Software Packaging with Open Build Service

Now a Hit Motion Picture Available on VHS

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Agenda

- Packaging is Important!
- Review RPM Packaging Basics
- Intermediate RPM Package Management for SUSE
- SUSE Packaging in Open Build Service
- Support for Other Packaging Paradigms in Open Build Service
- Lots of Hands On Along the Way

Why Packaging Is Critically Important

Critically Important

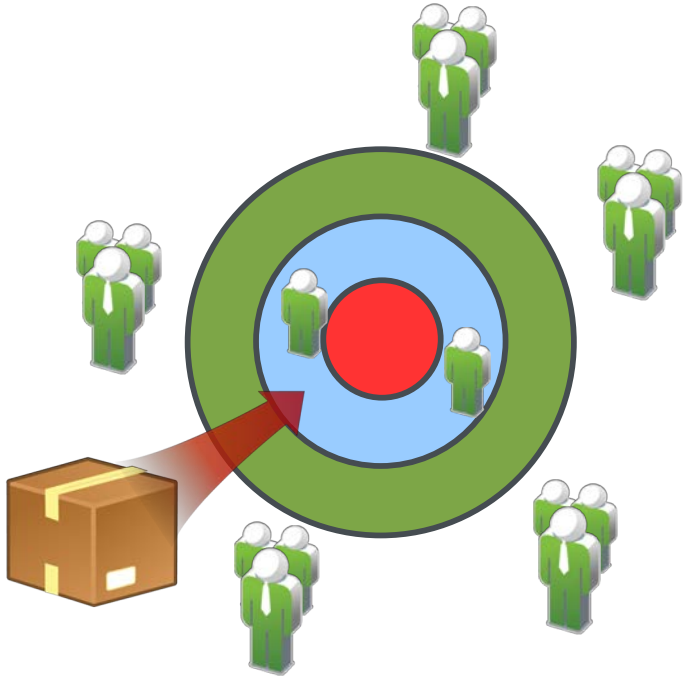
- Delivery of software to customers and users
- Reproducibility and Consistency
- Upgradeability and Uninstallability
- Tracking / Auditing / Monitoring

Packaging Makes Your Solution Universal

Want to make your software truly useful?

Package It!

Packaging streamlines the delivery of your software



Review of RPM Basics

RPM Metadata

- **Version tracking**
- **Manifest of files**
- **Descriptive data**
- **Rules for:**
  - Installing
  - Updating
  - Uninstalling
- **Dependencies**

```
Name        : glibc
Version     : 2.19
Release     : 38.2
Architecture: x86_64
Install Date: Tue Jul  5 20:00:15 2016
Group       : System/Libraries
Size        : 6658417
License     : LGPL-2.1+ and SUSE-LGPL-2.1+-with-GCC-exception and GPL-2.0+
Signature   : RSA/SHA256, Mon Jun 27 16:26:05 2016, Key ID 70af9e8139db7c82
Source RPM  : glibc-2.19-38.2.src.rpm
Build Date  : Mon Jun 27 16:07:38 2016
Build Host  : sheep23
Relocations : (not relocatable)
Packager    : https://www.suse.com/
Vendor      : SUSE LLC <https://www.suse.com/>
URL         : http://www.gnu.org/software/libc/libc.html
Summary     : Standard Shared Libraries (from the GNU C Library)
Description :
The GNU C Library provides the most important standard libraries used
by nearly all programs: the standard C library, the standard math
library, and the POSIX thread library. A system is not functional
without these libraries.
Distribution: SUSE Linux Enterprise 12
```

RPM Packaging Fundamentals

- **“package”**
  - Normal .rpm file (that contains the payload of software and metadata)
  - The set of files necessary to build the software
- **RPM Database**
- **rpm**
- **rpmbuild**
  - Builds software from sources
  - Builds for a specific architecture
  - Creates a versioned binary package for installation/upgrade
  - cpio archive of files + scriptlets

A Little Hands On

Intermediate Package Management

Intermediate Packaging Concepts

- **Source Patches**
  - Quilt https://goo.gl/dA6JQM
- **Macros**
- **Scriptlets**
- **Library Packages and Subpackages**
- **Dependencies, capabilities, renaming, prerequisites, etc.**
- **What about Epoch? (It's generally "a bad thing (tm)."")**
- **What about triggers? (Why you should try to avoid them.)**
- **Package Hub 15**
  - XXX Y:00 PM Ismail Dönmez

Scriptlets

Examine specfile

%pre, %preun
%post, %postun

Differentiating between initial install and upgrade
%pre
if [$1 -gt 1] ; then
fi

Scriptlets

Helpful table

(see: https://en.opensuse.org/openSUSE:Packaging_scriptlet_snippets)

	Install	Upgrade	Uninstall
%pre	$1 == 1	$1 == 2	n/a
%post	$1 == 1	$1 == 2	n/a
%preun	n/a	$1 == 1	$1 == 0
%postun	n/a	$1 == 1	$1 == 0

Macros/Variables

See /usr/lib/rpm/macros
/usr/lib/rpm/suse_macros

Library Packages and Subpackages

Examine specfile

%package -n
%description -n

%scriptlets (%post, %pre, etc)

%files -n

Dependencies and Capabilities

Examine specfile

Requires and BuildRequires
PreReq
Provides
Obsoletes

Epoch

Good or bad? A common example:

- perl version 5.00503
- Perl version 5.6
- 5.6 ?> 5.00503

Epoch to the rescue!

