Sys::OsRelease & Sys::OsPackage

System Info & Package Installation

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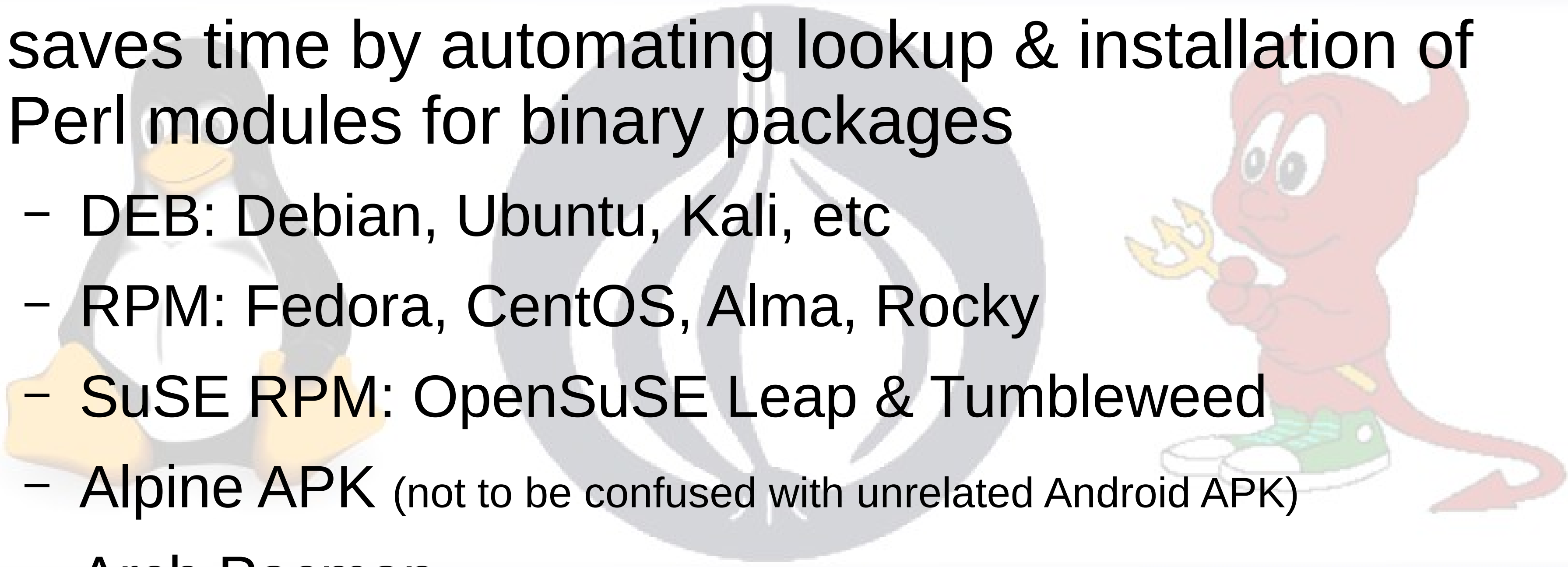
Problem: CPAN vs OS packages

- Problem: install binary OS packages of Perl modules
- goal: minimize CPAN time building modules from scratch
  - but searching for different naming patterns for OS packages is tedious
- example: CPAN build of YAML + dependencies
  - Debian/Ubuntu: `apt-get install libyaml-perl`
  - Fedora/CentOS: `dnf install perl-YAML`
  - Alpine: `apk install perl-yaml`
  - fall back to CPAN build on source-based distros or if binary not available

