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Title: 5g base station energy saving remote power off

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Can network energy saving technologies mitigate 5G energy consumption?

This technical report explores how network energy saving technologies that have emerged since the 4G era, such as carrier shutdown, channel shutdown, symbol shutdown etc., can be leveraged to mitigate 5G energy consumption.

What is 5G NR & how does it work?

The 5G new radio(NR) standard allows more components to switch off or go to sleep when the base station is in idle mode and requires far fewer transmissions of always-on signalling transmissions. Equipment deep sleep, a basic function that is introduced in the initial stage of the 5G deployment, can be applied to maximize energy saving efficiency.

Is a 5G energy saving solution enough?

It also analyses how enhanced technologies like deep sleep, symbol aggregation shutdown etc., have been developing in the 5G era. This report aims to detail these fundamentals. However, it is far away from being enough, a revolutionized energy saving solution should be taken into consideration.

How to evaluate a 5G energy-optimised network?

To properly examine an energy-optimised network, it is very crucial to select the most suitable EE metric for 5G networks. EE is the ratio of transmitted bits for every joule of energy expended. Therefore, while measuring it, different perspectives need to be considered such as from the network or user's point of view.

Simulations conducted on a realistic multi-technology 5G New Radio (NR) RAN in an urban environment validate the efficacy of the proposed strategy, achieving up to 73% of ...

Aiming at the problem of mobile data traffic surge in 5G networks, this paper proposes an effective solution combining massive multiple-input multiple-output techniques ...

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In the energy consumption structure, the power. consumption accounts for more than 80%. The electricity cost. energy consumption. ...

However, in 5G systems with new physical layer techniques and the highly heterogeneous network architecture, new challenges arise in the design of BS ON-OFF switching strategies. ...

The rapid development of 5G technology leads to increasing energy consumption in base stations (BSs). For the vision of green and sustainable communications, we.

The proliferation of User Equipment (UE) drives this energy demand, urging 5G deployments to seek more energy-efficient methodologies. In this work, we propose ...

In response to the requirement of an intelligent and self-adaptive energy saving solution, artificial intelligence (AI) and big data technology are introduced to form a more precise energy saving ...

In response to the current widespread issue of high energy consumption in 5G base stations, this article conducts overall design, hardware design, and software design of the base station ...

Execution Strategy: The integrated energy-saving strategy is sent to the network management system to perform the energy-saving operations on 5G base station, such as deep sleep, ...

In today's 5G era, the energy efficiency (EE) of cellular base stations is crucial for sustainable communication. Recognizing this, Mobile Network Operators are actively prioritizing EE for ...

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