



Excellence in
Software Engineering

<Linux>

Multiarch overview in linux distros and
their build systems



Agenda

1

Package basics

2

Fedora, OpenSUSE && build processes

3

Debian/Ubuntu, Gentoo, ArchLinux

4

Summary

Basic package stack

Smart package manager

yum,
dnf,
zypper

apt-get,
aptitude

Portage
(ebuild)

Pacman
(PKGBUILD)

Low level manager

rpm (.spec)

dpkg (.dsc)

Package formats

.rpm

.deb

.tbz2

.pkg.tar.xz

Package internals

- Meta-information
 - Package name
 - Package arch
 - ...
- Content
 - Binaries
 - Libraries
 - Docs
 - Headers
 - Debug files
 - ...

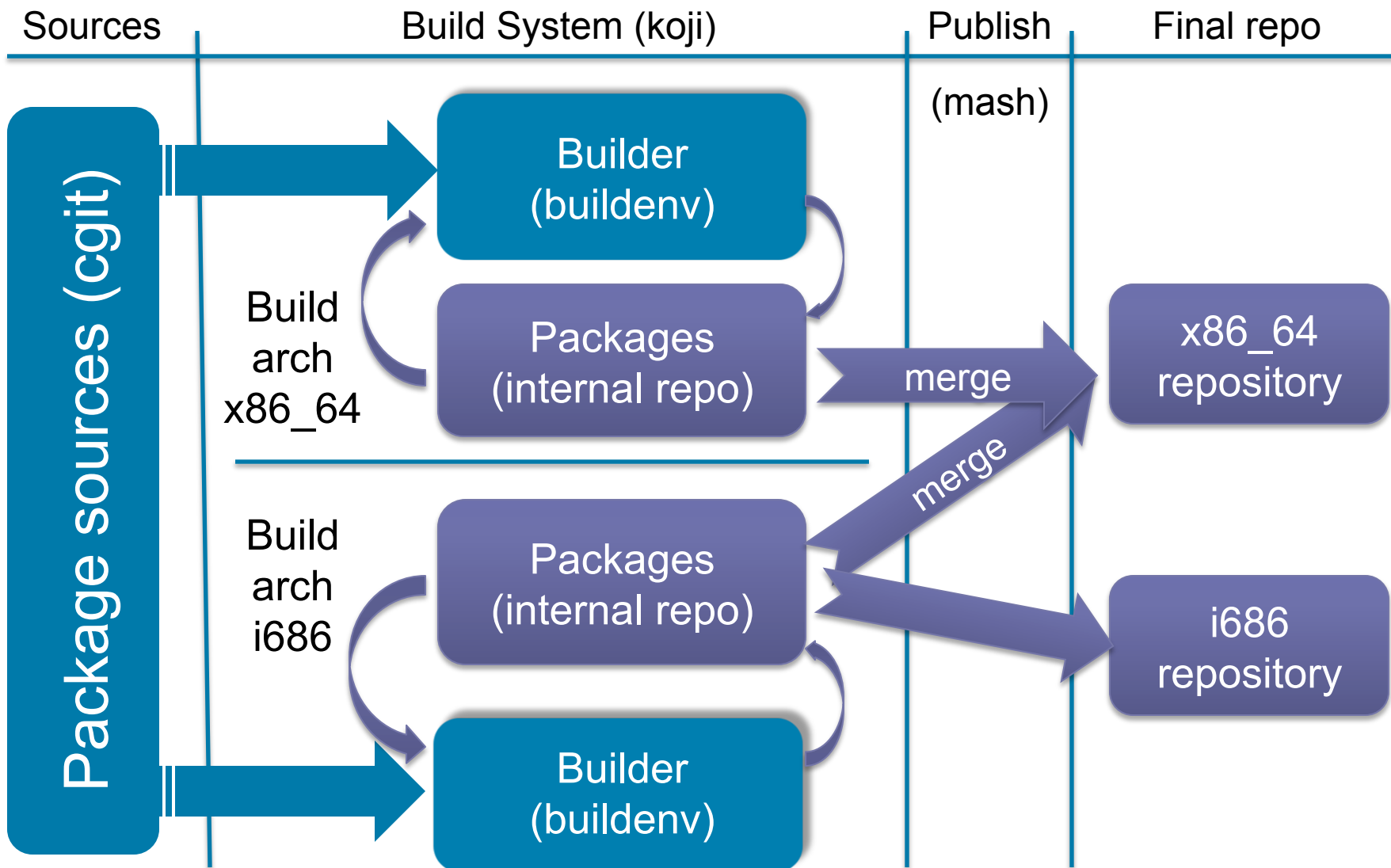
Package		
Name	Arch	Content
• somepac	• x86_64	• 64bit binaries



