Creating Your Own Project on-top of AGL

From minimal image to own project.
How to reuse AGL in your own company.

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Intro

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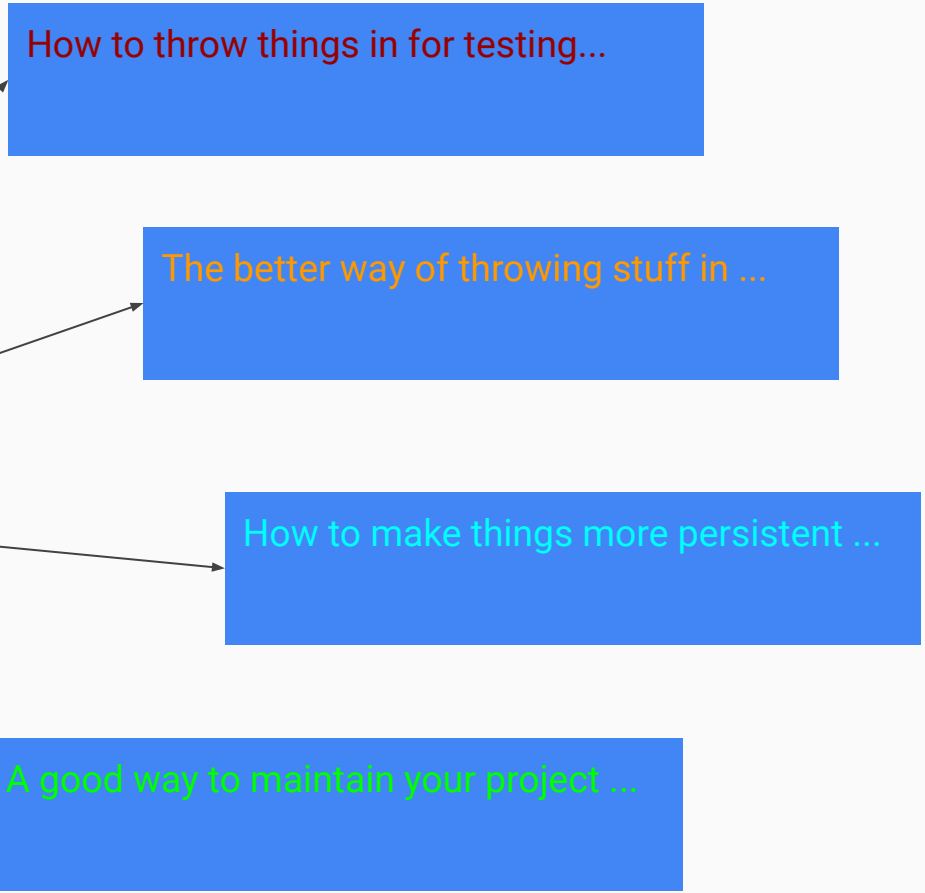
Topics

- What and why ?
- The Quick & Dirty
- The Nonpersistent
- The Good
- The Best
- Best Practices
- Summary
- Q/A

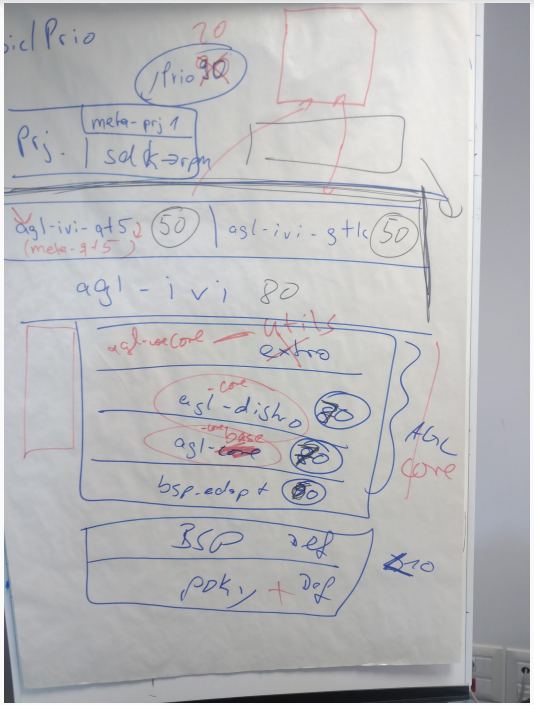


What and why ?!!

What and why ?

