

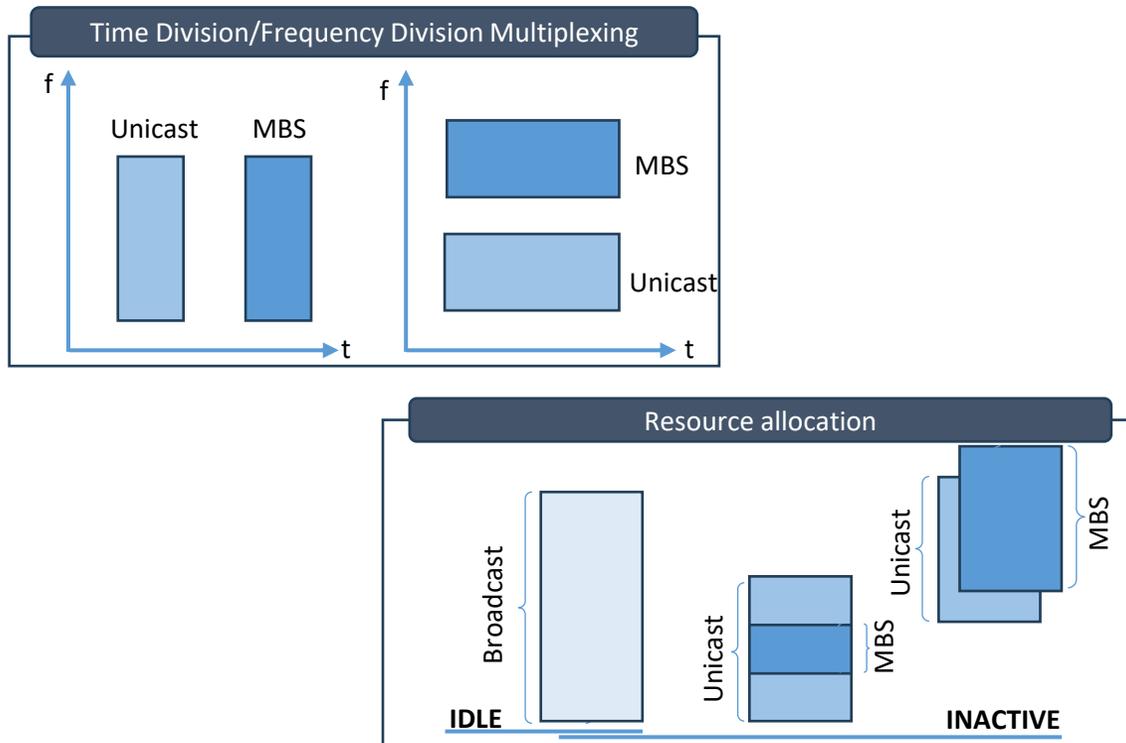
Discussion on NR MBS enhancement for Rel-19

CBN, China Broadnet, CATT

R17 NR MBS Filed Trial

CBN completed the industry's first end-to-end field trial to verify the signal coverage and reception of 5G NR MBS in Beijing. Based on the 3GPP R17 specification, the application of MBS broadcast in live streaming and public safety service scenarios has been achieved, demonstrating the technical advantages and application value of MBS broadcast.

This field trial covers basic services such as MBS broadcast, SIM-free broadcast, and emergency broadcast, as well as MBS field coverage test and video service mobility interaction test at 700MHz. .



| Index | Parameter |
|------------------------------------|--|
| NR Frequency | 700MHz |
| NR Cell Bandwidth | 5MHz |
| PRACH Format | Format0 |
| PRACHCycle | 10ms |
| PUCCHFormat | Format2 |
| SSBsub-carrier spacing | 15kHz |
| PBCHCycle | 20ms |
| Antenna Channels | 4 |
| Uplink Power Control | Enable |
| AMC | Enable |
| Terminal | SA: 1T2R(Commercial mobile phone) |
| RF Module Specifications | 4T4R |
| Terminal Transmit Power | The total power of SA shall not exceed 23dBm |
| Business Type | 5G NR TV Broadcasting (Video) |
| Wireless and Terminal Transmission | IPv6 |

R17 NR MBS pilot commercial plan

The program sources adapt two typical resolutions of 576×720 (standard definition) and 1080×1920 (high definition), and the frame rate is 25fps. Under the H.265 encoding format, the program bit rates are 250-300Kbps and 700-800Kbps respectively.

CBN is about to carry out pilot commercial operations in Beijing, Shanghai, Shenzhen and other places, and will officially enter formal commercial after the end of pilot commercial operations. This pilot commercial content covers many functions such as basic broadcast services, concurrent broadcast and unicast, SIM-free broadcast reception, emergency broadcast, etc.



5G NR广播

视频信息

频道列表

CCTV-1

CCTV-13

CBN 5G LAB
中国广电5G实验室
inspur 浪潮信息技术支持

R18 NR MBS WI

The objectives for Rel-18 include:

- Specify support of multicast reception by UEs in RRC_INACTIVE state.
 - PTM configuration for UEs receiving multicast in RRC_INACTIVE state.
 - Study the impact of mobility and state transition for UEs receiving multicast in RRC_INACTIVE.
- Specify Uu signaling enhancements to allow a UE to use shared processing for MBS broadcast and unicast reception, i.e., including UE capability and related assistance information reporting regarding simultaneous unicast reception in RRC_CONNECTED and MBS broadcast reception from the same or different operators.
- Study and if necessary, specify enhancements to improve the resource efficiency for MBS broadcast reception in RAN sharing scenarios.