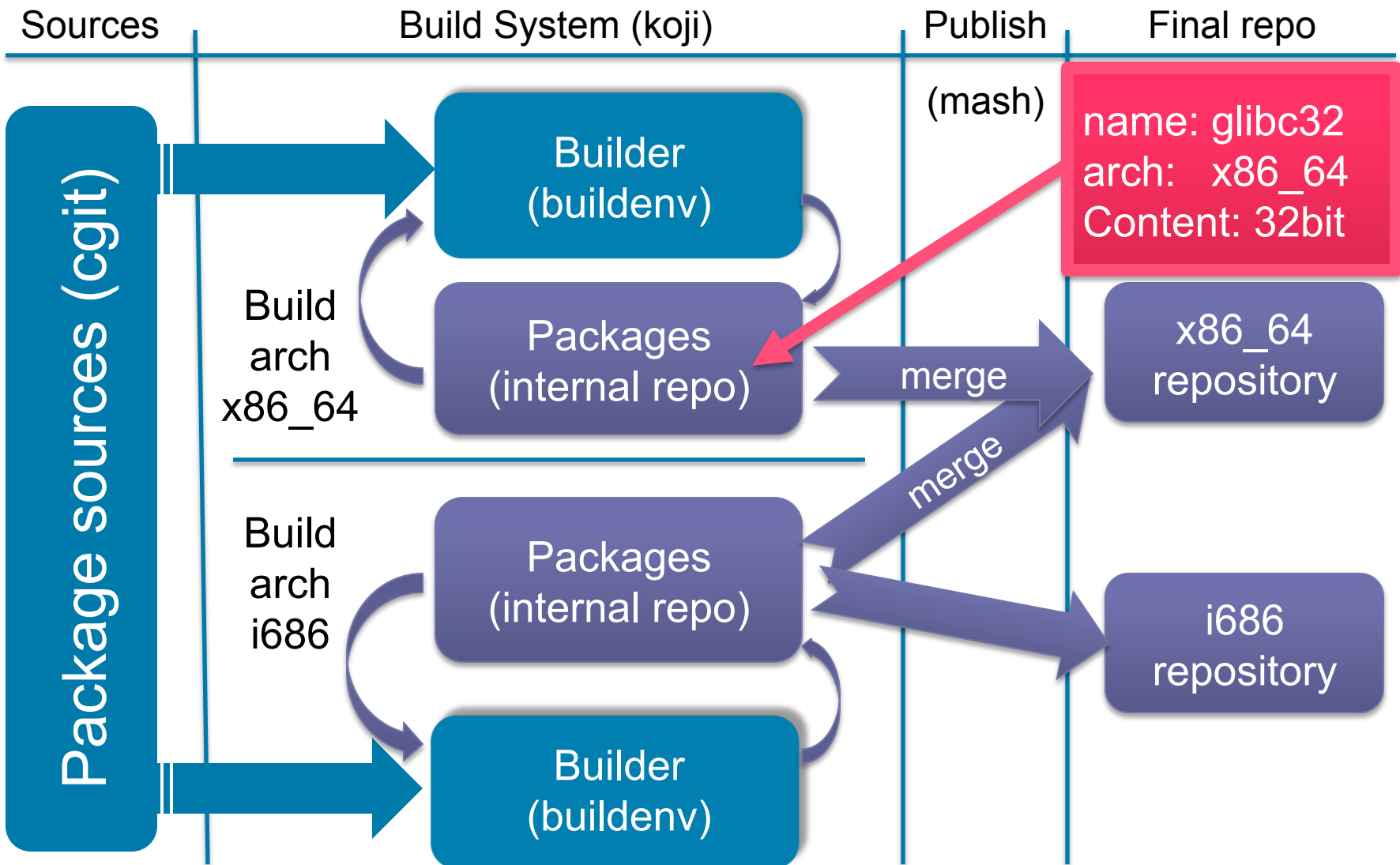
Multiarch (bi-arch, multilib)

- SW issues
 - Builds not on all arches
 - Grub, wine
 - No sources, only binaries
 - Steam, skype, other vendor packages
- Resolution
 - Place different arches in one setup
 - Start point x86_32 in x86_64

