

Setup

Access Gateway Hardware

Physical Gateways

- CPU - Intel(R) Celeron(R) CPU J3160 1.6Ghz
- Memory - 8GB DDR3 1066Mhz
- Storage - 120G SSD
- Network - 4x1 Gigabit Network Connection (rev03)

Traffic Emulator

- Spirent Landslide UE and eNB emulator with 1G traffic ports

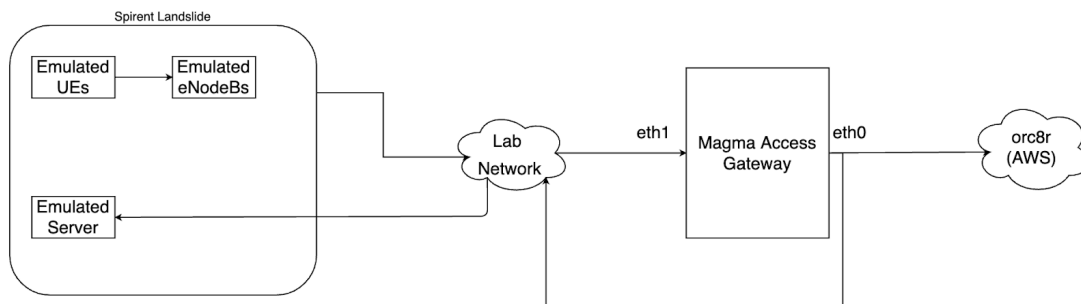


Fig 1 - High level block diagram for the emulated setup for a NAT setup

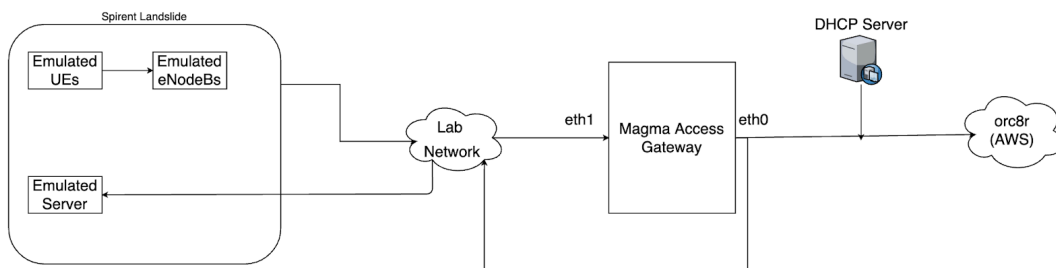


Fig 2 - High level block diagram for non-nat DHCP setup

Install, Upgrade Validation

AGW BareMetal

Ubuntu 1.7.0 Fresh Install

Download and run

```
wget
https://raw.githubusercontent.com/magma/magma/master/lte/gateway/deploy/agw_install_ubuntu.sh
<<Install Logs>>
```

Network Type Tested

- NAT
- non-NAT with DHCP (SGi)

AGW Upgrade

Download and run

```
wget
https://raw.githubusercontent.com/magma/magma/master/lte/gateway/release/upgrade_magma.sh
```

Ubuntu	1.7.0	Upgrade Logs & Verification
1.6.1 • NAT • Non-NAT	• NAT • Non-NAT	NAT - <<Upgrade Logs>> Non-NAT - <<Upgrade Logs>>

Orc8r

v1.7.0 Fresh Install (Cloudstrapper)

- Orc8r 1.7.0 [Fresh Install](#) logs (using cloudstrapper)

v1.6.1 -> 1.7.0 Upgrade (Terraform)

- Orc8r 1.6.1 → 1.7.0 logs (using terraform commands)
 - [Orc8r-db-upgrade-logs](#)
 - [orc8r-upgrade-logs-1.7](#)

Hardware in the Loop Testing

NOTE: In this version, IPFIX was enabled for as many test cases as possible. For performance testing, IPFIX was disabled due to the high tax on resources on the Protectli formfactor of the Access Gateway.

