

5G-MAG Reference Tools

Johann Mika

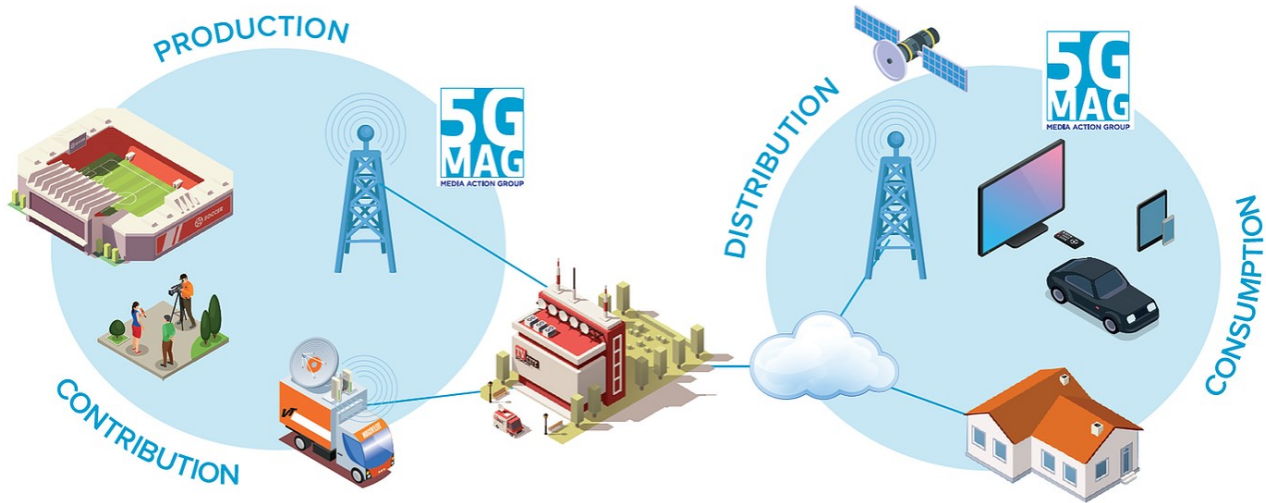
5G-MAG Reference Task-Force Leader / ORS



09.05.2022

5G-MAG: Shaping the Connected Media Future

- Cross-Industry Association (Media + ICT)
 - Getting the media industry a foot in the door in the development of next-generation global media technologies
 - 5G as a key opportunity for verticals (media industry) to engage



What is 5G-MAG working on?

- New services and applications
- Commercial requirements and deployment models
- Value chain and commercial role models, device ecosystem and stakeholders

Commercial Aspects and Ecosystem

- Pre- and post-standardisation activities
- Technical requirements, architectures, network features, APIs and standards

Technology and Standards

- Regulatory framework for the 5G media ecosystem: net-neutrality, zero-rating, device regulation
- Spectrum deployment options: local and temporal spectrum access, spectrum sharing models
- Media related aspects: digital services and digital markets

Regulation and Policy

- Learning-by-doing
- Information and exchange on demos and trials
- 5G-MAG Reference Tools Development Programme – open-source tools for 5G Media

Implementation, Demos and Trials

What is 5G-MAG Reference Tools?

<https://www.5g-mag.com/reference-tools>

- Development of common open-source reference tools to support implementation and interoperability of 5G Media technologies
- Validation and Verification of 5G standards, architectures, network features, APIs, etc
- Used for demonstrations, trials and even commercial services



Open Community

Open developers' community sponsored by 5G-MAG members



Reference Implementations

Reference implementation of 5G media platform components and features



Direct link to standardization

Facilitating exchange between developers and standardization experts



IPR-friendly License Model

Developed to foster contributions, demos, testing, commercialization

What is 5G-MAG Reference Tools?

- Kicked-off in Summer 2021
- Steadily growing community
 - Google Group: 68 members
<https://groups.google.com/g/5g-mag-reference-tools>
 - Slack: 29 members
<http://5g-mag.slack.com>
- Your entry point: <https://www.5g-mag.com/reference-tools>
- Repositories in Github: code, issues, documentation, architectures,...
<https://github.com/5G-MAG>



How are we organized?

- Sponsored by 5G-MAG / Participation is open to the community

(Internal) 5G-MAG Task Force

Under Workgroup CD-T Content Distribution-Technology

Definition of roadmaps
functionalities from 5G-MAG Work
Items, implementation prioritization,
discussions about architecture,
answering questions from
developers

(External) 5G-MAG Developer Community

Users, developers,
contributors
discussions about
implementation of
features, issue tracking



**Direct exchange between standardization
leaders and software developers and users**

Groups	Who can join?	When?	What is discussed?
Internal Task Force	5G-MAG Members	Weekly (when needed)	Use cases, architecture, roadmap, prioritization
5G-MAG Developers' Call	Anybody	Every 3 weeks	Exchange among developers, issues, questions, testing,...

