

# 5G Broadcast / Multicast Infographic

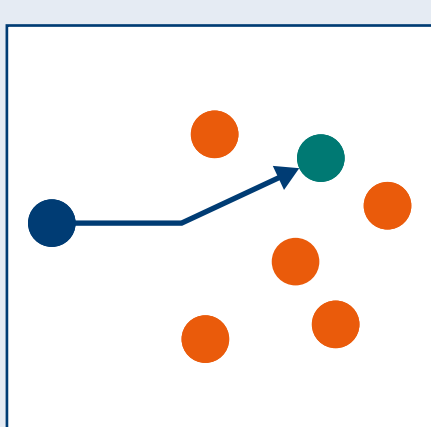
1

Say hello to 5G Broadcast/Multicast, a new way of distributing media content to the masses. 5G Broadcast/Multicast has a lot to tell, so let's begin.

There are several ways of distributing content over terrestrial networks. Unicast, multicast and broadcast are the most common ones.

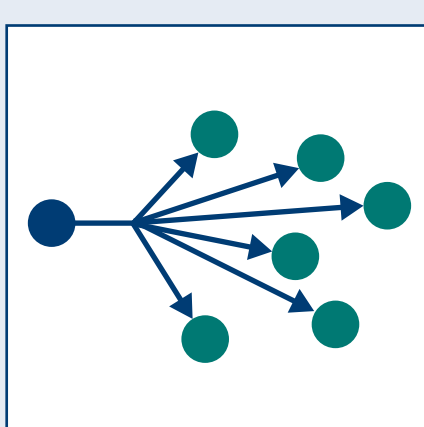
**UNICAST**

Unicast allows data traffic to move across networks from a single transmitting point to another single receiving point (one-to-one communication). Bi-directional unicast communications is the foundation of cellular networks.



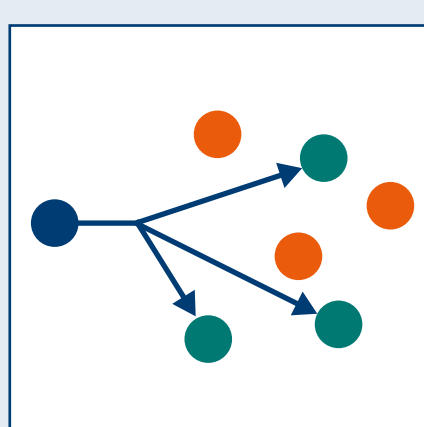
**BROADCAST**

Broadcast enables data traffic from a single point to all possible endpoints within reach of the network, simultaneously. This is the easiest and a very efficient technique to ensure data reaches its destination.



**MULTICAST**

Multicast enables data traffic from a single point to many receiving points, simultaneously. Multicast is a one-to-many distribution concept which exists between unicast (one-to-one) and broadcast (one-to-all) communication.



5G broadcast/multicast technology supports existing bidirectional unicast networks by distributing specific content more efficiently to consumers.