Sanity

Test Case	NAT	non-NAT
TC001_SANITY_control_50UE_3rate	Pass	Pass
TC002_SANITY_data_30UE_5rate_active_idle	Pass	Pass
TC003_SANITY_data_50UE_3rate_25M_attach_detach	Pass	Pass
TC004_SANITY_control_200UE_3rate	Pass	Pass
TC005_SANITY_data_200UE_3rate_100M_attach_detach	Pass	Pass
TC006_SANITY_data_200UE_3rate_400M_attach_detach	Pass	Pass
TC007_SANITY_control_400UE_3rate	Pass	Pass
TC008_SANITY_data_400UE_3rate_200M_attach_detach	Pass	Pass
TC009_SANITY_control_600UE_3rate	Pass	Pass
TC010_SANITY_data_600UE_3rate_300M_attach_detach (Fail)	Pass	Pass
TC011_SANITY_data_3UE_600M_attach_detach	Pass	N/A

Feature

Test Case	NAT	non-NAT
TC002_FEATURE_X2_HO_200UE_6enbs_500k_600sec	Pass	Pass
TC004_FEATURE_S1_HO_200UE_6enbs_500k_600sec	Pass	Pass
TC005_FEATURE_header_enrichment_wo_cipherring	Pass	Pass
TC006_FEATURE_APN_COR_50UE	Pass	Pass
TC007_FEATURE_PLMN_Restric_50UE	Pass	Pass
TC008_FEATURE_QoS_flow_res_200UE_tcp	Pass	Pass
TC009_FEATURE_IMEI_Restric_200UE	Pass	Pass
TC010_FEATURE_ipfix	Pass	Pass
TC001_IPV6_GTPv6_50UEv6_3rate	Pass	-
TC002_IPV6_GTPv6_50UEv4_3rate	Pass	-
TC003_IPV6_GTPv4_50UEv6_3rate	Pass	-
TC001_STATIC_multi_apn_100UE_500k	-	Pass
TC002_STATIC_IP_300UE_500k	-	Pass

Performance

Test Case	NAT	non NAT	Duration	Test Description
TC001_PERFORMAN CE_data_200UE_2M	Pass	Pass	8 hours	200 UEs attach at 3UEs/sec, push 2M per UE of traffic for 8 hours then detach at 3UEs/sec
TC002_PERFORMAN CE_data_600UE_500K	Pass	Pass*	8 hours	600 Ues attach at 3UEs/sec, push 500K per UE of traffic for 8 hours then detach at 3UEs/sec
TC003_PERFORMAN CE_data_300UE_12en bs_3rate_active_idle	Pass	Pass*	12-13 hours	2 groups of UEs (150 in each set) attach. Each group stays in active mode anywhere between 30-80 seconds then transition to idle for 4-10 seconds (Idle timer = 4 sec) then repeat. Each time UE goes active, it sends a probe ICMP traffic to determine datapath availability. This test runs over 12-13 hours.

* Non-NAT scale number are tested with 200 UE

Availability

Test Case	NAT	Duration	Test Description
TC001_AVAILABILITY_MIX	Pass	18 hours	Availability test case that setup the S1 connection and attaches a moderate number of users to the AGW with moderate data traffic. Further during the availability testing period, probing traffic will be sent to ensure that the data plane and control plane are available.

Feature Testing

TAU

- TAU LTE-Integ Test Logs: [Link](#), [Link](#)

Docker Access Gateway

- Docker AGW Logs: [Link](#)

IPv6

- Spirent Logs: [Link](#)

5G SA

- Wavelabs 5G Test Report: [Link](#)
- TeraVM Test Logs (TCs 0-13)

