RAN Network Simulation





FAST, RELIABLE AND COST-EFFECTIVE TESTING SOLUTIONS FOR 4G AND 5G RADIO AND BASEBAND

NetSIM Solution Summary

- Full function mobile network simulation
- Allows field of lab testing or 4G LTE and 5G NR* radios for full operational functionality
- Simulates the EPC and provides all required S1 signalling to the base station
- Supports all major OEMs and RATs
- Fully automatic setup, easy menu driven testing*



Network Core Simulation

- Testing and simulating LTE Evolved Packet Core (EPC), HSS, HLR, MME, SGW, PGW
- Full transparent packet capture on all interfaces
- Simulation of S1 link to eNodeB
- Spectrum analysis and radio testing options

* Future release





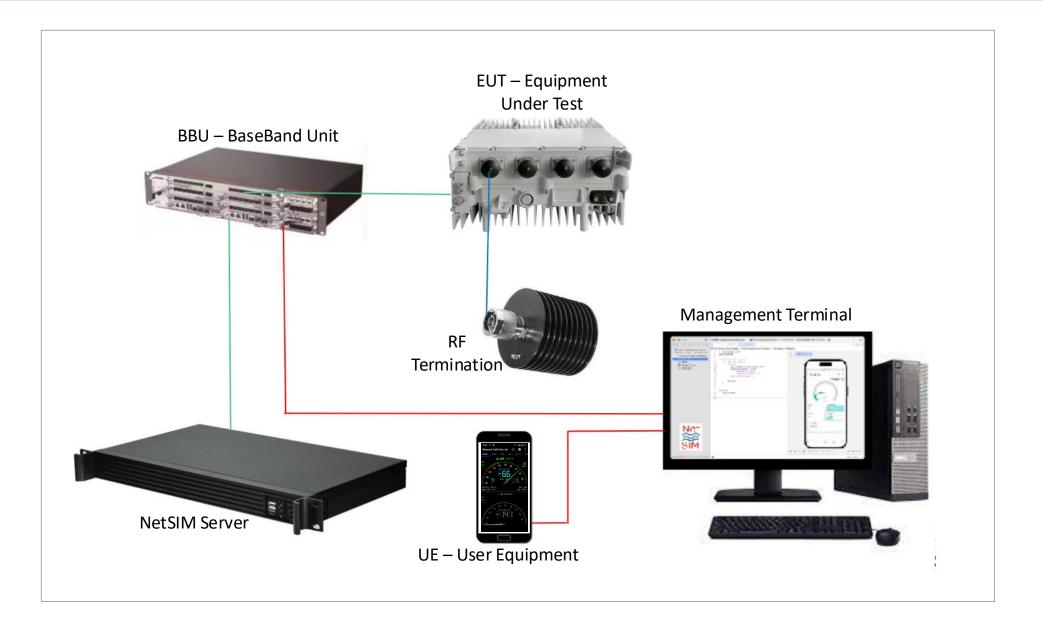
- Optimized for production environments (repeated testing of similar items)
- Rack-mount version ideal for lab / workshop use, can be installed and integrated into existing test platforms
- Portable version is self contained and ideal for users desiring mobility and compactness
- Optional fully automated test procedure (press start, get result as pass/fail)
- Solution delivered with all required hardware and base software for specified OEMs*
- Fast Return on Investment as pre-shipment testing ensures first time, install and operate (no out-of-box failures)
- Rental and leasing options available
- Each OEM is subject to separate / additional function licenses
- Solution supports LTE/FDD and LTE/TDD

* Each OEM and each product type may require unique configuration file which is not guaranteed available from NetSIM









NetSIM Test Procedure

S1 Interface Test Tool

RX ТΧ



Upload & Download Graph

-♥ ¥ 19 5il 74% № 12:59 4G UE \equiv Simple System Monitor GPS Hochladen Konto Aufzeichnen TIMES RAM NETWORK DISK ACTIVITY PING S1 eNB 32875 Cell 8 - LTE -71 dBm ACC: 262 MNC: 19 TAC: 505 -71 dBr -6 d 4G eNodeB E Reference Signal Received Power -1,81 MB/s TE Reference Signal Received Quality TE Channel Quality Indicator SI test TE Receive Signal Strength -33 dB UNDER TEST (RRU) 1.2 MB/s and Name 1820.0 MH X Frequency and Number S1 Interface -616,68 KB/s 1725.0 MH; (Frequency TE Cell Identity 841600 EA/UA/A)RFCN 135 33 6 E Signal to Noise Ratio **Downlink & Uplink Test** TE Physical Cell Identity -37,44 KB/s -24,96 KB/s -12.48 KB/s Core 4G eNodeB RRU Traffic test UPLOAD DOWNLOAD EnodeB /UUT/RRU DELTA 2.01 MB/s PEAK 2,41 MB/s (TPT 1 min) on the Test PC The TPT Tool performs from the UE a separate transmission channels for UL and DL 392.77 MB 1.07 GB TOTAL • UL = Uplink, channel from mobile to base station • DL = Downlink, channel from base station to mobile < · There are Traffic parameter testing 1. TPT for 1/15/30 min Test