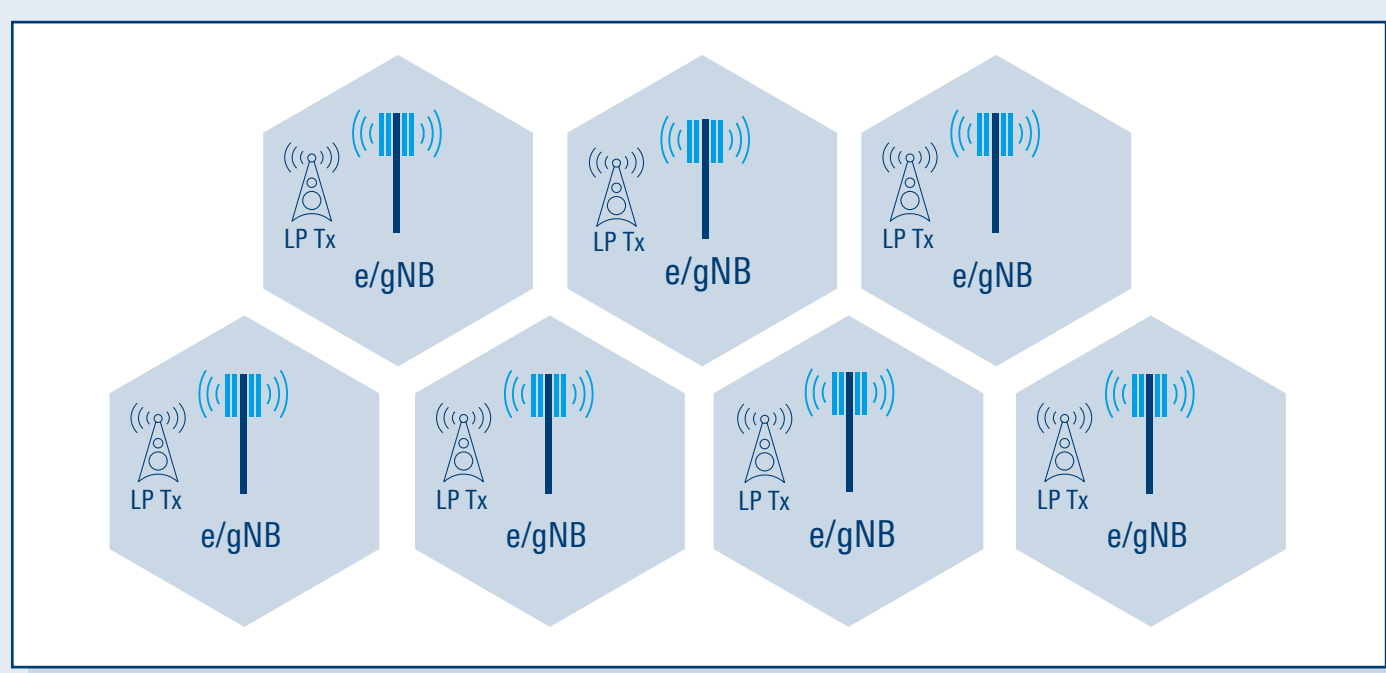
2

Solving tomorrow's and today's media consumption behavior requires a combined approach! This is where 5G Broadcast/Multicast solves the problem.

5G Broadcast/Multicast offers network operators two different ways of network deployment.

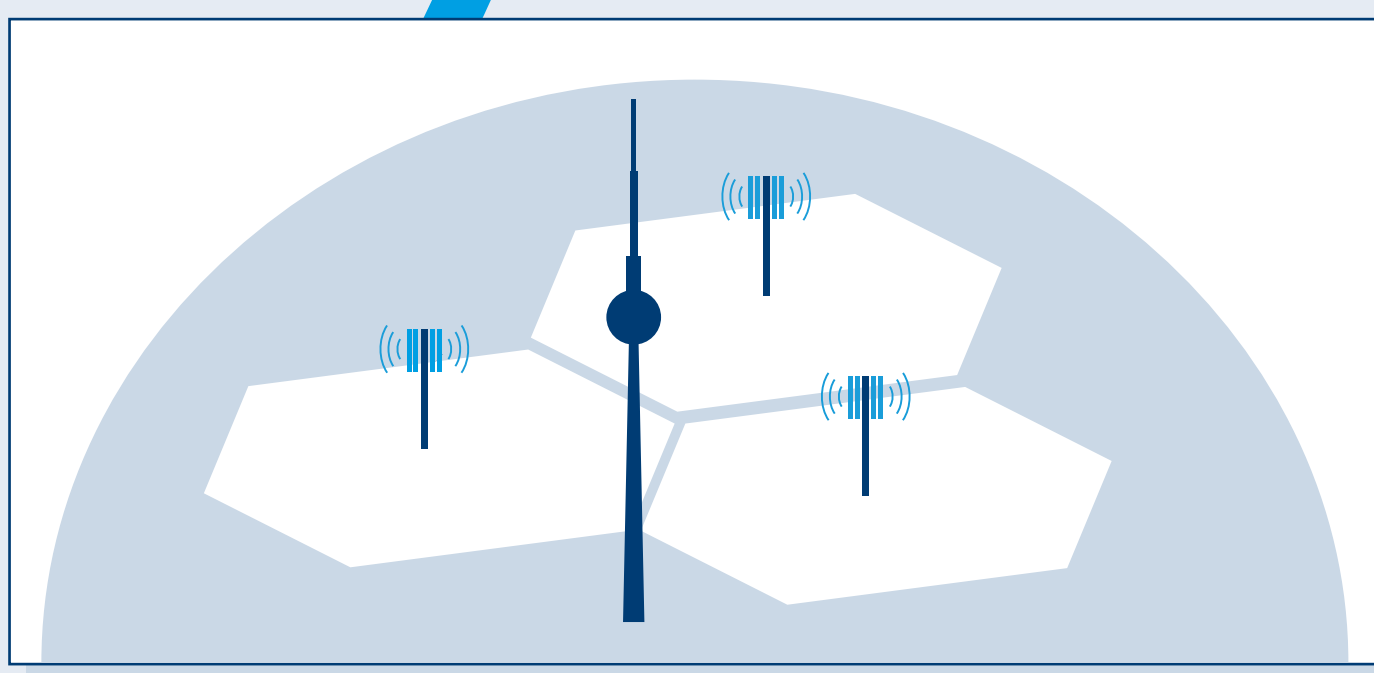
**1. UPGRADE EXISTING CELLULAR SITES USING SDL**

Unicast cells can be enhanced by 5G broadcast/multicast SDLs to keep up spectrum efficiency and coverage. They can be used in either dedicated mode or mixed mode.



