fedora

DEVCONF.cz

🔨 Building an Operating System

Choose your own adventure in Open Source contribution!

@jwf@floss.social

@jwf_foss

@jwflory

@jflory7:fedora.im

jwf.io

Justin W. Flory <jwf@redhat.com>

he/him/his

Fedora Community Architect

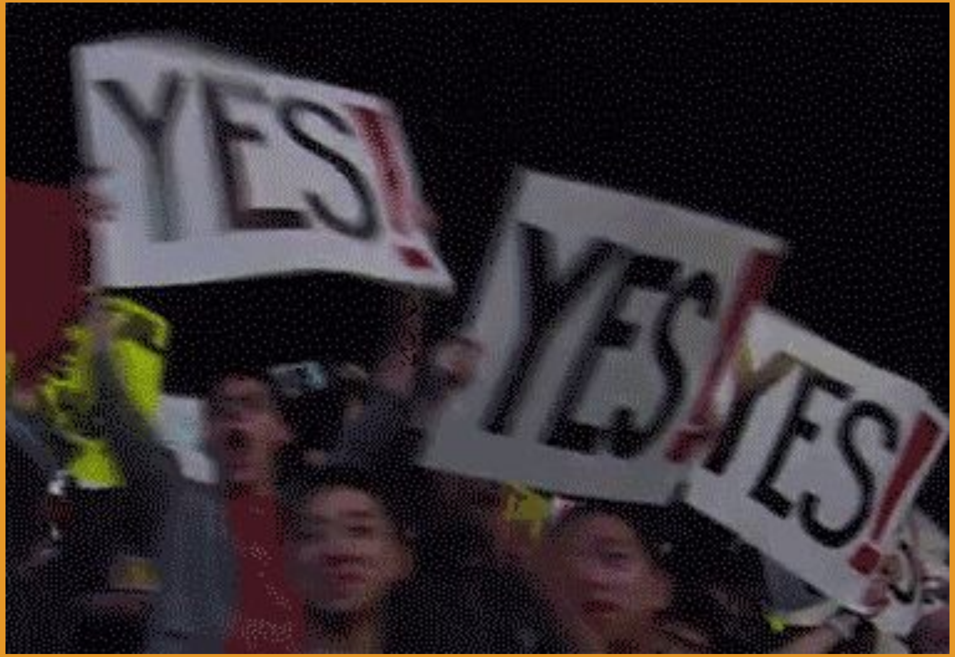
Red Hat

Slides: j.jwf.io/build-fedora

Open Source is…

A method.

A movement.



A culture.

Agenda

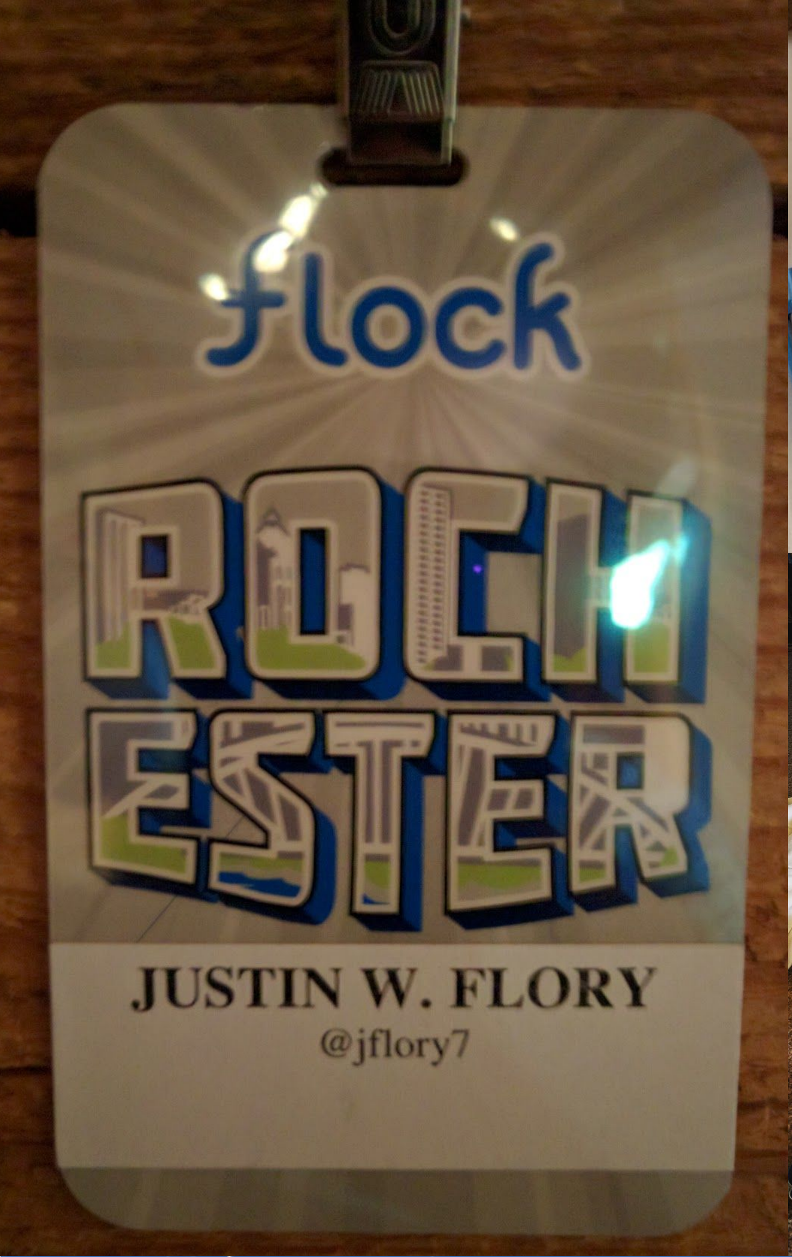
What are we doing here?

