

Analysis of 5G base station power consumption issues

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Can 3GPP reduce base station energy consumption in 5G NR BS?

Aiming at minimizing the base station (BS) energy consumption under low and medium load scenarios, the 3GPP recently completed a Release 18 study on energy saving techniques for 5G NR BSs. A broad range of techniques was evaluated in terms of the obtained network energy saving (NES) gain and their impact to the user-perceived throughput (UPT).

How does mobile data traffic affect the energy consumption of 5G base stations?

The explosive growth of mobile data traffic has resulted in a significant increase in the energy consumption of 5G base stations (BSs).

How can we improve the energy efficiency of 5G networks?

To improve the energy efficiency of 5G networks, it is imperative to develop sophisticated models that accurately reflect the influence of base station (BS) attributes and operational conditions on energy usage.

What is 5G base station?

1. Introduction 5G base station (BS), as an important electrical load, has been growing rapidly in the number and density to cope with the exponential growth of mobile data traffic. It is predicted that by 2025, there will be about 13.1 million BSs in the world, and the BS energy consumption will reach 200 billion kWh.

An energy consumption optimization strategy of 5G base stations (BSs) considering variable threshold sleep mechanism (ECOS-BS) is proposed, which includes the initial ...

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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In this article, we propose a novel model for a realistic characterization of the power consumption of 5G multi-carrier BSs, which builds on a large data collection campaign. ...

Importantly, this study item indicates that new 5G power consumption models are needed to accurately develop and optimize new energy saving solutions, while also considering the ...

To address this, we propose a novel deep learning model for 5G base station energy consumption estimation based on a real-world dataset. Unlike existing methods, our approach integrates ...

To ensure continuous functionality, wireless networks rely on available base stations (BSs). However, the persistent operation of BSs comes at the cost of substantial ...

5G base stations use high power consumption and high RF signals, which require more signal processing for digital and electromechanical units, and also put greater pressure ...

To further explore the energy-saving potential of 5 G base stations, this paper proposes an energy-saving operation model for 5 G base stations that incorporates ...

5G base stations use high power consumption and high RF signals, which require more signal processing for digital and ...

This paper proposes a power control algorithm based on energy efficiency, which combines cell breathing technology and base station sleep technology to reduce base station energy ...

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