**2. DEPLOYMENT OF AN OVERLAY NETWORK**

High power 5G broadcast/multicast transmitters are able to cover large geographic areas with 5G signals in order to enhance the capability of the cellular unicast network.

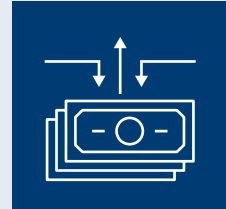


**SDL (Supplementary Downlink):**

An additional frequency resource to increase the capabilities of base stations for the downlink only (from network to mobile devices) in order to enable much higher data rates for the downlink than for the uplink direction.

3

5G Broadcast/Multicast directly addresses the challenges that network operators are facing in a world of ever-increasing mobile media content consumption.



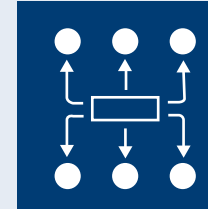
**GROWING CAPEX AND OPEX BURDEN**

Getting the same coverage with 5G as with 4G requires a significantly higher number of base stations. Operating costs are higher as well, where first studies show an energy consumption up to three times higher than 4G LTE.



**MAINTAINING CUSTOMER SATISFACTION**

With ever-increasing data demands due to new products and services, coupled with the continued increase in subscriber base, maintaining continued customer satisfaction is an increasing challenge.



**INFRASTRUCTURE UNDER/OVER-PROVISIONING**

Network operators can either choose between an under provisioned network that fails in worst cases scenarios or a very expensive overprovisioned network that is able to cope with even the highest traffic peaks.



**COVERAGE OUTAGES**

Cellular network congestion is a major pain point: Too many devices simultaneously accessing the same network and requesting high bandwidth services like video or live streaming cause a digital traffic jam. Network congestion is the leading cause of cellular coverage problems today.



**REASONABLE USE OF NETWORK RESOURCES**

Distributing content 24/7 with wide geographic coverage along with very high video and audio quality has always been the strength of broadcast network operators. But this jewel in their crown is partly "atrophied" as the content is "on air" regardless of the presence of an audience.



**CREATION OF DIVERSIFIED BUSINESS MODELS**

BNOs have been unsuccessfully striving over many years with DVB-H and MediaFLO to expand their traditional business models. MNOs, in contrast, are beginning to acquire the distribution rights for premium content or engaging with content providers directly.

**BNO:** Broadcast Network Operator  
**MNO:** Mobile Network Operator

4

5G Broadcast/Multicast offers many opportunities for a wide range of applications



**LIVE CASTING**

Live casting stands for media delivery of live events large and small. This application also covers linear video content delivery.



**OVER THE AIR UPDATES**

This application enables software updates to many connected devices simultaneously – similar to IoT devices and wearables.



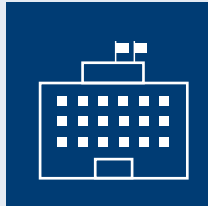
**V2X - VEHICLE CASTING**

V2X contains different applications like media and entertainment inside the vehicle, over-the-air updates, or over-the-air real-time traffic information.



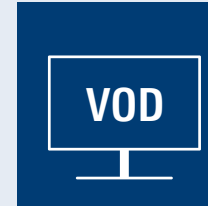
**VENUE CASTING**

With venue casting it is possible to get 2nd screen experience right inside the stadium. This allows the combination of the live atmosphere along with comfort features like replays, game highlights or multi-angle views simultaneously.



**PUBLIC SAFETY MULTICAST**

Public safety is one of the main pillars of broadcast capabilities, where in many countries emergency alerts and warning systems are used to inform the population of dangerous events.



**VIDEO-ON-DEMAND**

With 5G Broadcast/Multicast content can be preloaded in idle timeslots based on the subscriber's consumption behavior thereby avoiding any quality issues while consuming.

5

The benefits are extensive and powerful.

All players of the 5G eco system gain with 5G Broadcast/Multicast. With 5G Broadcast/Multicast, end users benefit from higher quality of experience when consuming media – independent of the number of concurrent consumers. That includes higher video resolution, improved color depth and lower latency.

