Python

The secret weapon of Fedora

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whoami

1. Today:

- Fedora Tester - Quality and Assurance
- Fedora Ambassador
- OeSC-Livre/XAP-Hackerspace member

2. Near future:

- Fedora Packager

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Before we start...

- As a engineer/developer you should:
  - Be agnostic, put the problem and solution before technology;
  - Be polyglot: There is no silver bullet;

- This presentation is my research and view as a Fedora contributor.

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Today's Topics

1. Fedora news

2. Fedora context

3. Python context / key-features
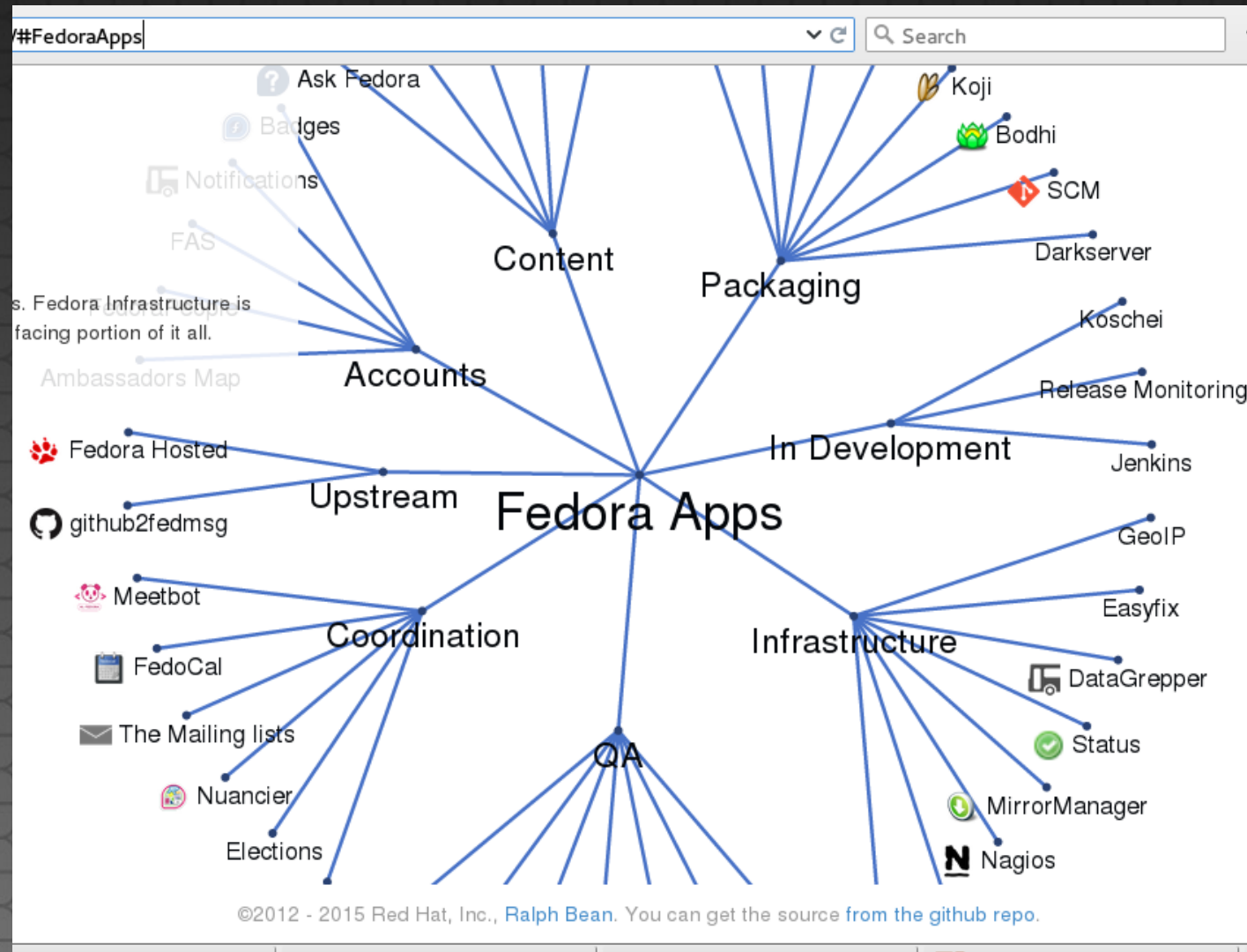
4. Python cases and demos

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Fedora news

- Workstation, Server, Cloud;
- Virt-manager supports ARM emulation;
- DNF, SystemD, Wayland;
- Vagrant / Atomic Host;
- Cockpit server management;
- and... way beyond that;
- Fedora 22 is on beta now (6 months cycle);