Sys::OsPackage automates it



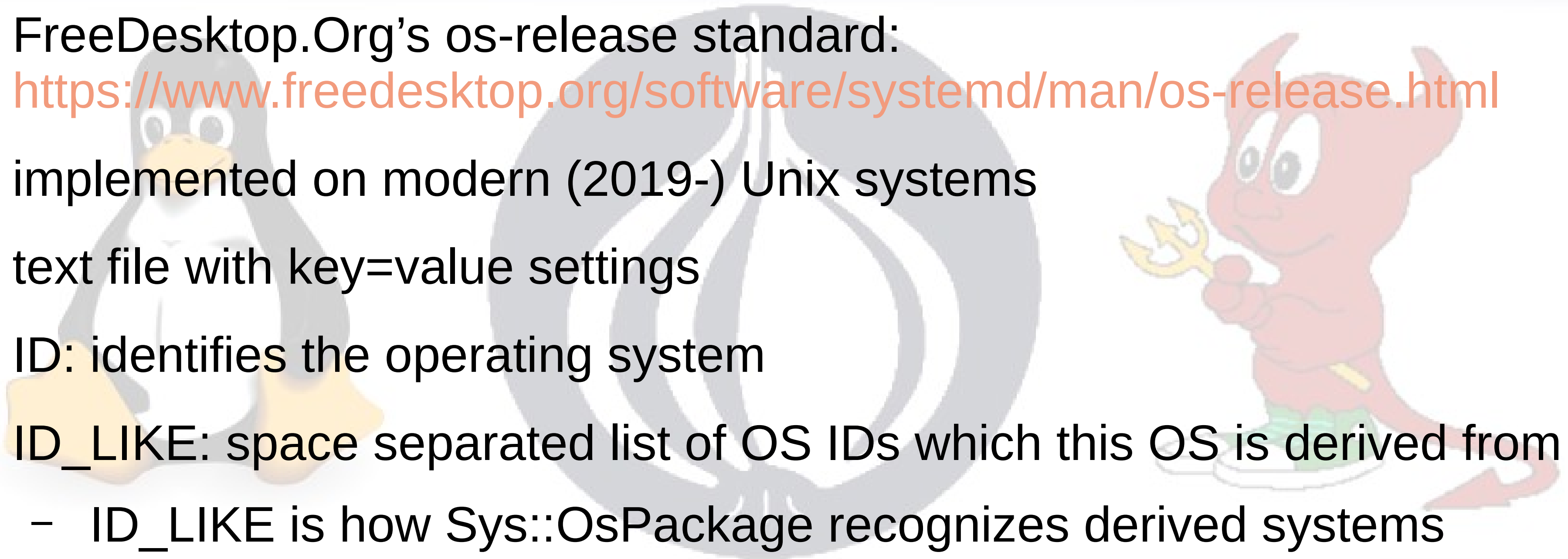
- saves time by automating lookup & installation of Perl modules for binary packages
  - DEB: Debian, Ubuntu, Kali, etc
  - RPM: Fedora, CentOS, Alma, Rocky
  - SuSE RPM: OpenSuSE Leap & Tumbleweed
  - Alpine APK (not to be confused with unrelated Android APK)
  - Arch Pacman