Who can contribute code? License Model

■ 5G-MAG Public License v1.0

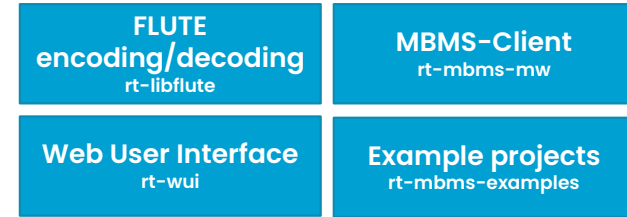
- modified version of the [Apache License v2.0](#)
- allows contributors to make patent license available to third parties under FRAND (fair, reasonable and non-discriminatory) terms for commercial exploitation.
- 5G-MAG Reference Tools code is free for study, testing and research purposes
- Allows contributions to the 5G-MAG Reference Tools code while protecting IPR

■ Libraries from third parties (e.g. AGPLv3)

■ Contributor License Agreement (CLA)

- To clarify the intellectual property license granted with contributions from any person or entity
- Signed by each Contributor
- For your protection as a contributor as well as the protection of 5G-MAG and its users
- Does not change your rights to use your own contributions for any other purpose.

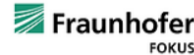
5G-MAG Public License v1.0



AGPLv3

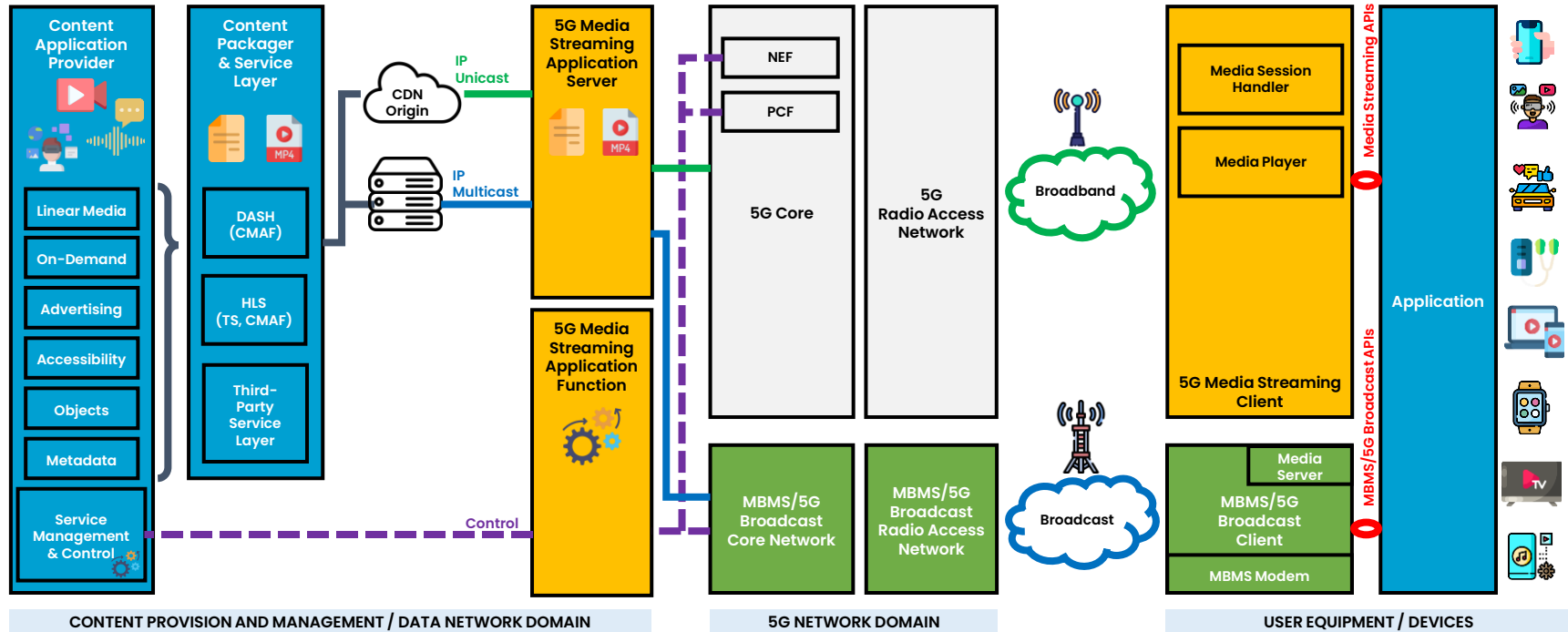


Current list of official contributors



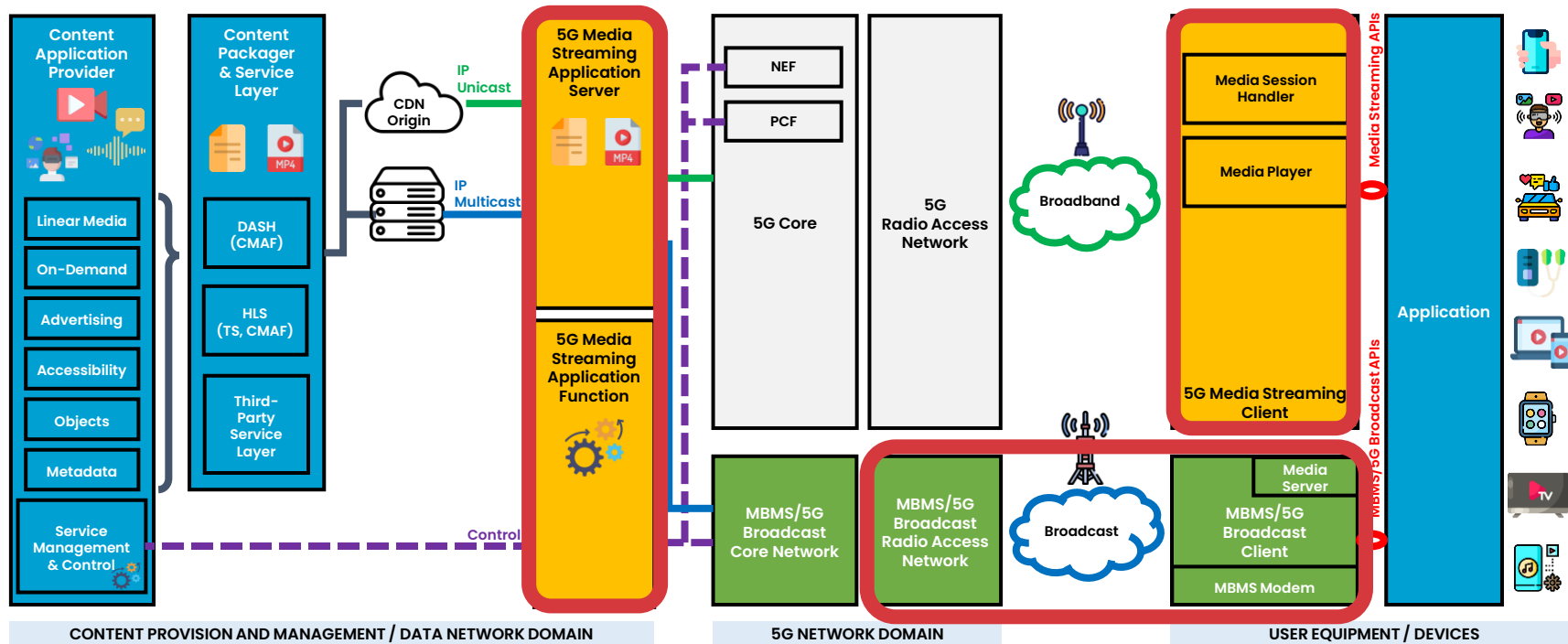
What is being implemented?

- Implementing the 5G Media distribution platform
 - Third-party service providers, 3GPP specifications, clients, APIs,...



What is being implemented?

- **Current development:** 3GPP Release 16 Media Streaming and LTE-based 5G Terrestrial Broadcast



What have we achieved so far?

- Features
 - 5G Broadcast modem
 - 5G Broadcast transmitter (PoC)
 - MBMS Client
- Use-Cases
 - RTP playback over 5G Broadcast reception
