

Not all devices on 5G NR have to support all bandwidths, which is a change from LTE. If a channel appears quiet, the ability to start a transmission without having to wait for a slot boundary reduces the chance of another device grabbing the channel. This is achieved in the higher network layers by changing header structures so that processing can begin without the full packet information being known, and at the physical layer by having the radio receive essential information from reference and downlink control signals instead of deriving it from the symbol stream. LTE and similar systems allocate bandwidth to different devices by slot, but 5G NR has a mechanism for a transmission to start within a slot, effectively creating what are called 'mini-slots'. This creates the opportunity for very low average power devices that can still deliver high performance -- IoT networks, for example, which normally only need small amounts of data for telemetry, but nevertheless need to be able to update their firmware for security and feature patches. Furthermore, 5G NR supports adaptive bandwidth, letting devices move to a low-bandwidth, low-power configuration when appropriate, and gearing up to higher bandwidths only when necessary.