Two layers to implementation

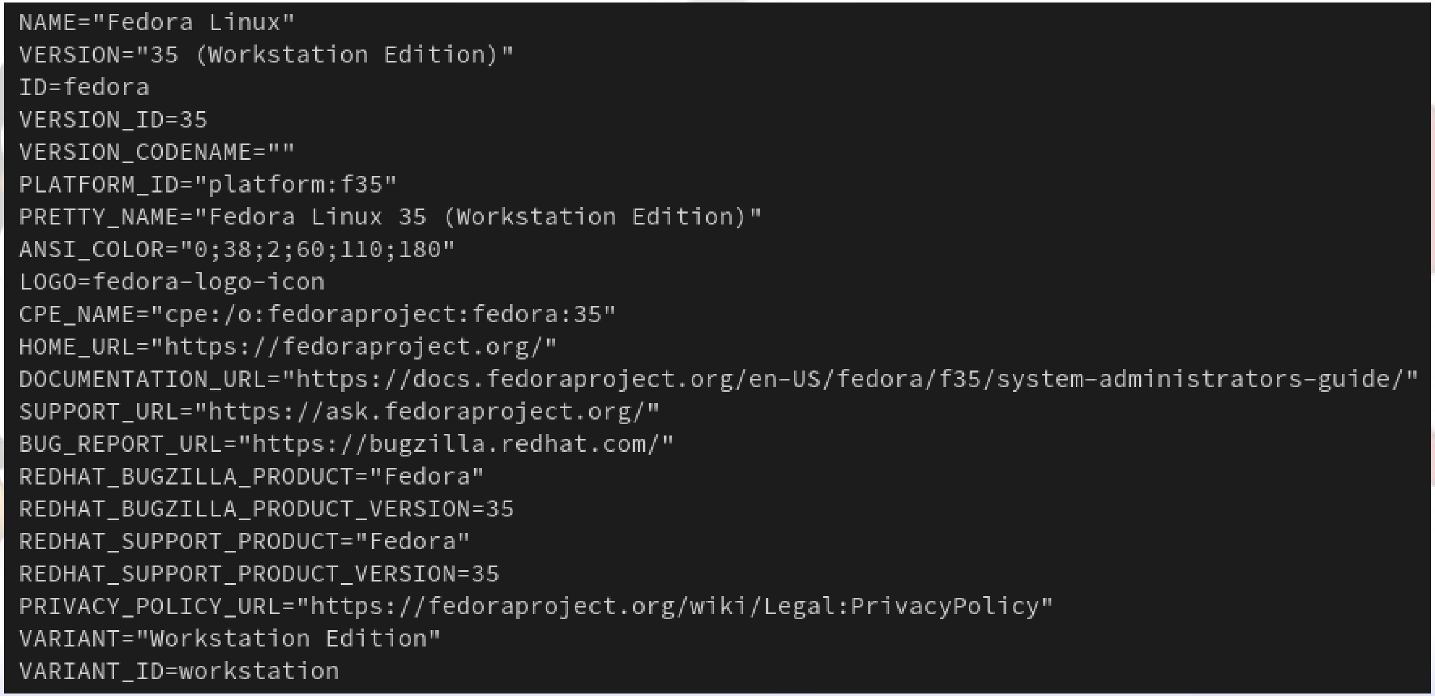
- Sys::OsRelease detects what system you’re running on
  - based on FreeDesktop.Org /etc/os-release
- Sys::OsPackage installs Perl modules as OS packages or CPAN modules
  - including automating package name lookups

Sys::OsRelease

- FreeDesktop.Org’s os-release standard: https://www.freedesktop.org/software/systemd/man/os-release.html
- implemented on modern (2019-) Unix systems
- text file with key=value settings
- ID: identifies the operating system
- ID_LIKE: space separated list of OS IDs which this OS is derived from
  - ID_LIKE is how Sys::OsPackage recognizes derived systems



Example /etc/os-release file



```
NAME="Fedora Linux"
VERSION="35 (Workstation Edition)"
ID=fedora
VERSION_ID=35
VERSION_CODENAME=""
PLATFORM_ID="platform:f35"
PRETTY_NAME="Fedora Linux 35 (Workstation Edition)"
ANSI_COLOR="0;38;2;60;110;180"
LOGO=fedora-logo-icon
CPE_NAME="cpe:/o:fedoraproject:fedora:35"
HOME_URL="https://fedoraproject.org/"
DOCUMENTATION_URL="https://docs.fedoraproject.org/en-US/fedora/f35/system-administrators-guide/"
SUPPORT_URL="https://ask.fedoraproject.org/"
BUG_REPORT_URL="https://bugzilla.redhat.com/"
REDHAT_BUGZILLA_PRODUCT="Fedora"
REDHAT_BUGZILLA_PRODUCT_VERSION=35
REDHAT_SUPPORT_PRODUCT="Fedora"
REDHAT_SUPPORT_PRODUCT_VERSION=35
PRIVACY_POLICY_URL="https://fedoraproject.org/wiki/Legal:PrivacyPolicy"
VARIANT="Workstation Edition"
VARIANT_ID=workstation
```

