PRESS RELEASE

5G-ECONET project aims to optimize the energy efficiency of campus networks

Erlangen, Germany: 5G campus networks are being used more in industry because they offer greater flexibility in production and logistics. To guarantee reliable quality of service and uninterrupted network availability, they require a constant supply of energy. But CO_2 reduction targets and high energy prices are presenting operators with some major challenges: How can the network's energy consumption be reduced without compromising the quality of service required? The Fraunhofer Institute for Integrated Circuits IIS has teamed up with four partners in the 5G-ECONET project to find out.

5G campus networks are well-suited for industrial applications due to their low latency, high reliability, and wireless connectivity. At the same time, Open RAN-based networks offer as yet untapped potential to optimize energy consumption. Especially against the backdrop of climate change and rising energy costs, this topic is becoming increasingly important to operators. This is why the 5G-ECONET project is exploring sustainable ways to maximize energy savings without inhibiting the performance of private 5G networks. Artificial intelligence (AI) methods have a role to play here as well.

Efficient, optimized, AI-assisted

The first step toward optimizing the energy efficiency of 5G campus networks is to thoroughly analyze how they are built, how they work, and how they can be managed. To this end, the project partners are creating AI-assisted simulator components, which they will use to examine various methods of saving energy. This will make it possible to generate accurate forecasts of the intensity of network use and quality of service. The researchers will then feed these insights back into the designs for new energy-efficient campus networks.

The 5G-ECONET partners are also investigating whether it's possible to turn off certain network elements in line with resource demand without compromising quality of service. They are also developing machine learning (ML) approaches in the form of applications for real networks and testing them using simulations. In Open RAN campus networks, these algorithms interact with the control elements and automatically adjust the operating parameters of the network. In this way, the total energy demand of the 5G network match the current requirements.

Head of Corporate Communications
Thoralf Dietz | Phone +49 9131 776-1630 | thoralf.dietz@iis.fraunhofer.de | Fraunhofer Institute for Integrated Circuits IIS |
Am Wolfsmantel 33 | 91058 Erlangen, Germany | www.iis.fraunhofer.de

Editor
Claudia Wutz | Phone +49 9131 776-4071 | claudia.wutz@iis.fraunhofer.de | Fraunhofer Institute for Integrated Circuits IIS |
www.iis.fraunhofer.de

From the test bed to the operator's campus network

What first gets examined through simulations will then be tested in practice: a further part of the project will be to establish an Open RAN test bed to try out new functions. This is where the partners will take their theoretical research findings and the components they have developed and put them through their paces, demonstrating the effects on energy consumption in practice. The new methods for optimizing energy consumption can be applied both to existing as well as new provider networks. Together with adaptive applications, these methods ensure power-saving operation.

Fusion of industry and research

The 5G-ECONET research project is funded by the German Federal Ministry for Digital and Transport as part of the InnoNT subsidy program and will run until December 2024. Coordinated by Fraunhofer IIS, the project benefits from the complementary expertise of partners from research and industry: AiVader GmbH, exceeding solutions GmbH, Keysight Technologies Deutschland GmbH, and the Institute for Technical Informatics and Engineering Informatics at the Technische Universität Ilmenau.