World's first open source and scalable 5G NR Multi-UE Network Emulator

End-to-end emulation testbed for the full 5G stack with virtual L1

BIOT, FRANCE, March 18, 2022 /EINPresswire.com/ -- EpiSci, EURECOM, and the OpenAirInterface Software Alliance (OSA) are proud to announce the release of world's first and only open-source, scalable 5G NR Multi-UE Network Emulator (5GEM) with virtual Layer-1 (L1) connections that fully support both 5G NR Stand-alone (SA) and Non-Standalone (NSA) modes.

> We believe that providing a hi-fi, scalable 5G full stack in EMANE would be a game changer for accelerated development & deployment of new features for tactical communication and networking community"
>
> *Bo Ryu - President of EpiSci*

The 5GEM is a complete, end-to-end emulation testbed setup with the full 5G stack that allows for running the OpenAirInterface (OAI) 5G Core Network (CN), the OAI eNB, the OAI gNB, as well as multiple 5G NSA and SA UEs that are connected to a co-existing eNB/gNB node through a simple yet user-configurable channel proxy. Furthermore, an end-to-end emulation testbed for both LTE and NSA/SA mode was created. For LTE mode, the OAI Evolved Packet Core (EPC), the OAI eNB, and between 30-50 LTE UEs are connected via the channel proxy. The full stack implementation of the NSA mode will utilize the EPC, OAI eNB and gNB, and multiple NSA UEs, connected via the channel proxy. The proxy is released as a separate package that has been integrated and tested with the OAI stack. The eNB and the gNB speak to the channel proxy through the LTE/4G and 5G nFAPI interfaces, respectively. The nFAPI MAC-PHY interface is defined by the Small Cell Forum, a renowned standardization entity. The continuously updated multi-UE multi-mode (SA and NSA) 5GEM is available at https://github.com/EpiSci/oai-lte-5g-multi-ue-proxy.

EpiSci, a US-based company focusing on adapting 5G technologies for defense applications, has further developed 5GEMANE, a customized version of 5GEM for EMANE (Extendable Mobile Ad-hoc Network Emulator), a widely used open-source tactical wireless network emulation tool. 5GEMANE is available to US government agencies and defense contractors upon request.

"We are thrilled that our active collaboration with EURECOM and OSA has produced 5GEM, a high-impact full-stack 5G system emulation software that is readily accessible to the 5G/6G community of wireless systems researchers and practitioners," said Bo Ryu, President of EpiSci. "We have long envisioned that providing a high-fidelity, scalable 5G full stack model in EMANE

would be a game changer for accelerated development and deployment of new features such as AI/ML and Mobile Ad hoc Networking for defense and public safety applications by government agencies, research institutions, and contractors. Our 5GEM and 5GEMANE accomplish just that and OAI has been unequivocally instrumental."

"This simulation environment where standardized interfaces have been combined with some very ingenious L1-abstraction techniques allows for testing with many UEs in LTE, 5G NSA and 5G SA modes. This is quite an engineering achievement," said Raymond Knopp, President of the OSA and Professor at Eurecom. "A tool like this in the hands of users of OAI enables multiple use cases like that of one of our partners interested in using parts of the simulator to test UEs for conformance under ETSI's TTCN conformance framework. We thank the EpiSci engineers for this remarkable work and others in the OAI community including the Indian Institute of Science (IISc) Bangalore team for their contribution to nFAPI design and coding."

About EpiSci:
EpiSci, based in Poway California, is a multidisciplinary innovation-driven company that develops next generation autonomous technologies for defense, aerospace, and commercial applications. Founded in 2012, EpiSci has been advancing modular, hybrid AI research and development in the areas of simultaneous localization and mapping, computer vision, communications, signal processing, networking, and high-assurance software development. To date, EpiSci has received numerous R&D projects and IDIQ system production contracts from various US defense agencies, large system integrators, and NASA. Through our Tactical AI technology, our vision is to be a leader of trustable autonomy and create disruptive autonomous and intelligent systems that are safe, secure, resilient, reliable, and human-machine teaming friendly. Our in-house and interdisciplinary strategy gives us a tremendous competitive advantage over companies that outsource product components from disparate entities in terms of development time, cost, and payoff.

For more information, please visit www.episci.com and www.linkedin.com/company/episci.

About EURECOM:
EURECOM is a top-ranked research lab and graduate school dedicated to ICT area, located in Europe's premier high-tech park Sophia-Antipolis, in the glamorous heart of the French Riviera. EURECOM is a joint venture by some of Europe's leading Technical Universities and key industrial players in the domains of digital technologies and intelligent transport networks. Besides a strong presence in industrial research projects, EURECOM is a major hub for European project activity, including fundamental research projects (ERC).

For more information, please visit https://www.eurecom.fr/

About the OpenAirInterface Software Alliance:
The OSA was founded in 2014 by EURECOM, a research institute in the south of France. The

Alliance manages and promotes OpenAirInterface (OAI) open-source software that offers 4G and 5G as well as Core Network stacks. Recently, agile service platforms under the label MOSAIC5G have also been added to the set of OSA's offerings. The OAI software is used by many different organizations across the world for purposes of research and testing as well as for building blocks of systems for different 4G/5G use-cases, some of them industrial. Today, AMD, Firecell.io, Fujitsu, InterDigital, Meta Connectivity, Nvidia, Orange, PAWR, Qualcomm, and Sequans Communications are represented on the Board of Directors of the OSA as Strategic Members.

For more information, please visit www.openairinterface.org and www.linkedin.com/company/openairinterface

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