Sys::OsRelease interface

non-object-oriented: class methods

```
Sys::OsRelease->init();
my $id = Sys::OsRelease->id();
my $id_like = Sys::OsRelease->id_like();
```

object-oriented: object methods

```
my $osrelease = Sys::OsRelease→instance();
my $id = $osrelease->id();
my $id_like = $osrelease->id_like();
```

Sys::OsRelease internals

- Sys::OsRelease is the lower-level of the 2 classes
  - It provides a common singleton pattern implementation which Sys::OsPackage imports
    - “singleton” means the class has only one instance object
  - Minimizes the number of CPAN dependencies
  - Fewer dependencies are better for building containers
    - otherwise Class::Singleton would have been a good option

os-release file attributes

all implemented by Sys::OsRelease

Sys::OsRelease generates methods to cover all the standardized attributes:

NAME ID ID_LIKE PRETTY_NAME CPE_NAME VARIANT VARIANT_ID VERSION VERSION_ID VERSION_CODENAME BUILD_ID IMAGE_ID IMAGE_VERSION HOME_URL DOCUMENTATION_URL SUPPORT_URL BUG_REPORT_URL PRIVACY_POLICY_URL LOGO ANSI_COLOR DEFAULT_HOSTNAME SYSEXT_LEVEL

Sys::OsRelease attribute lookup

- all attributes in the os-release file can be read with these methods
  - $sr->found_attrs(): returns list of attribute names found
  - $sr->has_attr($attr): return true if named attribute exists
  - get($attr): return value of named attribute

Sys::OsPackage interface

- Class & object methods like Sys::OsRelease

```
use Sys::OsPackage;
my $ospackage = Sys::OsPackage->instance();
foreach my $module ( qw(module-name ...)) {
  $ospackage->install_module($module);
}
```

Command line interface
fetch-reqs.pl

- usage

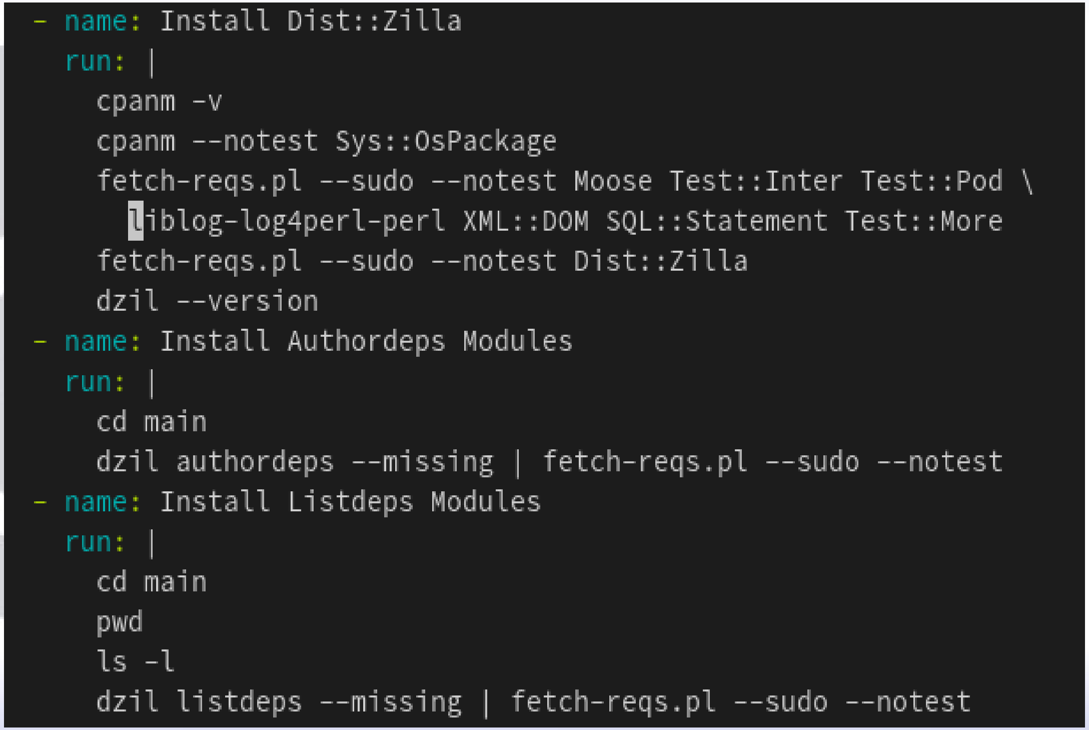
```
fetch-reqs.pl [--debug] [--quiet] [--notest]
  [--sudo] filename|module [...]
```