- Show how to add software to AGL
- Point out common pitfalls
- Highlight best practices

- Changes in project can have a big impact on the outcome of the build
  - need to be careful and aware
- Vision and goal is to create
  - SDK per architecture (***not*** per board)
  - Limit SDK variants !!
  - Common package feed



AGL repo checkout (since HH)

```
.
|-- bsp
|-- external
|-- meta-agl
|-- meta-agl-demo
|-- meta-agl-cluster-demo
|-- meta-agl-telematics-demo
|-- meta-agl-devel
`-- meta-agl-extra
```

- Board support
- External repositories (=upstream)
- AGL 'core' layers
- AGL 'demo' layers
- AGL 'devel' layers

The Quick & Dirty

The Quick & Dirty

- clone AGL
- just create/copy your recipe in some layer (or use devtool - same outcome)
- hack image ~~receipe~~/packagegroup
- call aglsetup.sh & bitbake

```
repobuild-quick-and-dirty> repo status
project meta-agl-demo/                                  (*** NO BRANCH ***)
 --  recipes-demo-hmi/foo-qnd/foo-qnd_git.bb
 -m  recipes-platform/packagegroups/packagegroup-agl-demo-platform.bb
```

The Quick & Dirty

- Simple and straightforward

- Not persistent
- Can't share
- Can't maintain
- Not updated with repo sync

Image: public domain

The Nonpresistent

The Nonpresistent

- clone AGL and call

```
meta-agl/scripts/aglsetup.sh agl-demo agl-devel agl-localdev
```

- then (within build/) we use bitbake-layers to create the layer folder

```
bitbake-layers create-layer --priority 20 ../meta-localdev/
```

- add your files underneath meta-localdev/

The Nonpresistent

```
.
|-- bsp
|-- build
|-- external
|-- meta-agl
|-- meta-agl-cluster-demo
|-- meta-agl-demo
|-- meta-agl-devel
|-- meta-agl-extra
|-- meta-agl-telematics-demo
`-- meta-localdev
```

```
meta-localdev/
|-- COPYING.MIT
|-- README
|-- conf
|   `-- layer.conf
|-- recipes-platform
|   `-- packagegroups
|       `-- packagegroup-X.bbappend
`-- recipes-example
    `-- example
    `-- example_0.1.bb
```

The Nonpresistent

- Own changes in separate YP compatible layer
- Can be shared
- Can be reused

- Not persistent
- Need to redo 'every time' when cloned
- Not updated with repo sync

The Good

The Good

- clone AGL and
- clone your project as meta-localdev

```
git clone https://foo.bar/projects/meta-baz.git meta-localdev
```

- call

```
meta-agl/scripts/aglsetup.sh agl-demo agl-devel agl-localdev
```

- call bitbake

The Good

```
.
|-- bsp
|-- build
|-- external
|-- meta-agl
|-- meta-agl-cluster-demo
|-- meta-agl-demo
|-- meta-agl-devel
|-- meta-agl-extra
|-- meta-agl-telematics-demo
`-- meta-localdev
```

```
meta-localdev/    (cloned from XYZ)
|-- COPYING.MIT
|-- README
|-- conf
|   `-- layer.conf
|-- recipes-platform
|   `-- packagegroups
|       `-- packagegroup-X.bbappend
`-- recipes-example
    `-- example
    `-- example_0.1.bb
```

The Good

- Own changes in separate YP compatible layer
- Can be shared
- Can be reused
- Recipes 'persistent' in git

- Need to redo 'every time' when cloned
- Not updated with repo sync

The Best

The Best

- clone AGL
- add your add-on manifest to `.repo/local_manifests/`
- call repo sync (again)
- call aglsetup.sh and bitbake as usual

```
repo init -u https://gerrit.automotivelinux.org/gerrit/AGL/AGL-repo.git

mkdir .repo/local_manifests/

curl https://raw.githubusercontent.com/dl9pf/meta-own-project/master/.project-manifest.xml > \
      .repo/local_manifests/meta-own-project.xml

repo sync
```

The Best

.project-manifest.xml:

```
<?xml version="1.0" encoding="UTF-8"?>
<manifest>

  <remote name="github" fetch="https://github.com/" />
  <project name="dl9pf/ meta-own-project" remote="github" path=" meta-own-project" >
    <copyfile src=".project-manifest.xml" dest=".repo/local_manifests/  meta-own-project.xml" />
  </project>

</manifest>
```

The Best

- Own changes in separate YP compatible layer
- Can be shared
- Can be reused
- Updated when syncing with repo

- Need to add **once** during initial checkout (but this is perfectly scriptable)

The Best (also)

Maintain **own repo manifest** with your projects added already.

Downside: **need to sync/rebase** your repo manifest with AGL all the time yourself!

