

Automotive AOSP App Framework Standardization Expert Group

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General Information

Welcome to the COVESA Automotive AOSP App Framework Standardization Expert Group Meeting!

Weekly Meeting: Monday, 5-6pm CEST ([Zoom Link](#)) ([Subscribe to Community Calendar](#) to stay up to date)

Slack: <https://covesacommunity.slack.com/archives/C05EB6A6J5R>

GitHub: <https://github.com/COVESA/aosp-app-framework-standardization>

Chairs:

- [Melina Mascolo](#) , BMW
- [Richard Fernandes](#) , General Motors
- [Gabriel Gautron](#) , FORVIA

Compliance statement:

Antitrust

Before we begin, we would like to make clear that COVESA is committed to compliance with the antitrust laws in all of its activities, and that it expects all participants to similarly comply with the antitrust laws. We will not engage in--and members must refrain from--any discussion of, or understandings regarding competitively sensitive topics. If you have any doubts regarding whether a matter is appropriate for discussion, please consult with your antitrust counsel.

Open and Royalty-Free

Further, COVESA aspires to be an open and royalty-free organization. The discussions and contributions made during this session are governed by the [COVESA Intellectual Property policy](#). If you are unfamiliar with that policy, please review it in detail prior to making any contribution that reads upon a patent.

Meeting Notes

13th May 2024 - Agenda

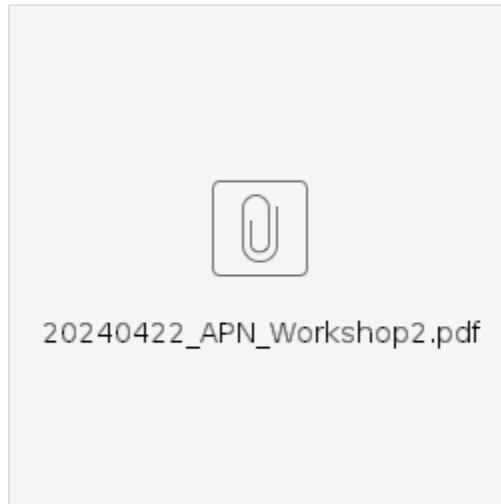
- COVESA @ Droidcon in Berlin: 3th - 5th July
- New working stream: Entertainment
 - Initial focus on geolocalization?
 - Gathering insights about current issues from group with geolocalization
- Status update UnifiedPush offering
 - COVESA about to create process to jointly finance 3rd Party
- Status COVESA SDK

6th May 2024 - Meeting cancelled

29th April 2024 - Meeting cancelled

22nd April 2024 - Agenda

- No weekly meeting today, as discussed on April 8th, the group will use this time for the Push Notification Workshop.
 - Presentation:



- - Please contact one of the Chairs if you have any question or concerns.

8th April 2024 - Agenda

- New AMM Agenda
 - 9:30-10: Status Update
 - 10-10:15: Snapp Ambient Light Initiative
 - 10:15-10:45: 3SS Entertainment topics Working Session
 - 10:45-11:15: European Broadcasting Union Working Session
 - 11:15-12: Push Notifications Working Session
 - 4:55-5:35: Panel discussion App Stores
- Push Notification Workshop
 - Date: 22nd April
 - Needed participants
 - Goal
- Grape up: Camera API working stream
- 3SS : Survey on challenges faced when integrating video streaming apps
 - => <https://www.surveymonkey.com/r/23DHNJ7>
 - @companies Please answer share your experience with video streaming apps

1st April 2024 - Meeting cancelled

25th March 2024 - Agenda

- Participants: BMW, GM, Mercedes, Ford, Forvia/Faurecia Aptitude, Harman, Abalta Technologies, RemotiveLabs, HAAS Alert, Snapp Automotive, Elektrobit, Profilence, 3S, Mavi.io
- AMM agenda update - Richard/Co-Chair
- Push Notification: Unified Push update - Gabriel/Co-Chair
- Round table discussion

18th March 2024 - Agenda

- Push Notification: Unified Push discussion - Co-Chairs and group members
 - Agreement to invite Unified Push members to April AMM for the Push Notification discussion meeting.
- Entertainment - Video Streaming discussion - Tomek/3SS
 - 3SS will provide more information based on group members feedback by April AMM or maybe sooner.
- Round table discussion - Migrating Android code CR#334 <<https://github.com/COVESA/vss-tools/pull/334>> - Richard/Co-Chair
 - Group members in agreement to close CR.