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Fedora context

Fedora Context

- Fedora Infrastructure is huge, there are DC's in multiple continents supporting many services

Fedora Apps browser screenshot showing categories: Content, Packaging, Accounts, Upstream, In Development, Infrastructure, Coordination, QA with apps including Ask Fedora, Badges, Notifications, FAS, Ambassadors Map, Fedora Hosted, github2fedmsg, Meetbot, FedoCal, The Mailing lists, Nuancier, Elections, Koji, Bodhi, SCM, Darkserver, Koschei, Release Monitoring, Jenkins, GeoIP, Easyfix, DataGrepper, Status, MirrorManager, Nagios. ©2012 - 2015 Red Hat, Inc., Ralph Bean. You can get the source from the github repo.

Lets take a look closer

- FedMsg (hook all services infrastructure)
  - fedmsg-tail –really-pretty (example)
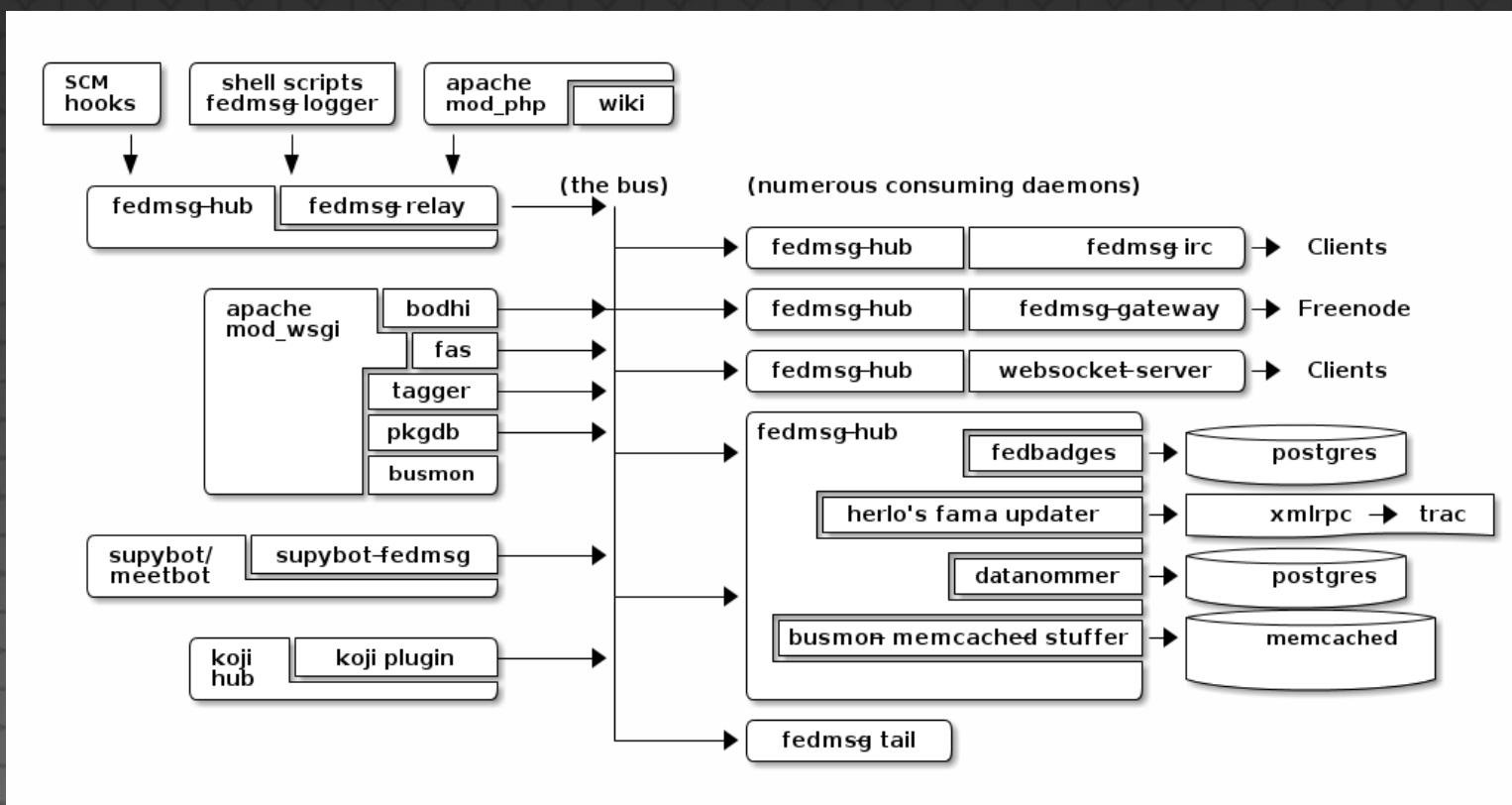
[2015-04-25 00:28:29][fedmsg   INFO]
{
    "username": "root",
    "i": 1,
    "timestamp": 1429932509,
    "msg_id": "2015-e28b6113-5268-42fd-b147-68427732d1e4",
    "crypto": "x509",
    "topic": "org.fedoraproject.prod.ansible.playbook.start",
    "msg": {
        "playbook_checksum": false,
        "extra_vars": {},
        "userid": "root",
        "playbook": "/srv/web/infra/ansible/playbooks/run_fasClient.yml",
        "check": false,
        "inventory": "/srv/web/infra/ansible/inventory/"
    }
}