Let’s make a contribution to an Open Source operating system!

1. Who am I?
2. *Activity*: Follow the Package!
3. *Presentation*: The lifecycle of a software package.
4. *Activity*: How would you contribute to a Linux distro?
5. Wrap-up & conclusion.

Who am I?

My background & career in Open Source.


flock
ROCHESTER
JUSTIN W. FLORY
@jflory7

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fedora activity day
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Me & Fedora.

Workshop kick-off:

Lightning intros!

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Lightning intros!

Let’s get to know each other better.

1. Name? How do you prefer to be called?
2. What city/country are you originally from? What city/country do you live in today?
3. In exactly one sentence, what brought you to this session today?

Warm-up activity:

Follow the Package!

Pay close attention… you may be quizzed momentarily. 😉

“How does software get to a user in Fedora Linux?”

A common way to contribute to a Linux distro is by creating and maintaining software packages[1].

[1] — Software packaging means compiling, building, and distributing the software in a format that is easily installable by an end-user.

A contributor who submits software packages to a Linux distribution is called a packager. Easy!

Fedora Linux packagers compile and build the software by writing a RPM spec file. They submit their spec file for peer review by other Fedora Linux packagers.

Once a package is approved with a passing build, it is added to Fedora’s official repositories and “mirrored” in other repositories around the world.

Follow the Package: Instructions

Did you follow that? Let's do a 10-minute activity to warm up our brains!

Activity instructions

1. Break out into small groups, or stay in your existing group.
2. Order the steps to the right in a sequence, where the beginning and end are known:
   - ○ **START**: Source code hosting platform (e.g. GitHub).
   - ○ **END**: End-user opens a desktop app (e.g. you, a friend, a colleague, a teammate).
3. At the end of 10 minutes, each group shares their sequence and a sentence on how they decided..

Steps to put in order between START and END

Steps in random order to update a package in Fedora Linux:

- Documentation about new features in the desktop app.
- Fedora Linux operating system on your personal or work computer.
- Fedora Linux software repository on the public Internet.
- Marketing a new release and features added in the release.
- RPM spec file for a desktop app (e.g. Discord, Slack, or your favorite app).

Presentation:

Lifecycle of a software package

How it started

1990s.

Software Wild West

- Change management for computers.
- Standardizing across hardware architectures.

2000s.

Build it!

- Build infrastructure: Less scripts, more code.
- Growing momentum. Still a niche.

2010s.

Automate it!

- Increased focus on:
  - Automation for packagers
  - Reproducible builds
- Deprecation / retirement of old packaging processes.

Distribution approaches to packaging

Debian software packages (*.deb)

- *Distros*: Debian, Ubuntu, Mint, etc.
- *Ubuntu*: Flexible for proprietary software. Medium barrier of entry.
- *Debian*: Must be Free Software. High barrier of entry.

RPM software packages (*.rpm)

- *Distros*: Fedora, CentOS Stream, RHEL, SUSE/openSUSE, AlmaLinux, Rocky, etc.
- *Fedora*: Must be Free Software. Medium barrier to entry.
- *CentOS Stream*: The next Enterprise Linux. Higher barrier to entry than Fedora.
- *RHEL*: Via EPEL. Otherwise, one must be a Red Hat employee to contribute packages.

