GTK Hob

Moving to 1.4

GTK Hob - Moving to 1.4
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This is Hob 1.3

Although we have made enormous progress, there is still some work to do.

This document outlines what I believe to be the main design issues standing on our way to achieve what we have been calling "product quality", i.e. a technically robust piece of software with a suitable graphical user interface (GUI).

The order in which issues are listed bears no relation to their importance. I've started with the most specific problems, in the order in which they are likely to be encountered as you build an image with Hob, followed by the most generic issues (performance, feedback and visual design).

Design issues

- Launching Hob
- Manipulating layers
- Selecting machines and base images
- Setting variables
- Presenting recipes and packages
- Editing images
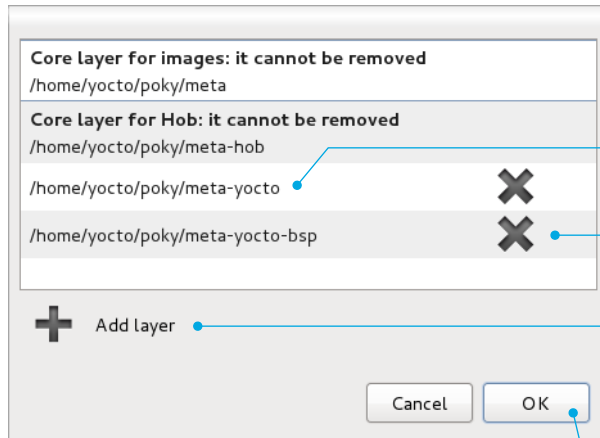- Performance
- Feedback
- Visual design
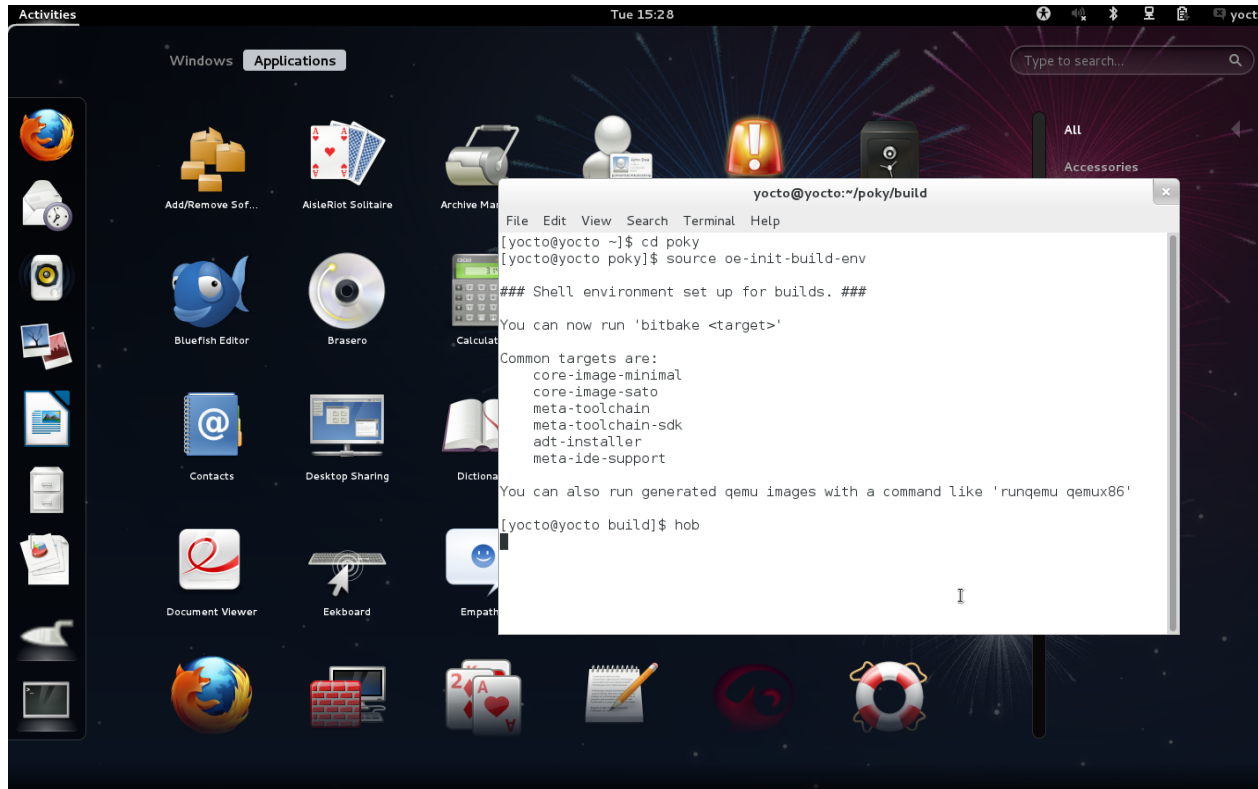
Launching Hob

Relevant bugs: 3360

Once you have downloaded a stable Yocto Project release or checked out the latest development code, launching Hob is a 2-step process using a command-line interpreter:

Step 1 - Run the OE Build Environment Setup Script
Step 2 - Type 'hob'

Although we can expect Yocto Project users to be confident with command line interfaces, Hob is a GUI and should probably follow GUI conventions. This involves making Hob accessible through the graphical application launching mechanisms provided by the host computer.

Core layer for images: it cannot be removed
/home/yocto/poky/meta

Core layer for Hob: it cannot be removed
/home/yocto/poky/meta-hob

/home/yocto/poky/meta-yocto
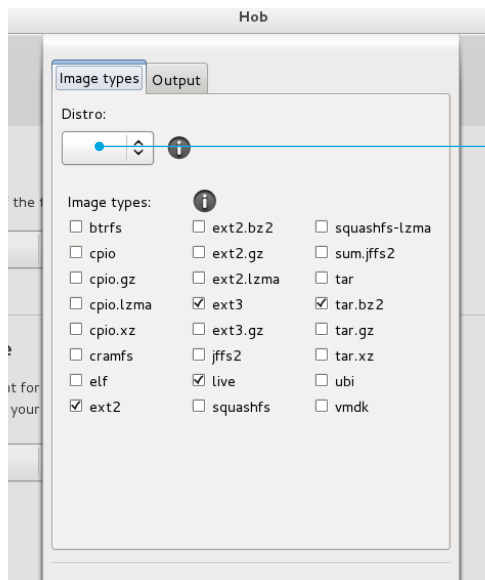
/home/yocto/poky/meta-yocto-bsp

Add layer

Cancel   OK

2. Removing the meta-yocto layer causes problems with the bblayers.conf file version number and the selected distro.

4.1, 4.2, 4.3. The 'Delete' icon hover state is barely noticeable and it removes layers on mouse down, instead of on mouse up. We should replace the icon with a standard, labelled button.