Best Practices

Best Practices

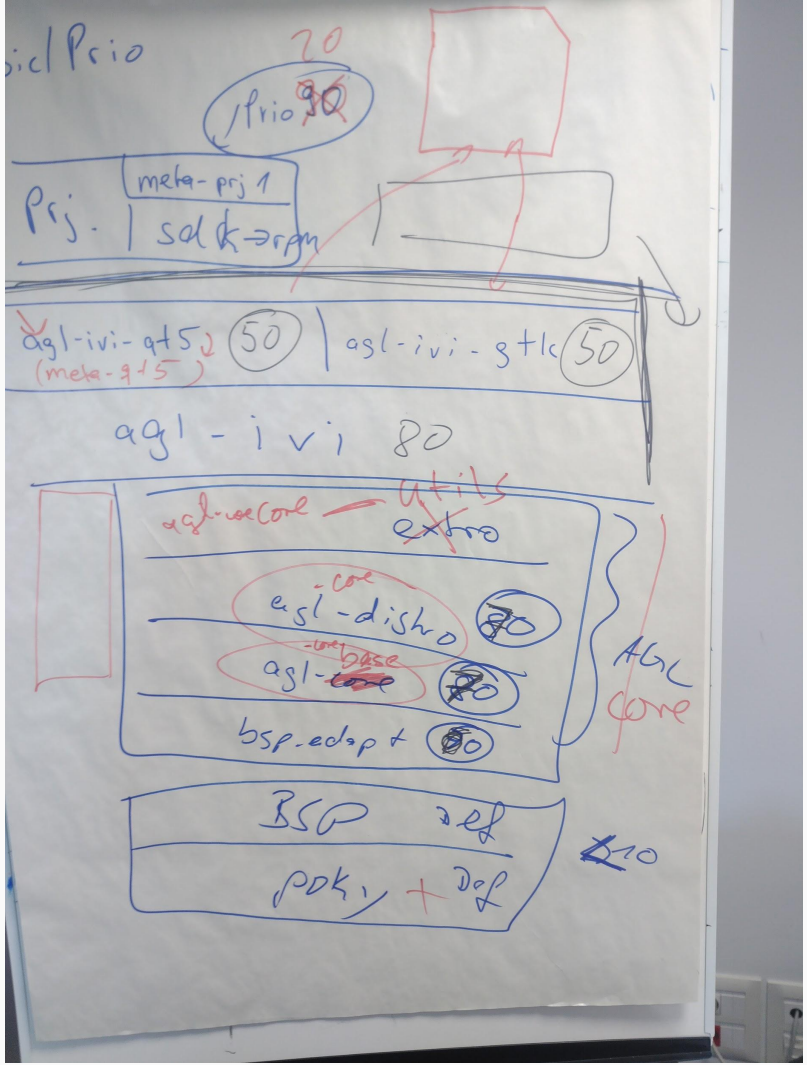
- Create your own image recipe by including either
  - agl-image-minimal.inc
  - agl-image-ivi.inc
  - agl-demo-platform.inc
  - agl-cluster-demo-platform.inc
- Create a packagegroup if more packages are added

```
my-layer/recipes-platform/images/my-image.bb:

DESCRIPTION = "FOO image contains a simple FOO UI."

require agl-image-ivi.inc

LICENSE = "MIT"

IMAGE_FEATURES_append = " \
      "

# add packages for FOO (include foo pkggroup) here
IMAGE_INSTALL_append = " \
       packagegroup-agl-foo \
       "
```

AGL Profiles

Profiles build on each-other:

```
|-- meta-agl
    `-- meta-agl-profile-core                          <- SDK w/o gfx components
        |-- meta-agl-profile-telematics
        `-- meta-agl-profile-graphical
            |-- meta-agl-profile-graphical-html5       <- SDK w/ HTML5
            |   |-- meta-agl-demo-html5                <- soon: HTML5 IVI demo
            |-- meta-agl-profile-graphical-qt5         <- SDK w/ qt5
            |   |-- meta-agl-demo                      <- AGL IVI demo (qt5)
            |   `-- meta-agl-cluster-demo              <- AGL cluster demo
            `-- meta-agl-profile-hud                   <- placeholder for hud
```


sic/Prio
20
/Prio
Prj.
meta-prj 1
sdk->rpm
agl-ivi-qt5
(meta-qt5)
50
agl-ivi-g+lc
50
agl-ivi 80
agl-useCore
utils
extra
agl-distro
agl-base
bsp-adapt
AGL
core
BSP
pdk
+
def
10

Best Practices

- A project sits on-top of a stack
- Rules:
  - Do not use .bbappends
  - Do not use .bbappends
  - Do not use .bbappends

Do not modify the stack from within the toplevel project.

Best Practices

- Your code needs to be MACHINE-**independent** (AGL has multiple arches!)
- If there are different optimizations (e.g. video decoder pipeline)
  - Have the **generic** variant (e.g. software decoding) as the **default**
  - Then either (in order of preference):
    - runtime-detect the available options and switch
    - provide a configuration file for the user to switch from default to optimized
      - and make it available as build-time switch as well !

better generic first , then specific as option

Best Practices

- "Upstream first" whenever possible
- Submit your changes early
- Small changes are easier to review
- if there are commonalities, rework things to include the common set

Q/A

AGL is a great stack
for your
automotive solution.

Thanks!

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