

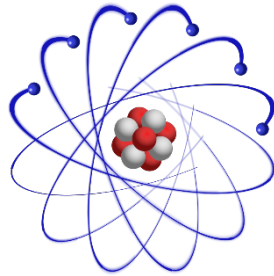
On Package Freshness in Linux Distributions

Work in progress

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Linux Distributions



Distribution Focus

Distros emphasise different aspects:

- **Stability:**
 - Debian (Stable)
 - CentOS
- **Security:**
 - Qubes OS
 - Parrot Security OS
 - Alpine Linux
- **Package Freshness (how up to date compared to upstream):**
 - Arch Linux
 - OpenSUSE Tumbleweed
 - Gentoo

Survey

- First part of mixed study, empirical analyses in future
- CHAOSSCon / FOSDEM
- 68 participants

- Questions:
 - Distros used
 - Perception of freshness
 - Importance of freshness
 - Motivations to update
 - Mechanisms used to update

Distributions Used

Distribution	First	Second	Third	Total
Ubuntu LTS	22	13	3	38
Debian Stable	13	9	8	30
Ubuntu	13	7	9	20
Debian Testing	5	8	2	15
Arch	8	4	2	14
CentOS	0	8	2	10
Mint	2	4	3	9
Fedora	3	4	1	8
Misc Others	2	6	2	10

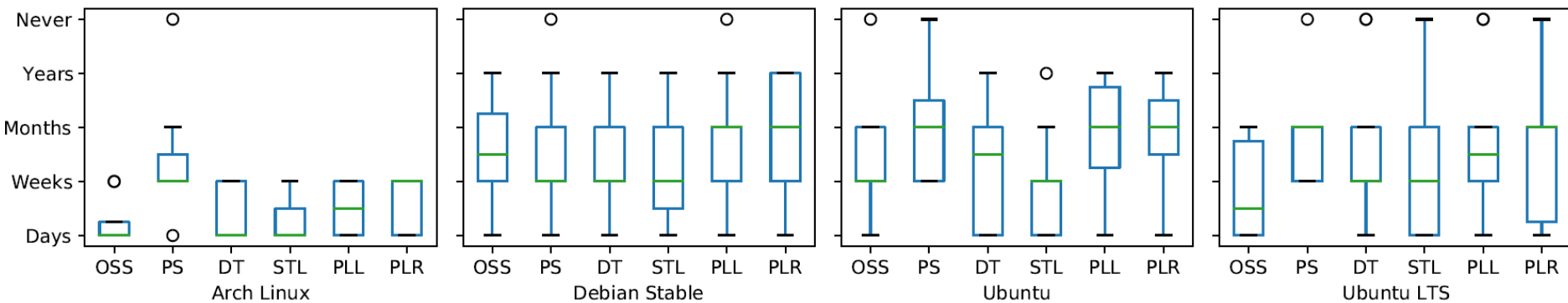
Package Categories

Asked about 6 package categories:

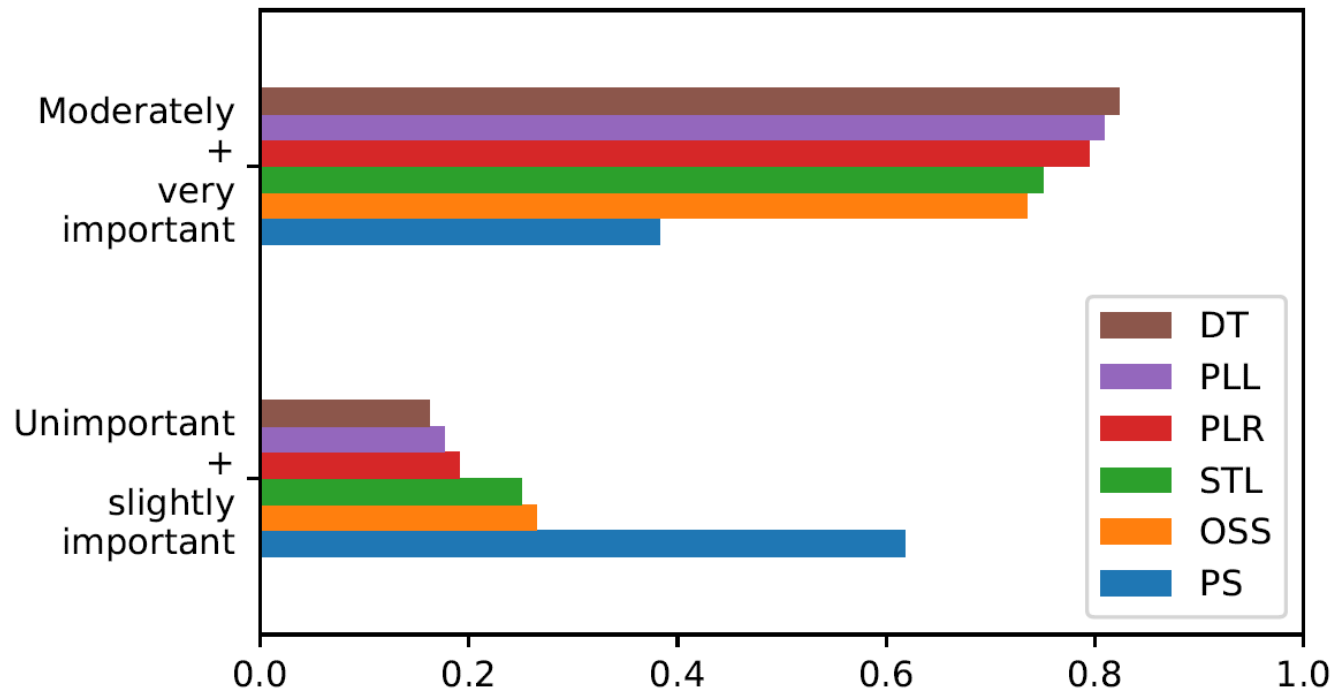
- Open source end-user software (OSS): LibreOffice, Firefox, GIMP...
- Proprietary end-user software (PS): Adobe Reader, Skype, Spotify...
- Development tools (DT): Emacs, Eclipse, git ...
- System tools and libraries (STL): openssl, zsh, sudo ...
- Programming language runtimes (PLR): Python, Java...
- Programming language libraries (PLL): Numpy, Lodash ...

User Perception

- Perception of time between upstream release and deployment in official repos of main user distro



Importance of Freshness



Reasons to Update

Reason	% of respondents
Security	88
Bugs	78
New features	60
Compatibility	32
Cutting edge	27

- “New features” answer less prevalent in users of less fresh distros
- Debian users less likely to answer “bugs”

Update Mechanisms

5 package sources:

- Official repositories of the distro (off)
- Community repositories of the distro (com)
- Third-party package managers (3rd): Flatpak, Snappy, Pip...
- Installing from binaries (bin)
- Installing manually from sources (src)

Update Mechanisms



Comparative Freshness

- % packages outdated compared to upstream
- No data on upstream: Arch (2019-12-31) as a proxy

Distribution	Release	% outdated
Fedora	31	25
Ubuntu	19.10	29
Debian Stable	10	46
CentOS	8.0	65
Debian Oldstable	9	77

Ongoing + Future Work

- Extended survey (170 participants)
 - Submitted to ICSME (NIER track)
- Further empirical analyses of comparative freshness:
 - Version lag (number of fresher versions available)
 - Time lag (time since a fresher version is available)
- Survey on impact of package freshness on user attractivity and migration (compared to stability and security)

Conclusion

- Users consider it important to keep packages fresh
 - Mostly for security + bugfixing concerns and to obtain new features
- Users rely on official repositories whenever possible
- Packages in official repositories perceived as slow to deploy in some distros' official repositories
- Indeed, 25% (Fedora) to 77% (Debian Oldstable) outdated compared
- Need further empirical analyses to classify distros on “package freshness continuum”

Questions?

