



Introduction to AGL Architecture

AGL Training Class

October 20, 2022

Walt Miner

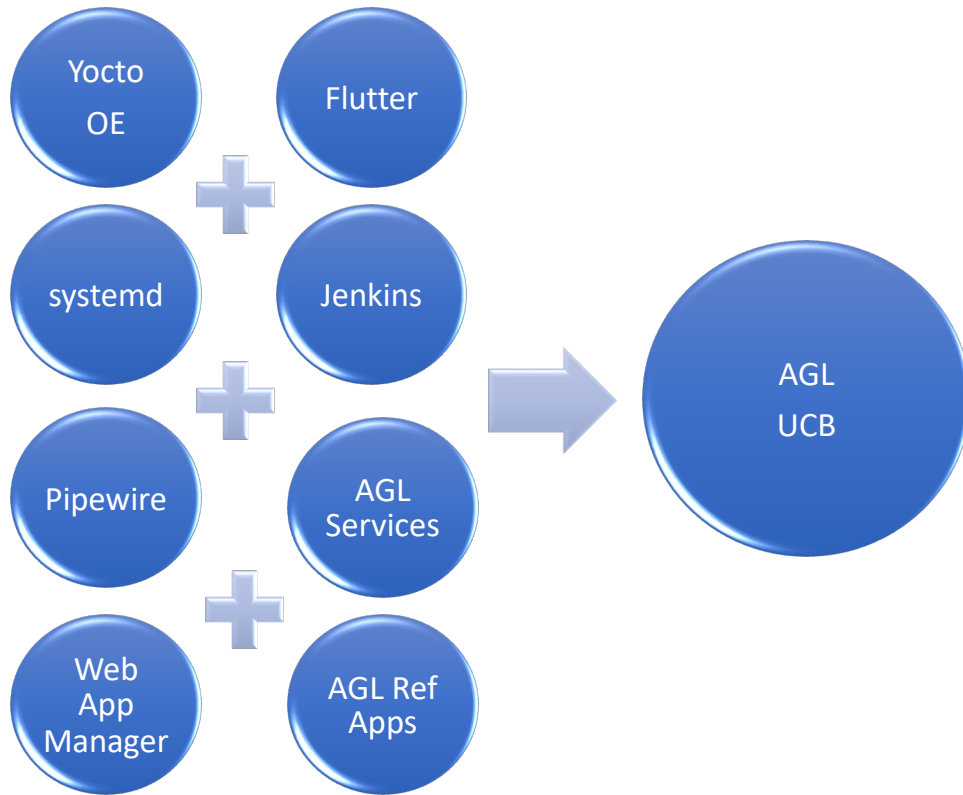
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AGL Community Manager

Intro

- This intended to be a brief intro to the AGL Architecture with links to other resources
- For a general AGL introduction view
<https://www.youtube.com/watch?v=bzAar7PwWOk>
- All of today's training sessions address Needlefish release and later

AGL Distro “Unified Code Base”



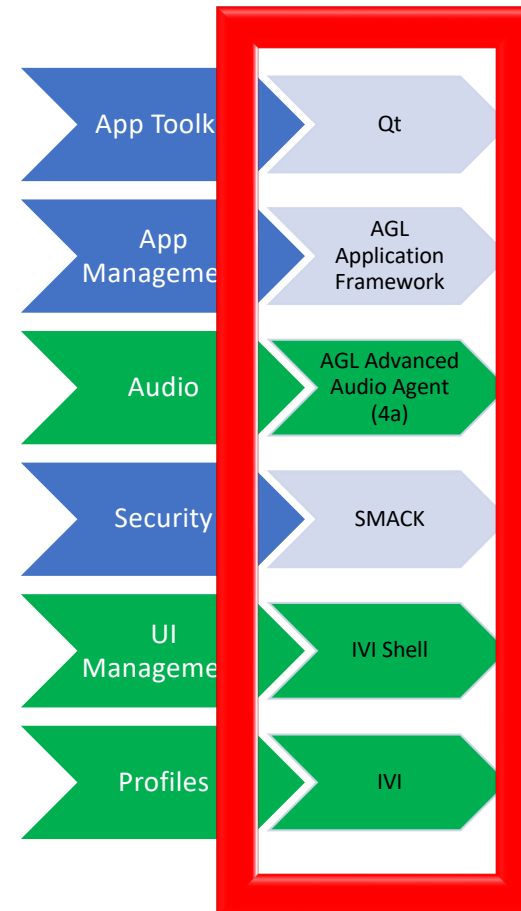
- *Fourteen major releases!*
- *Unifying the best of Open Source into a single code base for the entire industry!*
- *Reduce fragmentation, focus on innovation and new features!*
- *Production ready! Now in Toyota and Subaru vehicles!*

Code First/ Upstream First

- AGL has invested in automotive software components not available anywhere else
- Continually evaluating open source technologies to find best in class for automotive use cases
- AGL has invested (provided developers and upstreamed code) for open source projects such as Pipewire, Yocto, Lava, and others.

