



Power Your Car with Automotive Grade Linux

Automotive Linux Summit 2017

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Community Manager, [AGL](#), [The Linux Foundation](#)

What is AGL?

- Non-profit
- Open source Linux-based collaborative project
- Hosted at Linux Foundation
- Focused on rapid innovation of vehicle software

Automotive Grade Linux

Collaborating to build the car of the future through rapid innovation

[*http://AutomotiveLinux.org*](http://AutomotiveLinux.org)

Goals of AGL

- Build a single software platform for the entire industry
- Develop 70-80% of the starting point for a production project
- Reduce fragmentation by combining the best of open source
- Create an ecosystem of developers, suppliers, expertise all using a single platform

AGL Charter and Scope

AGL is the only organization planning to address all of the software in the vehicle

Infotainment

Instrument Cluster

Heads-Up-Display

Telematics / Connected Car

Advanced Driver Assistance Systems

Functional Safety

Autonomous Driving

AGL Growth

AGL now has 98 members!

10 OEMs are members of AGL

Over 60% growth in 2016

760+ developers on AGL mailing list



Total of 10 OEMs supporting AGL!



AGL Members - Total of 98 companies!

Platinum



Gold



Silver



Bronze



AGL is CODE FIRST

***AGL is a “Code First” organization!
Specifications lead to fragmentation!***

Top 25 Git Committers in 2017

Commits	Name	Company
577	Romain Forlot	IoT.bzh
250	Jose Bollo	IoT.bzh
127	Ronan Le Martret	IoT.bzh
79	Jan-Simon Moeller	Linux Foundation
43	Matt Ranostay	Konsulko
32	Stephane Desneux	IoT.bzh
30	Jens Bocklage	Mentor Graphics
30	Petteri Aimonen	Individual
30	Loic Collignon	IoT.bzh
25	Karthik Ramanan	TI
21	Anton Gerasimov	Advanced Telematics Systems
20	Martin Kelly	Xevo

Commits	Name	Company
18	Sebastien Douheret	IoT.bzh
16	Matt Porter	Konsulko
16	Scott Murray	Konsulko
7	Kotaro Hashimoto	Mitsubishi Electric
7	Naoto Yamaguchi	AisinAW
6	Marcus Fritzsch	Mentor Graphics
6	Milan Srdinko	ALPS
5	tte_zheng_wenlong	Toyota
4	Harunobu Kurokawa	Renesas
4	Philippe Coval	Samsung
4	Yuichi Kusakabe	Fujitsu-Ten
3	Multiple	

1394 Total Commits
45 Committers
21 Companies

- 01 Jan 2017 – 26 May 2017
- Commits to master

Commits by Company in 2017

Company	Commits
IoT.bzh	1039
Linux Foundation	79
Konsulko	77
Individual	38
Mentor Graphics	36
TI	25
Advanced Telematics Systems	21
Xevo	20
AisinAW	7
ALPS	7
Mitsubishi Electric	7
Renesas	7

1394 Total Commits
45 Committers
21 Companies

Company	Commits
Toyota	5
Fujitsu-Ten	4
Intel	4
Samsung	4
ADIT	3
Panasonic	3
Qt Company	3
Microchip	2
Trust Point Innovation	2
LG	1

- 01 Jan 2017 – 26 May 2017
- Commits to master

Other Numbers

- On pace to double last year (1791 commits)
- 19 new committers in 2017
- 64 unique individuals and 27 unique companies have contributed to AGL since the start of the project
- 7 individuals not affiliated with a member company have contributed
- 240 Jira issues closed since start of 2017

Vision for 2017

- Daring Dab July 2017
- Electric Eel Planned for CES 2018
- AGL App Framework Complete
- AGL Reference Apps available for both Qt5 and HTML5
- All APIs available as App FW Service Binders
- IC, Telematics and other profiles
- Complete set of documentation
- Daily, Weekly, and Event based board testing
- Published Test Results

Thanks for all the fish...

- AGL Releases:

AA – Agile Albacore – Jan 2016



BB – Brilliant Blowfish – July 2016



CC – Charming Chinook – Dec 2016



DD – Daring Dab – July 2017

EE – Electric Eel – Dec 2017

FF – Funky Flounder – July 2018



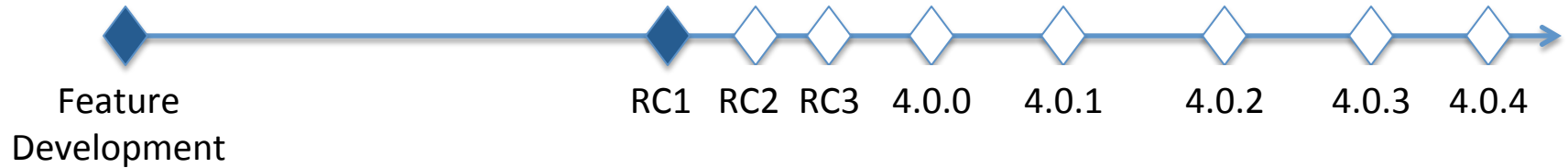
2017 AGL Schedule



Charming Chinook



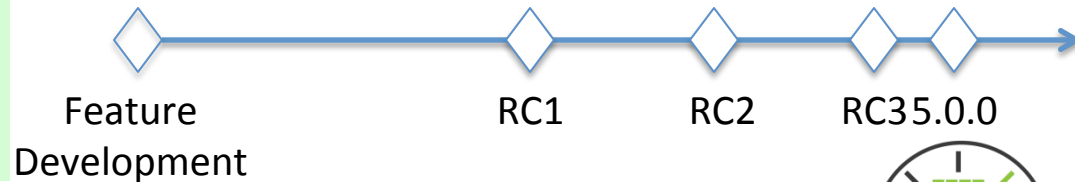
Daring Dab



See

https://wiki.automotivelinux.org/schedule#latest_schedule for latest schedule information

Electric Eel



CHARMING CHINOOK

Charming Chinook



- Released January 6
- Patch Releases
 - 3.0.1 – 30 Jan 2017
 - 3.0.2 – 08 Mar 2017
 - 3.0.3 – 29 Apr 2017
 - 3.0.4 – Planned for 14 Jun 2017
 - Yocto Update to 2.1.3
 - ALS App changes
 - 3.0.5 – Planned for 16 Aug 2017
 - Probable end of life

Charming Chinook

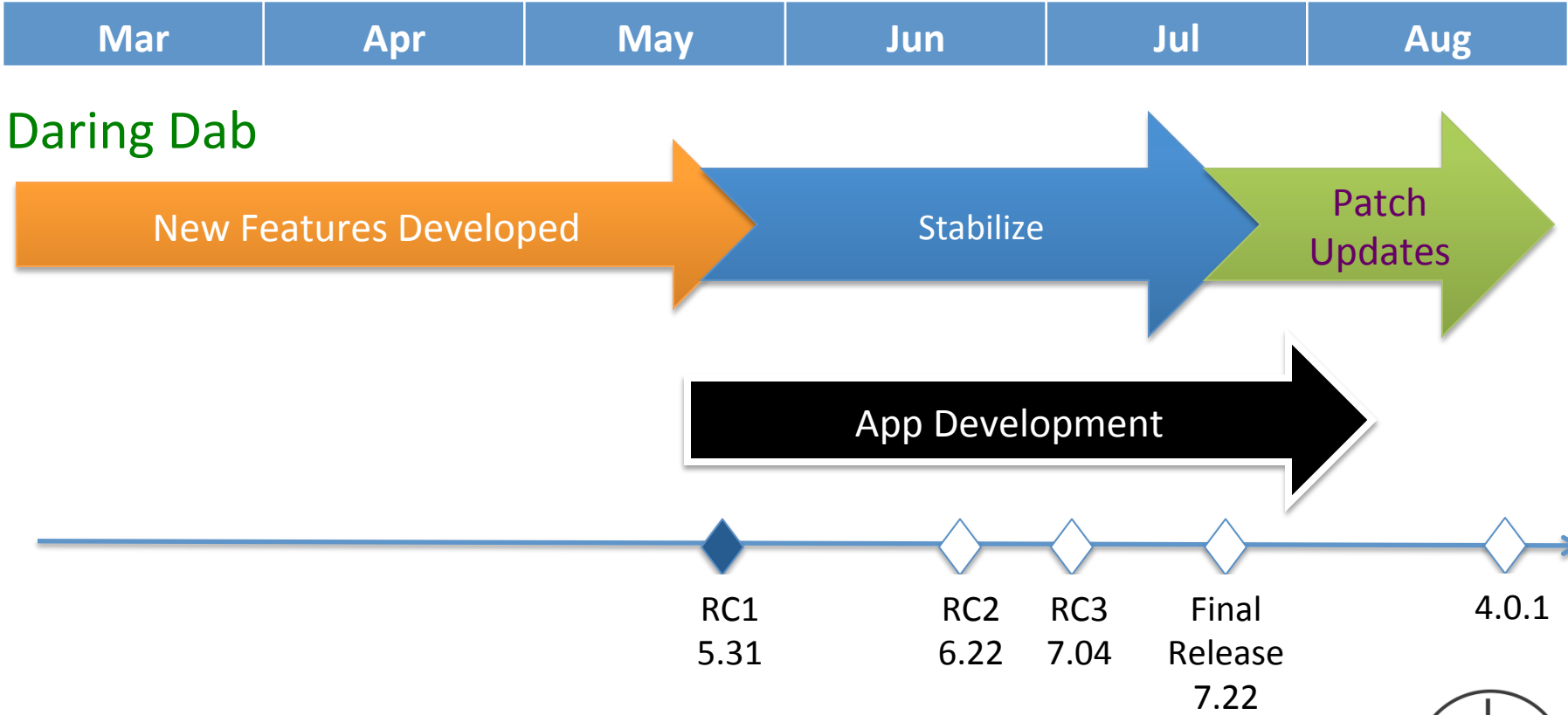


- Release notes, binary downloads, source code and more at

<https://wiki.automotivelinux.org/agl-distro/release-notes>

DARING DAB

Daring Dab



Daring Dab



- Updated to Yocto 2.2 (morty)
 - Pulls in updated kernel and user space packages
 - Improved tooling
- App Framework Improvements
 - CC Lessons Learned
 - App Templates
 - Security updates
 - App Installation and First-time Startup
- SOTA Updates