4.3. We should replace the hover button with a standard, labelled button. Hover buttons are reserved for key functionality in the Hob primary window (e.g. 'Advanced configuration').

4.4. We should turn the Layers dialog into an 'instant apply' window. 'OK' and 'Cancel' buttons would be replaced by a single 'Close' button.

Hob

Image types   Output

Distro:

Image types:
- [ ] btrfs
- [ ] cpio
- [ ] cpio.gz
- [ ] cpio.lzma
- [ ] cpio.xz
- [ ] cramfs
- [ ] elf
- [x] ext2

- [ ] ext2.bz2
- [ ] ext2.gz
- [ ] ext2.lzma
- [x] ext3
- [ ] ext3.gz
- [ ] jffs2
- [x] live
- [ ] squashfs

- [ ] squashfs-lzma
- [ ] sum.jffs2
- [ ] tar
- [x] tar.bz2
- [ ] tar.gz
- [ ] tar.xz
- [ ] ubi
- [ ] vmdk

2. If you delete the meta-yocto layer when the distro is set to 'poky', the selected distro changes to the 'Default' value. However, the 'Distro' combo box appears blank: the 'Default' value only appears when you click the combo box.
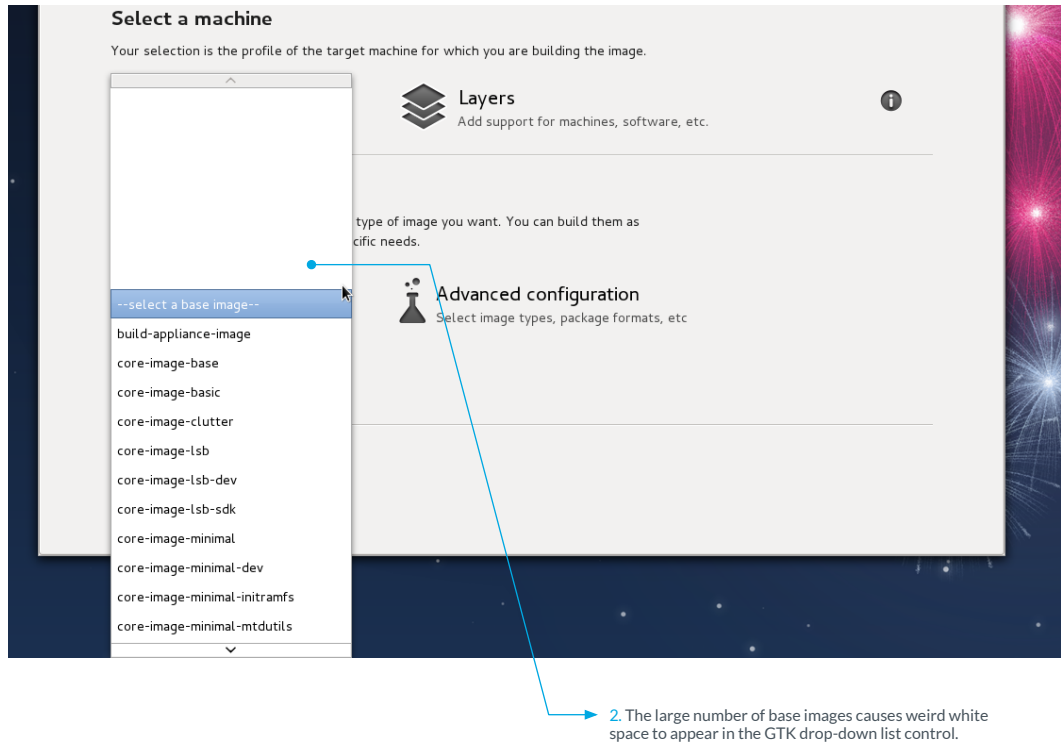
Manipulating layers

Relevant bugs: 2950, 3176, 3270

1. The lack of consistency between Hob and bblayers.conf is questioned on **bug 2950**.

2. You can remove the meta-yocto layer, but doing so causes problems with the bblayers.conf file version number. Removing the meta-yocto layer also impacts the distro selection, but this is not communicated to the user in any way. Currently, removing the layer when the distro is set to 'poky' sets the selected distro to 'Default', but the value does not appear in the 'Distro' combo box until you click on it . If you add the meta-yocto layer again, the selected distro does not revert back to 'poky' (**bug 3176**).

3. Since the order of the layers can affect the build outcome, users should be able to rearrange layers (**bug 3270**).

4. We need to revisit the dialog design:

- **4. 1.** The on-hover feedback from the 'delete' icon is barely noticeable
- **4. 2.** The 'delete' icon removes layers on mouse down, instead of on mouse up
- **4. 3.** We should present the 'delete' and 'add layers' functions as standard buttons
- **4.4.** We should consider turning this dialog into an 'instant apply window' (**http://developer.gnome.org/hig-book/3.5/windows-utility.html.en#windows-instant-apply**), since users receive immediate visual feedback when adding and deleting layers.

Select a machine

Your selection is the profile of the target machine for which you are building the image.

Layers
Add support for machines, software, etc.

...type of image you want. You can build them as
...cific needs.