11th March 2024 - Meeting cancelled

26th February 2024 - Agenda

- In-Vehicle Payments BOF discussion - Vamsi Putrevu/Mavi.io
- Discuss AMM agenda sessions and Panel topics for this group (April 16-18th, Sweden).

19th February 2024 - Agenda

- Participants: BMW, GM, Ford, Mercedes, Cariad, MHP, Remotive Labs, Faurecia Aptode, Harman, Mavi.io, Profilence, 3SS, Elektrobit, L&T Technology Services
- Follow up on 3SS presented topic from February 5th.
- Discuss Next Steps on UnifiedPush for Push Notification.
- Discuss AMM agenda sessions for this group (April 16-18th, Sweden).
 - Proposal:

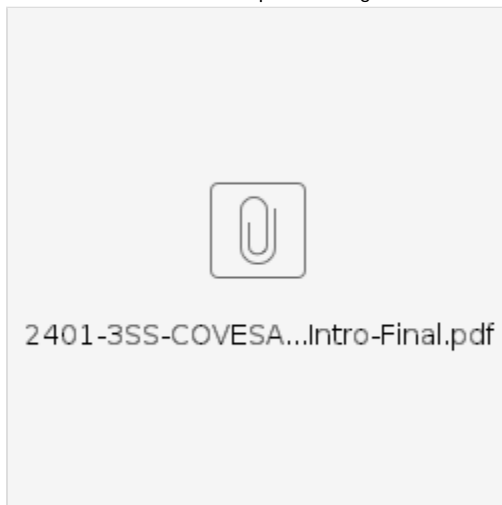
"Quo vadis white label app stores - how to evolve the automotive app ecosystem"

- Where are we today (How many apps are available, which apps are available, do we see further growth)? What learnings do we already have?
- What can we learn from other emerging/emerged ecosystems? What are potential reasons for failure?
- What can be done to prevent failure and facilitate additional growth?
- ...

12th February 2024 - Meeting cancelled

5th February 2024 - Agenda

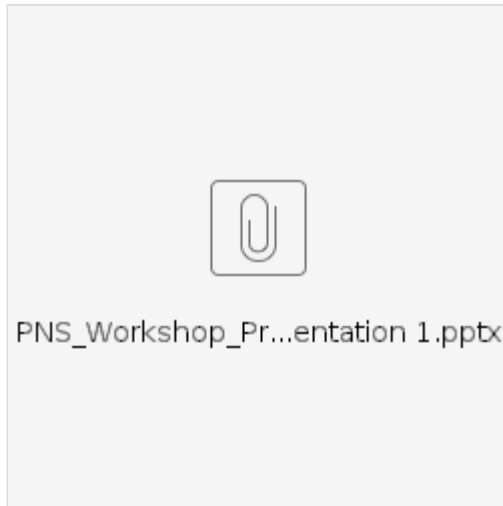
- Participants: BMW, Ford, GM, Cariad, Mercedes, 3SS, Forvia/Faurecia Aptode, Harman, RemotiveLabs, Hyundai Mobis, mavi.io, Elektrobit, Bosch
- Intro from 3SS about Entertainment topics needing standardization (including an OEM and App Store Provider survey)



- - Please contact Felix Walter (felix.walter@3ss.tv) and Tomasz Dzikowski (tomasz.dzikowski@3ss.tv) if you would like to get involved in this topic or if you have any questions.
- Next steps UnifiedPush / Push Notifications
- AMM Session (April in Sweden)

29th January 2024 - Push Notification Workshop (No Weekly meeting)

- Participants: BMW, Ford, GM, Cariad, Mercedes, Forvia/ Faurecia Aptode, Harman, Hyundai Mobis, mavi.io, Elektrobit, LTTS
- Push Notification Protocol Presentation:



