



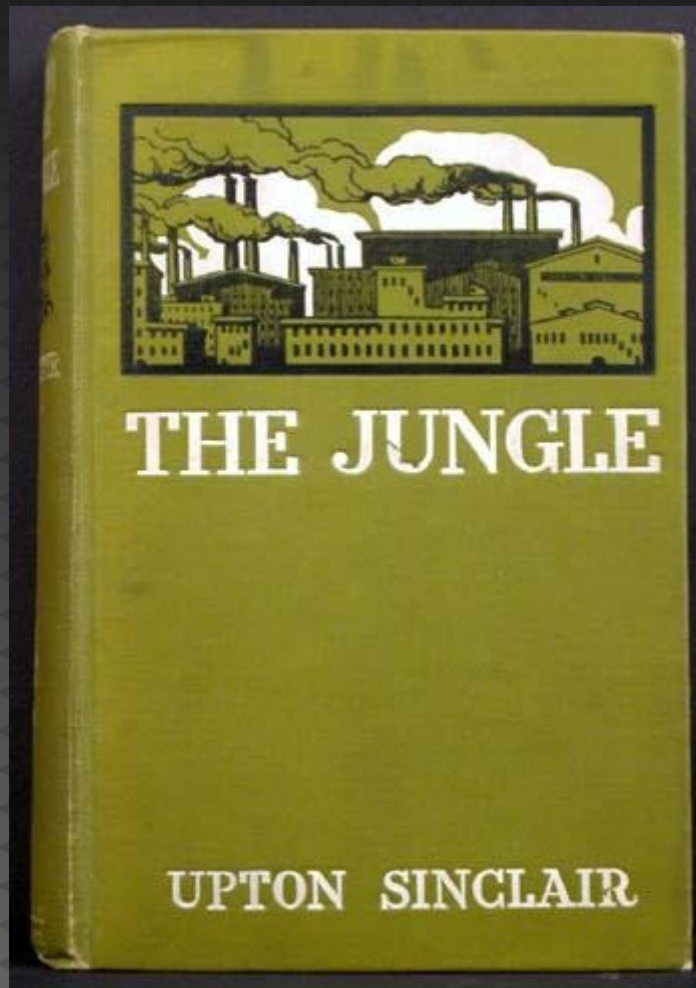
Linux Charcuterie

How distribution sausage is made

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Charcuterie (/ʃɑrˌkuːtəˈriː/ or /ʃɑrˈkuːtəri/; northern French: [ʃavkytˈvi] or southern French: [ʃavkytəˈvi], from chair 'flesh' and cuit 'cooked') is the branch of cooking devoted to prepared meat products, such as bacon, ham, sausage, terrines, galantines, ballotines, pâtés, and confit, primarily from pork.

“How Sausage is Made”



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pork products.

I'm here to talk about Linux
Distributions

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WHY?

Topics

- Fedora release, start to finish, plus updates
- Other distributions - compare and contrast
- New directions – Images, Containers and more
- Note regarding level of detail and audience :-)

GOAL

Understand and Appreciate what distros do and (maybe) contribute to the process of creating and maintaining one.



Fedora release in
60 seconds

Fedora Release Process

The old release is branched. Rawhide accumulates packages and updates, tracked in pkgdb/bodhi and dist-git and built in koji. The upcoming release is branched. New features are completed or dropped. Progressive release criteria are added prior to Alpha, Beta and GA release. TCs and RCs are generated and evaluated against these criteria. If all deliverables meet criteria, the milestone is released. When the milestone is GA, we are done..... so we start over.

What's missing?

- A 20 year accumulation of software and tools!

RPM packaging - Binary

- Single queryable system-wide package DB
- Signed and verifiable builds
- Updates
- BUT... Not Dependency Resolution

RPM packaging - Source

- Preserve upstream source vs patches
- Encapsulate the entire build process and deps
- Binary vs Configuration vs Doc
- Changelog
- Build multiple architectures
- A single controlling SPEC file

RPM packaging - SPEC

- Preamble – Metadata – Source, Desc, etc.
- %prep – Unpack, patch and occasionally more
- %build – configure, build
- %install – install to a staging/non-root location
- %files – inventory of installed files
- Macros – sometimes lots of them!