But does epoch really save you?

Triggers

- **Tread carefully – rare cases**
- **Often have unintended effects**
- **Better left to distro maintainers**
  - Not likely to have the intended effect for stand-alone application packages
  - Certainly “ok” for something like an independent appliance

Advanced Package Management

Advanced OBS Concepts

- **Source Services**
- **Building Other Stuff**
  - Packages for other distros
  - Images
  - JEOS, KVM, XEN, VirtualBox©, VMWare©, Live Distros, Appliances, etc.
- **Containers**
  - For CaaS Platform (Docker, Kube, etc.)
  - SUSE Container Registry

If we had more time…

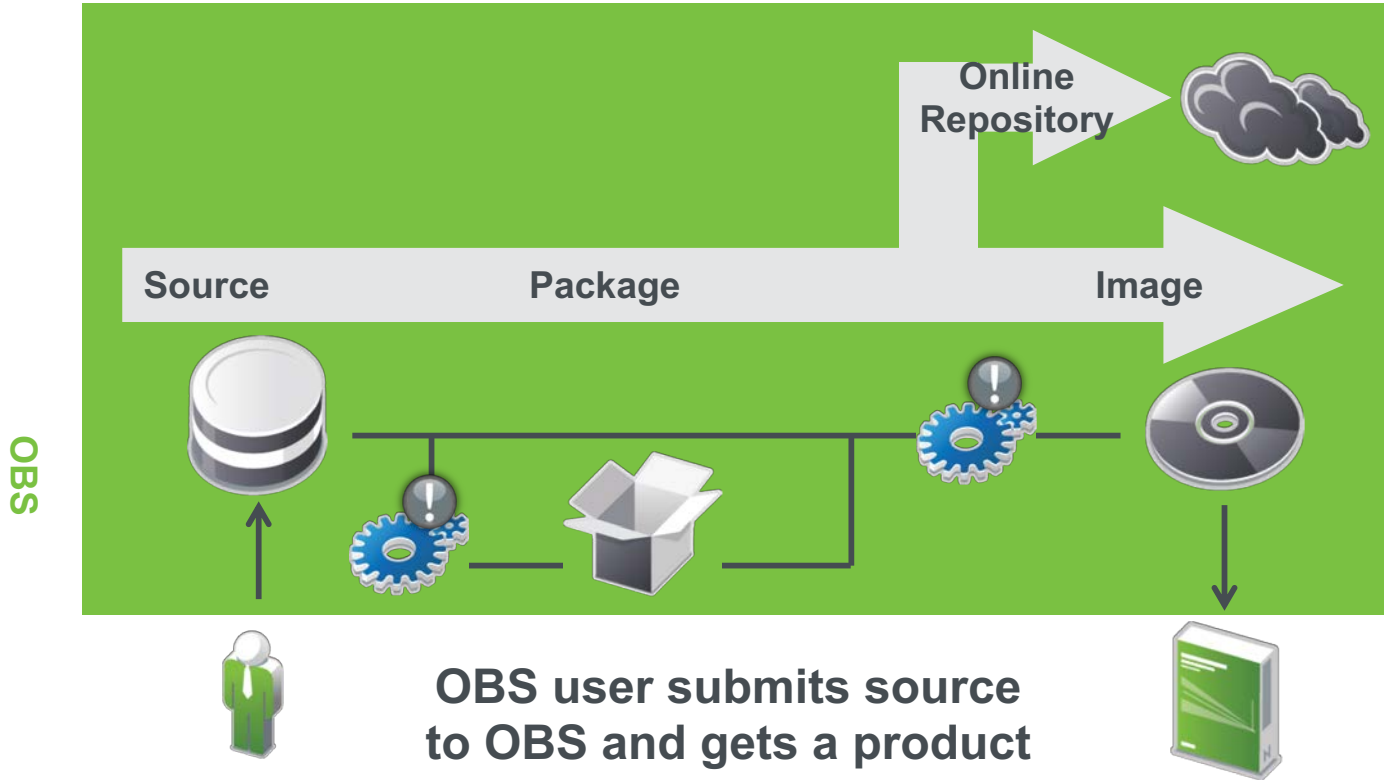
More Hands On Demonstration

Open Build Service

Build Service Basics

- **Builds Everything SUSE (and openSUSE)**
- **Builds on all supported architectures**
- **Builds for all current distributions (and, optionally, older ones)**
- **Builds from sources, outputs installable packages**
  - Also builds ISOs and other stuff mentioned earlier
- **Available for you to do your builds**
  - Use our Build Service
  - It’s open source: deploy and use your own Build Service