0	5G_FWA_SA	SA_TC1_UE_Initiated_Registration_with_SUCI_as_identifier	UE_Initiated_Registration_with_SUCI_as_identifier	PASS
1	5G_FWA_SA	SA_TC2_UE_Initiated_PDU_Session_Establishment_with_traffic_test	UE_Initiated_PDU_Session_Establishment_with_traffic_test	PASS
2	5G_FWA_SA	SA_TC3_UE_Initiated_PDU_Session_Termination	UE_Initiated_PDU_Session_Termination	PASS
3	5G_FWA_SA	SA_TC4_UE_Initiated_De_Registration	UE_Initiated_De_Registration	PASS
4	5G_FWA_SA	SA_TC6_UE_Initiated_Registration_with_GUTI_as_identifier	UE_Initiated_Registration_with_GUTI_as_identifier	PASS
5	5G_FWA_SA	SA_TC7_UE_Idle_Mode_Support_Service_Request_procedures	UE_Idle_Mode_Support_Service_Request_procedures	PASS
6	5G_FWA_SA	SA_TC7c_Verify_Service_Reject_for_SReq_MO_Signaling	Verify_Service_Reject_for_SReq_MO_Signaling	PASS
7	5G_FWA_SA	SA_TC8_UE_Initiated_Periodic_Registration	UE_Initiated_Periodic_Registration	PASS
8	5G_FWA_SA	SA_TC8b_UE_Initiated_Periodic_Registration_Idle_Mode	UE_Initiated_Periodic_Registration_Idle_Mode	PASS
9	5G_FWA_SA	SA_TC13_Verify_T3550_Expiry_Reg_Complete_Accept_Failure	Verify_T3550_Expiry_Reg_Complete_Accept_Failure	PASS
10	5G_FWA_SA	SA_TC14_Verify_T3560_expiry_and_Retransmission_of_AUTHENTICATION_REQUEST	Verify_T3560_expiry_and_Retransmission_of_AUTHENTICATION_REQUEST	PASS
11	5G_FWA_SA	SA_TC14b_Verify_T3560_expiry_and_Retransmission_of_Security_Mode_cmd	Verify_T3560_expiry_and_Retransmission_of_Security_Mode_cmd	PASS
12	5G_FWA_SA	SA_TC15_Verify_T3570_expiry_and_Retransmission_of_IDENTITY_REQUEST_message	Verify_T3570_expiry_and_Retransmission_of_IDENTITY_REQUEST_message	PASS
13	5G_FWA_SA	SA_TC17_Verify_T3592_expiry_and_Retransmission_of_PDU_SESSION_RELEASE_CMD	Verify_T3592_expiry_and_Retransmission_of_PDU_SESSION_RELEASE_CMD	PASS

- Wavelabs 5G Worker

TC ID	Rel.Tag	Test Case Name	Test Run Result	Scenario			Steps			
				Failed	Passed	Total	Failed	Passed	Skipped	Total
TIP-FWA-OCN-FUNC-01-TC020	1.7-5GAlpha	Simple_subscriber_mgmt	PASS	0	1	1	0	41	0	41
TIP-FWA-OCN-FUNC-01-TC003	1.7-5GAlpha	Initial_Registration_with_GUTI	PASS	0	1	1	0	47	0	47
TIP-FWA-OCN-FUNC-01-TC028	1.7-5GAlpha	OCN_supports_5Qi	PASS	0	1	1	0	46	0	46
TIP-FWA-OCN-FUNC-01-TC019	1.7-5GAlpha	OCN_supports_basic_control_functions	PASS	0	1	1	0	47	0	47
TIP-FWA-OCN-FUNC-01-TC017	1.7-5GAlpha	OCN_access_service_predefined_loc	PASS	0	1	1	0	47	0	47
TIP-FWA-OCN-FUNC-01-TC016	1.7-5GAlpha	CPE_Relocated_One_Location_To_Another	PASS	0	1	1	0	49	0	49
TIP-FWA-OCN-FUNC-01-TC004	1.7-5GAlpha	Periodic_Registration	PASS	0	1	1	0	61	0	61
MGM-5GSA-FUNC-TC006	1.7-5GAlpha	PDU_Session_Release	PASS	0	1	1	0	38	0	38
TIP-FWA-OCN-FUNC-01-TC007	1.7-5GAlpha	5G_Registration_PDU_Session_Establishment	PASS	0	1	1	0	44	0	44
TIP-FWA-OCN-FUNC-01-TC001	1.7-5GAlpha	NG_Setup_Request_Magma	PASS	0	1	1	0	12	0	12
TIP-FWA-OCN-FUNC-01-TC002	1.7-5GAlpha	Dereg_switchOff_suci	PASS	0	1	1	0	33	0	33
TIP-FWA-OCN-FUNC-01-TC012	1.7-5GAlpha	Session_Modification_procedure_IPv4	PASS	0	1	1	0	18	0	18