Advanced configuration
Select image types, package formats, etc

--select a base image--
build-appliance-image
core-image-base
core-image-basic
core-image-clutter
core-image-lsb
core-image-lsb-dev
core-image-lsb-sdk
core-image-minimal
core-image-minimal-dev
core-image-minimal-initramfs
core-image-minimal-mtdutils

2. The large number of base images causes weird white space to appear in the GTK drop-down list control.

Selecting machines and base images

Relevant bugs: 2565, 2345

1. When listing the base images your can choose, Hob does not take into account your selected distro (**bug 2565**).

2. At 19, the number of base images in Hob has exceeded what we can optimally handle with a drop-down list. This large number of items also causes problems with the GTK control (**bug 2345**). Note that long lists might also be an issue for the machine selection drop-down list when you add layers for supporting additional hardware (e.g. meta-ti).

The Gnome Human Interface Guidelines, which we use as a reference for the design of Hob's interface, advise against using drop-down lists with less than 3 or more than 10 items. (**http://developer.gnome.org/hig-book/3.5/controls-option-menus.html.en**).
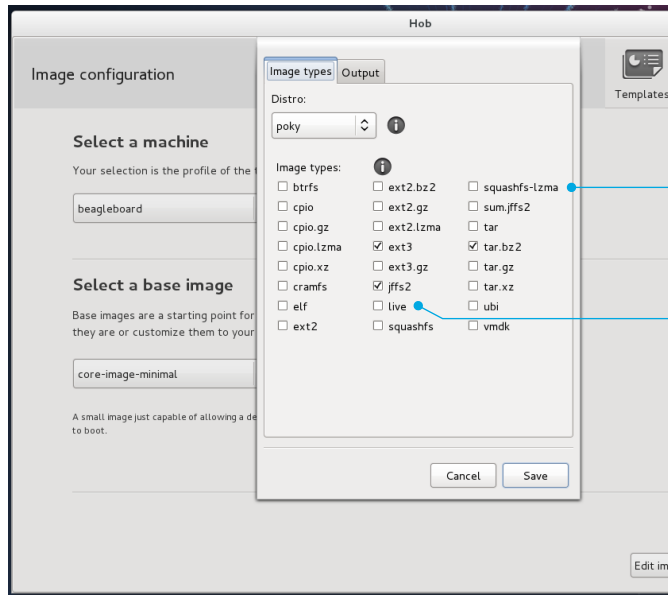
Selecting image types

Relevant bugs: 3197

1. Hob should only list those image types that are compatible with my chosen distro ('poky') and machine ('beagleboard') (bug 3197).

2. The 'live' image type should be replaced by 2 new ones: 'hddimg' and 'iso'. This will provide a direct relationship between the selected image types and the image files created by the build process (bug 3197).

yocto PROJECT
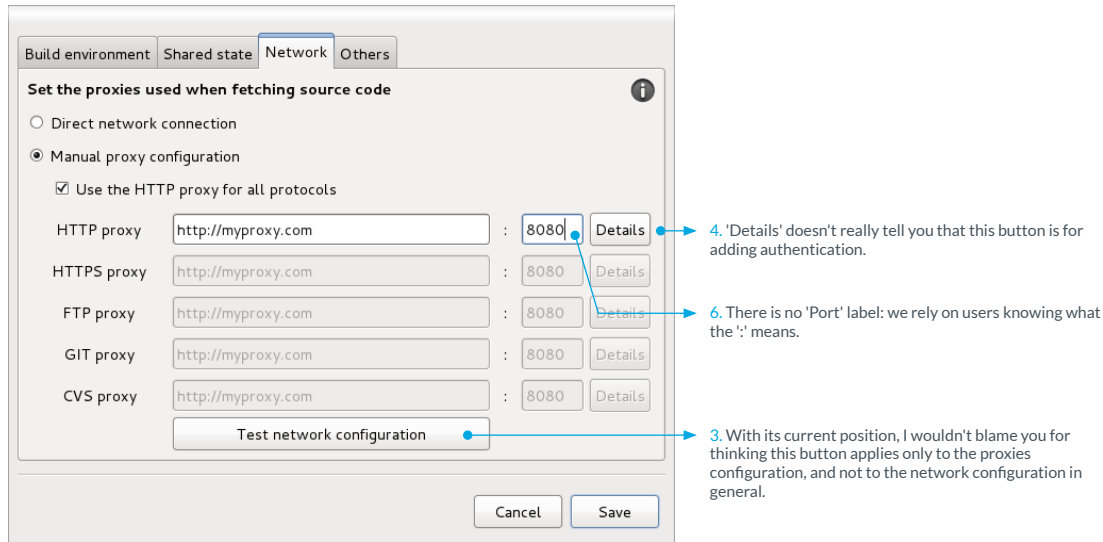
4. 'Details' doesn't really tell you that this button is for adding authentication.

6. There is no 'Port' label: we rely on users knowing what the ':' means.

3. With its current position, I wouldn't blame you for thinking this button applies only to the proxies configuration, and not to the network configuration in general.
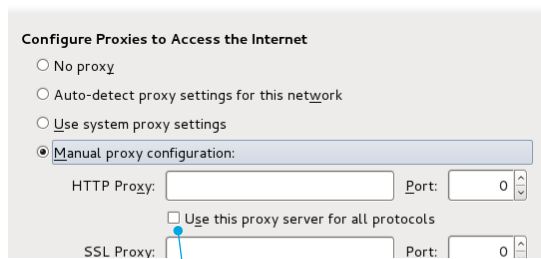
1. We should follow Firefox example and move our 'Use the HTTP proxy for all protocols' checkbox below the proxy it relates to.
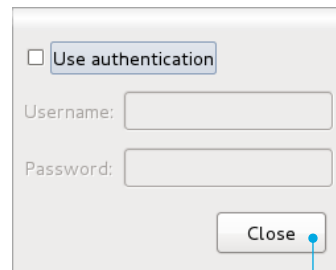
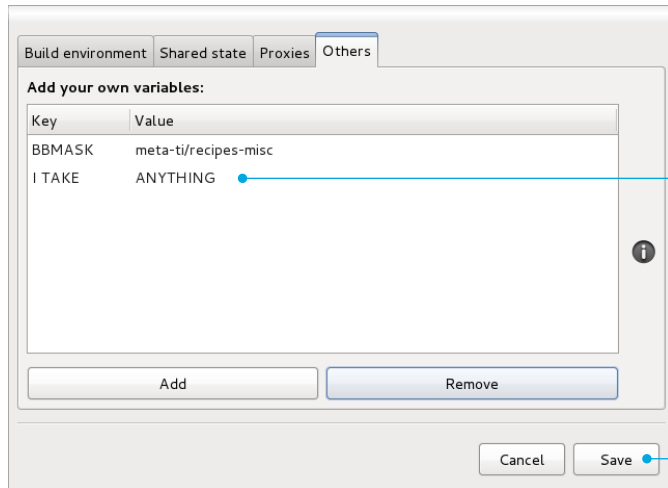5. After entering your authentication credentials you want to save them, not just close the window.