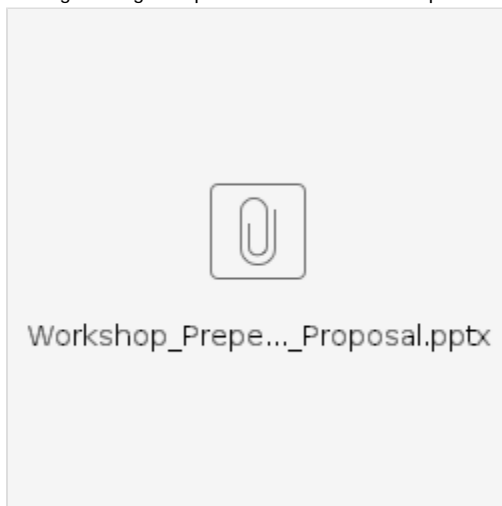
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- Video Recording of the workshop:
 - Link - <https://us06web.zoom.us/rec/share/6DNS8KdaGcizDDLj64Klj8twB1iqnwaZaUch9OWIbuCBCgtLQG9CYrUwkVGFqzFk.N4MKJDETVVCgC8aD>
 - Passcode: jw2K2F%Q

22nd January 2024 - Agenda

- Participants: BMW, GM, Ford, Mercedes, Cariad, Hyundai Mobis, Forvia/ Faurecia Aptitude, Harman, Profillence, UCF, mavi.io
- Shorter round: 30min only
- Quick recap for push notifications workshop (29th January) for participants who could not make it last week
- Round table discussions

15th January 2024 - Agenda

- Participants: BMW, Mercedes, GM, mavi.io, RemotiveLabs, L&T Technologies, Profillence
- Happy new year!
- Reminder about push notifications workshop January 29th Extended invite will follow
- Short overview goal & agenda push notifications workshop



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- Round table discussions

4th December 2023 - Agenda

- Participants: BMW, GM, Mercedes, Forvia, Harman, RemotiveLabs, Hyundai Mobis India, Geotab, mavi.io, Profillence, Elektrobit
- BMW/Maxi to provide overview of Push Notification Workshop goal (including what to be prepared for and who to bring to the Workshop)
Will be published before Christmas on Wiki
- Push Notification Workshop agenda:
 - Mobis and Mercedes to provide feedback on current proposal.
 - Does Jan 29th, 2024 work for the group?
 - Confirmed and agreed with the team (Time: 4-6PM/10AM-12PM)
- External 360 Camera feedback.
 - Feedback from Auto OEM and suppliers.

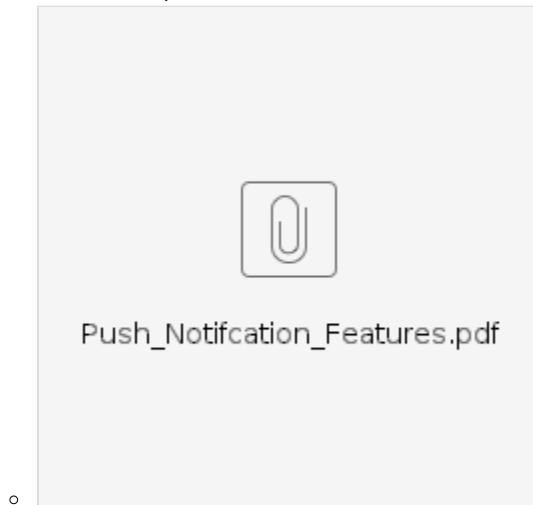
- Two sets of images - individual external camera or stitched images from the cameras.
 - Need additional discussion, to be reviewed next year.
- Round table discussions

