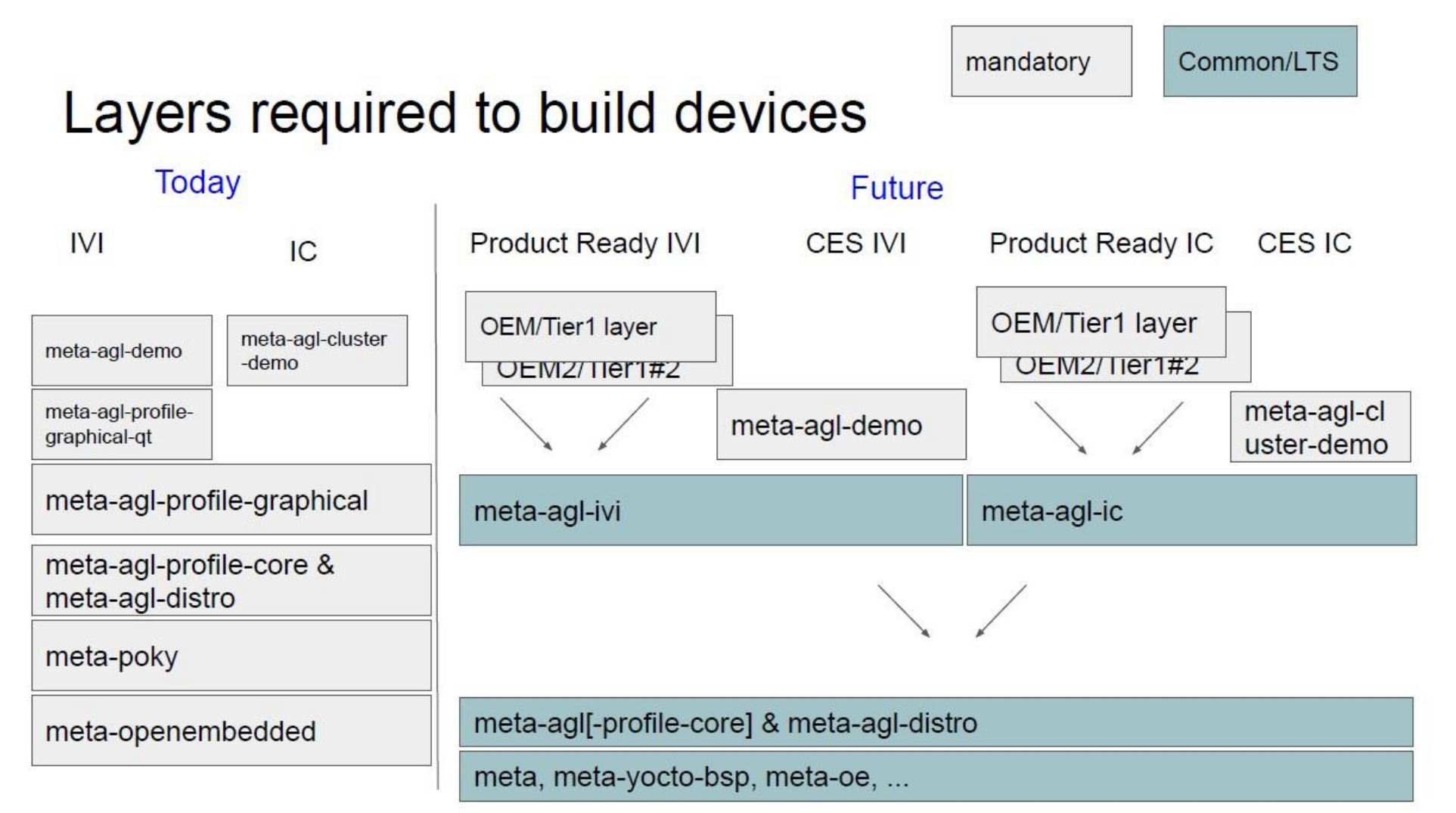
AGL Layer Design - Rethink

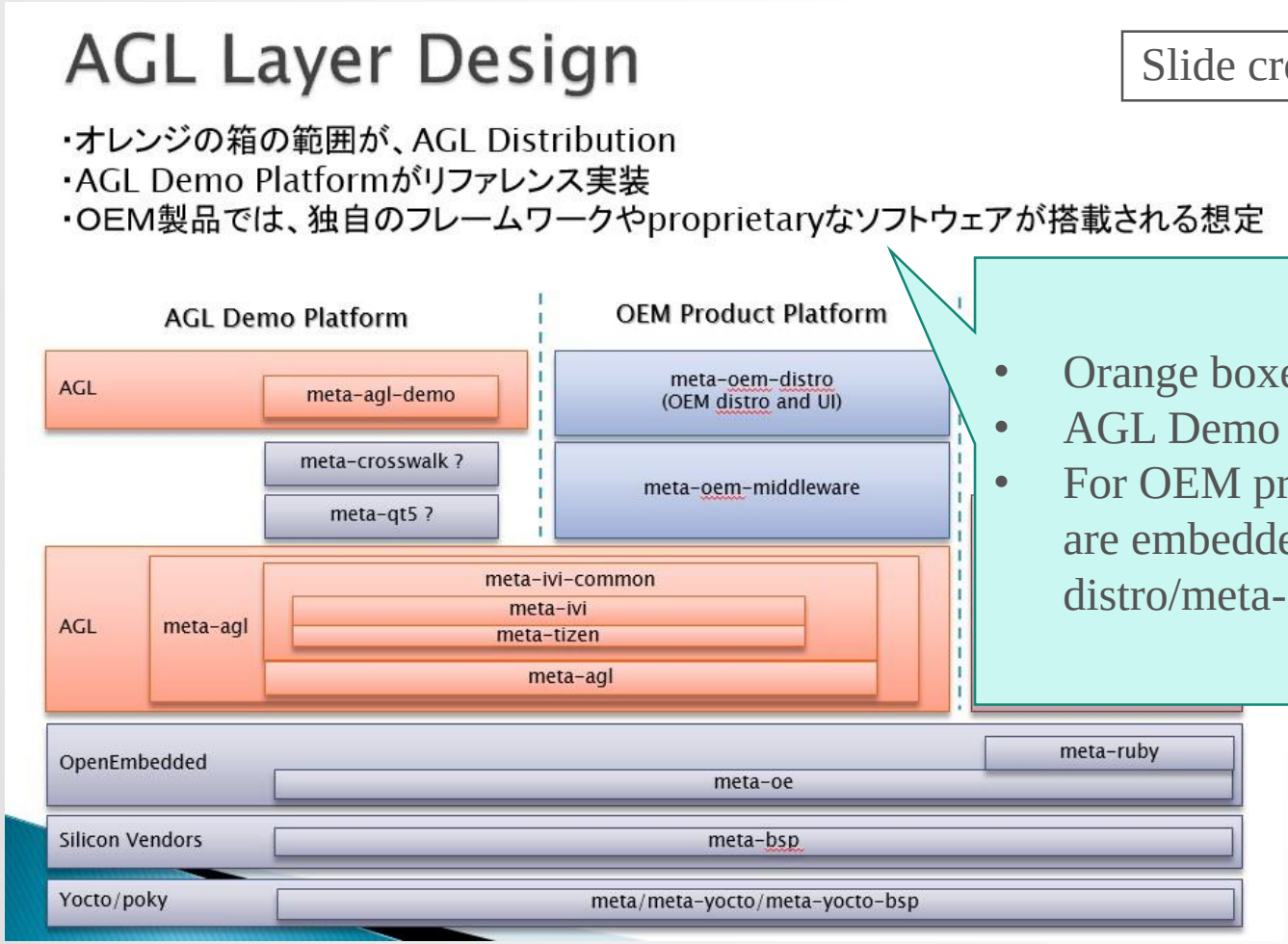
Tadao Tanikawa @ AGL Developer Community

Basically, I agree with



Page No.4 of https://wiki.automotivelinux.org/_media/agl-distro/notes_on_production_ready_ivi_proposal.pdf

Originally, it was very simple



Slide created at 2015/06/22

- Orange boxes are included in AGL Distribution
- AGL Demo Platform is a reference implementation of AGL
- For OEM products, own framework or proprietary software are embedded to own meta-layers (e.g. meta-oem-distro/meta-oem-middleware)

