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Collaborate. Create. Play

Join the Developer Community

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developer.5g-mag.com

Software Developer Community

About the Software Developer Community

Transforming Specs into Implementations via Open-Source Software



Standards validation, interop, early prototyping and testing



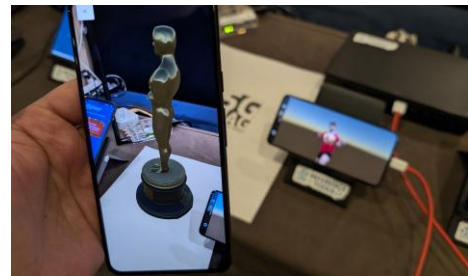
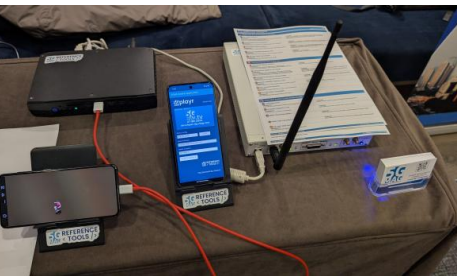
Ready-to-use code in production environments and as benchmark



Shared development effort avoids duplication across companies



Transparency, trust and collaborative enhancements

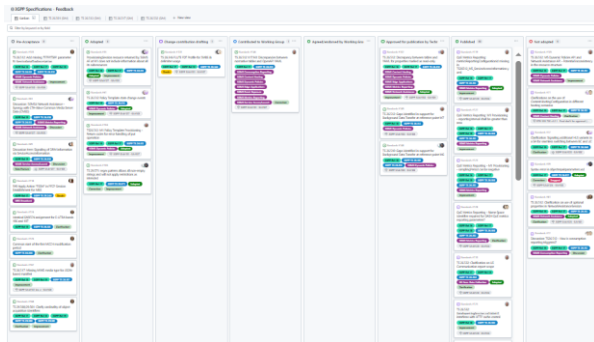


About the Software Developer Community

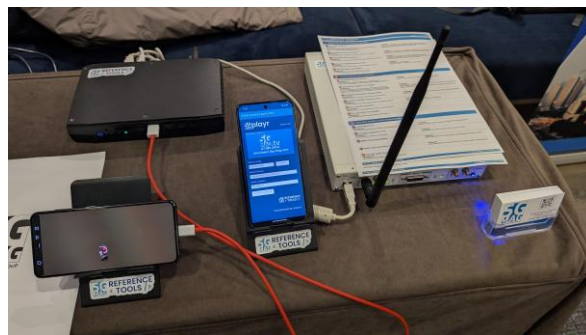
Collaboration in Technology Development and Deployment



Open to Contributions
Sponsored by 5G-MAG
(No requirement to be 5G-MAG member)



standards.5g-mag.com
Standardization **Feedback Loop**



Supporting Productization
Prototypes, Demos, Trials, Testbeds,...

About the Software Developer Community

Support to Software Developers



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Maintenance of GitHub Resources,
Documentation, Tutorials,...

5g-mag.com/roadmaps

Development **Roadmaps**,
Project Boards, Milestones

New Release!



TUTORIAL

Promotion, Visibility, Attribution



Additional **Resources**
(as requested)

About the Software Developer Community

Open and Accessible for the Industry, Developers, Academia,...

- For both 5G-MAG Members and Non-Members

WG DEV

5G-MAG Members' Workgroup
**Development &
Ecosystem-drive**

Dedicated WG for 5G-MAG Developers
(with weekly calls)



5G-MAG Dev Community

Fast communication with developers

[Join Slack!](#)



[Friday's Public Call](#)

Regular **Public Calls** for all
(last Friday of the month – 13:00 CEST)



Mailing List with Releases & News

News and Announcements

[Join Google Groups!](#)

About the Software Developer Community

Maintenance and Coordination



Coordination, Testing and Support by
Daniel Silhavy, Nils Duval, 5G-MAG Project Office
(in coordination with the contributors)

Guidelines for Contributors and Documentation
Issue tracking, PR processing, Roadmaps
Community Dashboard maintenance
On-boarding support

GitHub Teams

3GPP SA4 Standards Team

Write Access for Contributors

Early Access to Private Repositories

Integrity & Deployability of the Code

Actions, CI/CD pipelines

Consistent GitHub workflow with
RCs, Testing periods, Releases

Dockerization, Packages



REST API collections



POSTMAN



Insomnia

An IPR-friendly License Model

A License Model for contributions and usage adapted to industry's needs

5G-MAG balances open-source collaboration with commercial-grade IPR protection, ensuring a sustainable ecosystem for technology implementation.

Software & Dependencies

- Main Repositories: Covered by the **5G-MAG Public License** to protect contributor IPR.
- Third-Party Code: Utilizes forks of external projects to maintain baseline compatibility.