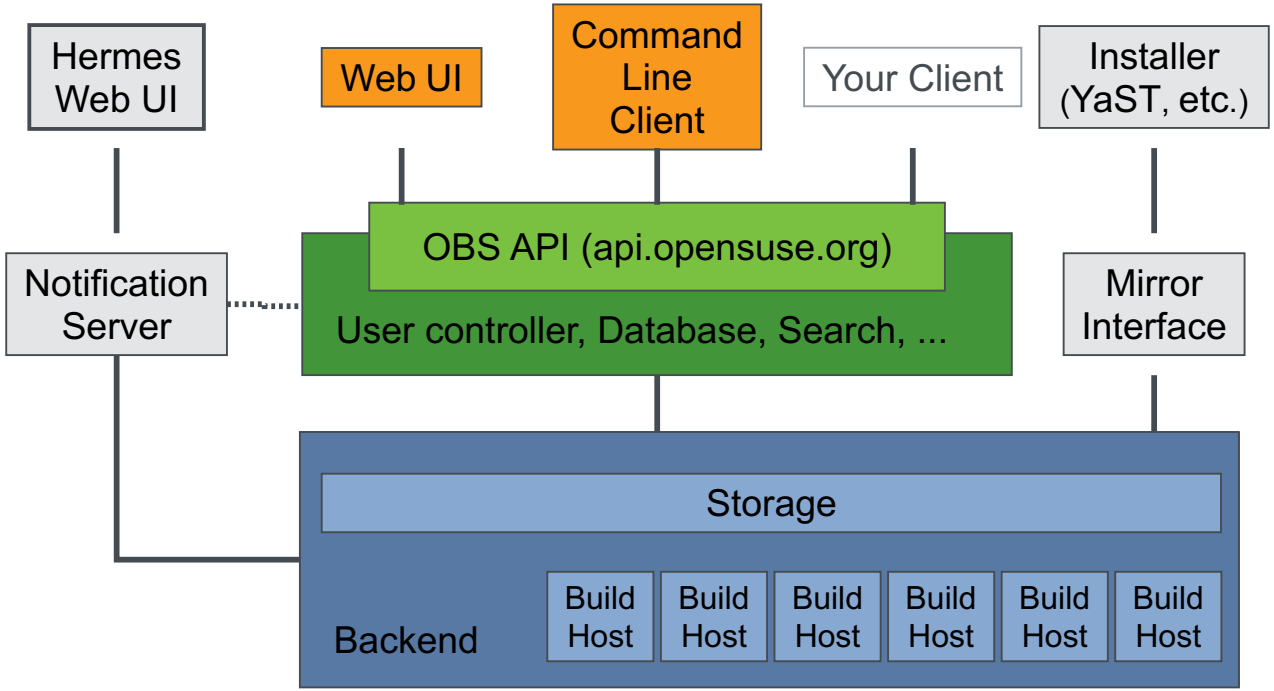
What Is Open Build Service (OBS)?



Components of Open Build Service

- **A Server that:**
  - Stores all source in a revision control system
  - Stores all built binaries
  - Calculates the need to rebuild packages
  - Acts as a database for various queries
- **A Set of Client Tools, API:**
  - “osc” command line interface
  - Optimized for handling sources
  - Run builds on your local machine the same as you would do on the server
  - Web UI
  - Optimized to see current status
  - Manage requests for changes

Server-side Components



Other Distros in Open Build Service

Build for Other Distributions

- **RedHat / Fedora**
  - RPM based, so (generally) use the same specfile
  - Macros for accommodating distribution differences
- **Debian / Ubuntu**
  - Packagename.dsc, debian.rules, and debian.control files
  - Debian.changelog file
  - http://en.opensuse.org/openSUSE:Build_Service_Debian_builds

Hands On with OBS

```
cp buildinfo/_build*  .

osc    build    \
--local-build   \
--alternative-project=openSUSE:Leap:15.1  \
standard
```

Resources

Learn More / Do More

- **Packaging**
  - Web: http://en.opensuse.org/Portal:Packaging
  - ML: http://lists.opensuse.org/opensuse-packaging
  - IRC: freenode #opensuse-packaging
- **Open Build Service**
  - Web: http://openbuildservice.org
  - ML: http://lists.opensuse.org/opensuse-buildservice
  - IRC: freenode #opensuse-buildservice

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