

# Introducing D2D communication into cellular networks can reduce the burden on base stations





## Overview

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Integrating device-to-device (D2D) communication into cellular networks can significantly reduce the transmission burden on base stations (BSs). What are the advantages of D2D communication in cellular networks?

Optimization of Power Levels: since D2D links exist between proximate devices, over a small distance, transmission power is less. This enhances the battery life of the devices. As a result, higher energy efficiency can be achieved with D2D communication in cellular networks. 4.

What is D2D communication in 6G network challenges?

In addition, D2D communication in 6G network challenges and open research areas are introduced. Device-to-device (D2D) communication is one of the most promising technologies in wireless cellular networks that can be employed to improve spectral and energy efficiency, increase data rates, and reduce links latency.

What is the difference between D2D and conventional cellular communication?

Conventional cellular communication is supported by the macro cell tier, while D2D communication is supported by the device tier. These cellular networks thus are similar to the existing networks. The difference lies in the fact that faithful services can be achieved by the devices at the cell edges and those in the congested areas within the cell.

How to maximize resource allocation in D2D communication?

Another technique for resource allocation is provided in Yu et al. (2011), maximizing throughput of the network. The cellular services are given the higher priority over the D2D communication. For evaluating a single-cell scenario, a system with D2D communication underlying cellular communication is considered.



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Device-to-Device Communication in Cellular Networks: A ...

Aug 1, 2016 · Proposed architecture for resource allocation in device-to-device (D2D) communication. In order to meet the rising subscriber demands and provide them satisfactory ...

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Cognitive D2D communication: A comprehensive survey, ...

Dec 1, 2023 · The integration of cognitive radio and device-to-device (D2D) communication gives rise to Cognitive D2D (cD2D) communication, which offers numerous advantages, such as ...

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The Analysis of Device-to-Device (D2D) Communication ...

May 2, 2025 · In contrast to traditional cellular connection, device-to-device (D2D) communication is a direct connection amidst adjacent mobile users that does not pass through the base ...

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Full-Duplex ISAC-Enabled D2D Underlaid Cellular Networks: ...

Jun 7, 2024 · Integrating device-to-device (D2D) communication into cellular networks can significantly reduce the transmission burden on base stations (BSs). Besides, integrated ...

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Device-to-Device Communication in Cellular Networks

Jul 16, 2025 · Device-to-device (D2D) communication in cellular networks represents a paradigm shift wherein mobile devices communicate directly with one another, bypassing traditional ...

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5G and D2D Network for Smart Cities Using Internet of ...

Mar 8, 2025 · The increasing presence of diverse devices interconnected within extensive networks strongly suggests a shift towards a more practical understanding of the Internet of ...

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A primer on design aspects, recent advances, and challenges in cellular

Nov 1, 2019 · Device-to-Device (D2D) communication coexisting with cellular networks is attracting a lot of attention in academia and industry nowadays. This is due to its potential to ...

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Joint Power and Channel Allocation for D2D Communication in Cellular

Jul 15, 2022 · Device-to-device (D2D) communication is a technology that allows devices communicating with other devices directly instead of going through the base station (BS), and ...

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Performance analysis of D2D cooperative networks based on ...

Dec 14, 2024 · Based on the introduction of Device-to-Device (D2D) assisted communication in cellular networks, this paper proposes a probabilistic relay forwarding mechanism, which uses ...

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Deep Reinforcement Learning-Based Optimization Method for D2D

Sep 25, 2024 · Given the context of the challenge of exponentially increasing data traffic on



communication networks brought by the 5G era, this paper focuses on how to apply deep ...

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Resource Allocation for RIS-Assisted Device-to-Device Communications ...

Apr 14, 2023 · In recent years, with the explosive growth of data traffic, communication base stations (BSs) need to serve more and more users. Offloading traffic from BSs has become an ...

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Full-Duplex ISAC-Enabled D2D Underlaid Cellular Networks: ...

Mar 18, 2025 · Integrating device-to-device (D2D) communication into cellular networks can significantly reduce the transmission burden on base stations (BSs). Besides, integrated ...

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Resource Allocation for D2D Communication ...

Mar 25, 2024 · Device-to-device (D2D) communication with direct terminal connection is a promising candidate for 5G communication, which increases the capacity of cellular networks ...

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D2D communication mode selection and resource

Apr 1, 2020 · In order to improve the efficient allocation of resources in the scenario of densely distributed mobile terminals in 5G networks, this paper proposes a resource allocation ...

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Introduction to D2D Communication

Feb 7, 2023 · The major driving force for D2D connectivity is the inherent flexibility for operators to offload traffic from the core network, and represents a real step forward for operators to reduce ...

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An overview of device-to-device communication in cellular networks

Dec 1, 2018 · Cellular network is now four generations old. Need for fast multimedia-rich data exchange along with high quality voice calls has been the primary motivation in this forward ...

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Survey on Device to Device (D2D) Communication for 5GB/6G Networks

Mar 16, 2022 · Device-to-device (D2D) communication is one of the most promising technologies in wireless cellular networks that can be employed to improve spectral and energy efficiency, ...

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A Survey on Device-to-Device Communication in Cellular ...

Jan 16, 2024 · D2D communication in cellular networks is defined as direct communication between two mobile users without traversing the Base Station (BS) or core network. D2D ...

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Device to Device (D2D)

Nov 24, 2025 · Device -to-Device (D2D) communication in cellular networks is defined as direct communication between two mobile users without traversing the Base Station (BS) or core ...

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A survey on device-to-device (D2D) communication: Architecture and

Jan 15, 2017 · To endure the rising demands, cellular networks need to undergo suitable changes. For fulfillment of the rising needs of users and efficient utilization of the available scarce ...

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