27th November 2023 - Agenda

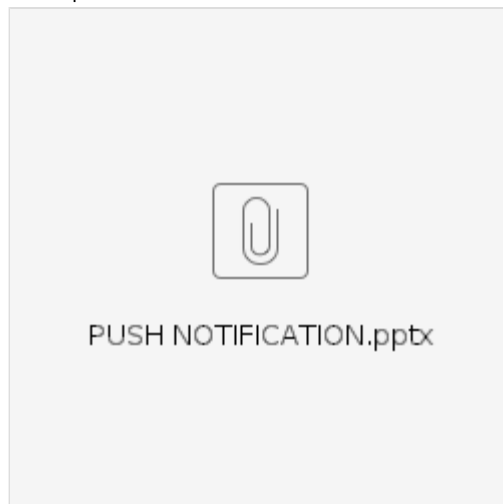
- Participants: BMW, GM, Ford, Mercedes, Forvia, Harman, L&T Technology Services, Bosch, RemotiveLabs, Hyundai Mobis India, Geotab, Profilence, mavi.io
- Feedback from Mercedes on Camera API discussion (360 degree property)
 - Link to discussion: https://developer.android.com/reference/android/hardware/camera2/CameraCharacteristics#AUTOMOTIVE_LENS_FACING
 - Action Item: Auto OEMs to investigate if the external 360 degree camera is accessible for 3rd Party app developers.
- Who is planning to join CES 2024 and agenda.
 - Please follow up with Mike Nunnery by December 1st, 2023.
- Joint date for push notification workshop Does doodle work for everyone? Any preferred days in January?
 - Tentative date: January 29th, 2024 (2-3h). Need team agreement.
 - @All: Please confirm this date until next Monday**
- Meeting schedule for the remainder of the year.
 - Last meeting for this group: December 4th, 2023. Regular meetings to begin January 15th, 2024.
- Round table discussions.
 - Harman will publish their emulator in GitHub and give feedback next Monday, when it will be uploaded there.
 - Next steps: OEMs/Apps to check out emulator, identify gaps, joint workshop, aligning who will be responsible for which extensions.

20th November 2023 - Agenda

- Participants: BMW, GM, Mercedes, Hyundai Mobis, Faurecia Aptitude
- Bi-weekly new time slot at 1pm (Germany), 7am (Detroit), 9pm (Tokyo), 4am (Los Angeles) to enable Honda to participate Works for everyone?
 - No Concerns from the group.
- BMW push notifications update
 - Maxi shared a presentation



- Hyundai Mobis push notifications update
 - Umanj shared a presentation:



- Chairs to have a follow up meeting to bring Hyundai Mobis up to speed.
- January: Push notifications workshop
 - Enable OEMs to bring in experts
 - Looking for feedback from the group in the next meeting
- Newcomers updates
- Exploring synergies with in-vehicle payment group
- Are there round table discussions discussion points?
 - Mercedes/Max to provide an update in the next meeting.

13th November 2023

Today's meeting is cancelled.

6th November 2023

Please note that beginning today the invite was switched to Zoom: [Zoom Link](#)

- Participants: BMW, GM, Harman, Forvia, Remotive Labs, mavi.io, Hyundai Mobis India, Profience
- Main contact per Automotive OEM
- Mercedes additional requirements on 360 degree camera and feedback.
 - No representative from Mercedes, no feedback today.
- Request to have one or more Tier 1 taking over camera reference implementation
 - To be discussed again next week.
- Push Notification, Next Steps Overview - BMW/Maxi
 - Discussion pushed to next week as we didn't have all the OEMs
- Emulator Workshop Discussion
 - Harman to have internal discussion on next steps
- Hyundai/Umag to share Push Notifications alternative proposal - November 20th, 2023

23rd October 2023 - Agenda

- *Participants: BMW, GM, Mercedes, Cariad, Forvia, Harman, Snapp, mavi.io*
- Update from Mercedes about Push Notifications details about 360 degree camera:
 - Request to have requirements that will support external 360 degree camera.
 - Mercedes will use their own services. Follow up needed on using COVESA interface (standardized API) - Mercedes feedback by November 6th, 2023.
- Overview from Harman and Snapp about emulator capabilities and alignment on next steps:
 - Presentation from Saverio Labella/Harman:



- Link to COVESA Licensing - <https://covesa.global/sites/default/files/COVESA-Public-Policy-for-Open-Source-Licensing.pdf>
- Need to decide as a group, where the emulator will be stored and who will update/maintain the emulator - Feedback from Chairs by November 6th, 2023.
- CES 2024: GM/Mercedes/Cariad regarding panel discussion and vehicle demo:
 - GM - Decision currently on hold
 - Cariad - Internal discussion on this topic, feedback to follow
 - Mercedes - No plan at this moment
 - CES Registration details:

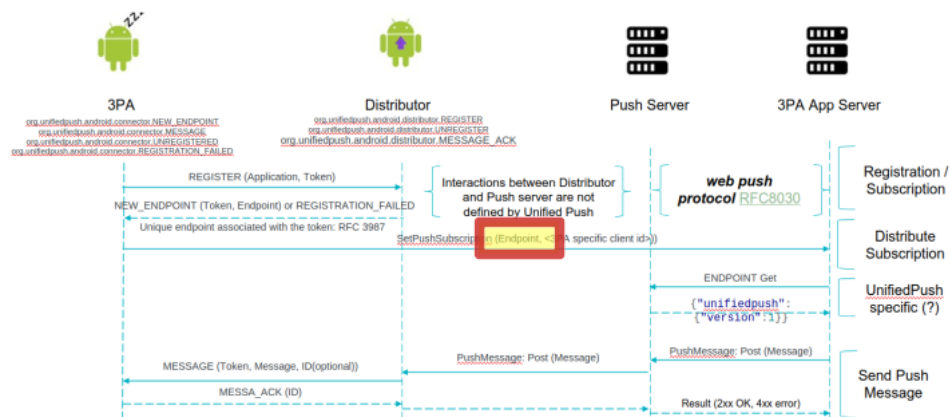
On the evening of January 9, 2024, COVESA will host its 12th annual CES Networking Reception at the Bellagio Hotel in Las Vegas.

The 22,000-sq. ft. ballroom venue will feature 65+ showcases presented by members and our valued partners including a "connected mobility" pavilion sponsored by MEDC, the Office of Future Mobility & Electrification. There will also be automotive cybersecurity, In-Vehicle Payment, EV Charging, In-Vehicle Experience, Android Auto, Commercial/Fleet Vehicles, Autonomy, Vehicle Safety, Electrification, Vehicle Data, Connected Vehicle & Cloud Services demonstrations and so much more!

REGISTER: <https://COVESAc2024.eventbrite.com> passcode is "collaboration"

Note: If this is your first time attending this event and you would like view photos from the COVESA's 2023 CES networking reception, you can view them here: <https://covesa.smugmug.com/COVESA-at-CES2023>

- Pictures from CES 2023, COVESA area - <https://covesa.smugmug.com/COVESA-at-CES2023>
- Maxi/BMW to discuss with Vamsi/mavi.io about how to bring both POCs together and how are next steps to define necessary feature set
 - Mavi to follow up with BMW offline on the POC to verify if the API works.
 - Mavi to share the API with GM offline, to conduct internal POC and provide feedback.
- Internal and External camera reference implementation support from Tier 1, next steps:
 - Faurecia Aptoido to provide feedback by November 6th, 2023
 - Harman
 - Camera API
 - Harman agreed with the Camera API proposal.
 - LENS_FACING_FRONT should be similar to AUTOMOTIVE_LENS_FACING and map to default camera, OEM to decide default mapping for INTERIOR_SEAT_ROW_1_LEFT|RIGHT|CENTER based on model and RHD/LHD
 - If a 3P wants to have finer controls documentation should include information on how to get the VehiclePropertyIds. INFO_DRIVER_SEAT in order to know if the car is RHD or LHD
 - 3D surround camera may need specific Camera2 value, OEMs to request it. In the meantime it could be mapped by default to EXTERIOR_OTHER
 - Evaluating Emulator Virtual device support for testing (same virtual scenes + special text overly identifying automotive camera used)
 - 3P feedback
 - LENS_FACING_FRONT, LENS_FACING_BACKOk, in the future may consider specific cameras.



- Push Notification:
 - Harman agreed with UnifiedPush proposal.
 - Harman is currently evaluating Common Emulator distributor for testing
 - 3P feedback
 - Using pushing, interesting, may need to check backend change
- Honda and Hyundai: request to know who will participate and need to have an agreed time slot (across 3 time zones):

- Paul/COVESA and Richard/GM to follow up with Honda and Hyundai on this topic.
- Harman: Feedback from which 3rd Parties they could get feedback about camera /push notifications (e.g. Zoom/WebEx/TikTok)
 - On going discussion with 3rd party app providers, mostly positive.

