SIMNOVUS

LabTool Kit

For Academia

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Product Overview

The LabTool Kit for Academia is an advanced simulation platform designed for telecom education, research, and innovation. It enables users to explore the complete 4G and 5G protocol stack, test new algorithms, and foster telecom-focused startups. This all-in-one toolkit provides hands-on learning opportunities, helping bridge the gap between theory and real-world telecom applications.

Key Features

- **Multi RAT Support:** Supports 4G and 5G
- **Device and Network Emulation in one:** Simulates multiple types of devices and all the elements in a 4G and 5G network.
- **Protocol Stack Visibility:** Gain insights into all layers of 4G/5G communication.
- **Customizable Test Scenarios:** Create and modify testcases to validate new algorithms.
- **Startup Incubation Support:** Can be used as a "Lab as a Service" platform.
- **Industry-Relevant Training:** Hands-on learning for faculty and students.

Applications

Use it for validating functional scenarios for the below use cases

- Academic research and teaching
- Telecom protocol development and testing
- Prototype validation for network devices
- Startup incubation and innovation labs ·
- Industry-aligned training and upskilling

Technical Specifications

Specification	Details
Supported Technologies	4G LTE, 5G NR (SA & NSA), Nb-IoT, NTN
Supported Scenarios	• UE Registration and Deregistration • Data traffic using UDP, TCP, Http, FTP • Voice and Video (VoLTE/VoNR, ViLTE/ViNR) • Handover scenarios • Nb-IoT and NR based Non-Terrestrial Networks • RedCap (Reduced Capability UEs) • Network Slicing • Unified Access Control • And many more
Configuration	Web-based and text-based configuration
Statistics	Web-based dashboard with real-time analytics
Logging	Web-based and text-based logging to view messages at different layers
Integration Capabilities	API support for third-party applications
Product Platform	• Standard x86-based server running on General Purpose Processor • Ubuntu OS

Product Variants

The requirements may vary, which is why we offer multiple variants tailored to meet your specific needs, based on the E-I-I Model.

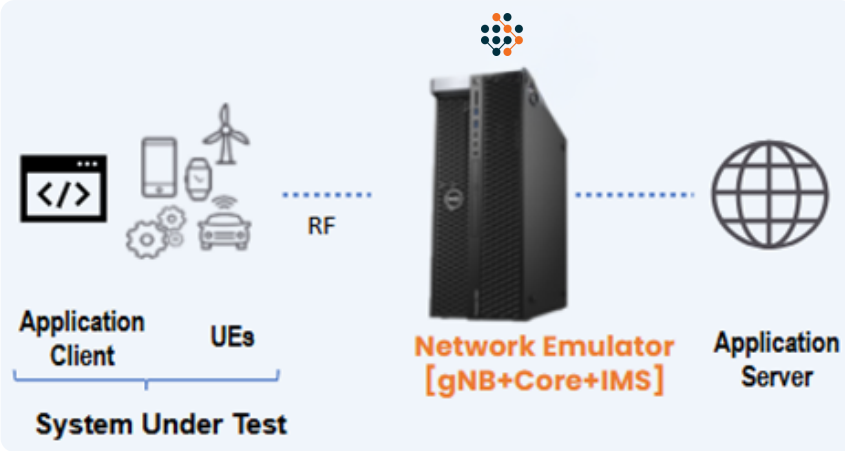
Variant	Max Carrier BW	No of cells	Features Supported
LabtoolKit-Foundation	50 MHz	1	All except handover
LabtoolKit-Ignite	100 MHz	1	All except handover
LabtoolKit-Elevate	50 MHz	2	All

SDR Variants

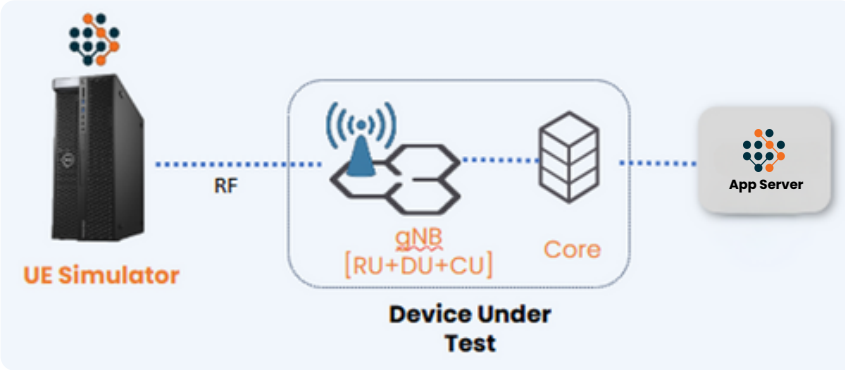
Feature	50 MHz	100 MHz
Frequency Range	500 MHz to 6.0 GHz	300 MHz to 6.0 GHz
Max bandwidth	50MHz	100 MHz
Number of SMA ports	5 (2 Tx, 2 Rx, 1 GPS)	9 (4 Tx, 4 Rx, 1 GPS)
PCIe spec	PCIe gen2 x1, full height, short length	PCIe gen2 x8, full height, full length