**35% OF THE CURRENT VOD TRAFFIC IN MOBILE NETWORK CAN BE OFFLOADED, ACCORDING TO R&S EXPERTS**



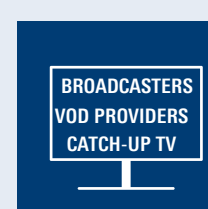
**BROADCAST NETWORK OPERATORS**

...benefit from a significantly increased number of receiving devices, which are no longer limited to TV sets. In addition, it enables the transition to flexible use of their infrastructure for new kinds of content.



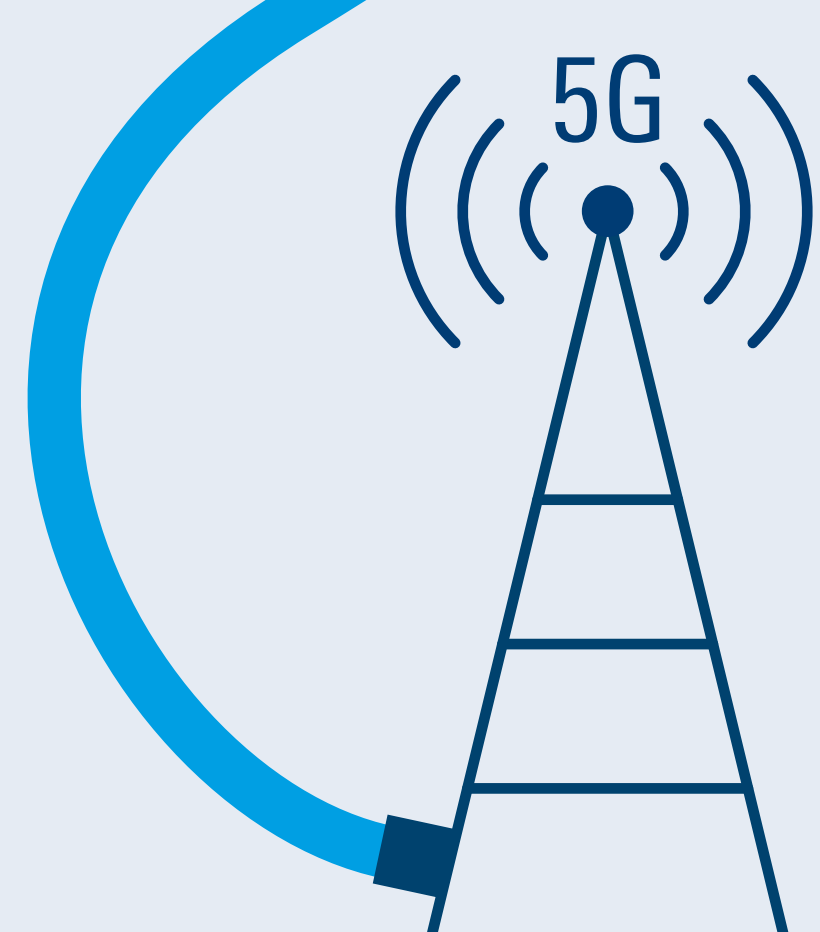
**MOBILE NETWORK OPERATORS**

...benefit from an extremely cost efficient method to enhance their network capacity by offloading popular and live content to the 5G Broadcast/Multicast infrastructure.

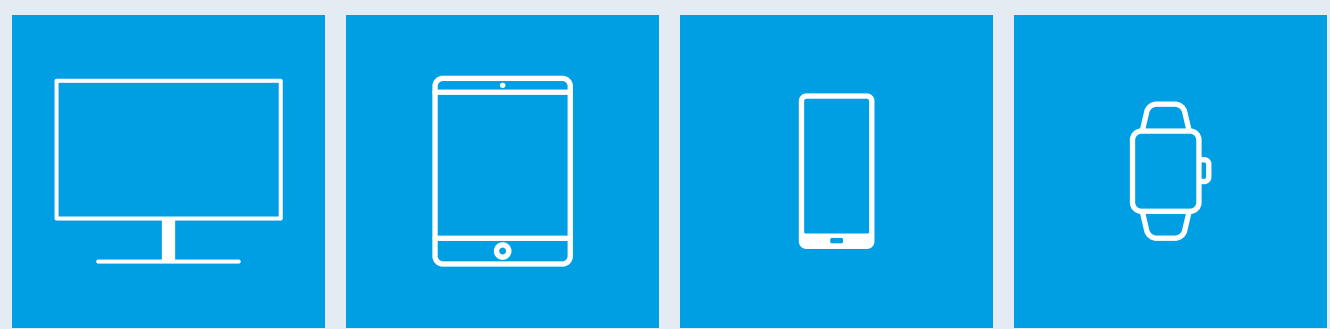


**CONTENT PROVIDERS**

...benefit with 5G broadcast/multicast through significantly increased reliability of media delivery for highly popular and live content.



**Devices**



**Applications**