Packaging in Fedora, CentOS Stream, & RHEL ecosystems

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Upsides to packaging for Fedora & other distros [1/2]

Community

- Work closer to downstream users.
- Create contribution pathways for engineers to contribute / share feedback on package distribution or build/compile options and flags.
- Increase transparency into how software is built and distributed.
- Use hundreds of public mirrors to make software more widely available and skip worrying about load-balancing for high demand (vs. centrally hosting a repository).

Security

- GPG sign and verify packages with Fedora distribution keys.

Upsides to packaging for Fedora & other distros [2/2]

Distribution CI

- Know whether your packages work on downstream distros before users open bug reports.
- Save time by not building your own testing and CI pipelines for package delivery.

Brand-building

- Packaging software for Linux distros like Fedora gets more exposure through different channels that software is distributed for Linux (e.g. GNOME Software).
- Open Source “street cred” and building a reputation in the community.

Downsides to packaging for Fedora & other distros

- **Time to release**: Longer wait before a new release is available to end-users.
  - Allows for community testing and feedback on updates.
  - Built packages are available immediately for those who REALLY want it or know where to look.
- **No freestyling**: Must follow Fedora Packaging Guidelines. Adds stability at cost of flexibility.
- **EPEL**:
  - Different policies than default Fedora repositories for Enterprise Linux repos.
  - Sometimes difficult to build packages in both Fedora and EPEL repos (depending on EL version, package complexity, and the dependency stack).
- **Metrics**: Not possible to count how many times a package is installed on an end-user's system.

Package & distro lifecycle

Fedora Linux

- Major releases every six months.
- Latest and greatest open source software and tools at the cutting edge.
- Everything Fedora provides by default is Free Software. Proprietary software is not available by default.

CentOS Stream

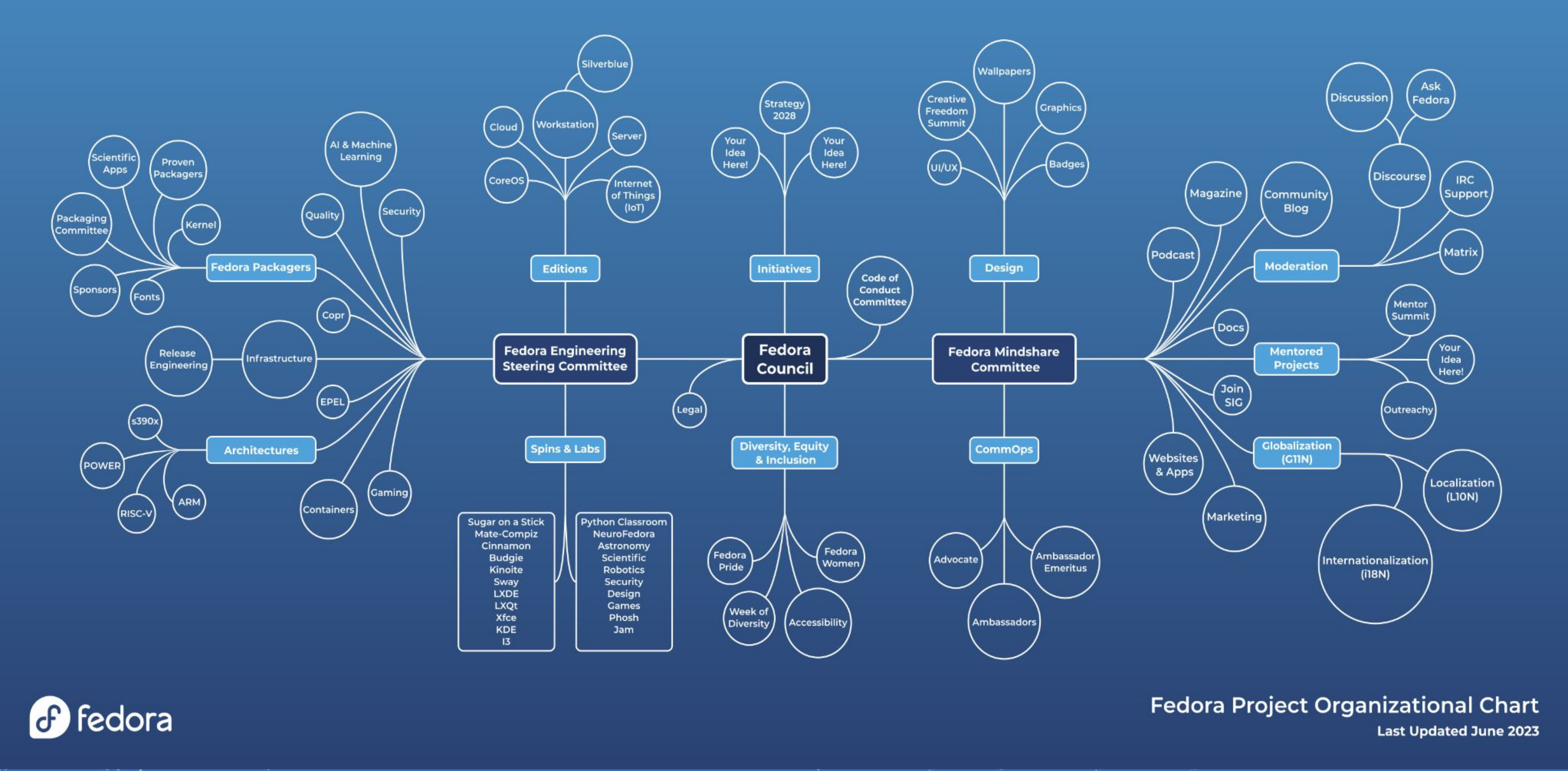
- Major releases every few years. Rolling updates to major releases during the supported period.
- Software packages are tuned and built for stability and enterprise use cases.
- CentOS Stream is a good testing environment for what is to come in EL, or for software that does not need a support promise behind it.