Observation on R19 MBS discussion in RAN

Our observation based on discussion(RP-232627, RAN#101) on R19 MBS,

- Clear coverage/spectral efficiency requirements from some operators,
 - CBN, China Unicom, China Telecom, Reliance Jio, etc
- Reasonable technical evolution directions to meet the operator's requirements

Moderator's observations:

A total of 11 TDOCs (12 companies) discussing/proposing enhancement to Broadcast/Multicast for Release 19.

There is significant support for enhancing coverage/spectral efficiency (e.g., extended CP, ECP/NCP interworking, SFN), RAN sharing and CA/DC related support.

- *Specify enhancements to enhance the coverage and spectral efficiency of MBS [RAN1, RAN2, RAN3]:*
- *Specify support for multicast/broadcast with extended CP for 15kHz and 30kHz SCS for DL and UL [RAN1, RAN2]*
 - o *Support ECP/NCP Switching in TDM manner [RAN1, RAN2]*
 - o *Study enhancements to support coordination between 5G MBS core network and NG-RAN nodes to achieve MBS media content synchronization with UE and/or to guarantee SFN transmission across gNB-DUs/CUs (SA2, RAN2/RAN3)*
- *Specify enhancements to improve the resource efficiency for multicast reception in RAN sharing scenarios [RAN3, RAN2]*
- *Specify enhancement for multicast reception on multiple CCs in CA scenario [RAN2, RAN1]*
- *Specify enhancement for multicast reception on SN in DC scenario [RAN3, RAN2]*

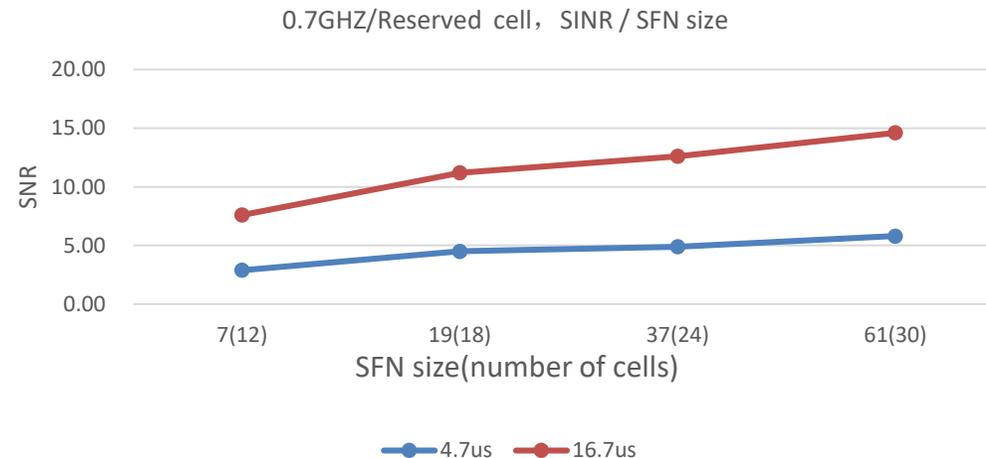
Rel-19 MBS: Extended CP support for NR MBS

Motivation:

- The specification only allows normal CP for the 15kHz and 30kHz subcarrier spacing so far, which unnecessarily imposes the limits to the deployments of MBS with low spectral efficiency.
- Support of extended CP has been motivated and discussed as in RWS-210446 and RWS-210330 when scoping Rel-18 but was precluded in the end due to leveraging several aspects including available TU and the proposed enhancements scope.

Radio Network:

- Specify support for multicast/broadcast with extended CP for 15kHz and 30KHz SCS for DL and UL[RAN1,RAN2]



Rel-19 MBS: RAN sharing for multicast



Motivation:

- R18 only specifies the enhancement for broadcast session in RAN sharing scenario.
- The radio resource efficiency can be significantly improved if the same MBS session from different PLMNs can share the same radio resource.

Radio Network:

- Specify enhancements to improve the resource efficiency for multicast reception in RAN sharing scenarios[RAN3,RAN2]
- Based on the solution of enhancement for broadcast in R18, discuss whether the similar solution can be applied to multicast to identify a same multicast service from different PLMNs from RAN perspective.
- The enhancement for loss-less handover procedure in such scenario, which is not required for broadcast service, and with quite a few impacts on 5GC procedures, e.g. SN alignment among the DL packets of the involved PLMN.

Summary of NR MBS enhancement for Rel-19



Continuous improvements are demanded based on strong market requirements for NR MBS deployment.

Proposal:

- Specify support for multicast/broadcast with extended CP for 15kHz and 30KHz SCS for DL and UL [RAN1, RAN2]
- Specify enhancements to improve the resource efficiency for multicast reception in RAN sharing scenarios [RAN3, RAN2]