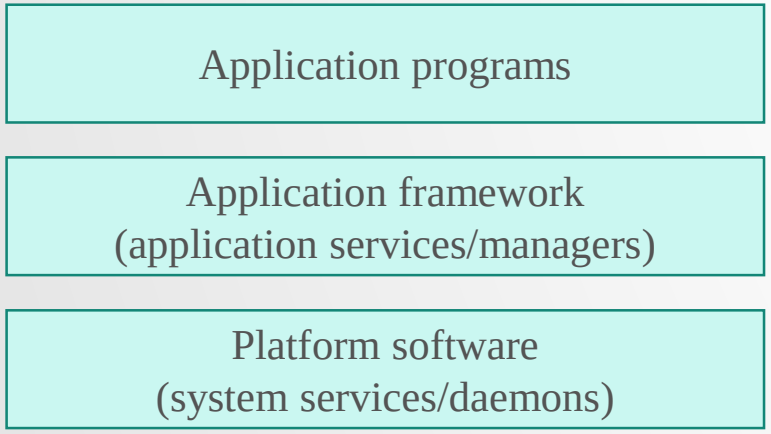
Proposed layers are similar to this

A study: What is product readiness of AGL?

- Goal: reducing cost of delivering OSS to products
  - What is major issues?
    - Functionality
    - Quality
  - GAP from functionality point of view
    - Missing features for automotive use cases
    - Missing functions to implements those missing features.
  - To fill these gaps, roughly 2 ways
    - Extend existing software → Re-use existing OSS and modify it
    - Develop new software → Create OSS projects inside/outside AGL UCB

