Measuring Success in Soft. Development Projects

Open Leadership Summit, Tahoe 2017

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https://speakerdeck.com/bitergia

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Outline

Introduction

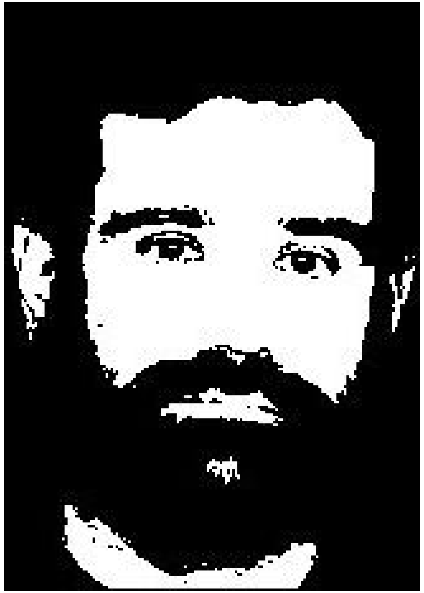
Open Source Goals

Linux Foundation analytics as use case

Inner Source vs Open Source

Measuring Inner Source

/Jesus



Bitergia

My two hats:

Like five years ago I was having coffees with the gang of Bitergia founders

Involved in the company since then

bitergia.com

I work at Universidad Rey Juan Carlos...

...researching about software development

gsyc.es/~jgb

/Daniel

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I only have one hat

Bitergia co-founder

OSS researcher

Data analytics

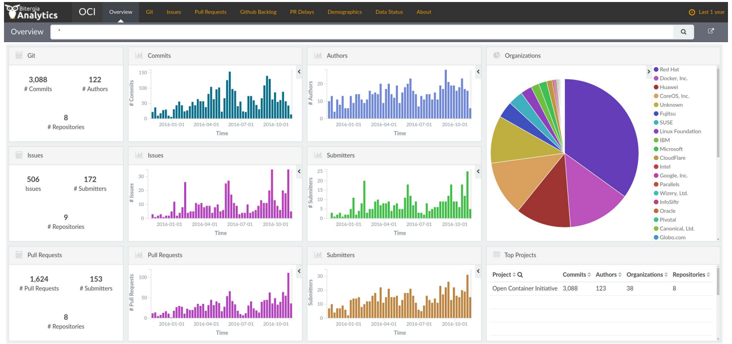
Diversity analysis

Love metrics

/Bitergia

Software Development Analytics

for your peace of mind



Git

3,088 # Commits

122 # Authors

8 # Repositories

Issues

506 Issues

172 # Submitters

9 # Repositories

Pull Requests

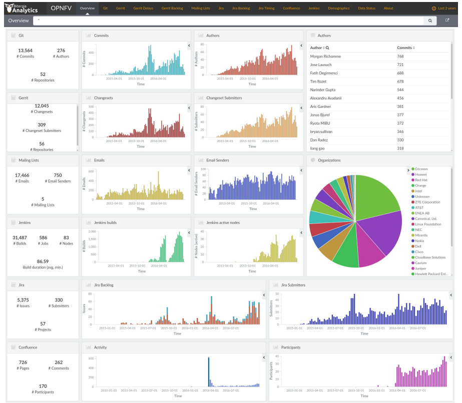
1,624 # Pull Requests

153 # Submitters

8 # Repositories

Top Projects

Project	Commits	Authors	Organizations	Repositories
Open Container Initiative	3,088	123	38	8