SPEC file

Summary: Powerful interactive shell
Name: zsh
Version: 5.2
Release: 4%{?dist}
License: MIT
URL: <http://zsh.sourceforge.net/>
Group: System Environment/Shells
Source0: <http://download.sourceforge.net/{name}/{name}-{version}.tar.bz2>
Patch0: zsh-serial.patch
Patch1: 0000-zsh-fix-runhelpdir-issue.patch
Patch4: zsh-4.3.6-8bit-prompts.patch
Patch5: zsh-test-C02-dev_fd-mock.patch
Patch12: <http://ausil.fedorapeople.org/aarch64/zsh/zsh-aarch64.patch>
BuildRequires: coreutils sed ncurses-devel libcap-devel
BuildRequires: texinfo texi2html gawk hostname

SPEC file

```
%prep

%setup -q
%patch0 -p1 -b .serial
%patch1 -p1
%patch4 -p1
%patch5 -p1

%patch12 -p1

cp -p %SOURCE7 .

%build
# Avoid stripping...
export LDFLAGS=""
%configure --enable-etcd-dir=${_sysconfdir} --with-tcsetpgrp --enable-
maildir-support

make all html
```


SPEC file

```
%install
rm -rf $RPM_BUILD_ROOT

%makeinstall install.info \
  fndir=$RPM_BUILD_ROOT%{_datadir}/%{name}/%{version}/functions \
  sitefndir=$RPM_BUILD_ROOT%{_datadir}/%{name}/site-functions \
  scriptdir=$RPM_BUILD_ROOT%{_datadir}/%{name}/%{version}/scripts \
  sitescriptdir=$RPM_BUILD_ROOT%{_datadir}/%{name}/scripts \
  runhelpdir=$RPM_BUILD_ROOT%{_datadir}/%{name}/%{version}/help

rm -f ${RPM_BUILD_ROOT}%{_bindir}/zsh-%{version}
rm -f $RPM_BUILD_ROOT%{_infodir}/dir

mkdir -p ${RPM_BUILD_ROOT}%{_sysconfdir}
for i in %{SOURCE1} %{SOURCE2} %{SOURCE3} %{SOURCE4} %{SOURCE5}; do
  install -m 644 $i $RPM_BUILD_ROOT%{_sysconfdir}/"${(basename $i .rhs)}"
done

mkdir -p $RPM_BUILD_ROOT%{_sysconfdir}/skel
install -m 644 %{SOURCE6} $RPM_BUILD_ROOT%{_sysconfdir}/skel/.zshrc
```

SPEC file

```
%files
%defattr(-,root,root)
%doc README LICENCE Etc/BUGS Etc/CONTRIBUTORS Etc/FAQ FEATURES MACHINES
%doc NEWS Etc/zsh-development-guide Etc/completion-style-guide
zshprompt.pl
%attr(755,root,root) %{_bindir}/zsh
%{_mandir}/*/*
%{_infodir}/*
%{_datadir}/zsh
%{_libdir}/zsh
%config(noreplace) %{_sysconfdir}/skel/.z*
%config(noreplace) %{_sysconfdir}/z*

%files html
%defattr(-,root,root)
%doc Doc/*.html

%changelog
* Wed Jan 27 2016 Kamil Dudka <kdudka@redhat.com> - 5.2-4
- prevent zsh from crashing when printing the "out of memory" message
(#1300958)
```

dist-git

- Where the “branch” happens
- Track multiple release streams
- Capture SPEC file changes
- Capture patches
- Sidecar storage of base sources
- Allows per-branch (meaning per-release) control
- Assisted by fedpkg

dist-git



```
[imcleod@localhost zsh]$ git branch --all
[...]  
remotes/origin/f22  
remotes/origin/f23  
remotes/origin/f24  
remotes/origin/master
```

```
[imcleod@localhost zsh]$ git ls-files  
sources  
zsh.spec  
systemd-zsh-completion.zsh  
zlogin.rhs  
zlogout.rhs  
[...]
```

```
[imcleod@localhost zsh]$ cat sources  
afe96fde08b70e23c1cab1ca7a68fb34  zsh-5.2.tar.xz
```



Where do I build it?