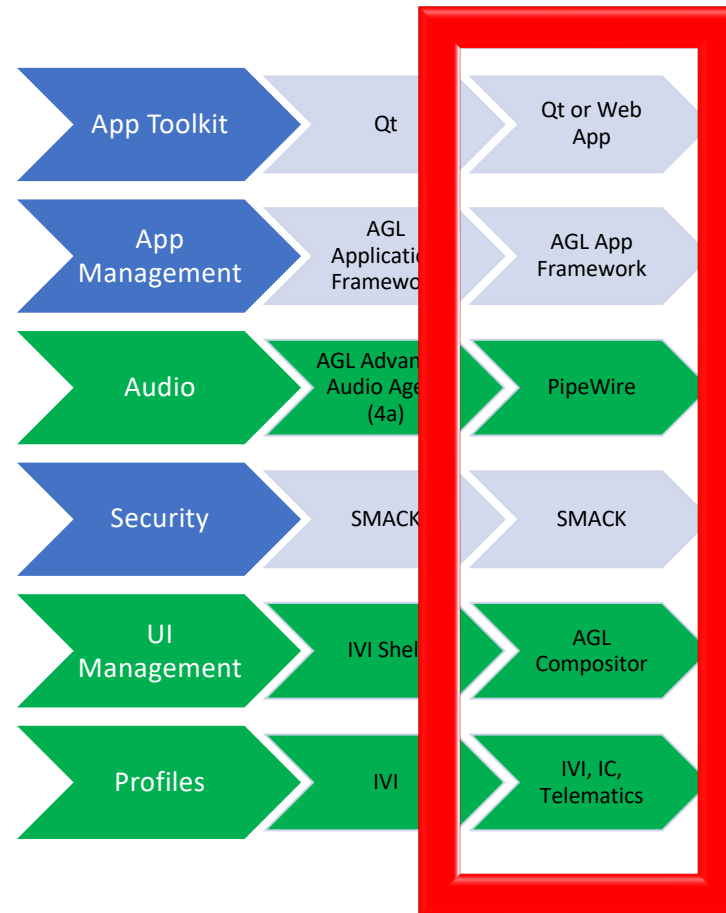
AGL Transformation (Pre-Lamprey)

- Initial releases of AGL UCB included carry-over and improvement of Tizen IVI components



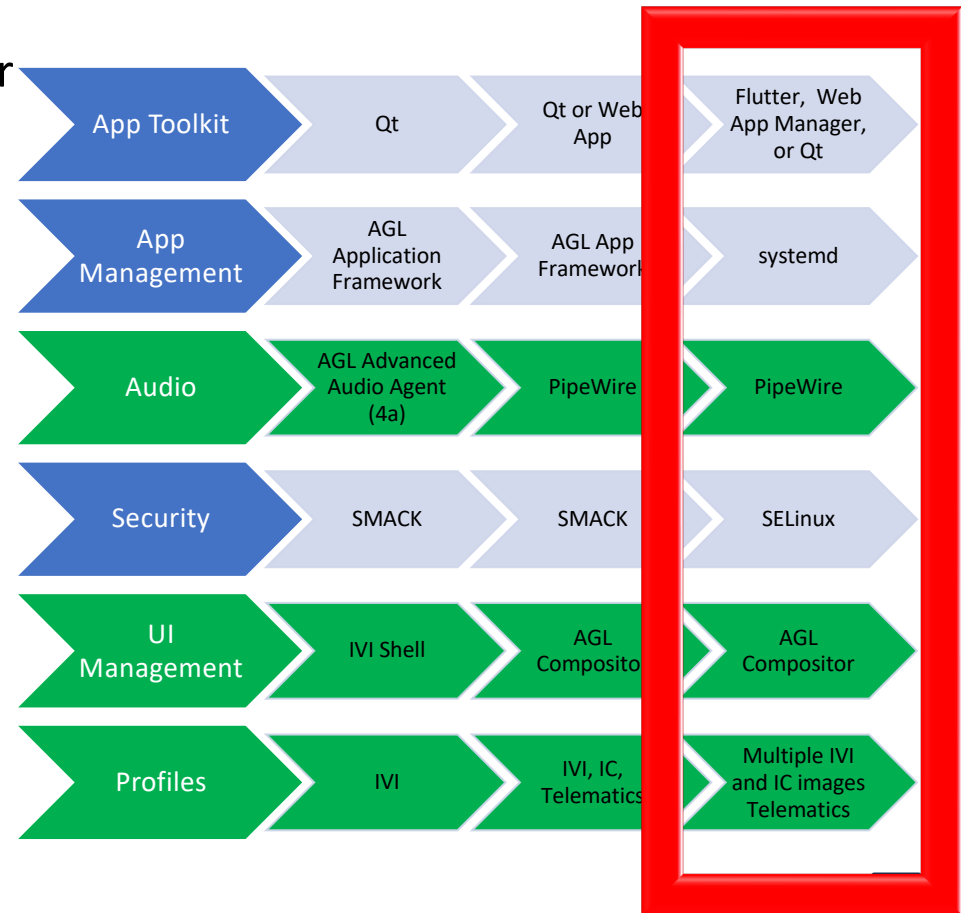
AGL Transformation (Lamprey)

