

## Kongres Container

# Outdoor base station transformation plan brief



## Overview

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Due to the high propagation loss and blockage-sensitive characteristics of millimeter waves (mmWaves), constructing fifth-generation (5G) cellular networks involves deploying ultra-dense base stations (BS).

How do outdoor base stations work?

Outdoor base stations integrate all essential systems into a single Integrated Cabinet, designed to endure harsh conditions like direct sunlight, rain, and extreme temperatures. These units protect the equipment while ensuring efficient functionality. Towers are crucial for mounting antennas at high elevations, ensuring wide signal reach.

How to optimize base station layout?

Moreover, we propose a dynamically adjusted quantum genetic algorithm (DAQGA) to optimize base station layout, with coverage and construction cost as objective functions. A signal reception strength metric is introduced to evaluate the effectiveness of the optimal layout.

How does base station coverage optimization work?

Therefore, the base station coverage optimization method proposed in this paper effectively mirrors real-world scenarios, visually exposes signal blind spots, and accurately identifies instances where users cannot connect to base stations due to complex environmental factors such as high-rise obstructions or areas beyond the coverage range. Fig. 9.

How does a base station deployment method optimize the base station layout?

The base station deployment method proposed in this study dynamically optimizes the base station layout based on annual environmental change characteristics.

What are the benefits of a base station?

Base stations, while small in structure, are equipped with everything

necessary to operate independently. They ensure: Protection against environmental factors like wind, rain, and lightning. Uninterrupted power supply through robust systems and backup solutions. Efficient signal transmission to connect users to the broader network.

What does a base station do?

The base station, positioned between users and data centers, is the first responder to user requests. It relays signals efficiently, ensuring users stay connected. This image highlights the compact but comprehensive nature of base stations, showcasing their integration of protective enclosures, power systems, and antennas. 3.

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