16th October 2023 - Agenda

- Participants: BMW, GM, Ford, Mercedes, Forvia, Harman, GrapeUp, L&T Technology Services, Hyundai Mobis India, RemotiveLabs, MathWorks, Appsfactory, Profilence,
- Debrief AMM Detroit: Presentations



- New OEMs joining AOSP Expert Group: Honda & Hyundai
Asian appropriate timeslot needed
- Harman contact change
Update Emulator / Camera API
- Further OEMs needed for push notifications POC
- Which app developers are willing to give input about features for push notifications implementation, besides Zoom/WebEx
- Mercedes
Camera API proposal works, however 360 degree camera not covered

25th September 2023 - Agenda

- Participants: Cariad, BMW, General Motors, Volvo, Harman, Faurecia Aptitude/Forvia, GrapeUp, RemotiveLabs, Elektrobit, COVESA, LTTS, Geotab, mavi.io
- Overview expert group activities Detroit AMM
- Mavi.io push notification MVP to be finalized this week
More clarifications tbd.
- WebEx is reviewing the push notification solution
@Albert (Harman): To discuss with Zoom
- 2nd October Bridge day in Germany: Weekly meeting to be cancelled?
Next meeting 16.10.
- Mercedes feedback work streams
Camera API: End this week
Push Notifications: Within next 2 weeks
- Cariad: No hard date at this point due to internal availabilities

11th September 2023 - Agenda

- Participants: BMW, Cariad, General Motors, Mercedes, Ford, Faurecia Aptitude/Forvia, Intellias, Grapeup, RemotiveLabs, Elektrobit, Jimmy Technologies, Bosch, COVESA, LTTS, mavi.io
- COVESA AMM in Detroit - activities on AOSP app framework standardization
 - 11/10
 - 9:00-9:45 - Status session to attract potential new members to the expert group. Onsite: Richard, Melina; Online: Camille
 - 9:45-10:30 - working session on push notifications

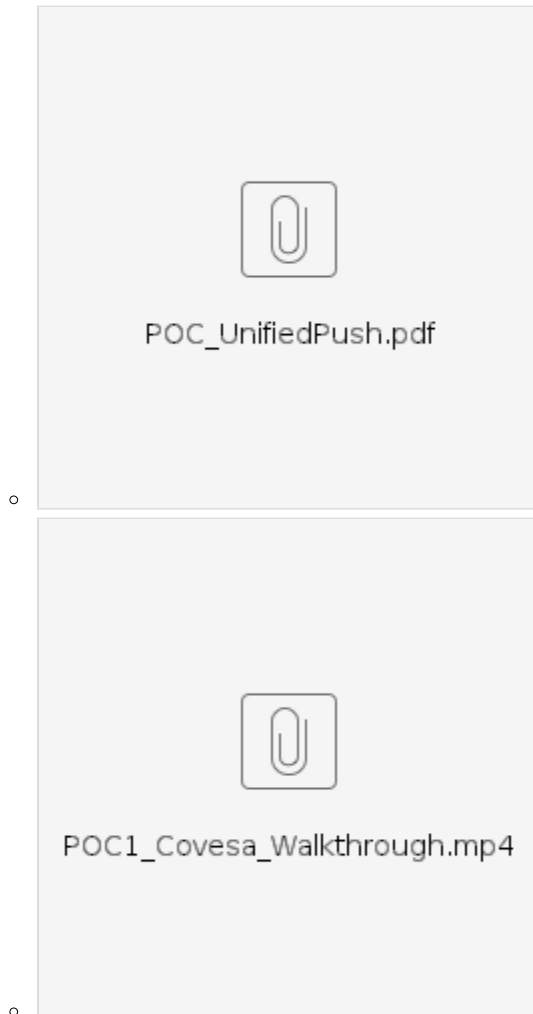
Members that will attend the working session:

- BMW
 - [Mavi.io](#)
 - GM
 - Elektrobit
 - Faurecia Aptitude
- 12/10 pm : Panel discussion

Forvia as Moderator, GM, [Mavi.io](https://mavi.io), STLA, potentially BMW. Open discussion on the topic

NB: Invitations to the AMM can be provided to companies (3rd party apps developers, OEMs...) that are or not members of COVESA so that they can join the sessions. Email to Mike Nunnery & Paul Boyes to get support in this invitation process

- Presentation Push Notifications POC by BMW



Next steps :

- POC walkthrough video can be used as a guideline, links to download apps are in the presentation
- **All OEMs to test the installation of the 2 apps and the notify backend**
 - before AMM to share feedback during the working session
 - Outcomes can be shared with members attending if attendance is not possible
- **POC by 3rd party apps dev to try to implement ([Mavi.io](https://mavi.io)) and provide feedback:** any use case that can be difficult to support with this solution?
- AMM working session on 11/10
 - Feedback
 - Define what is missing and thus what COVESA needs to standardize to play those use cases
- Invite UnifiedPush team to join and discuss once common decision is done

4th September 2023 - Cancelled due to public holiday in US

28th August 2023 - Cancelled by chairs due to key people being out.

