::2	70	ICMPv6	Router Solicitation from 0a:58:60
463	32.05465...	fe80::9462:5...	ff02::fb	203	MDNS	Standard query 0x0000 PTR _nfs._1

Protocols: ARP, HTTP2, ICMPv6, MDNS, TCP

5G protocols: PFCP and, indirectly, HTTP2

4.3 gNB1

```
ubuntu@ubuntu-VirtualBox: ~/5GLab/netns5g
[sudo] password for ubuntu:
UERANSIM v3.2.6
[2022-11-07 22:23:42.301] [sctp] Trying to establish SCTP connection... (10.0.124.254:38412)
[2022-11-07 22:23:42.303] [sctp] [info] SCTP connection established (10.0.124.254:38412)
[2022-11-07 22:23:42.303] [sctp] [debug] SCTP association setup ascid[9]
[2022-11-07 22:23:42.304] [ngap] [debug] Sending NG Setup Request
[2022-11-07 22:23:42.305] [ngap] [debug] NG Setup Response received
[2022-11-07 22:23:42.305] [ngap] [info] NG Setup procedure is successful
```

No.	Time	Source	Destination	Length	Protocol	Info
49	10.94869...	gNB1-N2	AMF-N2	138	NGAP	NGSetupRequest

> Frame 49: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits) on interface br1, id 0
> Ethernet II, Src: 4e:89:93:1f:35:41 (4e:89:93:1f:35:41), Dst: AMF-N2 (12:85:65:4c:d9:ee)
> Internet Protocol Version 4, Src: gNB1-N2 (10.0.124.1), Dst: AMF-N2 (10.0.124.254)
> Stream Control Transmission Protocol, Src Port: 54738 (54738), Dst Port: 38412 (38412)
> NG Application Protocol (NGSetupRequest)
 > NGAP-PDU: initiatingMessage (0)
 > initiatingMessage
 procedureCode: id-NGSetup (21)
 criticality: reject (0)
 > value
 > NGSetupRequest
 > protocolIEs: 4 items
 > Item 0: id-GlobalRANNodeID
 > ProtocolIE-Field
 id: id-GlobalRANNodeID (27)
 criticality: reject (0)
 > value
 > GlobalRANNodeID: globalGNB-ID (0)
 > globalGNB-ID
 > pLMNIdentity: 00f110
 Mobile Country Code (MCC): Unknown (1)
 Mobile Network Code (MNC): Unknown (01)
 > gNB-ID: gNB-ID (0)
 gNB-ID: 00000001 [bit length 32, 0000 0000 0000 0000 0000 0000 0000 0001 decimal value 1]
 > Item 1: id-RANNodeName
 > ProtocolIE-Field
 id: id-RANNodeName (82)
 criticality: ignore (1)
 > value
 RANNodeName: UERANSIM-gnb-1-1-1
 > Item 2: id-SupportedTAList
 > ProtocolIE-Field
 id: id-SupportedTAList (102)
 criticality: reject (0)
 > value
 > SupportedTAList: 1 item
 > Item 0
 > SupportedTAItem
 tAC: 1 (0x000001)
 > broadcastPLMNList: 1 item
 > Item 0
 > BroadcastPLMNItem
 > pLMNIdentity: 00f110
 Mobile Country Code (MCC): Unknown (1)
 Mobile Network Code (MNC): Unknown (01)
 > tAISliceSupportList: 2 items
 > Item 0
 > SliceSupportItem
 > s-NSSAI
 sST: 01
 sD: 010203
 > Item 1
 > SliceSupportItem
 > s-NSSAI
 sST: 02
 sD: 112233
 > Item 3: id-DefaultPagingDRX
 > ProtocolIE-Field
 id: id-DefaultPagingDRX (21)
 criticality: ignore (1)
 > value
 PagingDRX: v128 (2)

No.	Time	Source	Destination	Length	Protocol	Info
51	10.95009...	AMF-N2	gNB1-N2	118	NGAP	NGSetupResponse

> Frame 51: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface br1, id 0
> Ethernet II, Src: AMF-N2 (12:85:65:4c:d9:ee), Dst: 4e:89:93:1f:35:41 (4e:89:93:1f:35:41)
> Internet Protocol Version 4, Src: AMF-N2 (10.0.124.254), Dst: gNB1-N2 (10.0.124.1)
> Stream Control Transmission Protocol, Src Port: 38412 (38412), Dst Port: 54738 (54738)
> NG Application Protocol (NGSetupResponse)
 > NGAP-PDU: successfulOutcome (1)
 > successfulOutcome
 procedureCode: id-NGSetup (21)
 criticality: reject (0)
 > value
 > NGSetupResponse
 > protocolIEs: 4 items
 > Item 0: id-AMFName
 > ProtocolIE-Field
 id: id-AMFName (1)
 criticality: reject (0)
 > value
 AMFName: AMF
 > Item 1: id-ServedGUAMIList
 > ProtocolIE-Field
 id: id-ServedGUAMIList (96)
 criticality: reject (0)
 > value
 > ServedGUAMIList: 1 item
 > Item 0
 > ServedGUAMItem
 > gUAMI
 > pLMNIdentity: 00f110
 Mobile Country Code (MCC): Unknown (1)
 Mobile Network Code (MNC): Unknown (01)
 > aMFRegionID: ca [bit length 8, 1100 1010 decimal value 202]
 > aMFSetID: fe00 [bit length 10, 6 LSB pad bits, 1111 1110 00.. decimal value 1016]
 > aMFPPointer: 00 [bit length 6, 2 LSB pad bits, 0000 00.. decimal value 0]
 > Item 2: id-RelativeAMFCapacity
 > ProtocolIE-Field
 id: id-RelativeAMFCapacity (86)
 criticality: ignore (1)
 > value
 RelativeAMFCapacity: 255
 > Item 3: id-PLMNSupportList
 > ProtocolIE-Field
 id: id-PLMNSupportList (80)
 criticality: reject (0)
 > value
 > PLMNSupportList: 1 item
 > Item 0
 > PLMNSupportItem
 > pLMNIdentity: 00f110
 Mobile Country Code (MCC): Unknown (1)
 Mobile Network Code (MNC): Unknown (01)
 > sliceSupportList: 2 items
 > Item 0
 > SliceSupportItem
 > s-NSSAI
 sST: 01
 sD: 010203
 > Item 1
 > SliceSupportItem
 > s-NSSAI
 sST: 02
 sD: 112233