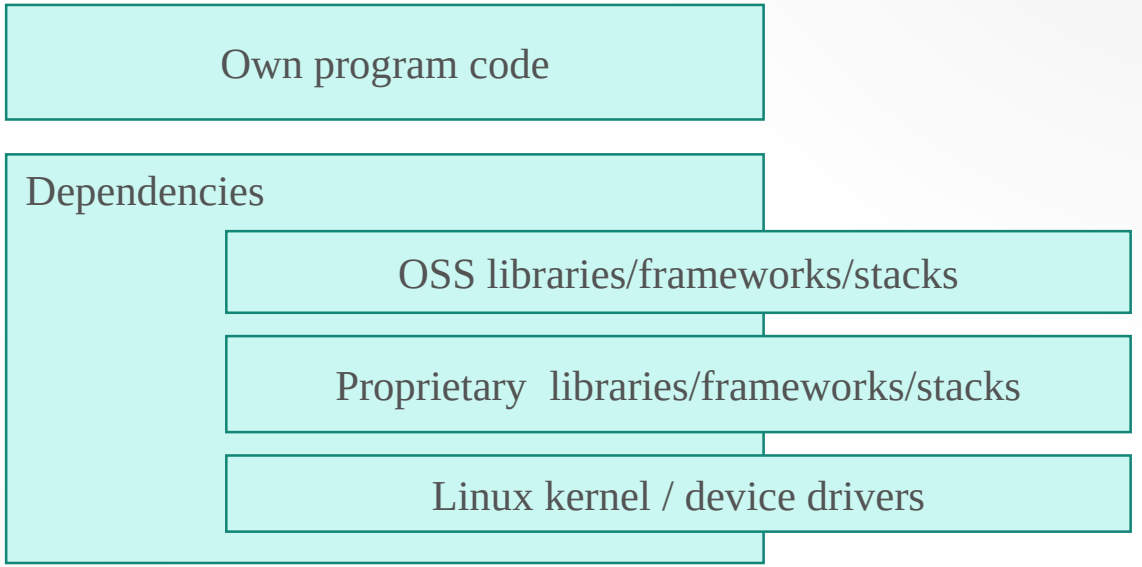
Basic software integration architecture

Software stack



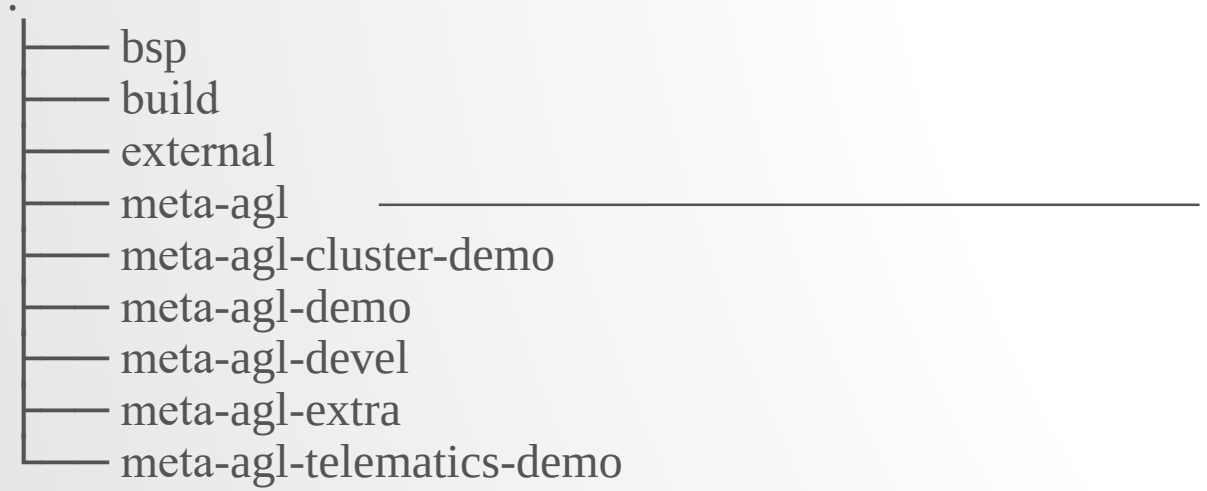
Defined by AGL layers

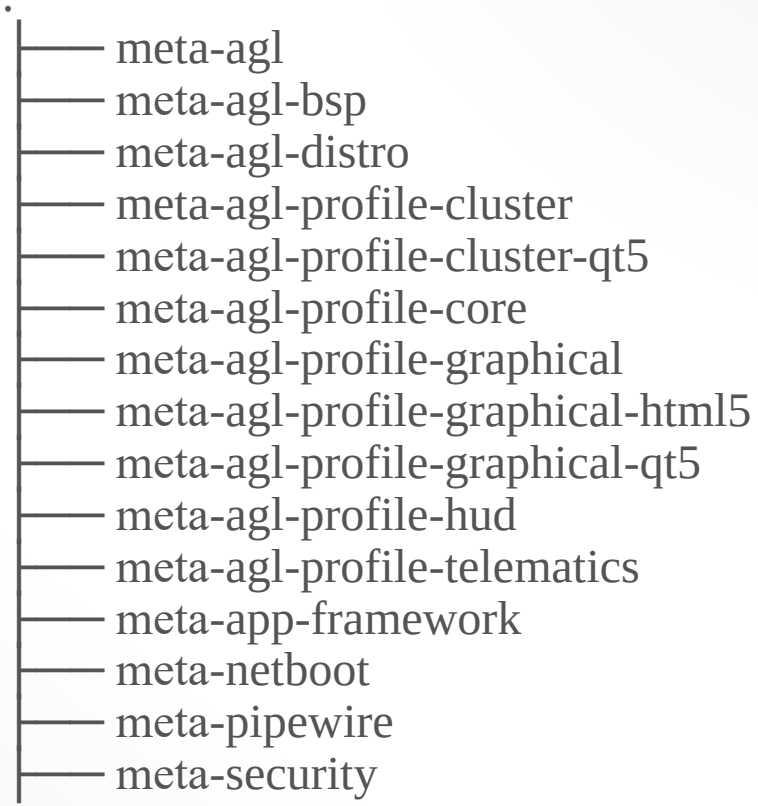
Software structure



Defined by AGL (bitbake) recipes
Selected by AGL features

Today's AGL layers, meta-agl-xxx





Difficult to understand

Today's AGL features

```
Available features:
  [meta-agl]
    agl-all-features :( agl-demo  agl-appfw-smack  agl-hmi-framework  agl-profile-graphical-qt5  agl-profile-graphical  agl-pipewire  agl-speech-framework  agl-netboot )
    agl-appfw-smack
    agl-archiver
    agl-buildstats
    agl-ci
    agl-ci-change-features :( agl-demo  agl-appfw-smack  agl-hmi-framework  agl-profile-graphical-qt5  agl-profile-graphical  agl-pipewire  agl-speech-framework  agl-devel  agl-netboot  agl-pipewire  agl-buildstats  agl-ptest )
    agl-ci-change-features-nogfx :( agl-demo  agl-appfw-smack  agl-hmi-framework  agl-profile-graphical-qt5  agl-profile-graphical  agl-pipewire  agl-speech-framework  agl-devel  agl-netboot  agl-pipewire  agl-buildstats  agl-ptest )
    agl-ci-snapshot-features :( agl-demo  agl-appfw-smack  agl-hmi-framework  agl-profile-graphical-qt5  agl-profile-graphical  agl-pipewire  agl-speech-framework  agl-devel  agl-netboot  agl-archiver  agl-pipewire  agl-buildstats  agl-ptest )
    agl-ci-snapshot-features-nogfx :( agl-demo  agl-appfw-smack  agl-hmi-framework  agl-profile-graphical-qt5  agl-profile-graphical  agl-pipewire  agl-speech-framework  agl-devel  agl-netboot  agl-archiver  agl-pipewire  agl-buildstats  agl-ptest )
