

Use Regression Testing to Make AGL Better

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- Li Xiaoming(lixm.fnst@cn.fujitsu.com)
- Work for FNST's AGL Team (2018 ~)

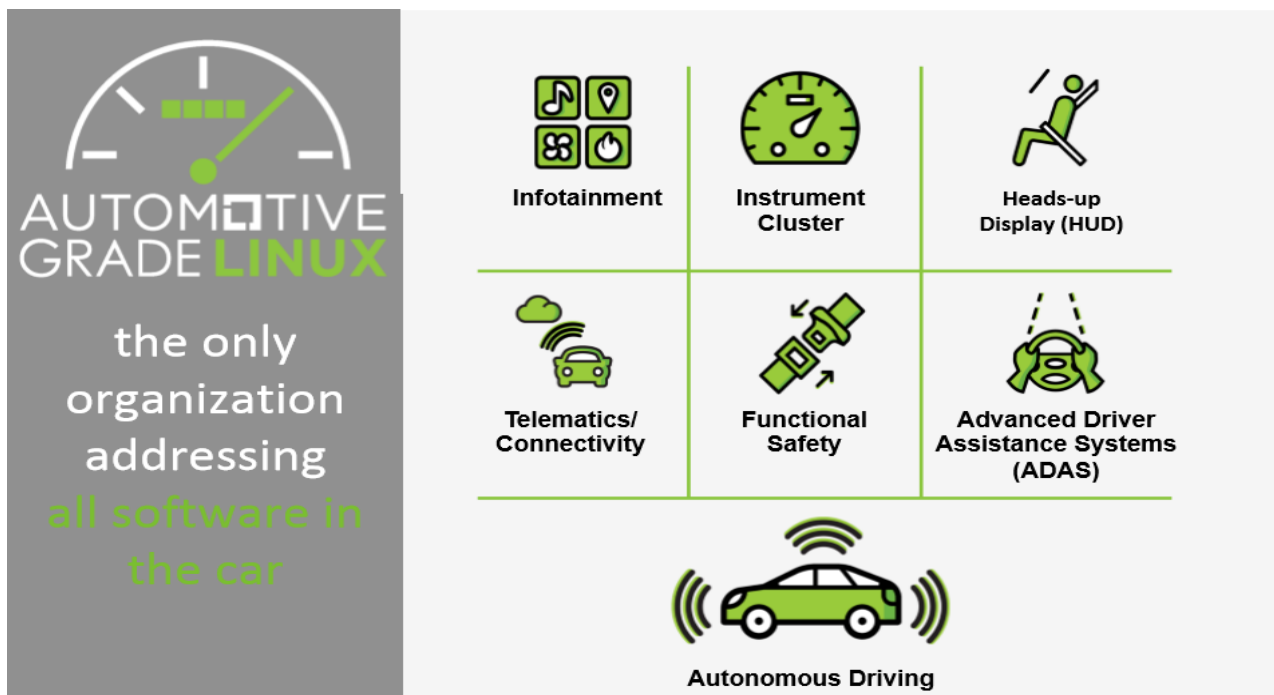
Table of Contents

- What is AGL?
- What to test?
- How to test APPs?
- What to do next ?
- What you can do ?

What is AGL ?

➤ What is AGL #1

- Embedded Linux OS
- Mainly aimed at auto industry
- bla,bla...



What to test ?

➤ Boot

- USB stick or emmc
- Network filesystem, e.g. NBD

➤ Build

- Using Yocto

➤ AGL Documentation

- <https://docs.automotivelinux.org/>

- AGL API(part)
 - AGL official use LAVA
 - We use Fuego to avoid booting process

- Demo Applications(part):
 - Homescreen
 - Mediaplayer
 - Navigation
 - WiFi
 - Bluetooth
 - ...

➤ Issues of high incidence (part):

- AGL can not boot in some board
e.g. <https://jira.automotivelinux.org/browse/SPEC-2552>
- Homescreen/toparea not shown
e.g. <https://jira.automotivelinux.org/browse/SPEC-1199>
- Bluetooth work unstable
e.g. <https://jira.automotivelinux.org/browse/SPEC-2290>
- some APP cat not startup
e.g. <https://jira.automotivelinux.org/browse/SPEC-2199>

How to test APPs ?

- Test period:
 - Every AGL release

- Selected target boards :
 - Renesas R-Car M3
 - Raspberry Pi 3 Model B/B+
 - Intel UP Squared
 - DragonBoard 410c
 - ...

➤ Test Case Design:

- In a QA's perspective
- Divide into atomic process
- Cover most functions
- Master target hardware details
- Familiar with latest AGL release notes

- Annoying hardware diff between boards
- Different board have different hardware configurations, different versions of same model usually does

e.g.

