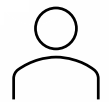


Implementation Areas of 5G

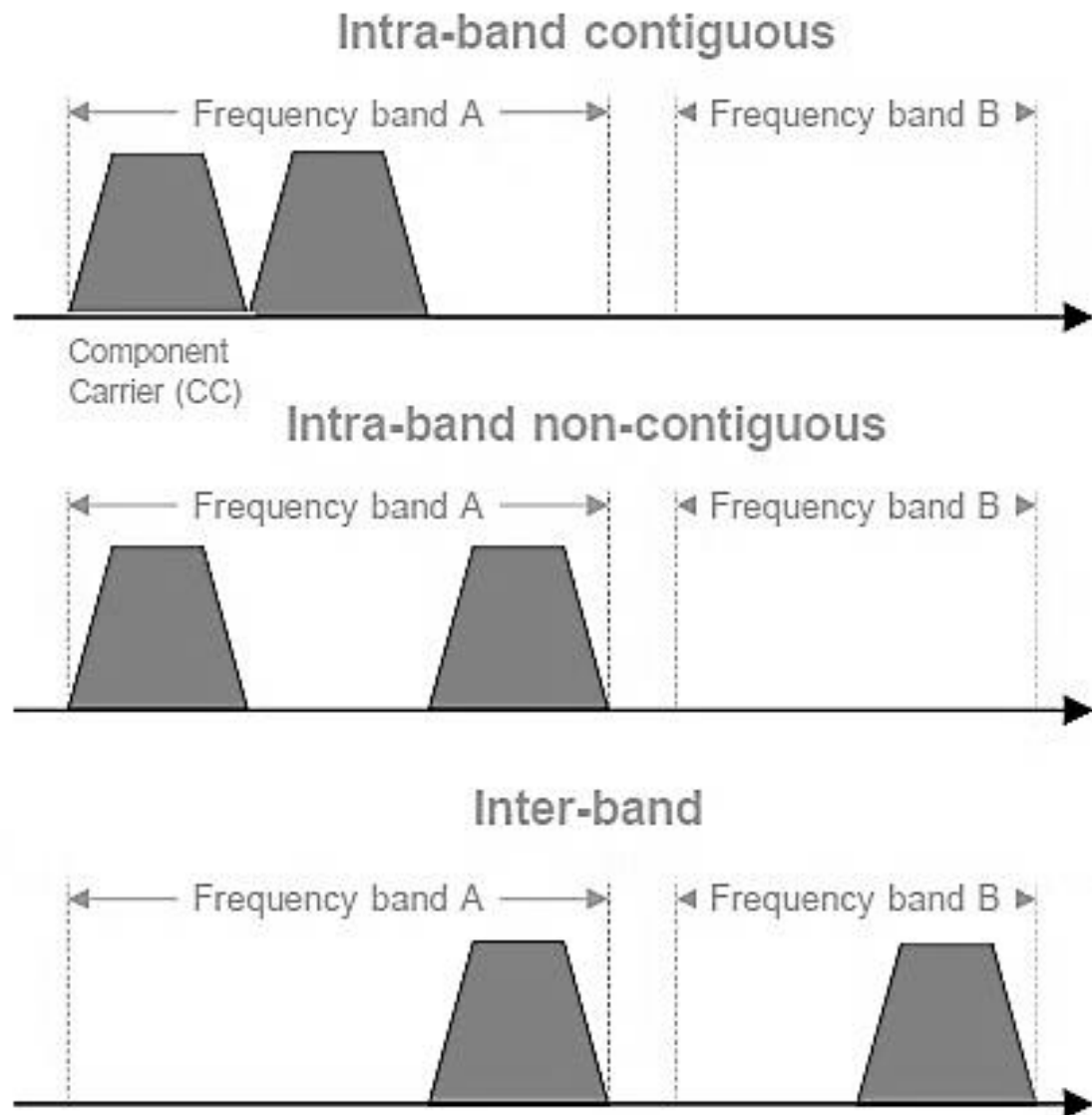
5G technology has revolutionized mobile communication by significantly improving speed, efficiency, and connectivity.



Ahmmad Jobayer (2101050)



Carrier Aggregation: Expanding Bandwidth



Intra-band Contiguous

Two carriers transmitted at neighboring channels.