Network configuration

Relevant bugs: 3026

The Romanian engineering team has done some excellent work in improving what we used to call the 'Proxies' tab in the 'Settings' dialog, and that is now labelled 'Network'. They have introduced input validation (adding the 'http://' string when missing and ensuring all proxies include a port number); implemented a network test and improved labelling.

There are still some enhancements we could make:

1. The 'Use the HTTP proxy for all protocols' check box should move below the HTTP proxy (similar to how it's done in the Firefox proxy settings dialog).

2. We could use a progressive disclosure approach, revealing the proxy configuration fields only when the 'Manual proxy configuration' radio button is selected; and hiding the additional proxy input fields when the 'Use the HTTP proxy for all protocols' check box is selected.

3. We could move the 'Test network configuration' button to make clear it relates to the network configuration, and not only the proxy servers.

4. We should find a better label for the 'Details' button, which opens a window to provide authentication credentials.

5. The authentication credentials window should not have a 'Close' button, but 'Save' and 'Cancel' buttons.

6. We could add a label to the port fields.

7. We should make sure we handle proxy authentication errors gracefully

Build environment | **Shared state** | **Proxies** | **Others**

Add your own variables:

Key	Value
BBMASK	meta-ti/recipes-misc
I TAKE	ANYTHING

2. There is no input validation in the 'Others' tab: nothing stops me from entering downright crazy variable - value pairs.

Add | **Remove**

Cancel | **Save**

1.4. We should consider turning the 'Settings' dialog into an 'instant apply' window. 'Save' and 'Cancel' buttons would be replaced by a single 'Close' button.
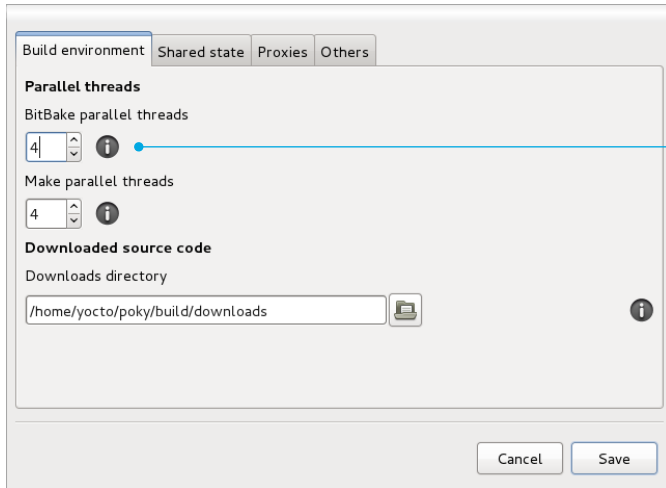
The 'Others' tab

Relevant bugs: 3193, 3198

1. In its current incarnation, the 'Others' tab requires Hob users to remember variable names and their valid values, which is an unreasonable expectation. In other words, this tab forces users to rely on recall rather than recognition (**bug 3198**), violating one of the fundamental principles of good GUI design. Other problems with the current design of this tab are:

1.1. Typing a variable is a cumbersome process requiring 3 prior steps: 1. click 'Add' button, 2. click on the new row and 3. double-click on a row cell.

1.2. To save a value, the value cell must lose focus before you click the 'Save' button (i.e. you must click outside the value row or press the enter key). Clicking 'Save' while the value cell is on focus will not keep the value you've typed.

1.3. Clicking the 'Save' button prompts the recipe parsing process

1.4. We should consider turning the 'Settings' dialog into an 'instant apply window' (**http://developer.gnome.org/hig-book/3.5/windows-utility.html.en#windows-instant-apply**), since users receive immediate visual feedback when making changes.
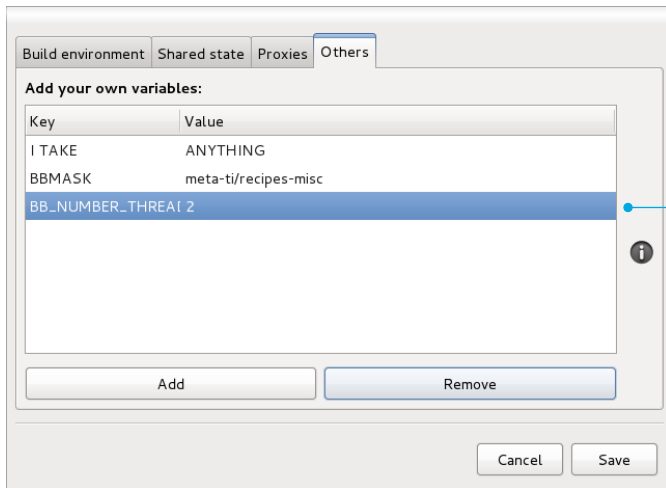
2. There is no input validation of any kind: nothing prevents me from entering non-existent variables or invalid values (**bug 3193**).