- With Lamprey release we had invested in PipeWire, Wire Plumber, AGL Compositor, and Web App Manager and more.
- 2022 sees us transitioning AGL Reference Apps and Service Binders to newer technologies
- Lamprey final release with Legacy AGL App Framework support
- YP 3.1.x LTS updates to continue until 2024



AGL Transformation (Needlefish)

- Replace Qt reference Apps with Flutter and Web Apps
- Replaced Vehicle Signal Manager with kuksa.val
- YP 4.0.x (kirkstone) LTS updates to continue until 2024
- Use Systemd units for app management



AGL App FW

Feature	Lamprey	Needlefish	Pike
App Start/Stop	App Framework Main	Applaunchd	Applaunchd
LSM	SMACK	SELinux	SELinux
Sandboxing	SMACK based	N/A	To be added
Packaging	W3C Widgets	N/A	TBD
IPC	Websockets	Not standardized	gRPC

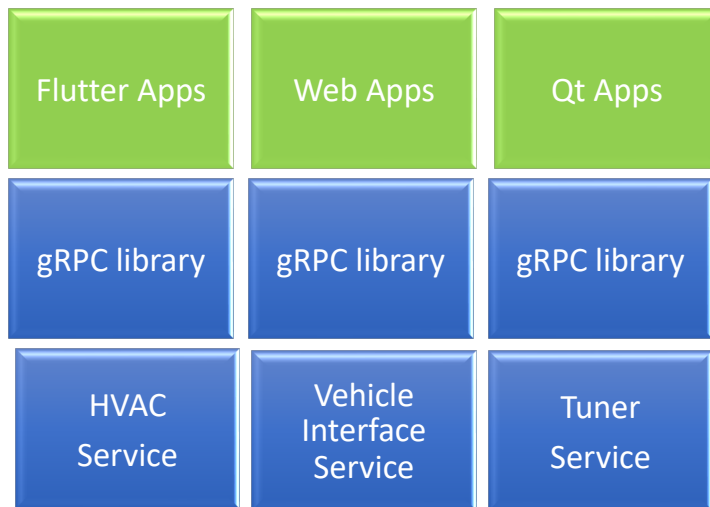
- Applaunchd uses systemd units. Less maintenance, more future proof.
- SELinux in permissive mode

Packaging/ Sandboxing

- W3C deprecated widget support so that was not really an option anymore
- Studied flatpack
 - In theory meets most of our requirements
 - Extensive, custom runtime support would be required for AGL
- We do not have resources to build a new custom runtime for packaging without an OEM/ Tier One giving preference and committing to it long-term (i.e. providing resources and support)

IPC

- Standardizing IPC to gRPC and protobufs across UCB
- Replace legacy web socket based AGL service binders with gRPC API



- Easier to add future toolkits.
- No custom code to be maintained per toolkit.

- Standard methodology to add new services

SELinux

- UCB runs SELinux in permissive mode
- Need donation or developer to work on rules for non-permissive SELinux

AGL Compositor

- Invested in creating a Wayland AGL Compositor to replace Qt Compositor used in older versions of the UCB
- See
 - <https://www.collabora.com/news-and-blog/news-and-events/a-libweston-based-compositor-for-automotive-grade-linux.html>
- IVI Shell still being used. Need to explore how to augment the compositor in 2023 to cover these use cases

AGL Audio

- Significant investment in Pipewire and Wireplumber for audio routing, management and policies
- For Pipewire see
 - https://wiki.automotivelinux.org/_media/agl-distro/tokyo-als-pipewire-july-2019.pdf
 - <https://www.youtube.com/watch?v=TWvketpgpec>
- WirePlumber
 - <https://www.collabora.com/news-and-blog/blog/2020/05/07/wireplumber-the-pipewire-session-manager/>

AGL CI

- AGL uses Jenkins and Lava to drive our CI
- See
 - <https://www.youtube.com/watch?v=Q-wxPRYS>

Ask Questions

- Weekly Developer Call on Tuesdays

<https://wiki.automotivelinux.org/dev-call-info>

- IRC channel #automotive on libera.chat

Discussion about open source software for vehicles. No help for mechanical issues should be accepted from anyone on this channel.

- Dev Community Mail List

<https://lists.automotivelinux.org/g/agl-dev-community>

THANK YOU