21st August 2023 - Meeting Agenda

- Participants: BMW, Ford, General Motors, Mercedes, Volvo, Hyundai, Faurecia Aptio/Forvia, GrapeUp, Intellias, Elektrobit, COVESA, Geotab
- Paul Boyes: AMM Detroit
 - **All members** to provide their feedback on AMM Detroit attendance to Paul **by next week**

- Align on CES plans (panel discussion <> vehicle demo)
Which participants would be interested?
What would we show during the vehicle demo?
 - **Paul Boyes** to discuss with Mike + Steve about the possibility to get a separate room at CES
 - Overview milestone planning camera API & push notification
 - **BMW**: Slides to be shared on the wiki + Collaborative document to be prepared for everyone to be able to contribute
- OEM and Store Providers:** timeline input needed
- **FAA / Harman** to align on who reaches out which developer



A copy has been placed on [Google Docs](#) for editing

7th August 2023 - Meeting Agenda

- Participants: BMW, Ford, General Motors, Mercedes, Volvo, Remotive Labs, Faurecia Aptiv/Forvia, Harman, Bosch, LTTS, Mavi.io, Elektrobit, Jimmy Technologies, Geotab
- Due to the Holiday next Tuesday (August 15th, 2023) in Europe, next meeting (August 14th, 2023) is cancelled.
 - No concerns from the group
- Feedback from Mercedes and Cariad about camera API.
 - Update will be provided at the end of summer.
- Statement that GM will be using uServices as a path moving forward. What is GM's path for the Emulator and potentially push notifications?
 - GM will be providing presentation on uServices in the following meeting.
 - GM Presentation on uProtocol - [Eclipse-uProtocol-Overview - Google Slides](#)
 - GM is interested and will monitor the development of the Emulator and push notifications.
- GM to share timeline on using Android API approach
 - GM is internally discussing this topic and will provide feedback in one of the upcoming meetings.
- Harman to Clarify next steps on contributing the Emulator:
 - Harman needs to first join COVESA and then confirm with their legal team in regard to contributing the Emulator.
- Andrew Lakin/Forvia looking for feedback from companies that can contribute to the AOSP App Framework Panel discussion at the AMM in October.
- Jose Freitas/FAA presented Push Notification presentation:
 - Next steps: FAA/Harman to help lead and define who does what, e.g. who reaches out to which apps (e.g. Zoom/WebEx/TikTok)



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31st July 2023 - Meeting Agenda

- Participants: BMW, General Motors, Remotive Labs, Forvia, Harman, Mavi.io, GrapeUp, Elektrobit, Bosch, COVESA, Tietoevery, LTTS
- Face to Face Meeting at 10 October 2023 in Troy, MI
 - [Can you attend?](#) [Please let us know here](#)
- CES Event planning
- Communication channel: Slack does not seem to work for everyone
 - Do we have counterproposals?
- Involvement GrapeUp in camera stream
- Feedback camera proposal
- Defining next steps camera proposal
 - Deliverable: Reference implementation published by COVESA; POC with 3rd Parties; testing capabilities for camera implementation via emulator (GrapeUp + Harman)
 - ToDo: Clarifying timeline for OEMs having this implemented
 - Timeline deliverable

24th July 2023 - Meeting Agenda

- Participants: Cariad, Ford, General Motors, Volvo, BMW, Faurecia, Harman, Snapp, Remotive Labs, Intellias, GrapeUp, Elektrobit, Jimmy Technologies, Bosch, COVESA, KPIT, Tietoevery, Geotab, Mavi.io
- Emulator presentation (Snapp, Remotive Labs, Volvo)
 - Slides from Snapp