[2015-04-25 00:28:28][fedmsg   INFO]
{
    "username": "apache",
    "i": 1,
    "timestamp": 1429932507,
    "msg_id": "2015-2939cb2a-1010-4930-83dc-237413310300",
    "crypto": "x509",
    "topic": "org.fedoraproject.prod.buildsys.task.state.change",
    "msg": {
        "info": {
            "parent": null,
            "completion_time": null,
            "start_time": "2015-04-25 03:28:27.86218",
            "request": [
                "../packages/perl-Term-Size-Any/0.002/15.fc22/src/perl-Term-Size-Any-0.002-15.fc22.src.rpm",
                "f23",
                {
                    "scratch": true
                }
            ],
            "waiting": null,
            "awaited": null,
            "method": "build",
            "priority": 50,
            "channel_id": 1,
            "state": 1,
            "create_time": "2015-04-25 03:28:20.574367",
            "id": 9563888,
            "owner": 2645,
            "host_id": 64,
            "label": null,
            "arch": "noarch",
            "children": []

Python in Fedora...

- Infrastructure software, as we have seen;

- Powering *.fedoraproject.org
  - Turbo Gears, Django, Flask

  - Like, Koji, bodhi, pkgdb

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Koji - Summary

Koji – Package details

Information for build python-sqlalchemy-1.0.2-1.fc23

ID	630723
Package Name	python-sqlalchemy
Version	1.0.2
Release	1.fc23
Epoch	
Summary	Modular and flexible ORM library for python
Description	SQLAlchemy is an Object Relational Mappper (ORM) that provides a flexible, high-level interface to SQL databases. Database and domain concepts are decoupled, allowing both sides maximum flexibility and power. SQLAlchemy provides a powerful mapping layer that can work as automatically or as manually as you choose, determining relationships based on foreign keys or letting you define the join conditions explicitly, to bridge the gap between database and domain. This package includes the python 2 version of the module.
Built by	nphilipp
State	complete
Started	Sat, 25 Apr 2015 01:43:19 UTC
Completed	Sat, 25 Apr 2015 02:15:06 UTC
Task	build (rawhide, /python-sqlalchemy:43734e26da3fcae0c5dee25eac95eb4777adc658)
Tags	f23
RPMs	

src

python-sqlalchemy-1.0.2-1.fc23.src.rpm (info) (download)

armv7hl (build logs)

python-sqlalchemy-1.0.2-1.fc23.armv7hl.rpm (info) (download)

python3-sqlalchemy-1.0.2-1.fc23.armv7hl.rpm (info) (download)