Right now, nothing stops me from setting BB_NUMBER_THREADS to '4' in the 'Build environment' tab of the 'Settings' dialog ...
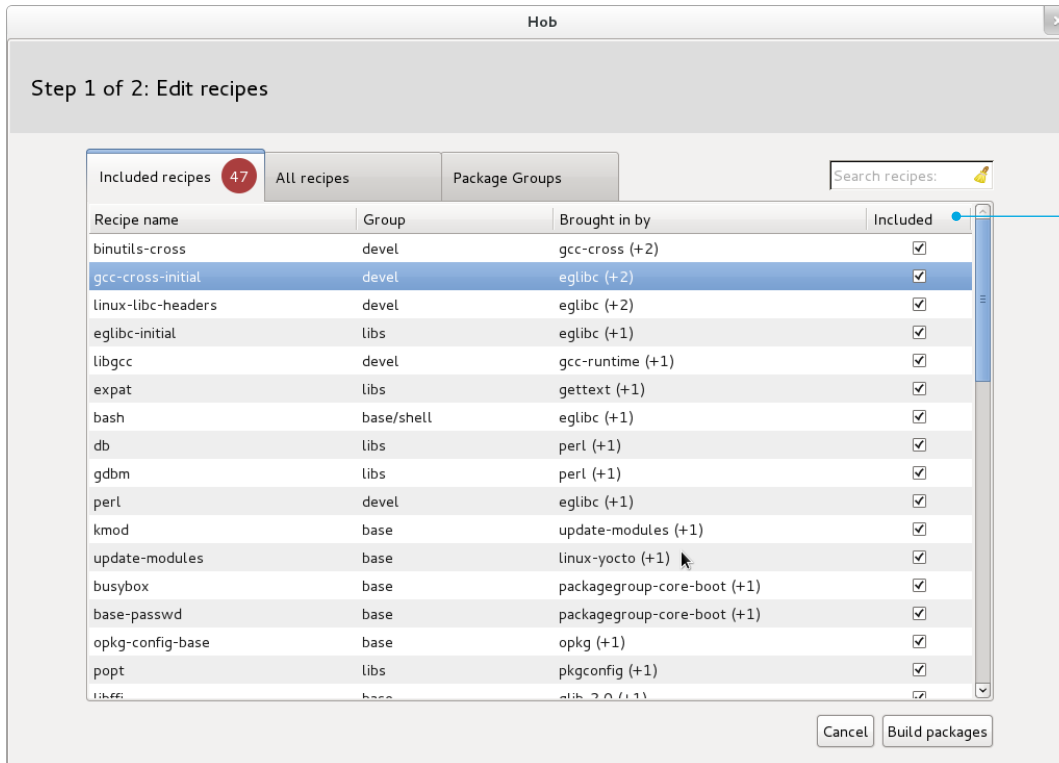
... and to '2' in the 'Others' tab of the same 'Settings' dialog.

The main challenge when redesigning the 'Others' tab is not the GUI itself, but the relation between this dialog and other dialogs where you can set certain variables. This is further complicated by new feature requests that are likely to require additions to the 'Settings' and 'Advanced configuration' dialogs (see bugs 1574, 1575 and 1576 for some examples).

It is paramount we stop users from setting the same variable more than once in Hob with different values in order to avoid conflicts. Right now, nothing stops me from setting BB_NUMBER_THREADS to '4 'in the 'Build environment' tab, and to '2' in the 'Others' tab of the same 'Settings' dialog.

For this reason, the redesign of the 'Others' tab cannot happen in isolation: we should make decisions about this tab taking into account which new features will be added to Hob during the 1.4 release.
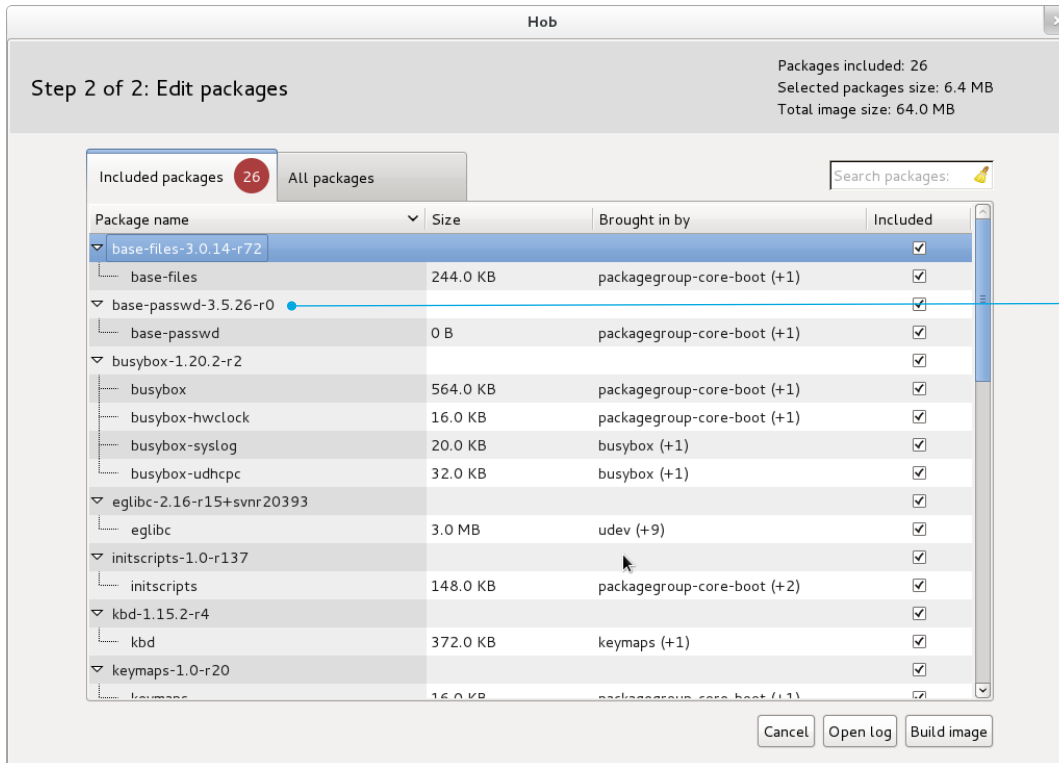
Hob

Step 1 of 2: Edit recipes

Included recipes 47	All recipes	Package Groups		Search recipes:

Recipe name	Group	Brought in by	Included
binutils-cross	devel	gcc-cross (+2)	☑
gcc-cross-initial	devel	eglibc (+2)	☑
linux-libc-headers	devel	eglibc (+2)	☑
eglibc-initial	libs	eglibc (+1)	☑
libgcc	devel	gcc-runtime (+1)	☑
expat	libs	gettext (+1)	☑
bash	base/shell	eglibc (+1)	☑
db	libs	perl (+1)	☑
gdbm	libs	perl (+1)	☑
perl	devel	eglibc (+1)	☑
kmod	base	update-modules (+1)	☑
update-modules	base	linux-yocto (+1)	☑
busybox	base	packagegroup-core-boot (+1)	☑
base-passwd	base	packagegroup-core-boot (+1)	☑
opkg-config-base	base	opkg (+1)	☑
popt	libs	pkgconfig (+1)	☑
libffi	base	glib-2.0 (+1)	☑

Cancel Build packages

There seems to be no sorting applied to the recipes table when it's first displayed. Its default sorting should be by 'Recipe name', A to Z.