    agl-devel
    agl-egvirt
    agl-fossdriver
    agl-gplv2
    agl-hmi-framework
    agl-netboot
    agl-pipewire
    agl-profile-cluster :( agl-profile-graphical )
    agl-profile-cluster-qt5 :( agl-profile-graphical-qt5  agl-profile-graphical )
    agl-profile-graphical
    agl-profile-graphical-html5 :( agl-profile-graphical )
    agl-profile-graphical-qt5 :( agl-profile-graphical )
    agl-profile-hud
    agl-profile-telematics
    agl-ptest
    agl-sign-wgts
    agl-sota
    agl-virt
    agl-virt-guest-xen
    agl-virt-xen :( agl-virt )
    agl-weston-remoting :( agl-profile-graphical )
  [meta-agl-cluster-demo]
    agl-cluster-demo :( agl-profile-cluster-qt5  agl-profile-graphical-qt5  agl-profile-graphical  agl-hmi-framework )
    agl-cluster-demo-preload
  [meta-agl-demo]
    agl-cloudproxy
    agl-cluster-demo-support :( agl-weston-remoting  agl-profile-graphical )
    agl-demo :( agl-appfw-smack  agl-hmi-framework  agl-profile-graphical-qt5  agl-profile-graphical  agl-pipewire  agl-speech-framework )
    agl-demo-preload
    agl-demo-soundmanager :( agl-appfw-smack  agl-hmi-framework  agl-profile-graphical-qt5  agl-profile-graphical  agl-audio-soundmanager-framework )
  [meta-agl-devel]
    agl-jailhouse
    agl-speech-framework
    agl-voiceagent-alexa :( agl-speech-framework )
    agl-voiceagent-alexa-wakeword :( agl-voiceagent-alexa  agl-speech-framework )
  [meta-agl-extra]
    agl-localdev
  [meta-agl-telematics-demo]
    agl-telematics-demo :( agl-profile-telematics )
```

