



WALMER ENERGY

# Base station and UE communication process





## Overview

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This topic presents the communication flow between the 5G base station (gNB) and user equipment (UE) nodes, explaining the uplink (UL) and downlink (DL) transmission. How does a base station work?

Figure 3.5: Base station establishes one or more tunnels between each UE and the Mobile Core's User Plane. Fourth, the base station forwards both control and user plane packets between the Mobile Core and the UE. These packets are tunneled over SCTP/IP and GTP/UDP/IP, respectively.

How does distributed execution affect base station control?

In the distributed execution phase, each actor network makes decisions independently based only on its own network and observations, and although each actor executes independently, the whole system is able to obtain a better base station control strategy because their strategies are based on the results of global optimization. Fig. 2.

How do base stations coordinate UE handovers?

Fifth, the base station coordinates UE handovers between neighboring base stations, using direct station-to-station links. Exactly like the station-to-core connectivity shown in the previous figure, these links are used to transfer both control plane (SCTP over IP) and user plane (GTP over UDP/IP) packets.

How does a UE node transmit a BSR?

The UE node transmits a BSR with a predefined periodicity as an out-of-band packet. You can use the `connectUE` object function of the `nrGNB` object to set the periodicity of the BSR report. Scheduling grant — Upon receiving the BSR from the UE node, the base station provides grants (an out-of-band packet) to the UE node for the UL transmission.



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5G NR Initial Access: How does a device establish connection ...

Jan 20, 2023 · The name comes from next-generation Node B, where Node B refers to a node acting as a base transceiver station (BTS). Simply put, the BTS is a station capable of ...

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Exploring 5G's Impact on UE-BS Communication Dynamics ...

Aug 10, 2024 · With the introduction of 5G technology, wireless communication is expected to enter a new age marked by unparalleled speed, low latency, and connection for numerous ...

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beam management 5g

Dec 22, 2023 · Beam management in 5G refers to the methods and techniques used to manage and optimize the transmission and reception of beams (or beams of radio frequency signals) ...

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Simplified model for analysis. LB1: Link between the base station ...

The HSF and the distance between the UE and the base station were utilized as input data to Self Organizing Map (SOM), an unsupervised machine learning algorithm, to form clusters of the UE.

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How UE Sends Multi-Band Capability to eNodeB/gNodeB

Jul 7, 2025 · The communication of multi-band capability from UE to eNodeB/gNodeB is a fundamental process that supports the efficient operation of mobile networks. Through ...

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Target Base Station

2. Target Base Station in Handover Processes During handover procedures in cellular networks, the target base station plays a central role across the preparation, execution, and completion ...

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Communication method, base station and user equipment (UE)

The invention provides a communication method, a base station and UE. The method comprises that a first base station determines measurement configuration information which indicates the ...

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Relay Base-Station Handover in a 5G Environment

Nov 2, 2017 · Increasing data-delivery throughputs for UE: The deployment of relay nodes can increase the density of base stations so that users have better signaling quality and network ...

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LTE RRC State Diagram: IDLE and Connected Modes Explained

Understand the LTE RRC state diagram, including IDLE and Connected modes, for efficient UE communication and battery management.

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LTE Physical Layer: eNodeB and UE

Explore the LTE physical layer, focusing on the transmitter modules in both the eNodeB (base



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station) and UE (user equipment) as per the LTE standard.

### Chapter 3: Basic Architecture

Nov 5, 2019 · Figure 3.3: Base Station detects (and connects to) active UEs. Second, each base station establishes "3GPP Control Plane" connectivity ...

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

Aug 1, 2025 · A base station control algorithm based on Multi-Agent Proximity Policy Optimization (MAPPO) is designed. In the constructed 5G UDN model, each base station is considered as ...

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### LTE Physical Layer: eNodeB and UE

Explore the LTE physical layer, focusing on the transmitter modules in both the eNodeB (base station) and UE (user equipment) as per the LTE ...

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### Chapter 3: Basic Architecture

Nov 5, 2019 · Figure 3.3: Base Station detects (and connects to) active UEs. Second, each base station establishes "3GPP Control Plane" connectivity between the UE and the corresponding ...

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### Base station

Nov 18, 2024 · Performance analysis of UAV - Base station network communications. This involves interfacing NetSim and the UAV toolbox of MATLAB. For Each UE in NetSim, a UAV ...

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### Communication Between gNB and UE Nodes

Communication Between gNB and UE Nodes Packet communication is central to the 5G new radio (NR) interface. This topic presents the communication flow between the 5G base station ...

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### Building a NarrowBand-IoT Base Station With USRP

Nov 21, 2023 · A Test Base Station for the Internet of Things The term "Internet of Things" (IoT) describes the vision of connecting a vast array of things such as environmental sensors, traffic ...

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### Interaction process between UE and the eNB ...

B2D, base-station-to-device; D2D, device-to-device; UE, user equipment from publication: Social-aware content dissemination through ...

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### 5g nr physical channels

Nov 21, 2023 · 5G New Radio (NR) defines a set of physical channels that facilitate communication between the user equipment (UE) and the base station (gNB, or Next ...

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### ue devices

Dec 26, 2023 · Key Components and Functions of UE: Radio Interface: The UE consists of a radio transceiver that communicates with the cellular base stations (NodeBs in LTE or gNBs in ...



Fake Base Station Detection and Localization in 5G ...

Jul 11, 2024 · Unfortunately, this scenario opens new security challenge against Fake base station, in which UEs can be at risk when transferred to these base stations. The aim of this ...

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Communication Between gNB and UE Nodes

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5g nr physical channels

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