 - HLS playback over 5G Broadcast reception
 - Seamless switching Broadcast/Broadband

BROADCAST BROADBAND
SEAMLESS SWITCHING

<https://www.youtube.com/watch?v=Jbir8B-gC4c>

**Closing the gap towards a
5G Broadcast Rel-16
open-source transmitter**

Jaime Sánchez Roldán
Universitat Politècnica de València (UPV)



https://www.youtube.com/watch?v=0_MfEE5KG6o



What is next?

- Feature: Implementation of 5GMS (5G Media Streaming)
 - Media Session Handler
 - Media Player ?
- Android support
- Use-Case: Broadcast-on-Demand
 - Provisioning of a 5G BC service based on consumption in specific areas utilizing 5G Media Streaming consumption and metrics reporting

→ Based on members and developers' interests

INTERESTED IN PARTICIPATING?

REACH OUT TO OUR COORDINATORS



Task-Force 5G-MAG Reference Tools Leader

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Developers' Team Coordinator

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Communication

Google Group:

<https://groups.google.com/g/5g-mag-reference-tools>

Slack:

<https://5g-mag.slack.com/>

Invite:

https://join.slack.com/t/5g-mag/shared_invite/zt-trtvsmw5-yYgcRidDglS7x_u48sTuQA

Code

Github projects

Main

<https://github.com/5G-MAG/>

Starting point

<https://github.com/5G-MAG/Documentation-and-Architecture>

Dissemination

Youtube:

<https://www.youtube.com/channel/UCKzSvQnMltdCHelTd9Pg3aQ/videos>

Blog:

<https://www.5g-mag.com/blog/categories/reference-tools>



MEDIA ACTION GROUP

www.5g-mag.com