Sorting table information

Relevant bugs: 2346

We need to bring some consistency to the way sorting mechanisms behave across the recipes and packages tables.

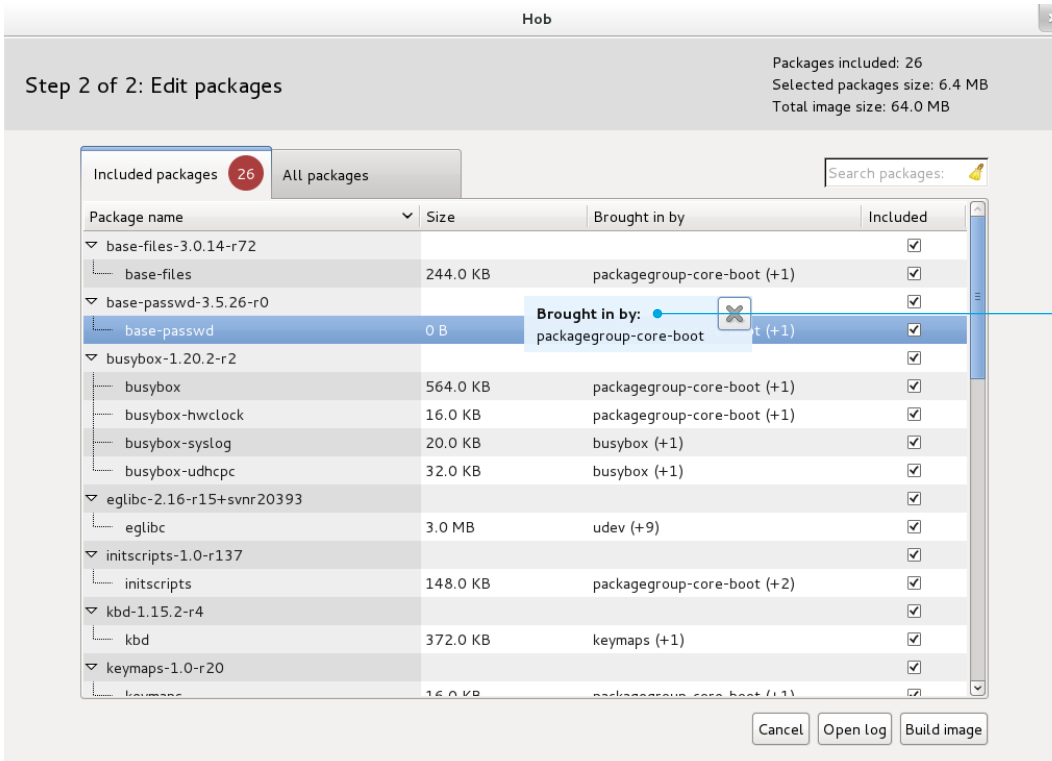See https://bugzilla.yoctoproject.org/attachment.cgi?id=719

Remove recipe groupings in the packages table

Relevant bugs: 2180

I have edited bug 2180 to tackle the specific issue of removing the recipe groupings in the Packages tables. Grouping packages by recipe makes the table information difficult to scan, difficult to sort, and weakens the relationship between content and table headers.

See https://bugzilla.yoctoproject.org/attachment.cgi?id=879

Providing information about recipes and packages

Relevant bugs: 2248

Hob should offer all the information available about recipes and packages. Things like summary, description, section or homepage could be useful when trying to decide what to include in your image, and what to exclude.

We should also review our help content about variables and features to provide useful definitions and links to documentation.