Git

13,564 # Commits

276 # Authors

52 # Repositories

Gerrit

12,045 # Changesets

309 # Changeset Submitters

56 # Repositories

Mailing Lists

17,466 # Emails

750 # Email Senders

5 # Mailing Lists

Jenkins

31,487 # Builds

586 # Jobs

83 # Nodes

86.59 Build duration (avg. min.)

Jira

5,375 # Issues

330 # Submitters

57 # Projects

Confluence

726 # Pages

262 # Comments

170 # Participants

Authors

Author	Commits
Morgan Richomme	768
Jose Lausuch	721
Fatih Degirmenci	688
Tim Rozet	678
Narinder Gupta	544
Alexandru Avadanii	456
Aric Gardner	381
Jonas Bjurel	377
Ryota MIBU	372
bryan.sullivan	346
Dan Radez	330
liang gao	318

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redhat. LINUX WIKIMEDIA FOUNDATION puppet Xen Project eclipse OPNFV The Document Foundation CoreOS

moz://a Couchbase OPEN CONTAINER INITIATIVE THE LINUX FOUNDATION CLOUD FOUNDRY OPEN-O ODPi

Introduction

Decisions based on data

Intro

Why do we need metrics?

- Check ongoing work
  - Awareness
  - Understanding
- Lead process improvement
  - Migrating to new infrastructure
  - New rules when code reviewing
- Motivational actions
  - Developers following some track - welcome and recognize new contributions

Intro

Several dimensions to measure:

- Activity
- Community
- Performance
- Code
- License compliance

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Open Source Goals

OSS Goals

THE LINUX FOUNDATION

"...accelerate open technology development and commercial adoption..."

openstack®

"...global development, distribution and adoption of the OpenStack cloud..."

THE APACHE® SOFTWARE FOUNDATION

"...open, collaborative software development projects..."

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OSS Goals

Each project has its own mission, but in general:

- Promote **adoption** and **collaboration** of their specific products
- Other potential reasons:
  - Become a standard in the industry
  - Free alternative to proprietary soft
  - Philosophical and ethical approach
  - And many other reasons to contribute to free software

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OSS Goals

It’s all about the **people** using and developing those products

Success = used and developed, by individuals or by the industry

Metrics are used for **transparency**, **neutrality**, **marketing**, and **engineering**

Linux Foundation Analytics

Linux Foundation Dashboard (Preview)

