System Imaging with KIWI

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System Imaging with `kiwi` – Overview

where are we

What kiwi is and what it's not

KIWI is:

- A command line based toolkit
- Usable as part of a process chain
- Usable as base tool for a high level application

KIWI is not:

- A product

kiwi history

- originated by **Marcus Schäfer**
- original purpose was creating "system on a stick"
- **James Willcox** (snorp) joins active development for Thin Client (SLETC)
- **Jigish Gohil** (CyberOrg) joins active development for LTSP project
- I join active development for Autobuild extension

Current project status

Used for the following products:

- SLEPOS – SuSE Linux Point of Sale
- SLETC – SuSE Linux Thin Client
- Hardware vendors for preload images
- *JeOS*

Community projects:

- Developers who deliver Live DVDs (KDE, openSUSE, . . .)
- users who want to make images containing their application

where are we

Help Wanted!

Documentation is available throughout the web in various places

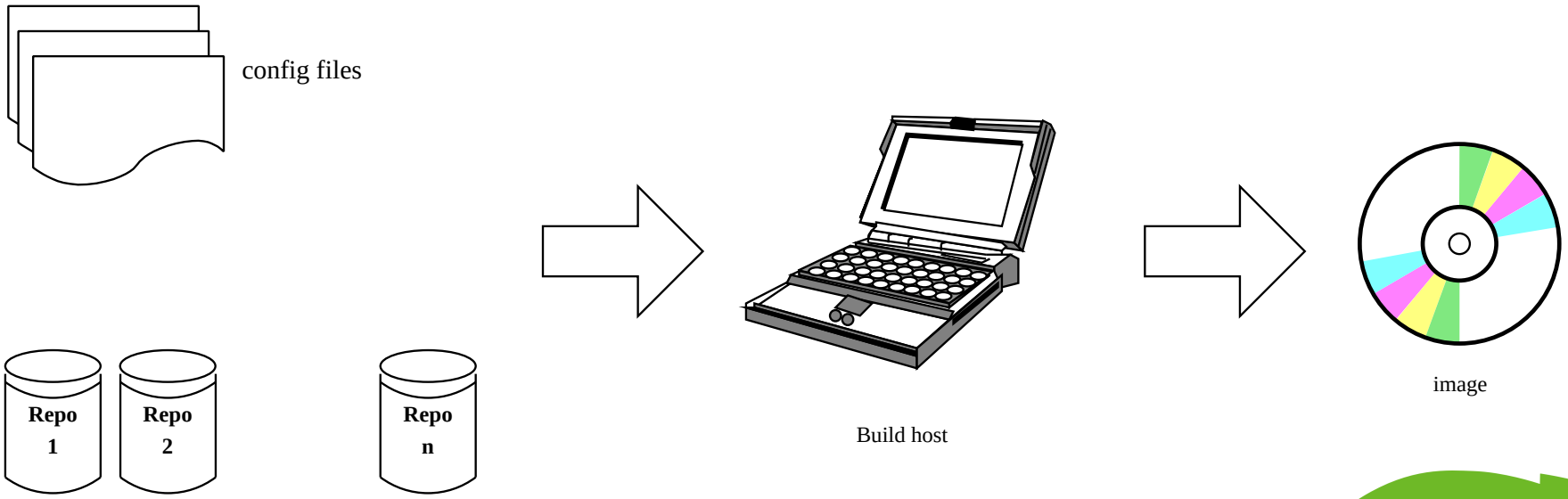
- `http://www.suse.de/~jcborn/kiwi-links.html`
- official documentation delivered with kiwi package: manpages and pdf

Setting up the buildhost

- Install **kiwi**, **kiwi-tools** and **kiwi-desc-*** packages
- create an image description file *config.xml*, or
- get and modify an existing image description

caveat: You must subscribe to the tools repository first!

Buildsystem overview



Buildsystem overview II

- Package repositories (local, network)
- Decent build host (esp. hdd)
- good network connection if using remote repositories
- Configuration file(s)

caveat: pick the correct `config.xml`

where are we

Contents of the Configuration Directory

config.xml	contains every necessary image information(packages, repositories, settings, ...
config.sh	customise the image after the packages are installed (end of `--prepare` stage)
image.sh	customise image at the beginning of the `--create` stage
root/	contains overlay files which are included in the image or needed in scripts
other	special YaST files and others

where are we

Running kiwi

Invoing kiwi is basically divided in two steps

- **prepare** Creating a changeroot tree and install system into that
- **create** Create an image from that prepared tree

In case of USB image the deployment to the stick is third stage.

Commands

The basic kiwi invocation looks like this

```
prepare kiwi -p <path-to-config.xml> -r <basedir>
 create kiwi -c <basedir> -t <type> -d <imagedir>
 deploy kiwi --bootstick <initrd>
             --bootstick-system <systemimage>
```

Tweaking

The base tree can be modified in some ways to shorten test time

- remove/install packages using chroot
- add/remove files
- modify configuration files
- add users, groups, . . .