Kingfisher m06:include radio

Kingfisher s03:no radio

Raspberry Pi 3 B+: support 5GHz and 2.4GHz AP

Raspberry Pi 3 B: only support 2.4GHz AP

➤ E.G. WiFi test in RPI3B :

- It is not just a “input password & connect” thing
- We have to consider a lot more...

➤ E.G. WiFi test in RPI3B :

- AP:

 - Android, IOS, 2.4GHz Router, 5Ghz Router

- Encrypt algorithms :

 - WEP, WPA-PSK, WPA-AES, WPA2-PSK, WPA2-AES

- Save password or not ?

- SSID list orderly ?

- Connection stability ?

- WiFi strength refresh?

- Board: 3B don't support 5GHz, 3B+ do

- ...

➤ E.G. WiFi test in RPI3B :

- To cover all the conditions, we write more and more case:

Guppy RC4: 2

Guppy 7.0.1: 34

Hallibut RC1(latest):159

Next: Keep growing

➤ e.g. WiFi test in RPI3B :

Test Case	WiFi			Expected Result	Actual Result/Remark	Judgement	Test Method
	Pre-condition	Dependencies	Test Steps				
WiFi Startup	1.startup SETTINGS	N/A	1.click icon to startup	1.display WiFi UI		PASS	Manual
WiFi close	1.startup WiFi	N/A	1.click "X" icon beside WiFi	1.switch to SETTINGS UI		PASS	Manual
WiFi enable in SETTINGS	1.startup SETTINGS	1.WiFi works	1.drag "WiFi" bar to enable WiFi	1."WiFi" bar get bright		PASS	Manual
WiFi disable in SETTINGS	1.startup SETTINGS	1.WiFi works	1.drag "WiFi" bar to disable	1."WiFi" bar get grey		PASS	Manual
WiFi enable in WiFi	1.startup SETTINGS	1.WiFi works	1.drag "WiFi" bar to enable WiFi	1."WiFi" bar get bright		PASS	Manual
WiFi disable in WiFi	1.startup SETTINGS	1.WiFi works	1.drag "WiFi" bar to disable	1."WiFi" bar get grey		PASS	Manual
WiFi signal search - Android Hot Point	1.startup WiFi setting in	1.WiFi works	1.re-search WiFi signals/drag	1.test signal displayed in		PASS	Manual
WiFi signal search - IOS Hot Point	1.startup WiFi setting in	1.WiFi works	1.re-search WiFi signals/drag	1.test signal displayed in		PASS	Manual
WiFi signal search - 2.4GHz Wireless Router	1.startup WiFi setting in	1.WiFi works	1.re-search WiFi signals/drag	1.test signal displayed in		PASS	Manual
WiFi signal search - 5GHz Wireless Router	1.startup WiFi setting in	1.WiFi works	1.re-search WiFi signals/drag	1.test signal displayed in		PASS	Manual
WiFi signal list scroll	1.startup WiFi setting in	1.WiFi works	1.scroll WiFi list	1.WiFi list scroll		PASS	Manual
WiFi connect Unencrypted android hot point	1.startup WiFi setting in	1.WiFi works	1.click test WiFi signal	1."Forget Network"		PASS	Manual
WiFi disconnect Unencrypted android hot point	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi disconnect		PASS	Manual
WiFi re-connected password-saved Unencrypted android hot point	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi connected to test		PASS	Manual
WiFi connect right password android hot point	1.startup WiFi setting in	1.WiFi works	1.click test WiFi signal	1."Forget Network"		PASS	Manual
WiFi disconnect android hot point	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi disconnect		PASS	Manual
WiFi re-connected password-saved android hot point	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi connected to test		PASS	Manual
WiFi connect wrong password android hot point	1.startup WiFi setting in	1.WiFi works	1.click test WiFi signal	1.connect fail		PASS	Manual
WiFi connect Unencrypted ios hot point	1.startup WiFi setting in	1.WiFi works	1.click test WiFi signal	1."Forget Network"		PASS	Manual
WiFi disconnect Unencrypted ios hot point	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi disconnect		PASS	Manual
WiFi re-connected password-saved Unencrypted ios hot point	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi connected to test		PASS	Manual
WiFi connect right password ios hot point	1.startup WiFi setting in	1.WiFi works	1.click test WiFi signal	1."Forget Network"		PASS	Manual
WiFi disconnect right password ios hot point	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi disconnect		PASS	Manual
WiFi re-connected password-saved right password ios hot point	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi connected to test		PASS	Manual
WiFi connect wrong password ios hot point	1.startup WiFi setting in	1.WiFi works	1.click test WiFi signal	1.connect fail		PASS	Manual
WiFi connect Unencrypted 2.4GHz Wireless Router	1.startup WiFi setting in	1.WiFi works	1.click test WiFi signal	1."re-connected password-		PASS	Manual
WiFi disconnect Unencrypted 2.4GHz Wireless Router	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi disconnect		PASS	Manual
WiFi re-connected password-saved Unencrypted 2.4GHz Wireless Router	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi connected to test		PASS	Manual
WiFi connect right password 2.4GHz Wireless Router_WEP-Shared_key	1.startup WiFi setting in	1.WiFi works	1.click test WiFi signal	1."Forget Network"		PASS	Manual
WiFi disconnect 2.4GHz Wireless Router_WEP-Shared_key-HEX-64bit	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi disconnect		PASS	Manual
WiFi re-connected password-saved 2.4GHz Wireless Router_WEP-	1.startup WiFi setting in	1.WiFi works	1.click blank area in test WiFi	1.wifi connected to test		PASS	Manual

