OpenEmbedded – A layered Approach

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Agenda

- OpenEmbedded – The classic way

- New Layered structure

- Existing layers

- Challanges with layers

- Q & A

OpenEmbedded Classic way

- All metadata together under one tree
  - Plethora of package recipes
  - Multiple versions of recipes
  - Numerous machines
  - Many distros
- push model for SCM
- Lot of pinning needed
- Release 2011.03 is still maintained

OpenEmbedded Classic Way

- Challanges
  - Lot of dead code.
  - Unmaintained recipes and machine
  - Push model broke build more often

Distribution – New way

Feature layers

Machine/BSP layer

Openembedded Core layer

Distribution policy layer

Tools

- Bitbake has .bbappend feature
  - Patch recipes
- Combo-layer
- bitbake-layers

Bitbake bbappend

- Patching recipes

  - <recipe>.bbappend can be used in layers to modify recipe data

  - It can not patch .inc or class files

  - Typically used for tweaking few settings

  - Changing configure options, CFLAGS etc.

bitbake-layers

```
usage: bitbake-layers <command> [arguments]


Available commands:

  flatten

    flattens layer configuration into a separate output directory.

  help

    display general help or help on a specified command

  show-appends

    list bbappend files and recipe files they apply to

  show-layers

    show current configured layers

  show-overlayed

    list overlayed recipes (where the same recipe exists in another layer that has a higher layer priority)

  show-recipes

    list available recipes, showing the layer they are provided by
```

combo-layer

Usage: combo-layer [options] action

Create and update a combination layer repository from multiple component repositories.

Action:

  init   initialise the combo layer repo

  update   get patches from component repos and apply them to the combo repo

  splitpatch [commit] generate commit patch and split per component, default commit is HEAD

Options:

  --version   show program's version number and exit

  -h, --help   show this help message and exit

  -c CONFFILE, --conf=CONFFILE

                   specify the config file (conf/combo-layer.conf is the

                   default).

  -i, --interactive   interactive mode, user can edit the patch list and

                   patches

  -D, --debug   output debug information

OpenEmbedded – Layered

- Divide metadata into set of maintainable layers
  - Core layer
    - Provide common metadata
    - Recipes needed almost on all systems
    - Reference Emulation machines
    - Distroless
  - Meta-openembedded
    - Umbrella for OpenEmbedded hosted layers
    - meta-oe

OpenEmbedded – Core layer

- Provide common metadata

  - classes

  - conf

- Recipes needed almost on all systems

- Reference Emulation machines

  - qemuarm, qemumips, qemuppc, qemux86,qemux86-64

- Distroless

- Self contained

- Reference images and common tasks

Existing Layers

- Openembedaded-core

  - Core meta data

- meta-oe

- meta-gnome

- meta-xfce

- meta-mozilla

- meta-java

- meta-micro

layers

- Distribution layers
  - Angström, SHR, micro, slugos, poky ...
- Board support layers
  - efikamx, NSLU2 ...
- Feature layers
  - Java, EFL, GNOME, GPE, XFCE ...
- Vendor layers
  - meta-texasinstruments, meta-intel , meta-xilinx ...

layers

- Further Informatio existing layers
- http://www.openembedded.org/wiki/LayerIndex

Layer Ettiquettes

- Top level README

  - Describe inter layer dependencies

  - Setup instructions to include in an integration layer

  - Patch flow and process

  - Maintainers

  - Copyright Notice

Existing layers

- Meta-smartphone
- meta-handheld

More layers

- Plasma Active

- Linaro

- Oracle Java

- More ….

Challanges

- Layer interactions

- Recipe duplication

- Feature conflicts

- Diagnostics

  - Which recipe gets picked

- Overcrowded layers

Challanges

- Layering tools
- SCM
- Classes
- Layer Release
- Distribution release
- Metadata synchronization

Where are we

- Distributions like poky, Angström SHR already using the layered model.

- All recipes from Classic Openembedded are not available.

  - Ported as needed

Q & A

Thank you