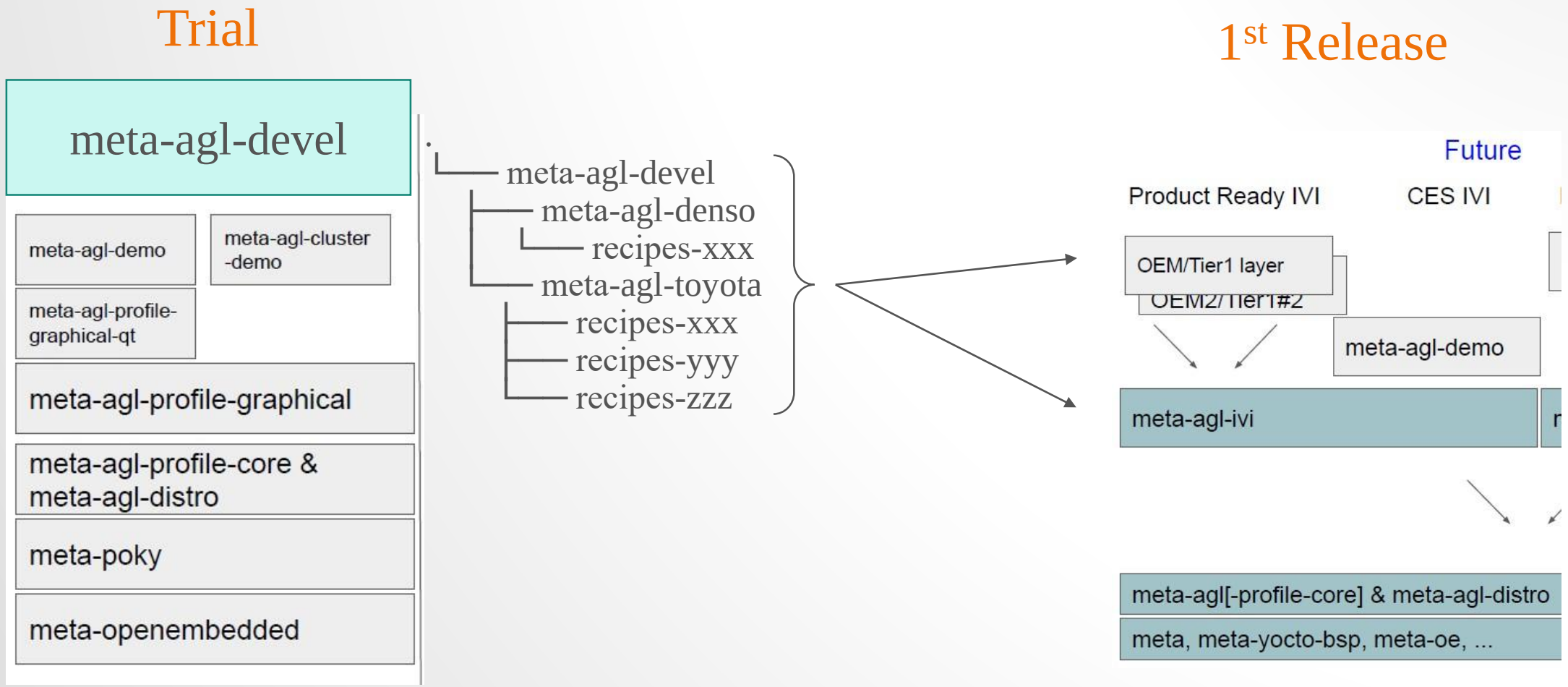
Difficult to understand

Goals of integration of IVI ProductReady Trial/1st release

- IVI ProductReady Trial
  - Re-use existing AGL UCB (means keeping Today's layers)
    - Adding RBA from DENSO
    - Adding BaseSystem's components from TOYOTA
    - Adding Test applications/services to evaluate several features (e.g. basesystem components/RBA/…)
- 1st Release
  - Improve / Relace exising AGL components (Assuming new design)
    - AppFw?
    - App Services? (e.g. BT / Radio)
    - …

How to integration of Trial

- All new components are integrated into meta-agl-devel once
  - After new layers come, migrates all recipes of IVI in meta-agl-devel to proper layers (e.g. meta-agl-ivi and OEM layer)



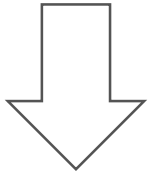
How to integration of Trial (cont.)

- Issues still remain: how to add AGL features for new components

E.g. today's basesystem in staging

```
Available features:
  [meta-agl]
     ns-backupmanager
     ns-commonlibrary
     ns-frameworkunified
     ns-loglibrary
     ns-notificationpersistent
     os-eventlibrary
     os-posixbasedos001legacylibrary
     os-rpclibrary
     os-vehicleparameterlibrary
     ps-communication
     ss-config
     ss-interfaceunified
     ss-loggerservice
     ss-powerservice
     ss-resourcemanager
     ss-romaccesslibrary
     ss-systemmanager
     ss-taskmanager
     ss-versionlibrary
     vs-positioning
     vs-positioningbaselibrary
```

Too complicated (too detailed)



Need to organize into Dependency of packages (recipes) and AGL Features (templates)