5G-MAG Public License v1.0

- A modified **Apache 2.0 license aligned with ETSI/3GPP FRAND policies**.
- Free Use: For non-commercial, research, and testing purposes.
- Commercial Use: Includes a patent clause allowing contributors to license IPR under Fair, Reasonable, and Non-Discriminatory (FRAND) terms.

Contributor License Agreement

- To cover code contributions from Individuals (CLA) and companies (CCLA)

www.5g-mag.com/license

Join the Software Developer Community

Current official contributors to the 5G-MAG Reference Tools



We remain fully open and welcome more contributors joining efforts



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Our Current Projects, Tools and Testbeds

The Software Projects

Application domains of the 5G-MAG Reference Tools Software Projects

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**Streaming,
Media Delivery and
Data Collection**

3GPP + OCTA SVTA DASH

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**5G Broadcast
for TV, Radio and
Emergency Alerts**

3GPP + ETSI IETF

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**Multicast and
Broadcast Services
in 5G Networks**

3GPP + IETF

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**XR: 3D Scenes
and Avatar
Communications**

3GPP + MPEG KRONOS

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**Volumetric Video
and Beyond 2D
Video Experiences**

3GPP + MPEG

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**Applications and
Services using
Network APIs**

3GPP + CAMARA

Build an Application

The Projects

The Testbeds

Testbeds and Evaluation Frameworks

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 **6G Testbed and
AI Traffic
Characterization**



Qualcomm

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 **AI & Machine
Learning in
5G Media Services**



Interdigital

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 **Beyond 2D
Video
Experiences**



PHILIPS

Testbeds and Evaluation Frameworks

Roadmaps

5G-MAG Reference Tools - Roadmaps

All 5G Media Streaming 5GC Components UE Data Collection 5G Broadcast Emergency Alerts 5G Multicast Broadcast Service Multimedia Content Delivery XR Media with MPEG-V3C Immersive Platform

label: "Project: 5G Media Streaming"

Candidates 1

This is a candidate for future work.

Getting-Started #126
Advanced Media Delivery (AMD) - In-band reporting of CMCD information

Under Study 1

This is under study.

Getting-Started #137
Cloud Deployment support

Under Development 4

This is actively being worked on.

Getting-Started #132
Dynamic Policies (M1 Policy Templates API + M5 Dynamic Policies API)

Completed 0

This has been completed.

Completed + Tested 6

Getting-Started #134
Consumption collection and reporting

Getting-Started #130
Implementation of M1d Provisioning APIs

Getting-Started #133
QoE metrics collection and reporting

Getting-Started #129
Implementation of AF to AS RESTful OpenAPI (M3)

Getting-Started #128
Support for basic media session handling (Application Function + Media Session Handler)

Getting-Started #127
Support for basic media stream handling (Application Server + Media Stream Handler)

All the contributions, on-going developments and opportunities for contributors

Roadmaps

Tutorials and Contributions

Multimedia Content Delivery Protocols

GPAC Flute interop with 5G-MAG Reference Tools

Sohaib Larbi
Motion Spell

Tutorial

BBC Dolby Fraunhofer FOKUS Qualcomm

5G Media Streaming Architecture

5G Media Streaming in the BBC standalone testbed

Richard Bradbury, David Waring,
Dev Audsin and John Elliott
BBC R&D

Tutorial

BBC Dolby Fraunhofer FOKUS Qualcomm

5G Broadcast TV and Radio Hybrid Services

Unicast/Broadcast Seamless Switching

Klaus Kühnhammer
ITEAM-UPV

Daniel Silhavy
Fraunhofer FOKUS

Tutorial

Bitstream Fraunhofer FOKUS ORS Qualcomm

XR Media with MPEG-I Scene Description

XR Unity Player in 5G-MAG Reference Tools

Imed Bouazizi
Qualcomm

Tutorial

Qualcomm Interdigital

5G Media Streaming Architecture

5GMS with Application Provider Portal

Vuk Stojkovic
Fraunhofer FOKUS

Tutorial

BBC Dolby Fraunhofer FOKUS Qualcomm



UE Data Collection, Reporting & Event Exposure

Docker Setup with Insomnia REST Client

Daniel Silhavy
Fraunhofer FOKUS

Tutorial

BBC Fraunhofer FOKUS

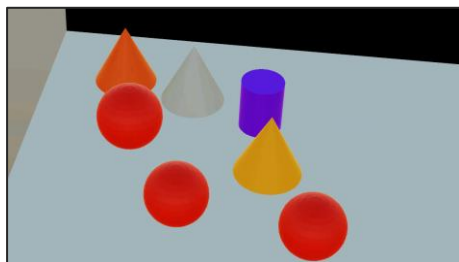
5G Multicast Broadcast Services

Initial support of 5MBS core network functions

Borja Inesta Hernández
ITEAM - UPV

Tutorial

BBC UNIVERSITAT DE VALÈNCIA



V3C Immersive Platform

Unity Player for Android with DASH Streaming Server

Tutorial

Interdigital PHILIPS

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contact us for more information**

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