Latest news on 5G–MAG activities

Dr. Roland Beutler
5G–MAG Vice-Chair
Overarching Objectives of 5G–MAG

- Unlock the **potential** of 5G technologies for media by:
  - Understanding how 5G technologies can help the media industry in the production and distribution of **media content & services**
  - Driving consensus towards **standardisation** of relevant features
  - Lowering the barriers towards development and **implementation**
  - Supporting industry engagement from use cases to **deployments**

- **5G–MAG** seeks **collaboration** with all stakeholders to pave the way for the creation of viable **ecosystems**

**Media + ICT + Collaboration**
Production: Flexibility, Agility, Independence

Cloud MEC → Acquisition Site → Studio Playout

Wireless All-IP workflows
Production: Flexibility, Agility, Independence

Ad-hoc and temporal setup
SNPN & PNI-NPN QoS priorities
Dynamic QoS
QoS exposure
D2D
UE on-boarding
Timing and synchronization
Low Latency
Cloud/Edge
Legacy devices
Web-based uplink/downlink streaming

Cloud
MEC

Acquisition Site

Studio Playout

Wireless All-IP workflows
Production: Flexibility, Agility, Independence

- Quality
- Cost
- Scalability
- Control
- Security
- Sustainability

Cloud MEC

Acquisition Site

Studio Playout

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Wireless All-IP workflows
Distribution: Devices, Formats, Users

Content Providers

Distribution

OTT
Terrestrial Networks
Satellite
Platforms

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Distribution: Devices, Formats, Users

Content Providers

Distribution

OTT

Terrestrial Networks

Satellite

Platforms

UHD/8K
Social
3D
Immersive
Personalized
Interactive
Gaming-like
Short & Long
Live
Linear
On-Demand
User Generated
AI-supported
Location
Global
Secure
Time-shift

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Distribution: Devices, Formats, Users

Content Providers

- Quality
- Cost
- Scalability
- Control
- Security
- Sustainability

Distribution

- OTT
- Terrestrial Networks
- Satellite
- Platforms

UHD/8K
Social
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Immersive
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Opportunity: Global media & access technologies

Content Production
Services and Applications

Global technologies and APIs (formats, codecs, transport, networking)

Examples (non-exhaustive):

- SMPTE
- SRT
- IETF
- IPE
- RIST Forum
- RAVENNA
- W3C

Content Distribution
Services and Applications

Global technologies and APIs (formats, codecs, delivery, presentation)

Examples (non-exhaustive):

- 3GPP
- MPEG
- IETF
- DASH
- DVB
- W3C
5G-MAG’s member-driven activities

- Transitioning technology into applications

Driving Industry Consensus
- Proposing Use Cases
- Creating Requirements
- Assessing Opportunities

Driving Standardization
- Tracking Standardization
- Defining Architectures
- Profiling Specifications

Driving Implementation
- Developing Software
- Supporting Developers
- Creating Ecosystems

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Current Work Items

WI#8 Feasibility Analysis of Audiovisual Production over 5G
WI#6 AV Production in 5G Non-Public Networks

Content Production

WI#7 Emergency Alert System based on LTE-based 5G Broadcast
WI#5 Audio-Video Codecs and Protocols
WI#4 5G Multicast Broadcast Services
WI#3 5G Linear and On-Demand Streaming
WI#2 5G Media Distribution in Mobile Networks
WI#1 LTE-based 5G Terrestrial Broadcast

Content Distribution
Driving Industry Consensus (examples of on-going work)

Use Cases, Requirements, Architectures and Features
- High-level architectures for news-gathering, live production and music setups,…
- 3GPP technologies for streaming over Unicast, Broadcast, Multicast, Edge,…

Ecosystem and Regulatory aspects
- Global 5G roll-out driving equipment and device ecosystems
- Frequency bands suitable for media production scenarios, in particular for NPNs
  - Mid-bands below 6 GHz, Germany 3.7–3.8 GHz, UK 3.8–4.2 GHz, …, mmWave bands
- Identification of suitable spectrum access frameworks (eLSA, CBRS, …)
  - Time-limited and ad-hoc access vs long-term license, coordination requirements to maximize efficiency

5G-MAG Explainers and Workshops
- Workshops for industry engagement into 3GPP work items
- 5G-MAG Explainers on NPNs (SNPN & PNI-NPN)
- Linear TV and Radio with LTE-based 5G Broadcast
- Work in progress around 5G Media Streaming, MBS and AV Codecs
Driving Standardization (examples of on-going work)

3GPP SA4 Work Item on NPN4AVPROD
- Contributions by 5G-MAG members into TR 26.805 “Study on Media Production over 5G NPN Systems”; Annex A on 5G-MAG Workshops and Trials
- 5G-MAG to follow up on recommendation guidelines

ETSI 103 720 «5G Broadcast System for linear TV and radio services»
- Specification update to include enhancements from 3GPP Rel-17 specifications:
  - Kanban Board

3GPP TS 26.512 - 5G Media Streaming (5GMS); Protocols
- Bug fixing and detection of issues arising from spec implementation
  - Kanban Board

3GPP TS 26.346: MBMS; Application Programming Interface and URL
- Bug fixing and detection of issues arising from spec implementation
  - Kanban Board

Contributions? https://github.com/5G-MAG/Standards/issues
Driving Implementation (examples of on-going work)

Why 5G-MAG Reference Tools?
- Implementation-driven specs
- Testing, validation, verification and direct feedback to SDOs
- Lower the complexity of spec implementation for developers

Current list of official contributors

Open Community of Developers
Open developers’ community sponsored by 5G-MAG members

Reference Implementations
Reference implementation of 5G media platform components and features

Feedback to standards experts
Facilitating exchange between developers and standardization experts

IPR-friendly License Model
Developed to foster contributions, demos, testing, commercialization

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Driving Implementation (examples of on-going work)

- Reliable **Video On-Demand** over Mobile Networks with **5G Media Streaming**
- Reliable **Personalized Live Radio** over Mobile Networks with **5MBS**
- **5G Broadcast On-Demand** with **5G Media Streaming**
- **Premium and Targeted Content Insertion** with **5G Media Streaming**
- **DVB-I** over **5G Media Streaming**
- **DVB-I Hybrid Service** over **5G Broadcast and 5G Media Streaming**
- **Emergency Alerts** and **Media Services** through **5G Broadcast**
- Contribution to **LTE-based 5G Broadcast** completion and **Multicast-Broadcast Service (MBS)** and **satellite/NTN broadcast** integration

Join the development efforts in 2023!

- **5G Media Streaming**
- Dynamic network QoS policies
- Event exposure framework
- Media Streaming over eMBMS
- **Edge Applications for Streaming 5G Multicast Broadcast Services**
- **eXtended Reality**