- filename arguments: parses Perl source for module dependencies and loads them
- module name arguments: loads named module
- in both cases prefers OS binary package
- falls back to CPAN module build if necessary

use case: Github CI container

Use fetch-reqs.pl from Sys::OsPackage to install packages on various OS containers

This is a work in progress of a Github Action for another Perl module called WebFetch



```
- name: Install Dist::Zilla
  run: |
    cpanm -v
    cpanm --notest Sys::OsPackage
    fetch-reqs.pl --sudo --notest Moose Test::Inter Test::Pod \
      liblog-log4perl-perl XML::DOM SQL::Statement Test::More
    fetch-reqs.pl --sudo --notest Dist::Zilla
    dzil --version
- name: Install Authordeps Modules
  run: |
    cd main
    dzil authordeps --missing | fetch-reqs.pl --sudo --notest
- name: Install Listdeps Modules
  run: |
    cd main
    pwd
    ls -l
    dzil listdeps --missing | fetch-reqs.pl --sudo --notest
```

Sys::OsPackage driver modules

driver module	package format	OS supported
Sys::OsPackage::Driver::Alpine	APK	Alpine
Sys::OsPackage::Driver::Arch	Pacman	Arch
Sys::OsPackage::Driver::Debian	DEB	Debian, Ubuntu, Kali, etc
Sys::OsPackage::Driver::RPM	RPM	Fedora, CentOS, RHEL, Alma, Rocky, etc
Sys::OsPackage::Driver::Suse	RPM	OpenSuSE Leap & Tumbleweed, SuSE

Platforms which have source-based packaging were not initially targeted because they just build the CPAN module like CPAN would.
As with any Open Source project, more modules can be added by contributing them or working with the author to develop them.

Looking forward

- Planned Sys::OsPackage::DepTree module
  - deep scan of module dependencies to pick up binary OS packages available further down
  - It will be separate module on CPAN
  - loadable via –deptree CLI option on fetch-reqs.pl
  - separates extra module dependencies from Sys::OsPackage
  - user gets to decide if they want to load the extra modules

Online resources

- Sys::OsRelease
  - CPAN https://metacpan.org/pod/Sys::OsRelease
  - Github https://github.com/ikluft/Sys-OsRelease
- Sys::OsPackage
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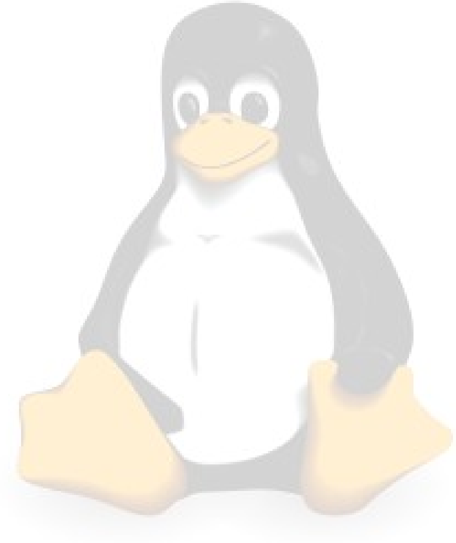

Questions?