See https://bugzilla.yoctoproject.org/attachment.cgi?id=737

Editing images

Hob   ✕
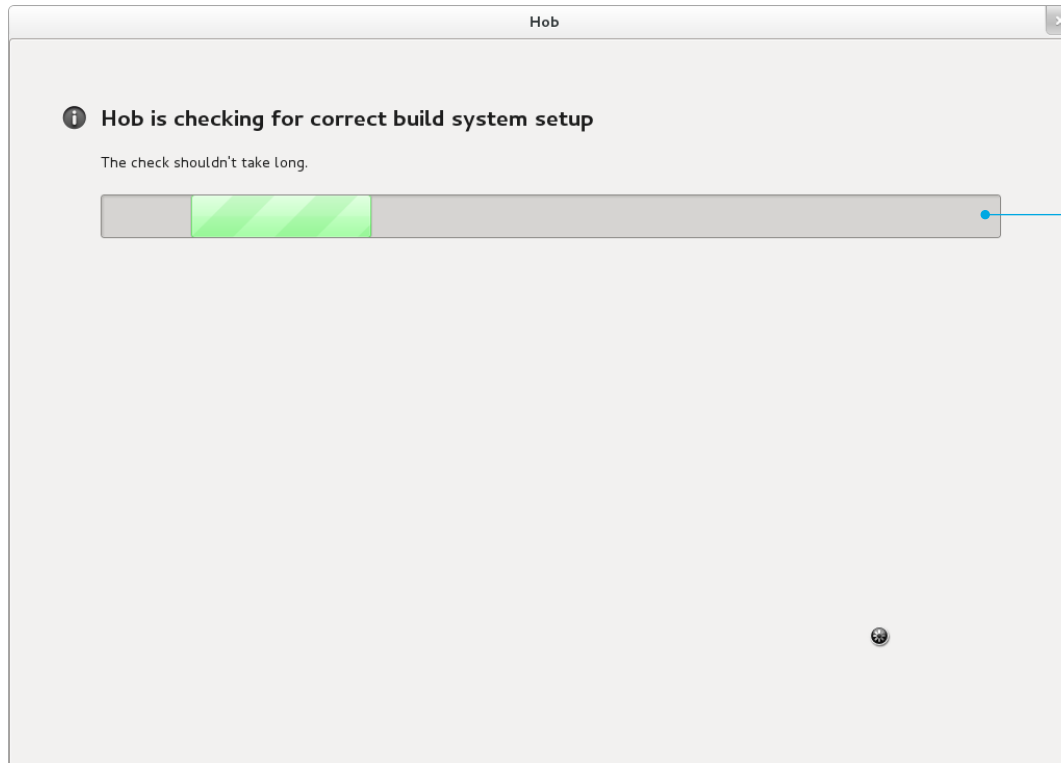
Image details

                                    Templates   Images   Settings

Name: core-image-minimal-qemux86-20121004101753

Files created: tar.bz2, ext3, ext2   **View files**

Directory: /home/yocto/poky/build/tmp/deploy/images

Packages included: N/A

Total image size: 8.2 MB
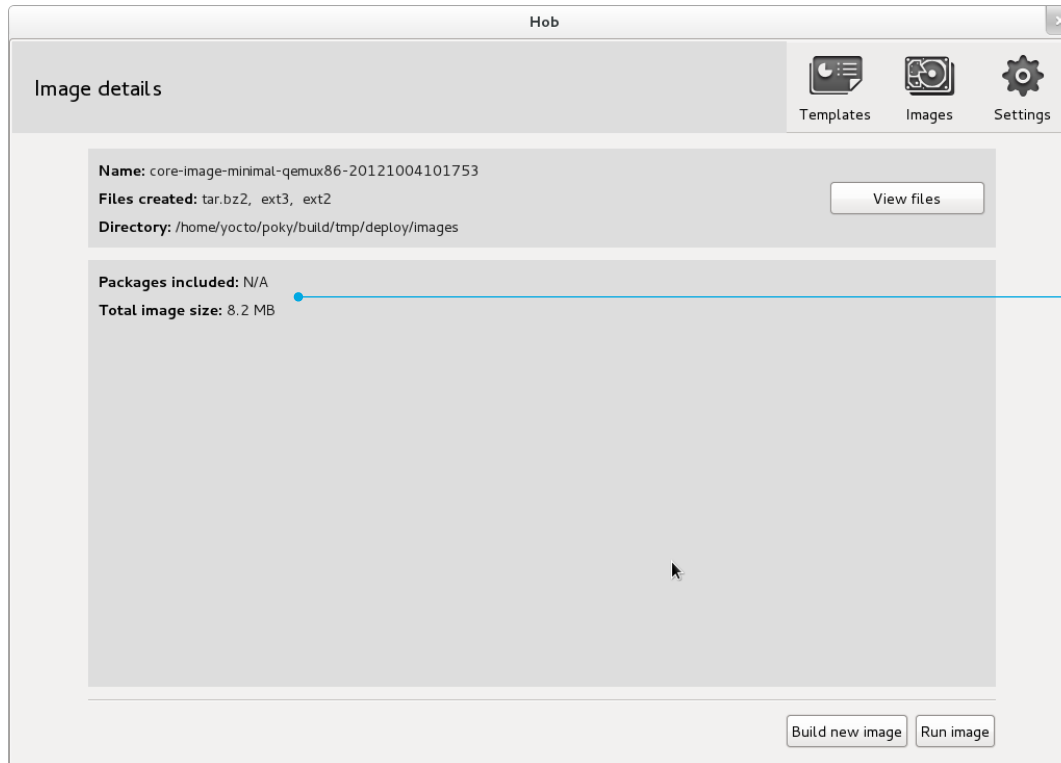
No package information or 'edit packages' option are available for images retrieved through the 'Images' button.

Build new image **Run image**

Editing images

Relevant bugs: 3003

Fixing this bug would be an important improvement, bringing to Hob the ability to edit your images.

The existing Hob suffers from very short memory: it is only able to give you a full list of the packages you included in your image right after the build finishes. If your retrieve an older image using the 'Images' button, Hob will not give you any information about the included packages and will not give you the option to the edit the image packages. This heavily limits Hob's utility when it comes to using existing images as a starting point for new images.

Hob

ⓘ **Hob is checking for correct build system setup**

The check shouldn't take long.

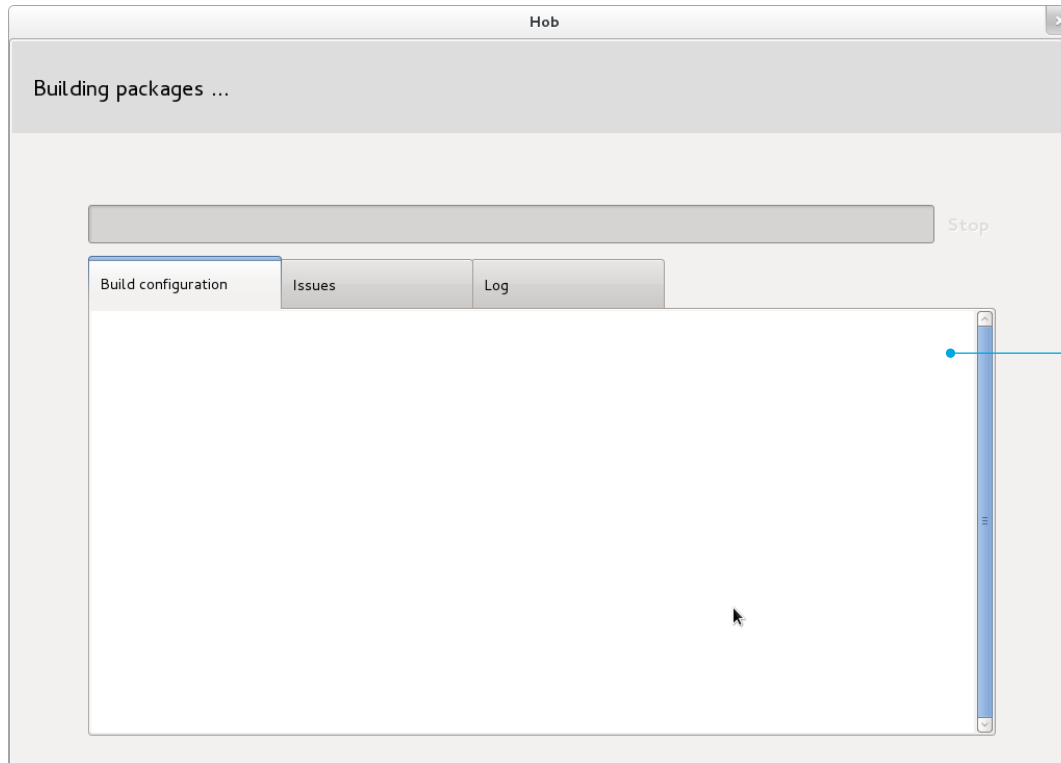The first thing I do when I open Hob is ... wait.