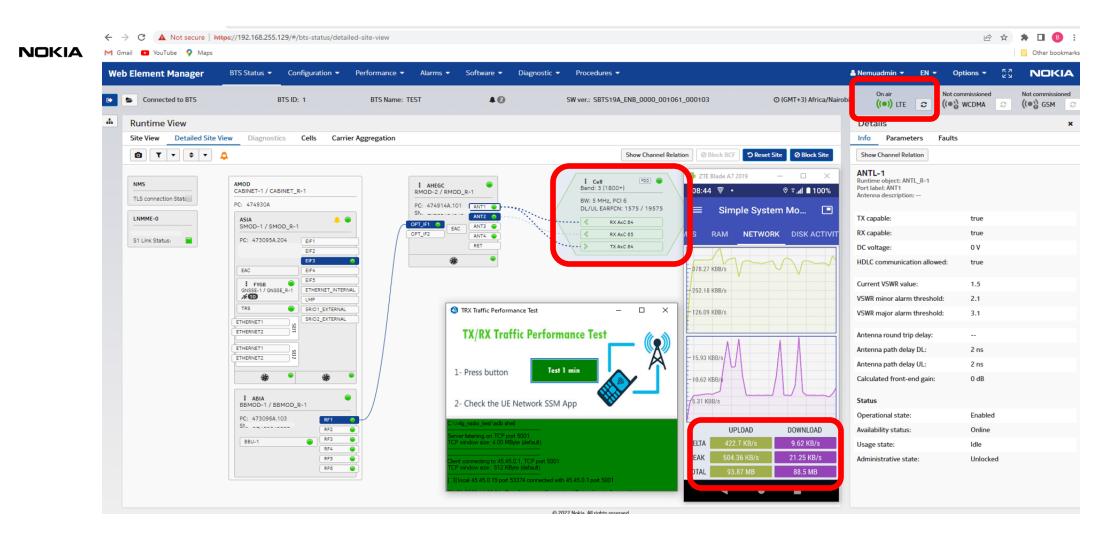
NetSIM Test Procedure



	BB5216 - MOSHELL 20.0n - Stopfile=/tmp/901	X	SM-A125F	_		×
	Last MO: 9366. Loaded 9366 MOs. Total: 9367 MOs. Checking available boards on node	^	17:03		f위I 100	0%
	Collecting RCS board data		" Network Cell Info	Lite	*	:
			GAUGE READINGS	SPEED RA	W PLOT	PLOT
			SIM1	LTE		
	Collecting TN data					
	Collecting RF data		SDR IWLAN	0 -90 -8	0/11/1/2 6	Band
	Node: RadioNode L CXP9024418/6_R85M37 (20.Q1)		-110	erving Cell	-70 -70	
			-120		-60	11
	FRU LNH BOARD ST FAULT OPER MAINT STAT PRODUCTNUMBER REV SERIAL DATE PMTEMP TEMP UPT		130			11111
	BB-1 0001 0 BB5216 1 OFF ON OFF ON KDU137925/31 R5A D160/033613 20170215 4 (OK) RRU4ANT BXP_ 048 RRU4415B1 1 OFF ON OFF N/A KRC161635/1 R5B 20170215 4 (OK) SUP-1 Z??_ 01 SUP601 1 OFF ON N/A 1/BE1 001009/ R2D BW99621079 20170711		-130 -140 RSSNR, dB	RSRP,	RSRQ, dB -5	11111
			TAC-ECI: 505-841574	18		
			eNB-LCID: 32874-4		PC	:I: -
	RBS6601 1/BFL901009/1 R3C BR81757640 20120116 30 Cabinet=1					
	FANGROUP OFF Cabinet=1,FanGroup=1			MIIIIIII	11.	
			1111-90	-85 -80 ₋₇₅	11/1/1	
	BOARD LNH PORT T S OpMode AutoNeg MacAddress VlanIds LOS BER		11 -95	kighbor #1	-/0 //	
	BB5216 000100 TN_A E 1 1G_FULL_SLAVE true 34:6E:9D:14:B0:19 797,800		1 -100		-60	11
	BB5216 000100 TN_B E 0 10G_FULL false 34:6E:9D:14:B0:1A BB5216 000100 TN_C E 0 10G_FULL false 34:6E:9D:14:B0:1B				-5	5 =
						111
	FRU LNH BOARD RF BP TX (W/dBm) VSWR (RL) RX (dBm) UEs/gUEs Sector/AntennaGroup/Cells (State:CellIds:PCIs)					
	RU4ANT BXP_2048 RRU4415B1 A 11/- SE=1 AG=1 FDD=R4443C1B1 (L:1:91)					
	RRU4ANT BXP_2048 RRU4415B1 B 11/- SE=2 AG=1 FDD=R4443C2B1 (L:2:94)					
	RRU4ANT BXP_2048 SE=3 AG=1 FDD=R4443C3B1 (L:3:97) RRU4ANT BXP_2048 RRU4415B1 D 11 1.2 (31.0) 1.17 (22.2) -103.7 1 - SE=4 AG=1 FDD=R4443C4B1 (1:4:100)					
	Tip: use option 'a or a co snow the connected Ancennasupantes and AntennaNearUnits.					
	Tip: use option "g" to print graphical view of CPRI connections and RF connections.			0	<	
	885216>)		

NetSIM Test Results





Under test environment, traffic on each cell/ant port is verified for throughout and RF performance

NetSIM Test Results