Caveat: risk of inconsistent system

where are we

Requirements and Regressions

- You want your own openSUSE based distribution
- You want own packages from your own BuildService repo on it
- You may want to include “evil” packages

where are we

Solution

Get the "evil" packages built in your BS instance

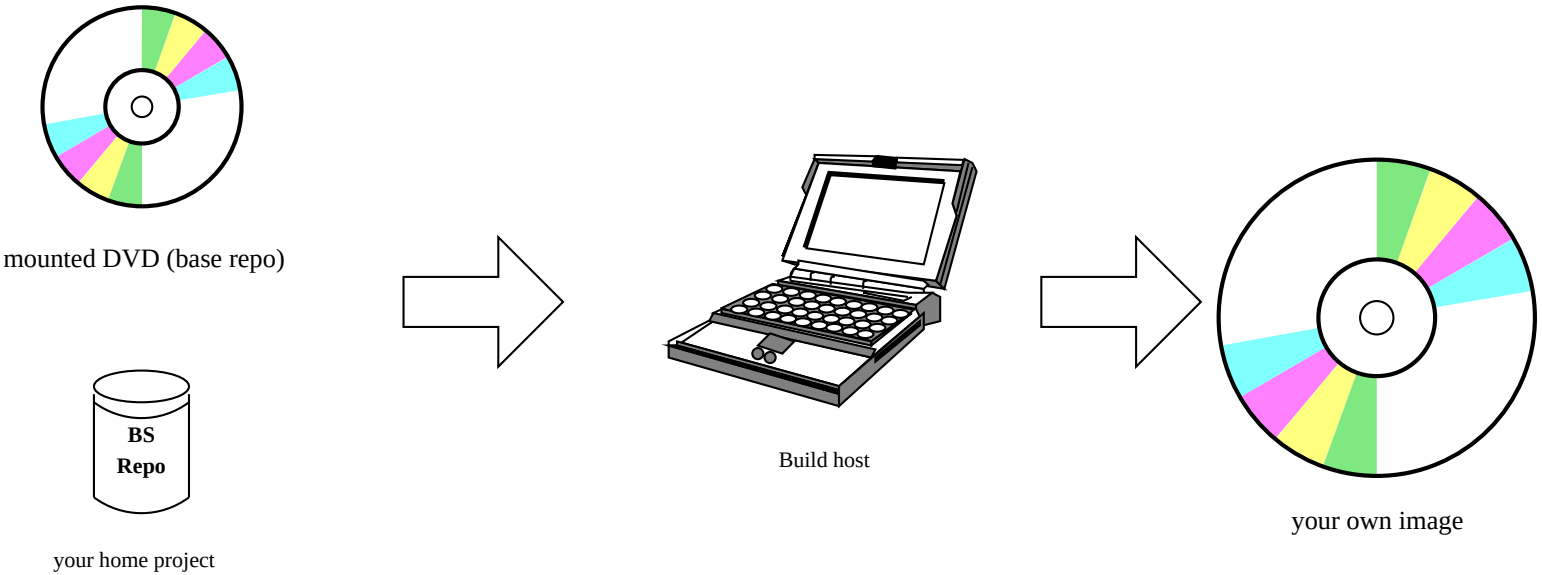
- set your BS' repository as source
- add the packages' names to the <packages> section
- Build your image

Alternative Solution (wip)

- Get the "evil" packages built in your BS instance
- Build your own installation source and release your own installable media

This will soon be possible with the `kiwi-instsource` package (see later)

Repository Configuration Example



where are we

Purpose

- Autobuild is current internal package and media factory
- openSUSE BuildService will be the next generation package factory
- `kiwi` will be able to create installation sources (WIP)

How it works

Autobuild is a distributed system

- Build clients build single RPMs based on a central scheduler and source base
- every employee's machine can (and should) be a build host
- scheduler collects built rpm files to internal "full trees" for each codebase and architecture
- metadata is created

where are we

Current Product Creation

- full trees for target architectures are sync'd to dedicated machines
- rpm files are selected and collected to one repository
- metadata for this particular repository is created
- finally all sorts of media are made:
  - ftp repositories
  - CD, DVD, torrent, . . .

Product Creation with `kiwi`

Collecting the target repository must be integrated into `kiwi`.

- Expansion of the config.xml syntax
- add module for repository creation
- allow priority value for repositories
- allow exceptions
- implement script hooks

Autobuild knowledge is necessary to create package lists and scripts

Product Creation with `kiwi` cont.

Generation of YaST metadata

- package description based on PDB
- patterns (through metapackage)
- contents, media, product files
- checksums
- root tree (through metapackage)

Creating the media itself uses *m_cd* atm.

Product Creation with `kiwi` cont.

State of project

- project is public as `kiwi-instsource`
- uses `instsourceutils`
- extended syntax for kiwi config file (still wip)
- first CD is in progress: *JeOS* – SLES based minimal system

Product Creation with `kiwi` cont.

Next steps planned:

- *LimeJeOS* installation CDs
- Code cleanup and performance enhancement
- Tests with released products
- Integration into BuildService for automatic instsource creation

Questions?

QUESTIONS. . . ?

Yet another talk is over

Thank you for your attention!
See you on

- `irc.freenode.net` #opensuse-kiwi
- for kiwi issues: `<kiwi-users@lists.berlios.de>`
- for packaging issues: `<opensuse-packaging@opensuse.org>`
- Bugzilla for kiwi: product "opensuse.org", component "system imaging"