Reworking: staging/toyota.git

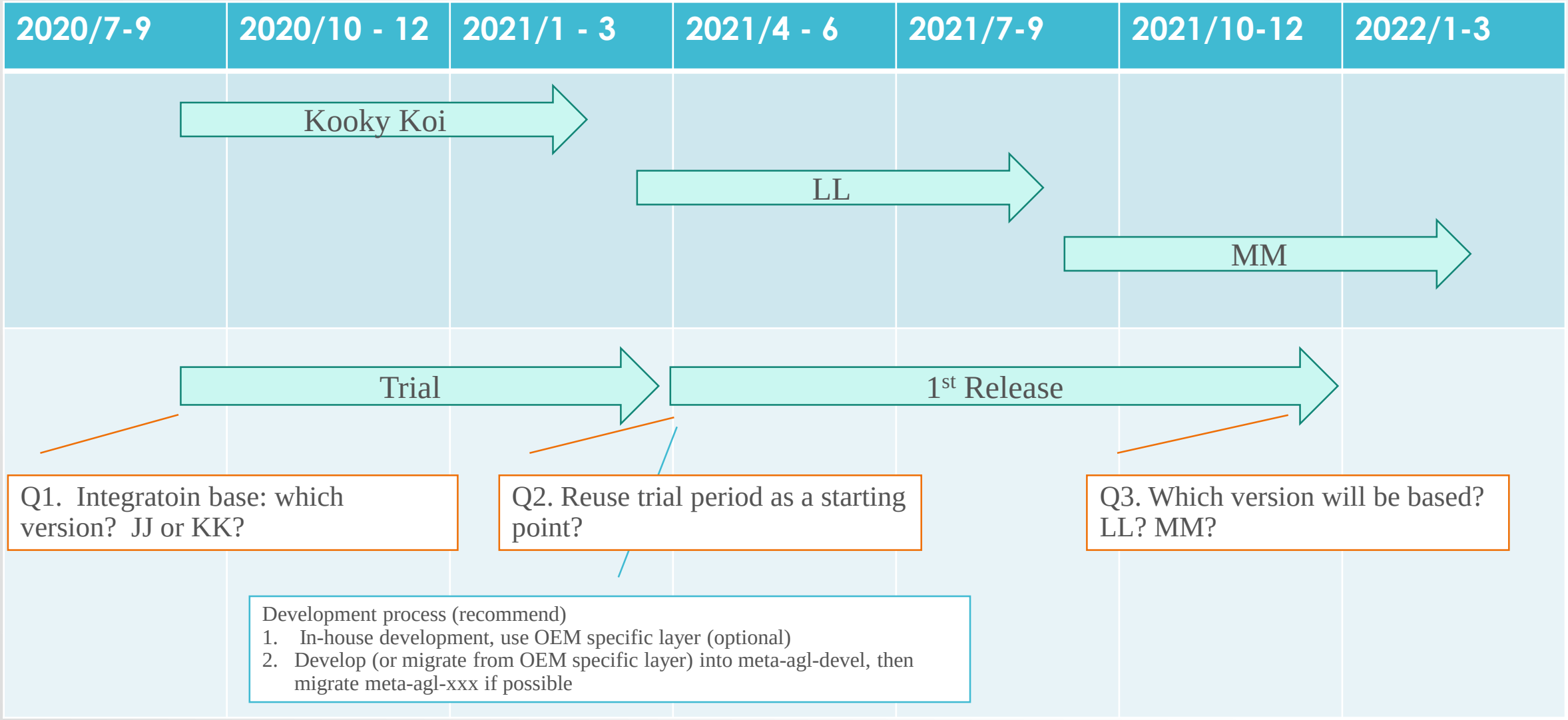
- Today's staging/toyota.git has lots of issues if followed current meta-agl's rule and policy of integration
  - All recipes merged into meta-agl already and commit whole recipes by 1 supermassive commit (not broken down into patches for individual elements/components)
  - Unclear integration policy for AGL AppFw non-compatible sevices
  - File structure of the repcies that violate the unspoken rule (e.g. complete source code files should not be included)
  - Packages of unknown purpose (e.g. kernel-module-evklib)
  - Non-HMI/GUI related packages are included into recipe-graphics
  - Multiple elements combined into 1 massive recipe (e.g. recipes-core/agl-systemd)
  - Unclear rule/policy of the choise between replacement and expansion existing packages (e.g. recipes-core/agl-basefiles)
  - And so on
- If ignoring these issues at Trial period, it would be a bigger challenge in the nest 1st Release
  - E.g. When plan to move from an OEM-specific layer (meta-agl-devel/meta-agl-toyota) to a more generic meta-agl-ivi.

Reworking: staging/toyota.git (cont.)

- Plan A
  - Trial Period
    - Keep the current recipes of staging/toyota as it is and integrate it into meta-agl-devel/meta-agl-toyota
  - 1st Release
    - Reorganize the package structure and recipes, carefully reintegrate them one by one into meta-agl-toyota and meta-agl-ivi
  - Pros
    - The amount of development during the Trial Period is minimal
  - Cons
    - Lots of work put off to the 1st Release
- Plan B
  - Trail Period
    - Reorganize the package structure and recipes, integrate them into meta-agl-devel/meta-agl-toyota once
  - 1st Release
    - Discuss and review whether it is appropriate to integrate into meta-agl-toyota or meta-agl-ivi for each package
  - Pros
    - As OSS development methodology, Plan B is better because we can focus on discussion and review for the 1st Release
  - Cons
    - The amount of development during the Trial Period would be huge