Daring Dab



- App FW Service Binders
- API V2
 - Stub generation from OpenAPI JSON
 - Permission integration through OpenAPI
 - Monitoring
- System-D
 - Private user-ID
 - Smack label
 - Cgroups

Daring Dab



- SDK Improvements
 - Docker image to eliminate host dependency issues
 - Available for reference boards with published images that include graphics drivers
 - Enables rapid AGL application development
Support for Qt (HTML5 planned!)
 - No Yocto knowledge is needed or assumed for SDK users

Daring Dab



- Secure signaling and notifications to and from vehicle buses
 - Optimized usage of CAN sockets
 - Migrated to BCM sockets
 - Map logical CAN bus names from CAN databases to physical can as present on hardware.

Daring Dab



- Available App FW Service Binders
 - Audio Manager
 - Bluetooth
 - Tuner
 - CAN signaling
 - Media Scanner

Daring Dab



- Apps
 - App business logic separated from API
 - Templates created to ease new App development
 - Homescreen improvements
 - CAN Test App – New
 - Phone App works with Bluetooth HFP
 - Media Player
 - Bluetooth A2DP and AVRCP
 - USB and SD card detection

Daring Dab



- BSPs - Default tunings per architecture (e.g., Intel, ARM 32 and ARM 64)

Daring Dab Board Support

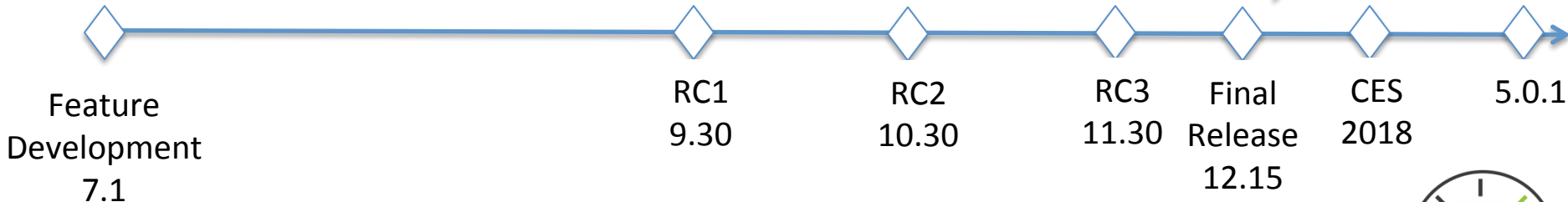
- Reference BSPs – Fully supported by manufacturer, CI, etc.
 - ✓ Renesas R-Car 3 – M3 board (ARM 64)
 - ✓ Renesas R-Car 2 - Porter board (ARM 32)
 - ✓ Intel - Minnowboard Turbot and Joule (Intel 64 bit)
 - ✓ TI - Jacinto 6 - Vayu board (ARM 32)
 - ✓ QEMU (Intel 64 bit)
- Community BSP – Best effort by AGL community
 - ✓ Raspberry Pi 2/3 (ARM 32 bit)
 - ✓ NXP – i.MX6 – SABRE (ARM 32 bit)
 - ✓ QCOM – Dragonboard 410-c (ARM 64 bit)
 - ✓ Qualcomm Snapdragon 820 (ARM 64 bit)
 - ✓ TI BeagleBone Black (ARM 32 bit medium profile)

ELECTRIC EEL

Electric Eel



Electric Eel



Electric Eel

- Yocto 2.3 – Pyro branch
- Rework Yocto Layers for headless devices
- Window Manager and Graphics Architecture
- Home Screen as an app
- Audio Manager architecture
- Additional Service Binders
 - Telephony
- CI and Automated Test Improvements
 - Fuego and Lava integration
 - “Lab in a box”
- CES 2018 Demo apps

MORE INFORMATION

AGL Documentation

- Getting Started

<https://wiki.automotivelinux.org/start/getting-started>

- AGL documentation site

<http://docs.automotivelinux.org/>

- AGL Wiki

<https://wiki.automotivelinux.org/>

- AGL Jira

<https://jira.automotivelinux.org/>

2017 F2F Workshops

- Feb 8 -10 – AGL AMM - Tokyo
- Apr 4 – 5 – Microchip - Karlsruhe, Germany
- May 31 – ALS Tokyo Japan
- July 11 – 12 – Bay Area, California
- October - Fall AMM - Germany
- Nov 15-16 – CES Integration Session – Japan TBA
- Dec 13-14 – CES Integration Session - Japan TBA



Q & A

Q & A

- This is the segment where
 - You ask intelligent, well thought out questions
 - I ramble pointlessly and unintelligently
- And/Or
 - You ask “dumb” questions
 - I respond with concise, insightful, and well-reasoned answers



THANK YOU