

ContainerPower Energy Solutions

Analysis of the reasons for the power outage of communication base stations



Overview

How many base stations in China have a power outage?

In this paper, we closely examine the power outage events and the backup battery activities from a 1.5-year dataset of a branch of a major cellular service provider in China, including 4,206 base stations and more than 1.5 billion records on base stations and batteries.

Can a base station predict a power outage?

Though each single power outage of one given base station is truly hard to predict precisely, the statistical long-term power outage trends (e.g., in every year) can have a very similar pattern (e.g., a base station built in cold area may suffer from several power outages due to the heavy snow every year).

Why do cellular communication base stations need a battery alloc?

Current cellular communication base stations are facing serious problems due to the mismatch between the power outage situations and the backup battery supporting abilities. In this paper, we proposed BatAlloc, a battery allocation framework to address this issue.

Is there a mismatch between backup batteries and power outages?

Our real trace-driven data analysis clearly reveals that in the battery allocation strategy currently used in practice, there exists a mismatch between the supporting ability of backup batteries and the power outage situations in each base station. The mismatch can lead to serious problems in base stations.

What causes power outages?

The modern power grid is known to be highly reliable in urban areas, but still suffers from outages due to the severe weather (e.g., storm, hurricane, fire, earthquake) or human-driven accidents (e.g., vandalism or theft) . In many rural areas, the outages can be quite frequent, no matter in developing or

developed countries.

Why are base stations important?

Base stations play a key role in 4G/5G communications , , edge computing and vehicular network based applications . Their reliability and availability heavily depend on the electrical power supply, for such modules as transceivers, air conditioners, monitoring system are all power hungry.

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