Red Hat Enterprise Linux (RHEL)

- Major releases every few years, minor releases more often.
- Built from CentOS Stream (which is always one release ahead of RHEL).
- Long-term support available, enterprise-grade stability, expert support to help you make the most of Linux for your needs.
- Can include proprietary & closed source software.

Main activity:

How would *you* contribute?



- Fedora Council
  - Initiatives
    - Strategy 2028
    - Your Idea Here!
    - Your Idea Here!
  - Code of Conduct Committee
  - Legal
  - Diversity, Equity & Inclusion
    - Fedora Pride
    - Fedora Women
    - Week of Diversity
    - Accessibility
  - Fedora Engineering Steering Committee
    - Editions
      - Silverblue
      - Workstation
      - Cloud
      - Server
      - CoreOS
      - Internet of Things (IoT)
    - Spins & Labs
      - Sugar on a Stick, Mate-Compiz, Cinnamon, Budgie, Kinoite, Sway, LXDE, LXQt, Xfce, KDE, I3
      - Python Classroom, NeuroFedora, Astronomy, Scientific, Robotics, Security, Design, Games, Phosh, Jam
    - Fedora Packagers
      - Scientific Apps
      - Proven Packagers
      - Packaging Committee
      - Kernel
      - Sponsors
      - Fonts
    - AI & Machine Learning
    - Quality
    - Security
    - Copr
    - Infrastructure
      - Release Engineering
    - EPEL
    - Architectures
      - s390x
      - POWER
      - RISC-V
      - ARM
    - Containers
    - Gaming
  - Fedora Mindshare Committee
    - Design
      - Wallpapers
      - Creative Freedom Summit
      - Graphics
      - UI/UX
      - Badges
    - CommOps
      - Advocate
      - Ambassador Emeritus
      - Ambassadors
    - Magazine
    - Community Blog
    - Podcast
    - Moderation
      - Discourse
        - Discussion
        - Ask Fedora
      - IRC Support
      - Matrix
    - Docs
    - Mentored Projects
      - Mentor Summit
      - Your Idea Here!
      - Outreachy
    - Join SIG
    - Websites & Apps
    - Marketing
    - Globalization (G11N)
      - Localization (L10N)
      - Internationalization (i18N)

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Fedora Project Organizational Chart

Last Updated June 2023

There are many things to do in Fedora…

How would you contribute: Instructions

There are many ways to contribute to Fedora, both engineering and non-engineering. Let's try it out!

Activity instructions

1. Break out into small groups for each of the topics on the right.
2. Elect a scribe / note-taker for your group.
3. Using sticky notes, chart out with your group what contributions you think are needed during a Fedora Linux release cycle on your chosen contribution topic.
4. Use existing Fedora documentation as a guide. Write down questions about things that are not clear. docs.fedoraproject.org
5. Elect a group spokesperson to explain your sticky note map at the end.

Contribution topic groups

- **Packaging** (e.g. adding/updating software)
- **Design** (e.g. graphic design, UI/UX)
- **Editions** (e.g. creating a new default offering of the Fedora Linux operating system)
- **Content & Marketing** (e.g. press releases, community updates, release announcements, promoting Fedora Linux, outreach strategies)
- **User Q&A** (e.g. forum moderation, chat room support, troubleshooting)

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