python-sqlalchemy-debuginfo-1.0.2-1.fc23.armv7hl.rpm (info) (download)

i686 (build logs)

python-sqlalchemy-1.0.2-1.fc23.i686.rpm (info) (download)

python3-sqlalchemy-1.0.2-1.fc23.i686.rpm (info) (download)

python-sqlalchemy-debuginfo-1.0.2-1.fc23.i686.rpm (info) (download)

x86_64 (build logs)

python-sqlalchemy-1.0.2-1.fc23.x86_64.rpm (info) (download)

python3-sqlalchemy-1.0.2-1.fc23.x86_64.rpm (info) (download)

python-sqlalchemy-debuginfo-1.0.2-1.fc23.x86_64.rpm (info) (download)

Changelog * Sat Apr 25 2015 Nils Philippsen <nils@redhat.com> - 1.0.2-1
- version 1.0.2, upstream bugfix release

* Fri Apr 24 2015 Nils Philippsen <nils@redhat.com> - 1.0.1-1

Bodhi – some tech details

bodhi – Mozilla Firefox

bodhi ✕ | Fedora Update System ✕ | Build System Info | koji ✕ | ✚

https://fedorahosted.org/bodhi/ | Search

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OpenID Login | Fedora Account Sign Up | Preferences | Help/Guide | About Trac | CGit | RPC API

Wiki | Timeline | Roadmap | Browse Source | View Tickets | Search

wiki: WikiStart   Start Page | Index | History

Last modified 3 years ago

What is bodhi?

Bodhi is a modular web-system that facilitates the process of publishing updates for a Fedora-based software distribution. It is written in Python and utilizes the ⇨TurboGears web framework. Bodhi is also equipped with a fairly extensive test suite.

Bodhi is currently ⇨being used to push out all package updates for Fedora.

Goals

- Provide an intuitive interface for developers and release engineers to manage pushing package updates for multiple distribution releases.
- Ensure package quality and repository sustainment with automated testing
- Encourage community testing and involvement through allowing people to easily test updates and provide feedback
- Provide a modular framework that will allow future integration to various other QA and developer tools.

Architecture

Written using the ⇨TurboGears Python web framework

- **Model**: SQLObject ⇨http://sqlobject.org
- **View**: Kid ⇨http://kid-templating.org
- **Controller**: CherryPy? ⇨http://cherrypy.org

A modular piece of the Fedora Infrastructure stack

- Utilizes the ⇨Koji Buildsystem for tracking RPMs
- Creates the update repositories using ⇨Mash, which composes ⇨yum repositories based on tagged builds in Koji.
- Acquires ACL information from the ⇨Fedora Package Database
- Authenticates users against the ⇨Fedora Account System
- Handles automatically updating / closing bugs in ⇨Bugzilla.

Documentation

[*Unsaved Document 1 - gedit]   [working]   Fedora-Python-xmrbrz.odp - Libre...   bodhi - Mozilla Firefox   1 / 4
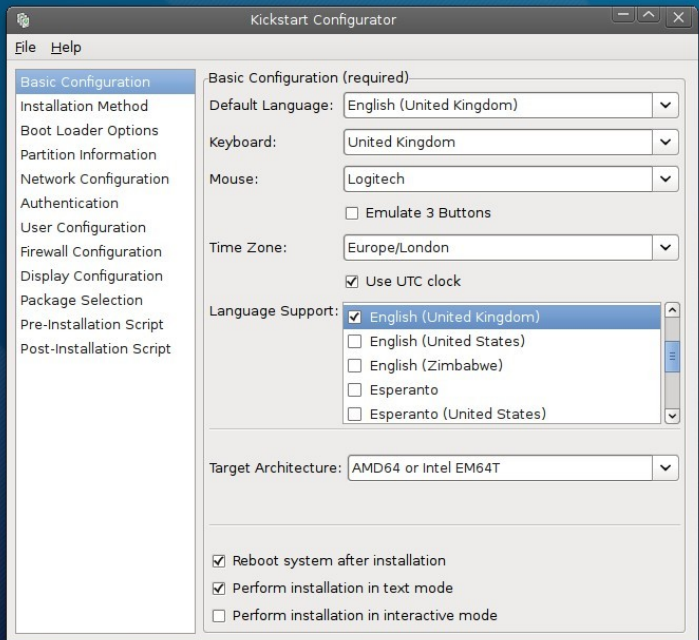
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Bodhi – Updates