COVESA - AAOS emulator.pdf

Slides from RemotiveLabs/ Volvo



Developing with ...th July 2023.pdf

Input Harman would give for emulator topic:

1. System UI RROs and Settings Manager for System Bars and Navigation Bars. This allows, with one emulator, to simulate various OEM UIs
2. Multidisplay + Cluster Enablement (does not need Emulator downgrade to < 30.8.4.0)
3. Camera Enablement
4. Enablement for VIM3 HW
5. Various fixes (most backported from S, T or U)
6. Automotive Video Library integration
7. Unbundled Apps + Fixes
8. Car Companion Device + Phone Companion App (BLE passthrough needs special hw)

Next steps:

@Melina Mascolo (BMW): Setting up Slack Channel for Emulator: <https://covesacommunity.slack.com/archives/C05JJNGSUH2>

@Snapp/Harman/Volvo/RemotiveLabs: To align on next steps

- Status quo camera API
Checked by Harman, BMW, Faurecia,
Still need to be checked by: Cariad (31.7.), GM (31.7.), Mercedes, Volvo (after summer)
Next step: Finding 1-2 app developers willing to do POC with this reference implementation
- Push Notifications: Faurecia Aptoide created first overview for possible approaches
Proposal will be shared by Faurecia Aptoide on this Confluence page
To be reviewed August 7th
Mavi.io willing to do an POC with their application for the reference implementation
- Status update license for code and documentation (Apache?)
Works for GM, Cariad, BMW, Snapp
Needs to be checked by: RemotiveLabs/Volvo, Faurecia Aptoide
- Vacation overview tbd.
Which meetings can we keep during summer break
Camille (Faurecia) to share vacation planner via Slack

17th July 2023 - Meeting cancelled

- Meeting cancelled this week due to majority of the participants being OOO
- Presentation of emulators from Snapp & RemotiveLabs will be done on 24th July

10th July 2023 - Virtual Meeting

ToDos are underlined 😊

- Participants: BMW, Cariad, General Motors, Mercedes, Forvia/Faurecia Aptoide, Harman, Snapp, Remotive Labs, Ansys, Intellias, GrapeUp, Bosch, drimaes, Elektrobit, KPIT, COVESA, Tietoevry, L&T Technologies, HAAS, Geotab
- Preferred license: Potentially Apache
@All: 17.7. confirming if this license can be chosen for code and documentation
- @Matthias Ostermeier (Cariad) & Albert Jordan (Harman): 17.7. Feedback if willing to contribute to collection of best practices / developer documentation

Proposal: Starting a collection with learnings of different OEMs / App Store Providers

Longterm having more full-blown developer documentation

- Differences between OEMs that Faurecia Aptoide found next to the ones listed in F2F Meeting: Media Player Integration, Car API, DRM, Toasts / Snackbar Usage

To be revisited after priority list

- Handling of different workstreams:
 - For now aligned within Monday meeting
 - Potentially separate sessions needed where members can loop in their experts
- Stream Owners:
 1. **Cross-OEM Emulator:** Juhani Lehtimäki (Snapp) with support of Emil Dautovic (Remotive Labs)
 - @Juhani Lehtimäki (Snapp) & Emil Dautovic (Remotive Labs): First session on emulator on 17th July
 2. **Camera API:** Manuel Saraiva (BMW)
 - @All: 17.7. Clarifying if reference implementation in PDF document from F2F meeting (22.6.) works across OEMs (https://wiki.covesa.global/download/attachments/64978970/230622_F2F_Meeting_Garching.pdf?version=1&modificationDate=1689063969292&api=v2)
 3. **Push Notifications:** tbd.
 - @José Freitas (Faurecia Aptode): giving overview on 24th July
 - @Melina Mascolo (BMW): Sharing first proposal with José
 4. **Best Practices:** tbd.
- General communication channel for workstreams: Slack
 - Link will be shared with group
- @All: 24.7. Clarifying if attending AMM in Detroit (10.-12.10.) would be possible
 - Idea would be to combine it with longer workshops, e.g. with communication app providers

22 June 2023 - Face to Face Workshop

- [Details](#)
- Consolidated Meeting Notes, participants and presentations (in PDF)



Charter



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