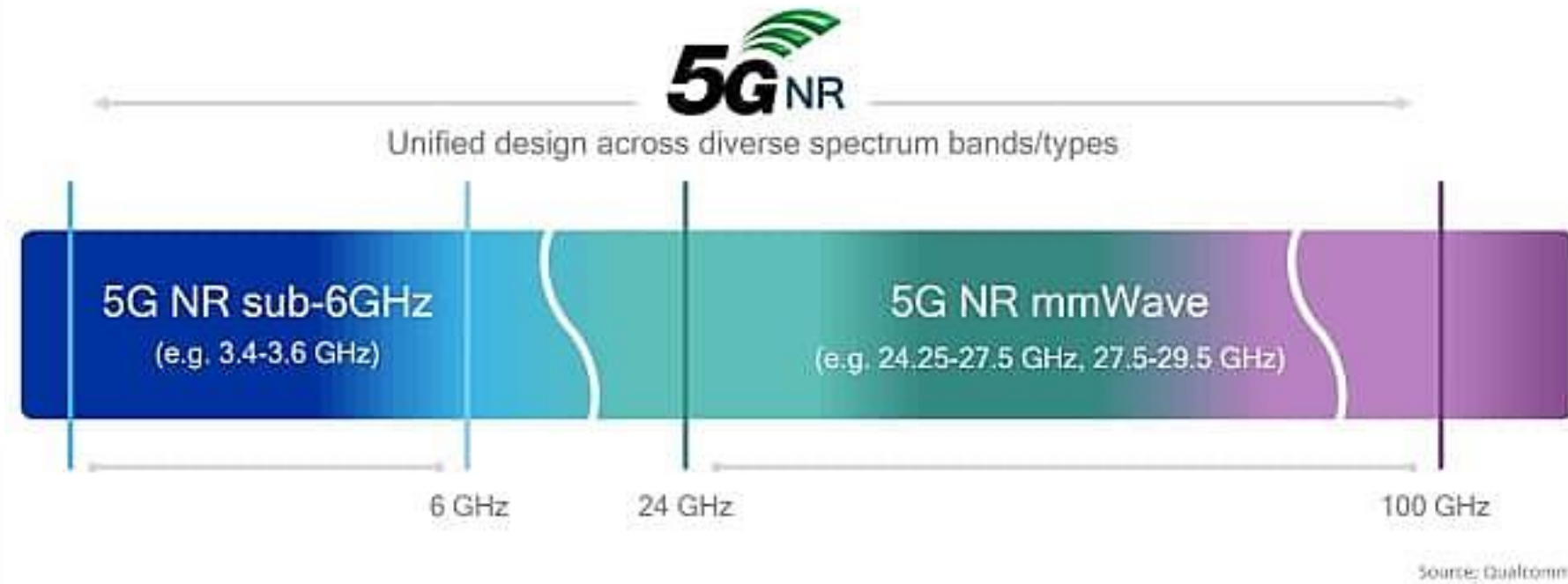
Intra-band Noncontiguous

Two carriers transmitted with channel spacing.

Inter-band

Different LTE bands used simultaneously for transmission.

Millimeter Waves: The Future of Speed



1

Gigabit Speeds

5G NR (new radio) is the new standard for 5G wireless technology, which is capable of much faster, more efficient, and more scalable networks. It will enable us to connect with many things in the surroundings with low latency

2

Adaptive Bandwidth

Handsets automatically switch to faster internet only when needed. and keeps lower data activities while not using any applications



Small Cell Concept: Enhancing Efficiency

Subdivision

Cells are divided into micro and pico cells.

Spectrum Reusability

Allows for adding more users in a small area.

Reduced Coverage

5G cells cover smaller areas than previous generations since it works in higher frequency

MIMO: Multiple Antennas for Enhanced Transmission



Multiple Antennas

Used for both transmission and reception.



Simultaneous Data Transfer

Enables efficient data rates.





Wi-Fi Offloading: Seamless Connectivity

1

Wi-Fi Connection

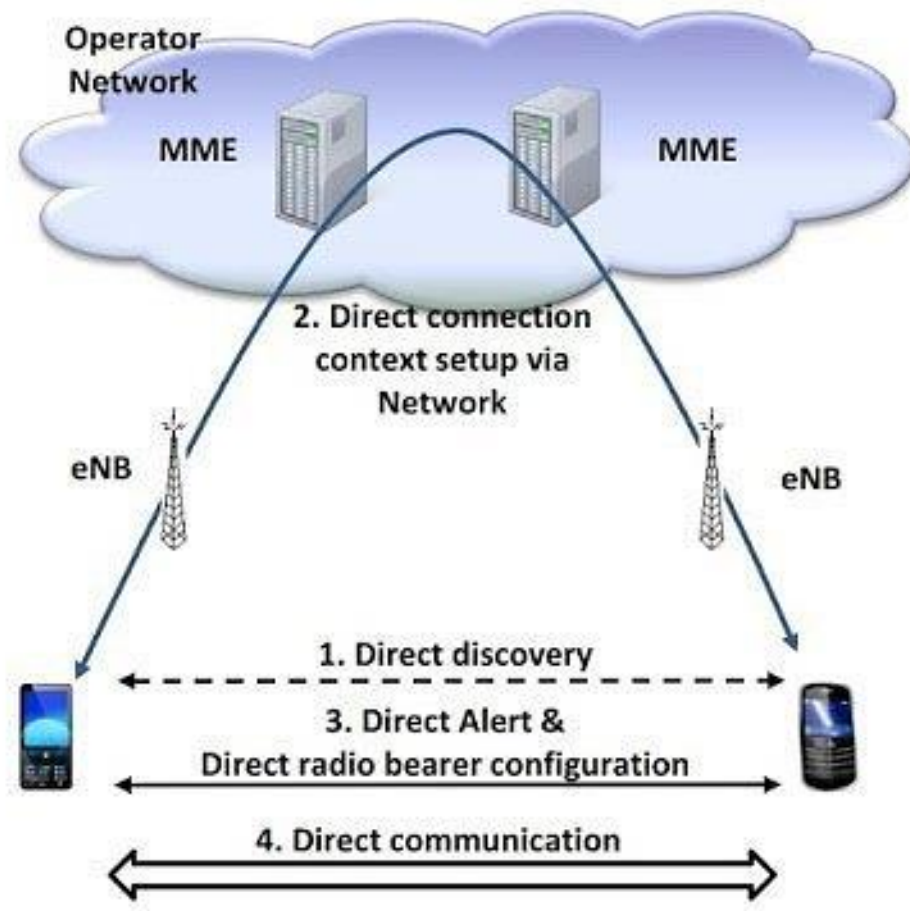
Users connect to a Wi-Fi network.