Fedora build process



Fedora build process



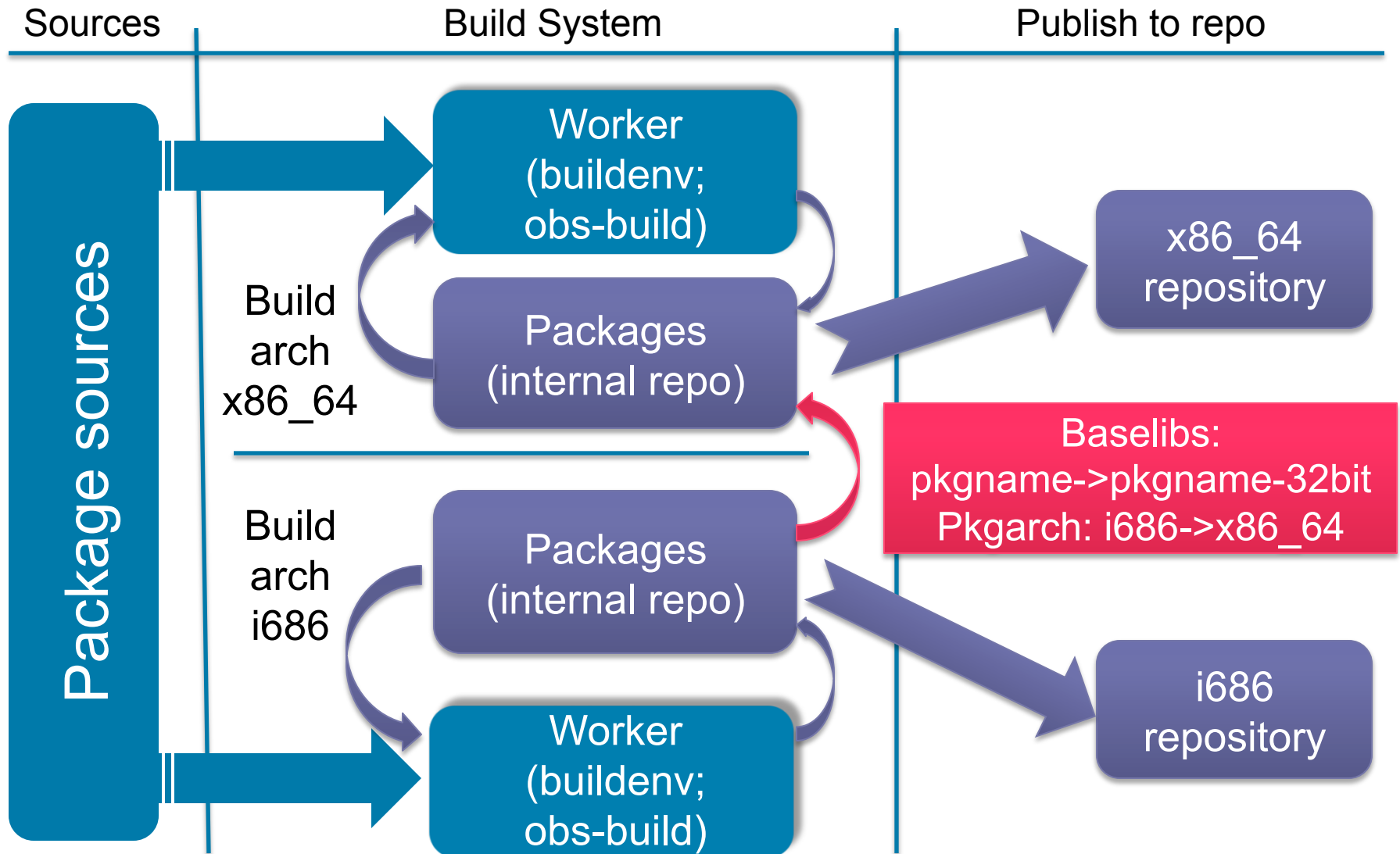
YUM



```
# yum install pkgname.arch
```

```
/lib32, /lib64
```


OpenSUSE build process (OBS)



OpenSUSE zypper

zypper install pkgname

/lib32, /lib64

Debian < 7, Ubuntu < 11.04

- Pkgname:
 - ia32-libs* (20130215)
 - lib32gcc1
 - lib32*
- Pkgarch: amd64
- Pkgcontent: 32bit



Debian 7, Ubuntu 11.04

- dpkg
 - “pkgname:arch”
- Pkgname
 - Same for both arches:
libgcc1:amd64,
libgcc1:i686
- Pkgarch: amd64
- Pkgcontent: 64-bit
- gcc-multilib deps?
 - No, still lib32gcc1, etc.
- buildd?
 - Manual package build/upload?
- FHS ignore
 - {prefix}/lib/{gnu-triplet}

Gentoo

- emul-linux*
 - 15 big packages
 - Content 32bit, pkgarch amd64
- gx86-multilib project
 - eclasses wrapper
 - Abi use flags (abi_x86_32, abi_x86_64)
- “wine” in tree as example
- multilib-portage (fork)
 - No modifications in ebuilds

ArchLinux

- Multilib repo
 - 174 packages
 - x86_64 pkg arch
 - lib32-* pkg names
 - wine, skype, steam
 - gcc-multilib replaces gcc

Summary

- Fedora in OBS possible future improvements:
 - Spec release: fixed
 - File deps: no (prjconf)
 - Fedora multiarch (for build): like koji – bad
 - Fedora multiarch (for images): no/yes
- Dependencies
- Future
 - pkgarch == pkgcontentarch
 - Running not old packages/programs/arches
 - Arch switch without reinstall
 - Binaries collision, FHS
 - Automation, clear processes
 - Virtualization

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