4.4 gNB1

Wireshark capture of NGAP or PCP or SCTP traffic. The packet list shows a sequence of messages between gNB1-N2 and AMF-N2. The selected packet (No. 23) is an NGAP SetupRequest message.

No.	Time	Source	Destination	Protocol	Length	Info
19	3.681427119	gNB1-N2	AMF-N2	SCTP	82	INIT
20	3.681486811	AMF-N2	gNB1-N2	SCTP	306	INIT_ACK
21	3.681503582	gNB1-N2	AMF-N2	SCTP	278	COOKIE_ECHO
22	3.681537506	AMF-N2	gNB1-N2	SCTP	50	COOKIE_ACK
23	3.681843059	gNB1-N2	AMF-N2	NGAP	138	NGSetupRequest
24	3.681859940	AMF-N2	gNB1-N2	SCTP	62	SACK
25	3.683035445	AMF-N2	gNB1-N2	NGAP	118	NGSetupResponse
26	3.683052777	gNB1-N2	AMF-N2	SCTP	62	SACK
117	34.422643851	AMF-N2	gNB1-N2	SCTP	106	HEARTBEAT
118	34.422681261	gNB1-N2	AMF-N2	SCTP	106	HEARTBEAT_ACK
119	36.466729637	gNB1-N2	AMF-N2	SCTP	106	HEARTBEAT
120	36.466790190	AMF-N2	gNB1-N2	SCTP	106	HEARTBEAT_ACK

Frame 23: 138 bytes on wire (1104 bits), 138 bytes captured (1104 bits) on interface br1, id 0
Ethernet II, Src: gNB1-N2 (ca:99:31:03:4d:83), Dst: AMF-N2 (8a:7f:95:6c:39:33)
Internet Protocol Version 4, Src: gNB1-N2 (10.0.124.1), Dst: AMF-N2 (10.0.124.254)
Stream Control Transmission Protocol, Src Port: 47112 (47112), Dst Port: 38412 (38412)
NG Application Protocol
NGAP-PDU: initiatingMessage (0)
initiatingMessage
procedureCode: id-NGSetup (21)
criticality: reject (0)
value
NGSetupRequest
protocolIEs: 4 items
Item 0: id-GlobalRANNodeID
ProtocolIE-Field
id: id-GlobalRANNodeID (27)
criticality: reject (0)
value
GlobalRANNodeID: globalGNB-ID (0)
globalGNB-ID
pLMNIdentity: 00f110
Mobile Country Code (MCC): Unknown (1)
Mobile Network Code (MNC): Unknown (01)
gNB-ID: gNB-ID (0)
gNB-ID: 00000001 [bit length 32, 0000 0000 0000 0000 0000 0000 0000 0001 decimal value 1]
Item 1: id-RANNodeName
ProtocolIE-Field
id: id-RANNodeName (82)
criticality: ignore (1)
value
RANNodeName: UERANSIM-gnb-1-1-1
Item 2: id-SupportedTAList
ProtocolIE-Field
id: id-SupportedTAList (102)
criticality: reject (0)
value
SupportedTAList: 1 item
Item 0
SupportedTAItem
tAC: 1 (0x000001)
broadcastPLMNList: 1 item
Item 0
BroadcastPLMNItem
pLMNIdentity: 00f110
Mobile Country Code (MCC): Unknown (1)
Mobile Network Code (MNC): Unknown (01)
tAISliceSupportList: 2 items
Item 0
SliceSupportItem
s-NSSAI
sST: 01
sD: 010203
Item 1
SliceSupportItem
s-NSSAI
sST: 02
sD: 112233
Item 3: id-DefaultPagingDRX
ProtocolIE-Field
id: id-DefaultPagingDRX (21)
criticality: ignore (1)
value
PagingDRX: v128 (2)

Wireshark: br1_20221114231410_R9SXas.pcapng
Packets: 506 · Displayed: 28 (5.5%)
Profile: Default

4.5 gNB2

Cell identifiers and the supported slices are different between the two cells