- Shared in github: <https://github.com/LiXiaoming-FNST/AGL-REGRESSION-TEST-TEMPLATE>

What to do next ?

- What to do with a failed case (Easy mode)?
 - Check similar issue in AGL jira list and report if none
<https://jira.automotivelinux.org>
 - Contact AGL mail list
automotive-discussions@lists.linuxfoundation.org
 - Refer AGL docs and Google to confirm

➤ What to do with a failed case (Hack mode)?

- Created a jira:

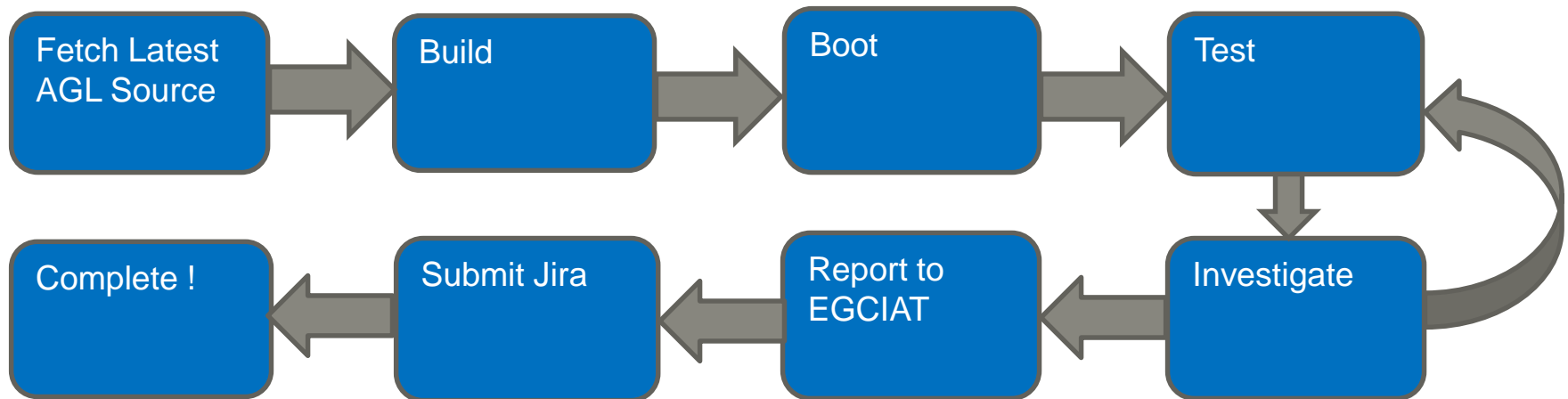
<https://jira.automotivelinux.org>

- Push a fix:

<https://gerrit.automotivelinux.org>

Add jira spec no in the commit-msg

➤ Workflow:



➤ Our contribution:

	Patch	Jira
• long long ago ~ 2018	2	0
<u><i>Dec 2018, FNST started Regression Testing ...</i></u>		
• 2019 ~ Now	14	50