The choice is up to Toyota, because the AGL developers can only respond to reviews and, due to resource, can't really help with refactoring and development recipes (which Toyota should do voluntarily)

How to align with UCB Release



Sample integration how to use meta-agl-devel

- CES2020 container integration demo

```
Manifest branch: refs/tags/halibut/8.0.3
Manifest merge branch: refs/heads/halibut
Manifest groups: all,-notdefault
----------------------------

Projects Overview
meta-agl
* sandbox/ruke47/ces2020_803        ( 3 commits, Tue Jan 7 02:07:11 2020 +0900)
                                      - 320f3744 [RCAR] Update graphics driver
                                      - 5e20dda4 weston: Disable wayland backend frame
                                      - 576d49b3 Fix wayland-backend bug with more than 2 outputs

meta-agl-demo
* sandbox/ruke47/ces2020_803        ( 1 commit, Wed Dec 25 21:15:32 2019 +0900)
                                      - 2c41a10f agl-container-demo: split recipe of sllin driver and service

meta-agl-devel
* sandbox/ruke47/ces2020_803        (24 commits, Thu Jan 30 12:06:54 2020 +0900)
                                      - 34fdd427 agl-container: initial import into meta-agl-devel
                                      - 1c617a7e agl-container: base config of LXC container
                                      - 7247ea0d agl-container: new packagegroup for agl-container-host
                                      - f5c9474c agl-container: new packagegroup for agl-container-lxc-guest
                                      - 9b097f00 agl-container: backport lxc 3.2.1
                                      - 6ea7578d agl-container-demo: initial import into meta-agl-devel
                                      - caa01996 agl-container-demo: new host image of agl container demo
                                      - 9e669054 agl-container-demo: config of guest's rootfs
                                      - 051d0598 agl-container-demo: setup lxc-net for host
                                      - 04c91ec2 agl-container-demo: setup wayland compositor of host
                                      - 2bc01410 agl-container-demo: lxc-net would fail if run before eth0 up
                                      - 971580b1 agl-container-demo: enable LIN, Radio and Audio
                                      - 25401314 agl-container-demo: enable gstrecord on container
                                      - 393e88c0 agl-container-demo: agl-demo-platform for lxc container
                                      - dd5adcc3 agl-container-demo: config of IVI demo container
                                      - 84275562 agl-container-demo: setup child weston for guest IVI
                                      - 73bc477b agl-container-demo: agl-cluster-demo-platform for LXC container
                                      - 166b7414 agl-container-demo: config of IC demo container
                                      - 97a321c7 agl-container-demo: setup child weston for guest IC
                                      - 541cb025 agl-container-demo: enable Radio of Kingfisher
                                      - 89ecdcfe agl-container-demo: [HACK] most/unicens (host)
                                      - 12bf2345 agl-container-demo: simple container manager, lxc-launcher
                                      - 74829e2c agl-container-demo: support demo of rebooting container/system
```

Only bug fixes for CES2020 demo use case

All new features and components are added here

Sample integration how to use meta-agl-devel (cont.)

- meta-agl-devel for CES2020 container integration demo

```
meta-agl-devel
├── meta-agl-container
│   ├── meta-container-guest
│   │   ├── recipes-config
│   │   ├── recipes-core
│   │   └── recipes-platform
│   ├── meta-container-host
│   │   └── recipes-platform
│   └── meta-virtualization
│       └── recipes-containers
├── meta-agl-container-demo
│   ├── meta-container-host
│   │   ├── recipes-config
│   │   ├── recipes-connectivity
│   │   ├── recipes-containers
│   │   ├── recipes-graphics
│   │   ├── recipes-platform
│   │   └── recipes-support
│   ├── meta-container-ic
│   │   ├── recipes-config
│   │   ├── recipes-core
│   │   ├── recipes-graphics
│   │   └── recipes-platform
│   ├── meta-container-ivi
│   │   ├── recipes-config
│   │   ├── recipes-containers
│   │   ├── recipes-core
│   │   ├── recipes-graphics
│   │   └── recipes-platform
│   └── meta-container-others
└── templates
    └── feature
        ├── agl-container
        ├── agl-container-demo
        ├── agl-container-demo-host
        ├── agl-container-demo-ic
        ├── agl-container-demo-ivi
        ├── agl-container-demo-others
        ├── agl-container-guest
        ├── agl-container-host
        └── agl-container-lxc
```

Thank you