Use Cases

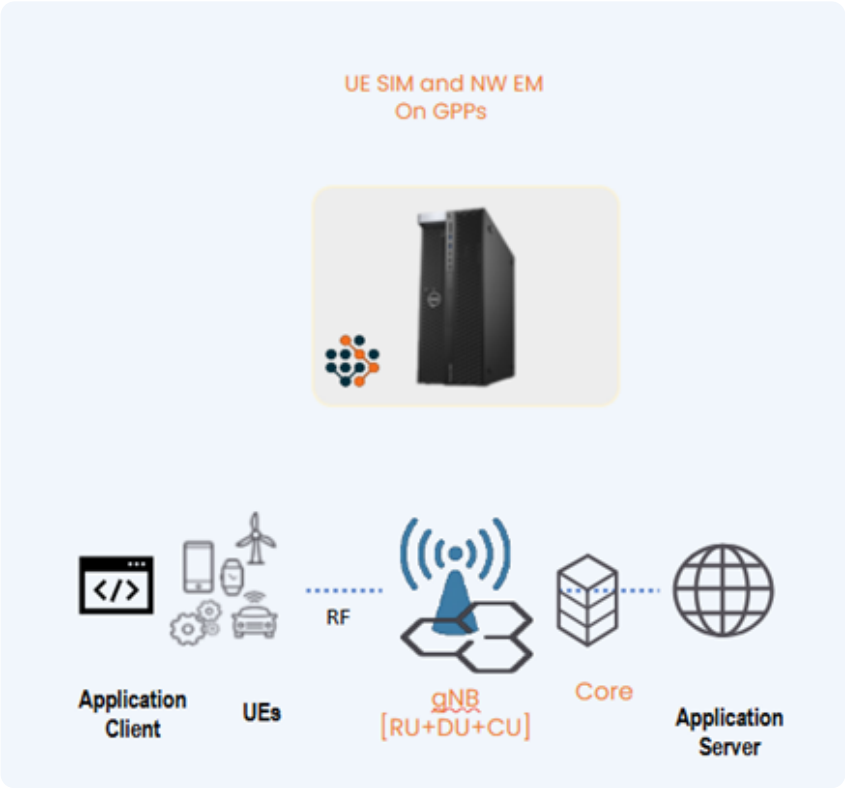
As a Network Emulator for Device testing



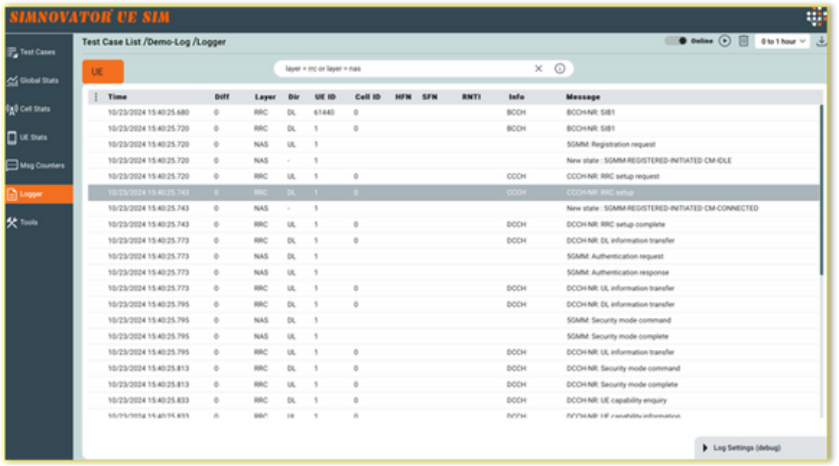
As a UE Simulator for RAN Validation



As both UE Simulator and Network Emulator for educational and research purposes.



Logging


SIMNOVATOR UE SIM
Test Case List /Demo-Log /Logger
Test Cases
Global Stats
Cell Stats
UE Stats
Msg Counters
Logger
Tools
UE
Time
Diff
Layer
Dir
UE ID
Cell ID
HFN
SFN
RNTI
Info
Message
Log Settings (debug)

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SFN
RNTI
Info
Message
10/23/2024 15:40:25.743 0 RRC DL 1 0 DCCH DCCH-NR: RRC setup
10/23/2024 15:40:25.743 0 NAS - 1 New state : SGMM-REGISTERED-INITIATED-CM-CONNECTED
10/23/2024 15:40:25.743 0 RRC UL 1 0 DCCH DCCH-NR: RRC setup complete
schedulingRequestToAddModList {
{
schedulingRequestId 0,
sr-TransMax n64
}
}
},
bsr-Config {
periodicBSR-Timer sf20,
retxBSR-Timer sf320
},
tag-Config {
tag-ToAddModList {
{
tag-Id 0,
timeAlignmentTimer infinity
}
}
},
phr-Config setup: {
phr-PeriodicTimer sf500,
phr-ProhibitTimer sf200,
phr-Tx-PowerFactorChange dB3,
multiplePHR FALSE,
dummy FALSE,
phr-Type2OtherCell FALSE,
phr-ModeOtherCG real
},
skipUplinkTxDynamic FALSE
},

Extensions Available

- **NTN Package:** Enhances the toolkit with Non-Terrestrial Network (NTN) capabilities, enabling simulation and testing of satellite-based 5G communications.
- **Training Modules:** Comprehensive training programs designed to upskill faculty and students on 5G fundamentals and network component validation.

Contact Us

Learn what our products can do for you, ask questions, and get started with Simnovus.

simnovus.com/contact-us