Anaconda Installer

Fedup was also written in Python

Configuration / Management packs

Many utilities in the distribution itself (general-purpose language, simple hacks that may turn in something else long-term)

also, could be

one-off scripts;

```
[xmrbrz@localhost ~]$ dnf info python3
Using metadata from Wed Apr 22 15:58:14 2015 (2 days, 11:22:18 hours old)
Installed Packages
Name        : python3
Arch        : x86_64
Epoch       : 0
Version     : 3.4.2
Release     : 4.fc22
Size        : 36 k
Repo        : @System
Summary     : Version 3 of the Python programming language aka Python 3000
URL         : http://www.python.org/
License     : Python
Description : Python 3 is a new version of the language that is incompatible
            : with the 2.x line of releases. The language is mostly the same,
            : but many details, especially how built-in objects like
            : dictionaries and strings work, have changed considerably, and a
            : lot of deprecated features have finally been removed.
```

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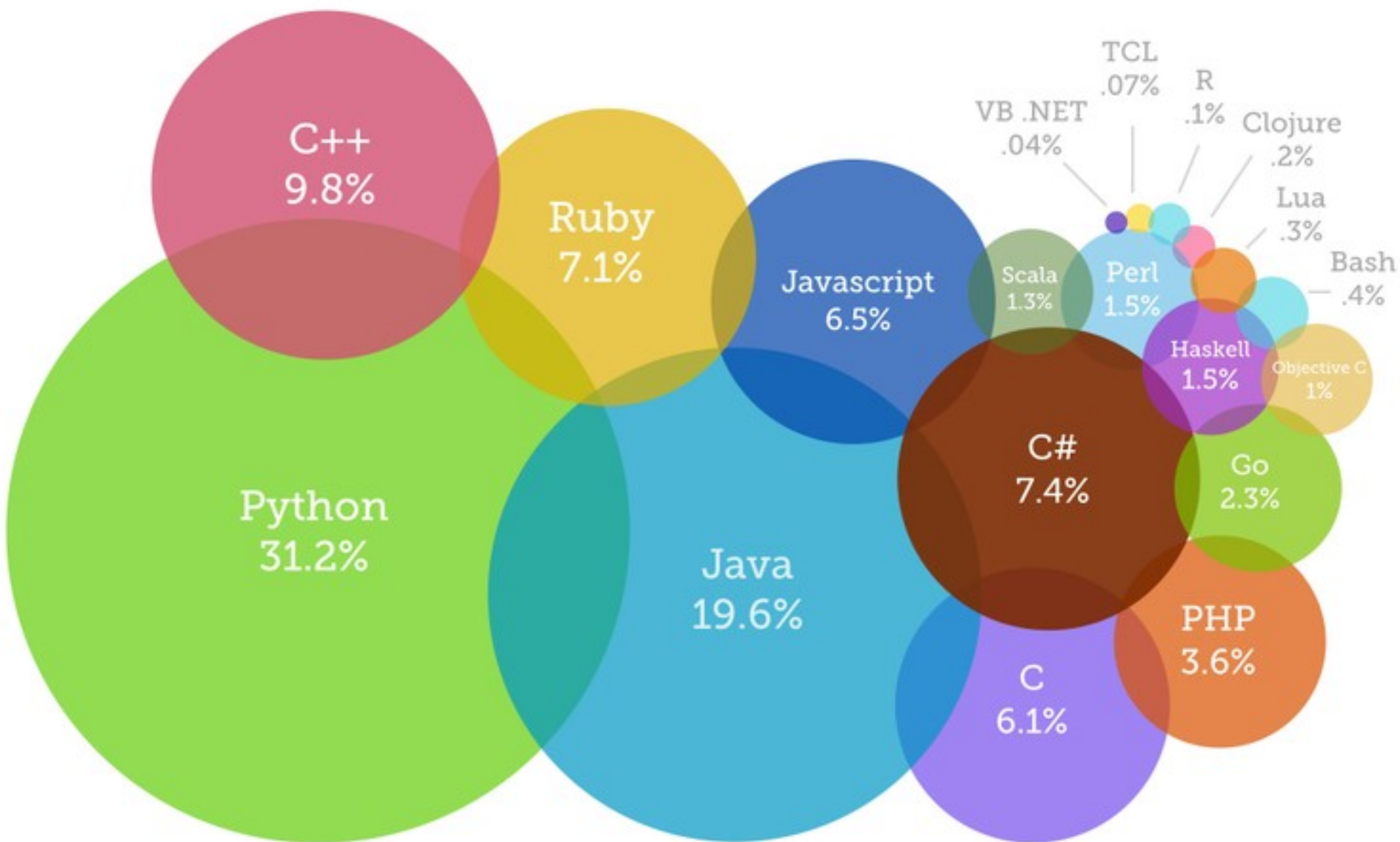# Other practical example