5G NSA

- TeraVM Test Logs (TCs 46-50)

46	FWA_NSA	NSA_attach_TC01	nsa3_attach_01	PASS
47	FWA_NSA	NSA_attach_TC02	nsa3x_attach_02	PASS
48	FWA_NSA	NSA_multiple_pdn_two_apn_TC06	NSA_multiple_pdn_two_apn_06	PASS
49	FWA_NSA	NSA_registration_loop_TC07	nsa3x_registration_loop_07	PASS
50	FWA_NSA	NSA_idle_active_transition_TC09	nsa3x_idle_active_transition_09	PASS

GTP Echo

- TeraVM Test Logs (TCs 42 & 43):

42	4G_FWA_FED_Mode	inbound_roaming_08	UL traffic check S1U ECHO	PASS
43	4G_FWA_FED_Mode	inbound_roaming_8b	UL+DL traffic check S1U/S8U/S8C ECHO	PASS

Inbound Roaming - Dedicated Bearer

- TeraVM Test Logs (TC 40 & 41):

40	4G_FWA_FED_Mode	inbound_roaming_07	Single Roaming subscriber attaches and sends data (switch between Default & Dedicated Bearer)	PASS
41	4G_FWA_FED_Mode	inbound_roaming_7b	Single Roaming subscriber attaches and sends data (switch between Default & Dedicated Bearer), Delete dedicated bearer and check pkt flow	PASS

L3 Transport

- Logs to be added [here](#)
- For support check FFi Slack [channel](#)

S8 Unique TEID

- TeraVM Test Logs (TC 33-43):

33	4G_FWA_FED_Mode	inbound_roaming_01	Single Roaming subscriber attaches and sends data	PASS
34	4G_FWA_FED_Mode	inbound_roaming_1b	Single Roaming subscriber attaches and sends data, select rate (5), size (1500) and total num (500) packets	PASS
35	4G_FWA_FED_Mode	inbound_roaming_02	Multiple Roaming & Non-Roaming subscriber attaches and sends data	PASS
36	4G_FWA_FED_Mode	inbound_roaming_03	Single Roaming subscriber attaches but receives a create session response with an error cause	PASS
37	4G_FWA_FED_Mode	inbound_roaming_04	Single Roaming subscriber, Idle->Conn mode (NET initiated)	PASS
38	4G_FWA_FED_Mode	inbound_roaming_05	Single Roaming subscriber, Idle->Conn mode (UE initiated)	PASS
39	4G_FWA_FED_Mode	inbound_roaming_05b	Single Roaming subscriber, Idle->Conn mode (UE initiated) loop 3 times, UL/DL traffic 100 pkts	PASS
40	4G_FWA_FED_Mode	inbound_roaming_07	Single Roaming subscriber attaches and sends data (switch between Default & Dedicated Bearer)	PASS
41	4G_FWA_FED_Mode	inbound_roaming_7b	Single Roaming subscriber attaches and sends data (switch between Default & Dedicated Bearer), Delete dedicated bearer and check pkt flow	PASS
42	4G_FWA_FED_Mode	inbound_roaming_08	UL traffic check S1U ECHO	PASS
43	4G_FWA_FED_Mode	inbound_roaming_8b	UL+DL traffic check S1U/S8U/S8C ECHO	PASS