https://jira.automotivelinux.org/issues/?filter=-2

Jira Software

Reported by me

reporter = currentUser() order by created DESC

1-42 of 42

Key	Summary	Assignee	Reporter	P	Status	Resolution	Created	Updated	Due	Develop
SPEC-2553	halibut 7.99.1 dragonboard 410c not work with touchscreen and mouse	Jan-Simon Moeller	Li Xiaoming	OPEN	Unresolved	21/Jun/19	27/Jun/19			
SPEC-2552	halibut 7.99.1 intel up2 boot fail	Jan-Simon Moeller	Li Xiaoming	OPEN	Unresolved	21/Jun/19	01/Jul/19			
SPEC-2551	Mediaplayer BT play function not work	Matt Ranostay	Li Xiaoming	OPEN	Unresolved	21/Jun/19	25/Jun/19			
SPEC-2547	Homescreen toparea WiFi status icon not work	raquel medina	Li Xiaoming	OPEN	Unresolved	21/Jun/19	28/Jun/19			
SPEC-2545	Download: can not display full file name	Ryan Day	Li Xiaoming	OPEN	Unresolved	21/Jun/19	27/Jun/19			
SPEC-2531	helloworld-service:Remove redundant autobuild script	Stéphane Desneux	Li Xiaoming	RESOLVED	Fixed	14/Jun/19	27/Jun/19			
SPEC-2522	meta-agl: 7.99.1 tag to a wrong commit	Jan-Simon Moeller	Li Xiaoming	RESOLVED	Fixed	13/Jun/19	19/Jun/19			
SPEC-2503	Docs: Fix signal composer app path	Li Xiaoming	Li Xiaoming	CLOSED	Fixed	10/Jun/19	14/Jun/19			
SPEC-2501	Docs: Fix Signal Composer typo	Li Xiaoming	Li Xiaoming	CLOSED	Fixed	08/Jun/19	14/Jun/19			

What you can do ?

➤ Q: I am interested in AGL. But I am a new guy.
Can I do anything?

➤ A: Sure.

A: Top 3 advices:

A: Use AGL!

A: Use AGL!

A: Use AGL!

➤ The serious version:

- Download a image

<https://download.automotivelinux.org/AGL/>

- Boot with QEMU(or Raspberry Pi)

Why these two targets?

- Experience the APPs

- Any complaint is welcome!

Mail-list, jira, IRC

➤ Q: I mean, I want to add some code to AGL ?

➤ A: Ennn, it maybe something different.

➤ A: The common procedures include: download source, set cross-build enviroment, deploy&debug, create a jira, patch in gerrit ...

A: There are still some easy ways to start.

➤ Easy Way I:

- Update outdated documents.
- E.G. <https://gerrit.automotivelinux.org/gerrit/c/apps/agl-service-signal-composer/+/21561>

The screenshot shows a web browser displaying a Gerrit code review page. The address bar contains the URL <https://gerrit.automotivelinux.org/gerrit/c/apps/agl-service-signal-composer/+/21561>. The page header includes navigation links for 'Gerrit', 'CHANGES', 'YOUR', 'DOCUMENTATION', 'BROWSE', and 'PROJECTS', along with a search bar. The main content area shows a review titled '21561: Fix signal composer app path.' with a 'Merged' status. The review details include: Updated: Jun 12; Owner: Li Xiaoming; Assignee: Set assignee...; Reviewers: Jan-Simon Moeller, José Bollo, Jenkins Job builder account, Romain Forlot; Repo: [apps/agl-service-signal-composer](#); Branch: [master](#); Parent: [5dc7c72](#); Topic: No topic. A 'REPLY' button is visible, and the review content states 'Fix signal composer app path.' with a reference to 'Bug-AGL : [SPEC-2503](#)'. The change ID is 'Ie059134c89b88b2fd7f45ae6c59a66ad602ddbdc' and the signed-off-by is 'Li Xiaoming <lixm.fnst@cn.fujitsu.com>'.

➤ Easy Way II:

- Remove build error and warning.
- e.g. <https://gerrit.automotivelinux.org/gerrit/c/apps/agl-service-steering-wheel/+21340>

The screenshot shows a web browser displaying a Gerrit code review page. The address bar shows the URL: <https://gerrit.automotivelinux.org/gerrit/c/apps/agl-service-steering-wheel/+21340>. The page header includes the Gerrit logo and navigation menus for CHANGES, YOUR, DOCUMENTATION, BROWSE, and PROJECTS. The main content area shows a review for change 21340, titled "21340: Fix build warning of typecast". The review is marked as "Merged" and has a commit hash of 932a226. The review details include: Updated: Jun 12; Owner: Li Xiaoming; Uploader: Jan-Simon Moeller; Committer: Jan-Simon Moeller; Assignee: Set assignee...; Reviewers: Jan-Simon Moeller, yuichi kusakabe, José Bollo, Zheng Wenlong, and Jenkins Job builder account. A blue "REPLY" button is visible. The review content includes the text: "Fix build warning of typecast" and a code snippet:

```
struct stat stbuf.st_size is off_t{aka long int},  
but malloc and free need size_t{aka long unsigned int}.
```

 The review also references a bug: "Bug-AGL: [SPEC-2422](#)". The Change-Id is I93fe49004133cd979fe24001d029a56c2660a62b and the Signed-off-by is Li Xiaoming <lixm.fnst@cn.fujitsu.com>. There is an "ADD REVIEWER" link at the bottom.


➤ Future plan:

- Automated more cases (E.G. WiFi, BT, some APIs)
- Cover more functions and apps
- Cover more targets (E.G. QEMU)

Questions?

Thank you!

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