- sudo dnf group install virtualization
  - dnf/yum (install pkg) = python
  - Bodhi (distribute pkg) = python
  - Koji (build pkg to each architectures) = python
  - Mock (generate buildroots) = python
  - Pkgdb (meta database) = python
    - Virt-manager = python
      - Dependencies
    - Other tools

And.. this is just the beginning

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Python context key-features

Most Popular Coding Languages of 2015

C++ 9.8%

Ruby 7.1%

Javascript 6.5%

Python 31.2%

Java 19.6%

Scala 1.3%

Perl 1.5%

C# 7.4%

Haskell 1.5%

Objective C 1%

Go 2.3%

C 6.1%

PHP 3.6%

VB .NET .04%

TCL .07%

R .1%

Clojure .2%

Lua .3%

Bash .4%

Python key-features

- Scientists and Engineers (even kids) love it, because they have focus on problem solving, not software/technology;

- Language is high-level, highly-readable, cross-platform, has a very active community and diverse ecosystem;

- There is a huge theoretical and practical reference.

- Batteries included and third party (PyPI);

- github.com/vinta/awesome-python

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Python is fun

- Language really Expressive (you can do a lot in a few lines of code);

- Some examples:

  - Simple Clock (by Luciano Ramalho);

  - Gmail Email Client;

  - Polymorphic card games (by Luciano Ramalho);

  - Minecraft 500 lines python;

  - Frets on Fire;

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What "they" say about Python

- "Python is fast enough for our site and allows us to produce maintainable features in record times, with a minimum of developers," said Cuong Do, Software Architect, YouTube.com.

- "Python is one of the five most important languages that every programmer should know" Bjarne Stroustrup (C++ Creator)

- "Python is the most effective (programming language) for translating pure thought into action." Eric Raymond

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What "they" say about Python

- Bruce Eckel author best-seller Thinking java:
  - "Life is better without keys";
  - "Life is short, you need python"

- "Python poised to become the de facto engine for modern science" Joshua Bloom, Berkeley Astronomy Department, at SciPy2012