~50 million commits

~80,000 different authors

~7,000 git repositories

~250 mailing lists

~1 million messages

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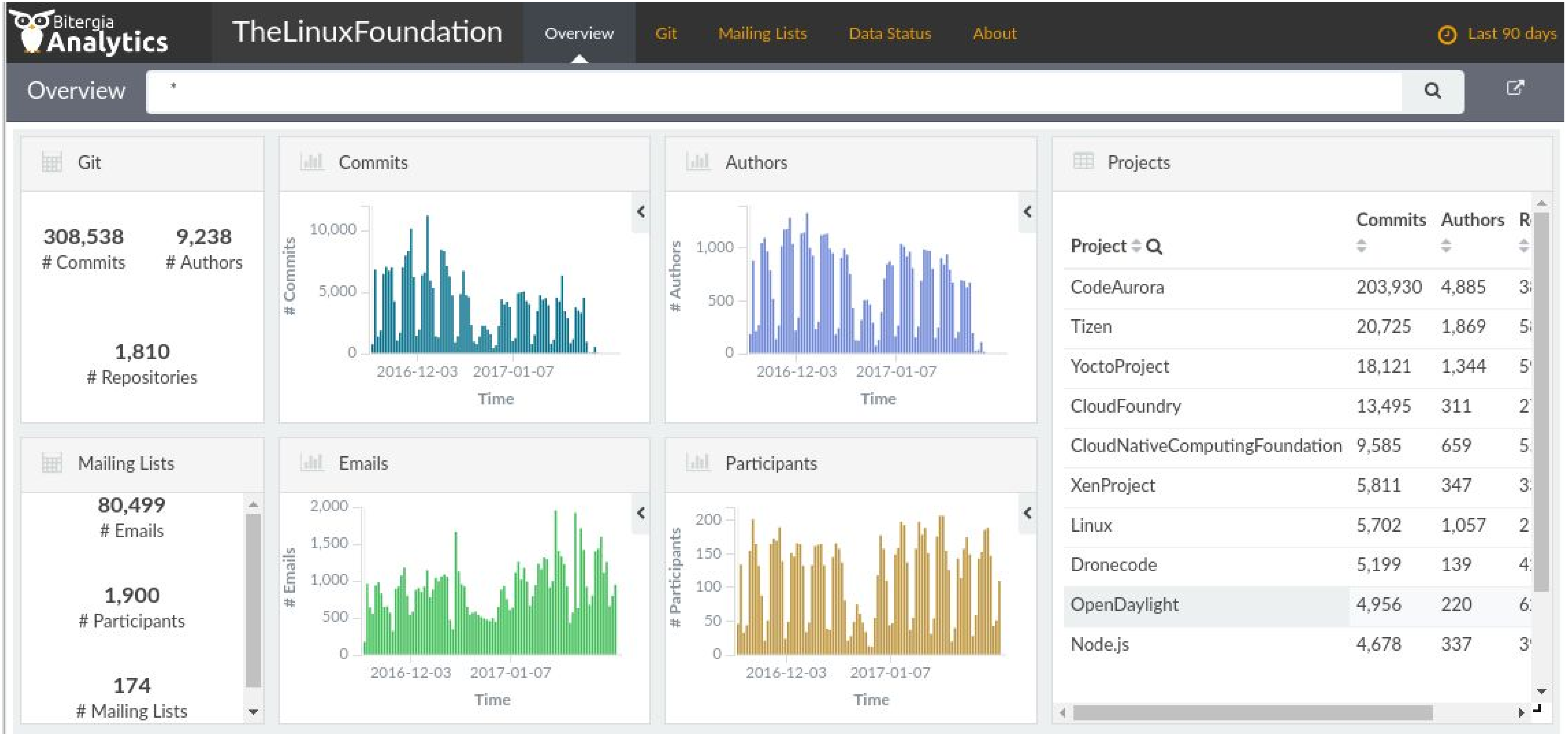

Git

308,538 # Commits

9,238 # Authors

1,810 # Repositories

Mailing Lists

80,499 # Emails

1,900 # Participants

174 # Mailing Lists

Projects

Project	Commits	Authors	R
CodeAurora	203,930	4,885	3
Tizen	20,725	1,869	5
YoctoProject	18,121	1,344	5
CloudFoundry	13,495	311	2
CloudNativeComputingFoundation	9,585	659	5
XenProject	5,811	347	3
Linux	5,702	1,057	2
Dronecode	5,199	139	4
OpenDaylight	4,956	220	6
Node.js	4,678	337	3

