Use Regression Testing to Make AGL Better

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Li Xiaoming
Nanjing Fujitsu Nanda Software Technology Co., Ltd (FNST)
Self Introduction

- Li Xiaoming([lixm.fnst@cn.fujitsu.com](mailto:lixm.fnst@cn.fujitsu.com))

- Work for FNST’s AGL Team (2018 ~ )
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What is AGL?
What is AGL #1

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

AUTOMOTIVE GRADE LINUX

the only organization addressing all software in the car

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<td>Functional Safety</td>
<td>Advanced Driver Assistance Systems (ADAS)</td>
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Autonomous Driving
What to test?
What to test? #1

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

- **Build**
  - Using Yocto

- **AGL Documentation**
  - [https://docs.automotivelinux.org/](https://docs.automotivelinux.org/)
What to test? #2

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

- Demo Applications (part):
  - Homescreen
  - Mediaplayer
  - Navigation
  - WiFi
  - Bluetooth
  - …
What to test? #3

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?
How to test APPs #1

- Test period:
  - Every AGL release

- Selected target boards:
  - Renesas R-Car M3
  - Raspberry Pi 3 Model B/B+
  - Intel UP Squared
  - DragonBoard 410c
  - …
How to test APPs #2

Test Case Design:

- In a QA’s perspective
- Divide into atomic process
- Cover most functions
- Master target hardware details
- Familiar with lates AGL release notes
How to test APPs #3

- 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
How to test APPs #4

E.G. WiFi test in RPI3B:

• It is not just a “input password & connect” thing
• We have to consider a lot more…
How to test APPs  #5

- E.G. WiFi test in RPI3B :
  - AP:
    - Android, IOS, 2.4GHz Router, 5Ghz Router
  - Encrypt algroithms:
    - WEP, WPA-PSK, WPA-AES, WPA2-PSK, WPA2-AES
  - Save password or not?
  - SSID list orderly?
  - Connection stably?
  - WiFi strength refresh?
  - Board: 3B don’t support 5GHz, 3B+ do
  - ...

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How to test APPs #6

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
### How to test APPs #7

#### e.g. WiFi test in RPI3B:

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<th>Expected Result</th>
<th>Actual Result/Remark</th>
<th>Judgment</th>
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<td>1 click icon to startup</td>
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<tr>
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<td>WiFi enable in SETTINGS</td>
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<td>1. WiFi works</td>
<td>1 drag “WIFI bar to enable WIFI”</td>
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<td>WiFi connect right password and old hot point</td>
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<td>WiFi connect right password, 2.4GHz Wireless Router, WEP Shared key</td>
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</table>

- Shared in github: [https://github.com/LiXiaoming-FNST/AGL-REGRESSION-TEST-TEMPLATE](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.automotivelsinux.org

- Contact AGL mail list
  automotive-discussions@lists.linuxfoundation.org

- Refer AGL docs and Google to confirm
What to do next  #2

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

  - Created a jira:  
    [https://jira.automotivelinux.org](https://jira.automotivelinux.org)

  - Push a fix:  
    [https://gerrit.automotivelinux.org](https://gerrit.automotivelinux.org)  
    Add jira spec no in the commit-msg
What to do next #3

Workflow:

1. Fetch Latest AGL Source
2. Build
3. Boot
4. Test
5. Investigate
6. Report to EGCIAT
7. Submit Jira
8. Complete!
What to do next #4

Our contribution:

- long long ago ~ 2018
  Dec 2018, FNST started Regression Testing …
- 2019 ~ Now
What you can do?
What you can do #1

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!
What you can do #2

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
What you can do  #3

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.
What you can do #4

Easy Way I:

- Update outdated documents.
What you can do #5

- Easy Way II:
  - Remove build error and warning.
  - e.g. https://gerrit.automotivelinux.org/gerrit/c/apps/agl-service-steering-wheel/+/21340
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!

lixm.fnst@cn.fujitsu.com
shaping tomorrow with you