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Python on Blender

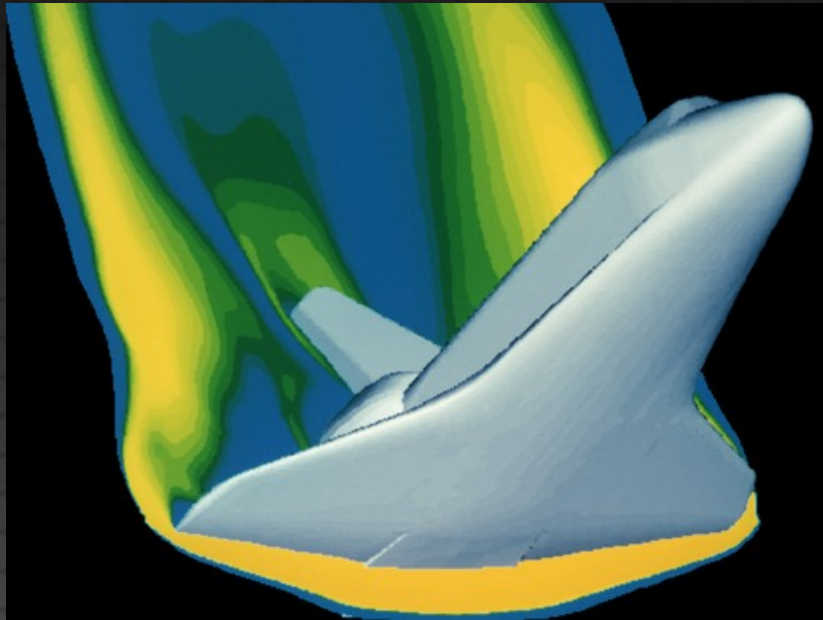

01_02_01_E1-2

View   Select   Add   Object   Object Mode   Global

nvenience imports: from mathutils import *; from math import *
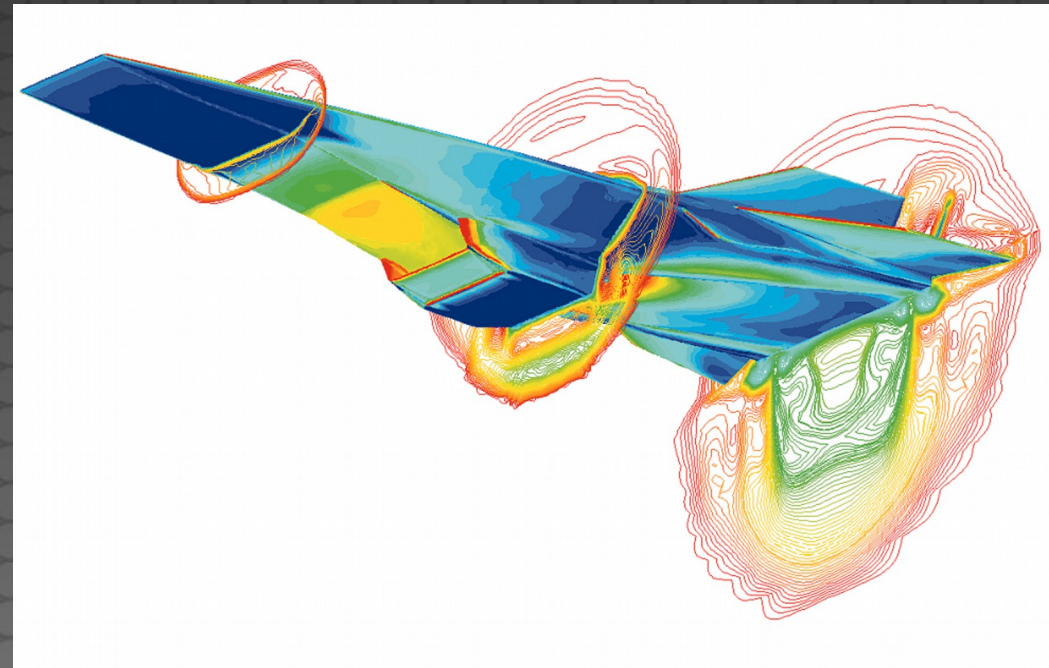nvenience Variables: C = bpy.context, D = bpy.data

>

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Computational fluid dynamics

A computer simulation of high velocity air flow around the Space Shuttle during re-entry.

A simulation of the Hyper-X scramjet vehicle in operation at Mach-7

Font: wikipedia CFD

PyCon 2015 – PyPy.JS

- Presented by Ryan Kelly (Mozilla Software Engineer) at PyCon 2015;

- PyPy.js is an experiment in building a fast and compliant python environment for the web.

  - Using llvm to compile PyPy (JIT) into javascript;

  - it can run in the browser (with asm.js)

  - Which runs faster than CPython

  - pypyjs.org

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Where is the code?

- Github vs FedoraHosted;
  - Virt-manager;
  - yum/dnf;
  - Anaconda;
  - fedup;
  - System-config-kickstart;
  - Fedora-python;

Get yourself involved

- Because we're Pythonistas, too

- "The Fedora project can use your Python skills as a contribution to a global, free software movement."

- "If you want to be a good writer, you need first be a good reader" Same applies to software.

- "A single idea shared in the open can change everything." Red Hat

- "Simplicity is the ultimate sophistication." Leonardo da Vinci

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Slides will be available at:
http://xmrbrz.fedorapeople.org/presentations/FLISoL2015

Questions?

Contact:
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