Koji

- Software that builds all Fedora RPMs
- Infrastructure running that software:
<http://koji.fedoraproject.org/>
 - 40 – i386/x86_64
 - 48 – 32 bit ARM
 - Dozens more for Power, aarch64 and even s390 secondary architectures!

Koji - Essentials

- Collects packages into groups (tags)
- Tags can inherit from other tags
- Builds against content of one tag but may place results in a different tag (targets)
- Actual building is done with mock
- Examples
 - Tags: f23, f23-updates, f23-updates-candidates
 - Targets: f23 (build: f23-build dest: f23-updates-candidates)

Koji – Example

- <http://koji.fedoraproject.org/koji/buildinfo?buildID=714097>

pkg-db and bodhi

- Work in concert with koji to track new packages and package updates
- Pkg-db – package validity and ownership
- Bodhi – feedback (manual and automated)

Pkg-db and bodhi

- <https://admin.fedoraproject.org/updates/FEDORA-2014-10072/zsh-5.0.6-1.fc20>
- <https://bodhi.fedoraproject.org/updates/FEDORA-2015-1447813dc8>



What do I do with a big pile of packages?

Putting it together

- Mash – aggregates packages into repos
- Anaconda – Is the thing that you actually see when you install Fedora
- Lorax – Builds a small bootstrap environment that can run Anaconda
- Pungi – Uses “all of the above” to generate install media

QA

- Controls Alpha, Beta and GOLD release
- Establishes objective criteria for each release
- Request composes
- Manages testing against criteria
- Herds cats for doing actual testing
- Votes along with other groups on release decision
- F22 Release Criteria - https://fedoraproject.org/wiki/Fedora_Release_Criteria

QA – Criteria Examples

- Alpha – Images must boot – installer must run
- Beta – Upgrades, Full Installs
- GOLD – Translations, Backgrounds, Final Media
- NB – Much of QA is testing the install, much of the rest is initial components

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RHEL

- Danger, mild marketing ahead
- “branched” from RHL and branches from Fedora
- Stable, Supported – much longer lifecycle
- Tooling – much is similar (koji) a bit is not
 - Errata, particularly embargoed security
 - Specific compose tooling
 - Internal QA process

Scientific Linux

- Modified “Red Hat Linux” that evolved into a RHEL rebuild/clone
- Managed by Fermilab!
 - Pat Riehecky “Where does Scientific Linux Flourish!” - 10:00 AM – Room B
 - Troy Dawson “RHEL Clones for Fun and Profit” - 3:00 PM – Room B

CentOS

- Community rebuild of RHEL
- CORE – minimal diff → different build process
- Extras – Non RHEL content – Xen, others?
- SIGs – stable but tweakable base, active upstreams

OpenSUSE

- Previously closed build, open release
- Now entirely open feeding SLES
- OBS
 - Unified interface to some distinct Fedora services
 - Triggered, cascading builds based on deps
 - OpenQA/Tumbleweed – Tested rolling release

Debian

- Dpkg versus RPM – modularity
- Buildd versus koji
 - Upload locally build binaries
 - Build noarch packages on a specific arch

Next Gen Charcuterie

- Fedora.NEXT – Particularly rings
- COPR, Software Collections and other non-core package sets
- Cloud Images/Docker Images
- Atomic images

Where can I help?

- Make your own sausage!
- Adopt a package
- Create a package
- Test a package
- Participate in QA
- Write documentation
- Evangelize!

Charcutier ACKs

- Adrian Schröter - SUSE
- Don Armstrong – Debian
- Adam Williamson, Matt Miller and Dennis Gilmore – Fedora
- JZB, Gina - OSAS

Questions?

<https://imcleod.fedorapeople.org/flourish/>



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