2

Cellular Network Allocation

Cellular network is freed up for other users.

Device-to-Device Communication: Direct Connections



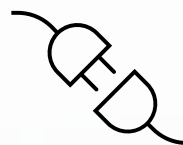
Network Authorization

Network allows two devices to communicate directly.



Traffic Routing

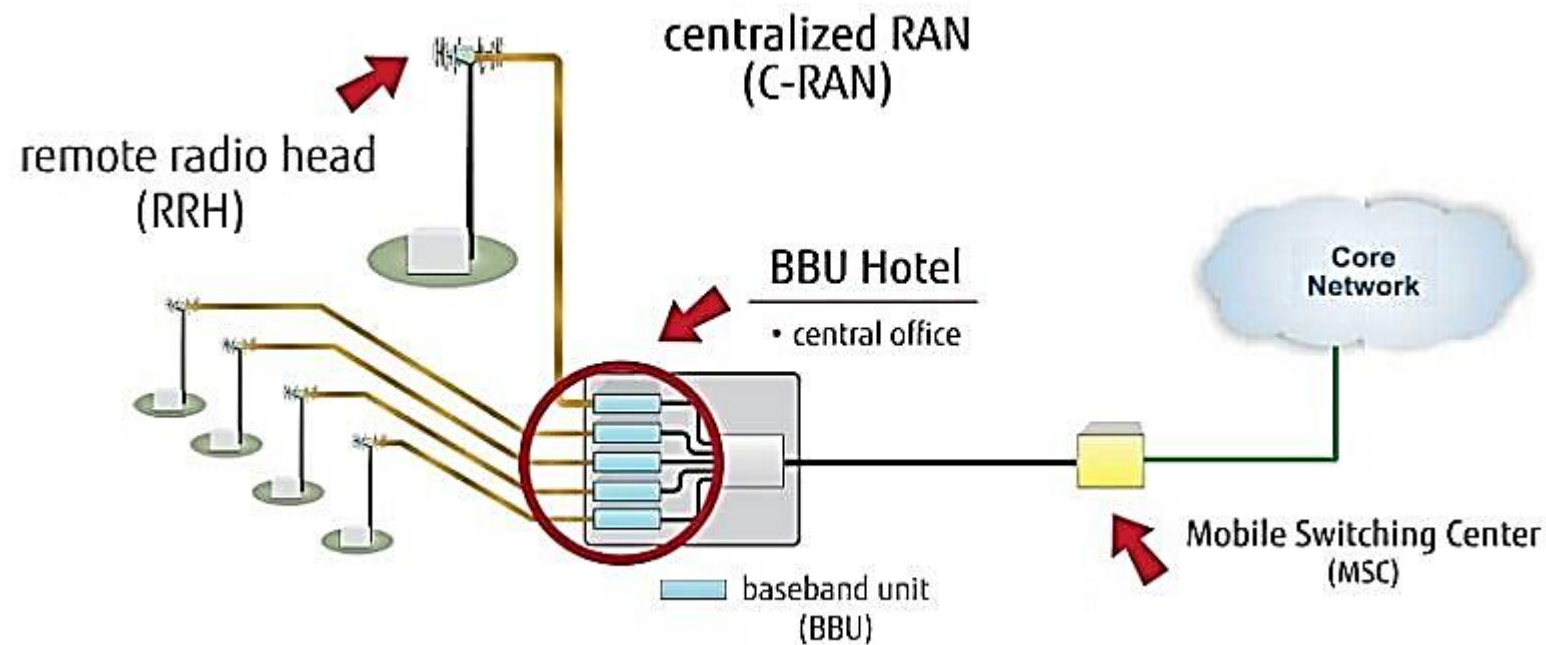
Operator controls traffic routing between direct and network paths.



Offline Connection

One device can connect to another device without network.

C-RAN: Cloud-Based Radio Network Access



Centralized Processing

baseband units are relocated from individual cell sites to a centralized office

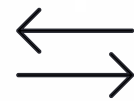
Efficient Fiber Optic Connections

Beamforming



Locating

the base station will be able to
detect and locate the user



Precise Transmission

only transmit in the direction of the user



Thank you for your patience