

How to save power in 5g base stations





Overview

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).

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.

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 can a base station save energy?

There are two main methods of base station energy saving, including hardware and software.



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Energy Saving of 5G Base Stations Based on Symbol Shutdown and Power

Jun 12, 2025 · The rapid development of 5G technology leads to increasing energy consumption in base stations (BSs). For the vision of green and sustainable communications, we propose a ...

Evaluation of the power-saving effect of 5G base station ...

May 29, 2025 · Abstract The research and application of energy-saving technology for 5G wireless networks are significant for the emission-reduction work of Communication Operators. ...



A Power Consumption Model and Energy Saving Techniques for 5G ...

Download Citation , On May 28, 2023, Maria Oikonomakou and others published A Power Consumption Model and Energy Saving Techniques for 5G-Advanced Base Stations , Find, ...

A Power Consumption Model and Energy Saving Techniques for 5G ...

May 28, 2023 · 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 ...



Energy-saving control strategy for ultra-dense network base stations

Aug 1, 2025 · 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 ...



Optimal energy-saving operation strategy of 5G base station ...

Dec 1, 2025 · 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 ...



[Energy-efficiency schemes for base stations in 5G ...](#)

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 ...





Threshold-based 5G NR base station management for energy saving

Mar 1, 2025 · In spite of promising outcomes in optimizing energy usage for Radio Access Network (RAN) Base Station (BS) hardware, deployment, and resource management, existing ...



[Final draft of deliverable D.WG3-02-Smart Energy Saving...](#)

May 7, 2021 · Change Log This document contains Version 1.0 of the ITU-T Technical Report on "Smart Energy Saving of 5G Base Station: Based on AI and other emerging technologies to ...

[Prediction of Base Station Energy Saving Strategy](#)

May 11, 2024 · The power consumption of 5G base stations is a major pain point for operators, 5G energy-saving strategies are currently simplistic, it usually sets a unified energy-saving time ...



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