Performance

Relevant bugs: none

One of the weakest Hob areas is responsiveness and performance.

Things like running sanity checks as soon as you open Hob, or the long recipe parsing process right after selecting a machine, make Hob look slow, cumbersome and unresponsive. We need to be cleverer when it comes to handling these processes, running them only when strictly necessary, deferring them as much as possible, or embedding them within the build itself, so that they become less onerous to users.

An ideal Hob would:

- allow me to select everything that's needed to build an image without delays

- warn me before the build starts if any of my selections causes problems

- give me the chance to amend problematic selections before the build starts.

Hob

Building packages ...

Stop

| Build configuration | Issues | Log |

Quite often it is obvious Hob is doing something, but it won't tell me what.

Feedback

Relevant bugs: 3260, 3259, 2997, 3215, 3282, 3357

We have made a lot of progress on how Hob keeps users updated about what it is doing. But, in general, Hob is still a bit too silent.

One of the most critical aspects of giving feedback is error reporting. Although again we have made significant progress, there are still numerous errors we are not handling properly. Errors that could be improved include:

- Fetching errors due to lack of network connectivity
- Proxy server authentication errors
- Build failure due to lack of disk space

yocto
PROJECT
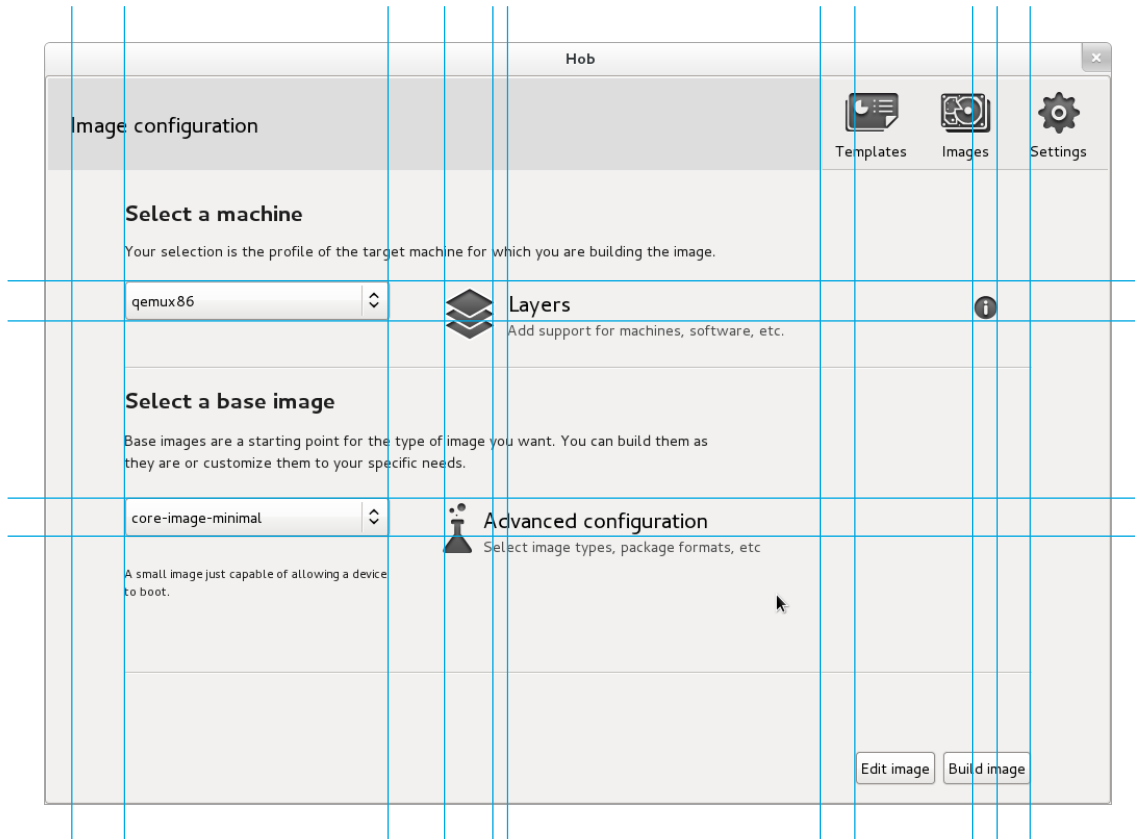
Visual design

Relevant bugs: only 2170 (lots more needed)

We have built Hob without graphic design help, and it is showing. Quickly tracing some guides through the image configuration screen shows the absence of a coherent approach to layout and white space. The same kind of problems are evident in all other Hob screens and dialogs.

We need graphic design expertise to create a visual framework for Hob. Using the Gnome Human Interface Guidelines as a starting point (**http://developer.gnome.org/hig-book/3.5/design.html.en**), the visual framework should provide consistent rules for:

- Layout
- White space
- Control size
- Optimal window size
- Window resizing behaviour
- Font size and style
- Iconography
- Bespoke interface elements (like stop and failure notifications)

I can't emphasise enough how important this is for interface quality. If there is only one thing I could do for the 1.4 release, it would be bringing a graphic designer into the team.

Questions? Comments? Rants?

Send them to Belén at
belen.barros.pena@intel.com