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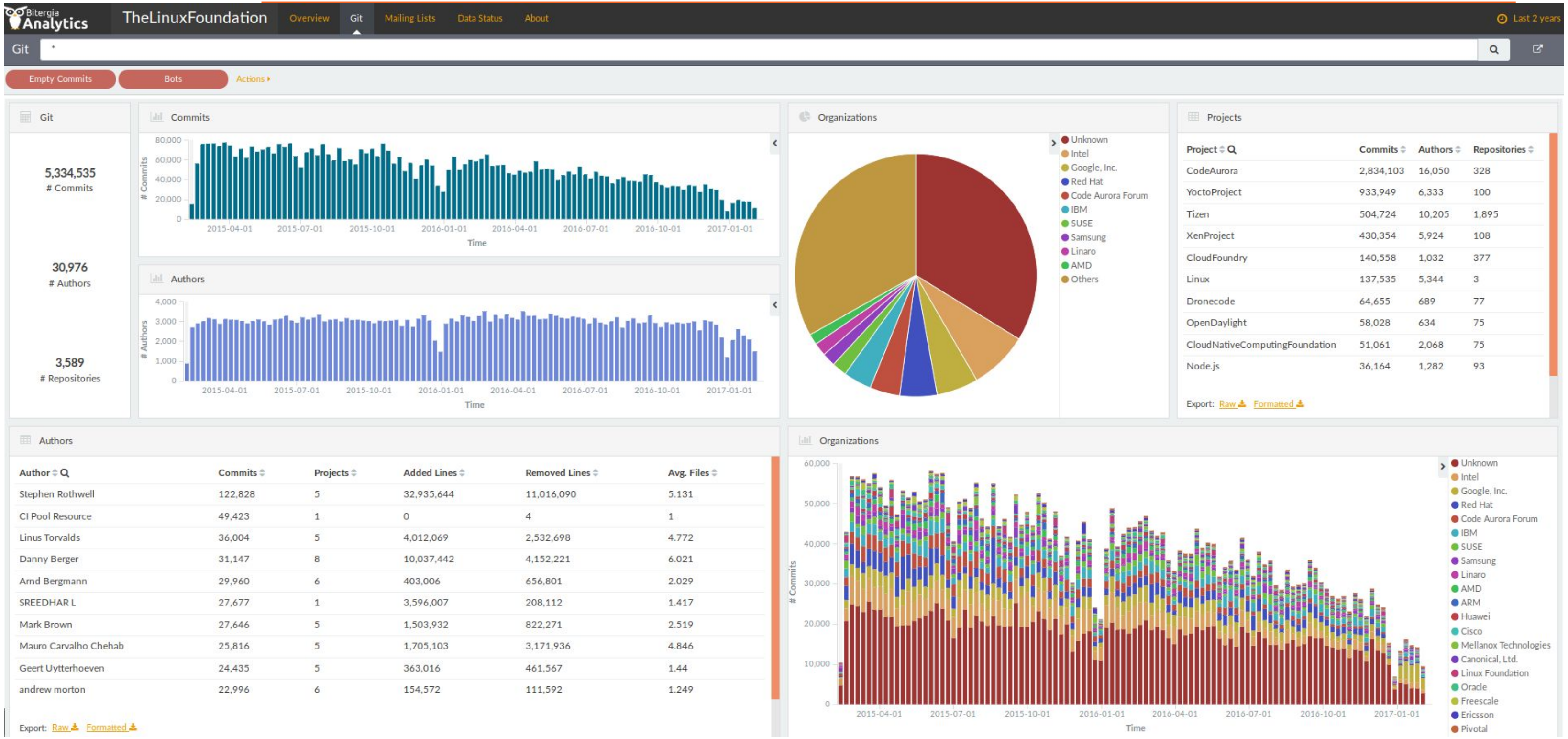
Git



Git

5,334,535
Commits

30,976
Authors

3,589
Repositories

Projects

Project	Commits	Authors	Repositories
CodeAurora	2,834,103	16,050	328
YoctoProject	933,949	6,333	100
Tizen	504,724	10,205	1,895
XenProject	430,354	5,924	108
CloudFoundry	140,558	1,032	377
Linux	137,535	5,344	3
Dronecode	64,655	689	77
OpenDaylight	58,028	634	75
CloudNativeComputingFoundation	51,061	2,068	75
Node.js	36,164	1,282	93

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Authors

Author	Commits	Projects	Added Lines	Removed Lines	Avg. Files
Stephen Rothwell	122,828	5	32,935,644	11,016,090	5.131
CI Pool Resource	49,423	1	0	4	1
Linus Torvalds	36,004	5	4,012,069	2,532,698	4.772
Danny Berger	31,147	8	10,037,442	4,152,221	6.021
Arnd Bergmann	29,960	6	403,006	656,801	2.029
SREEDHAR L	27,677	1	3,596,007	208,112	1.417
Mark Brown	27,646	5	1,503,932	822,271	2.519
Mauro Carvalho Chehab	25,816	5	1,705,103	3,171,936	4.846
Geert Uytterhoeven	24,435	5	363,016	461,567	1.44
andrew morton	22,996	6	154,572	111,592	1.249

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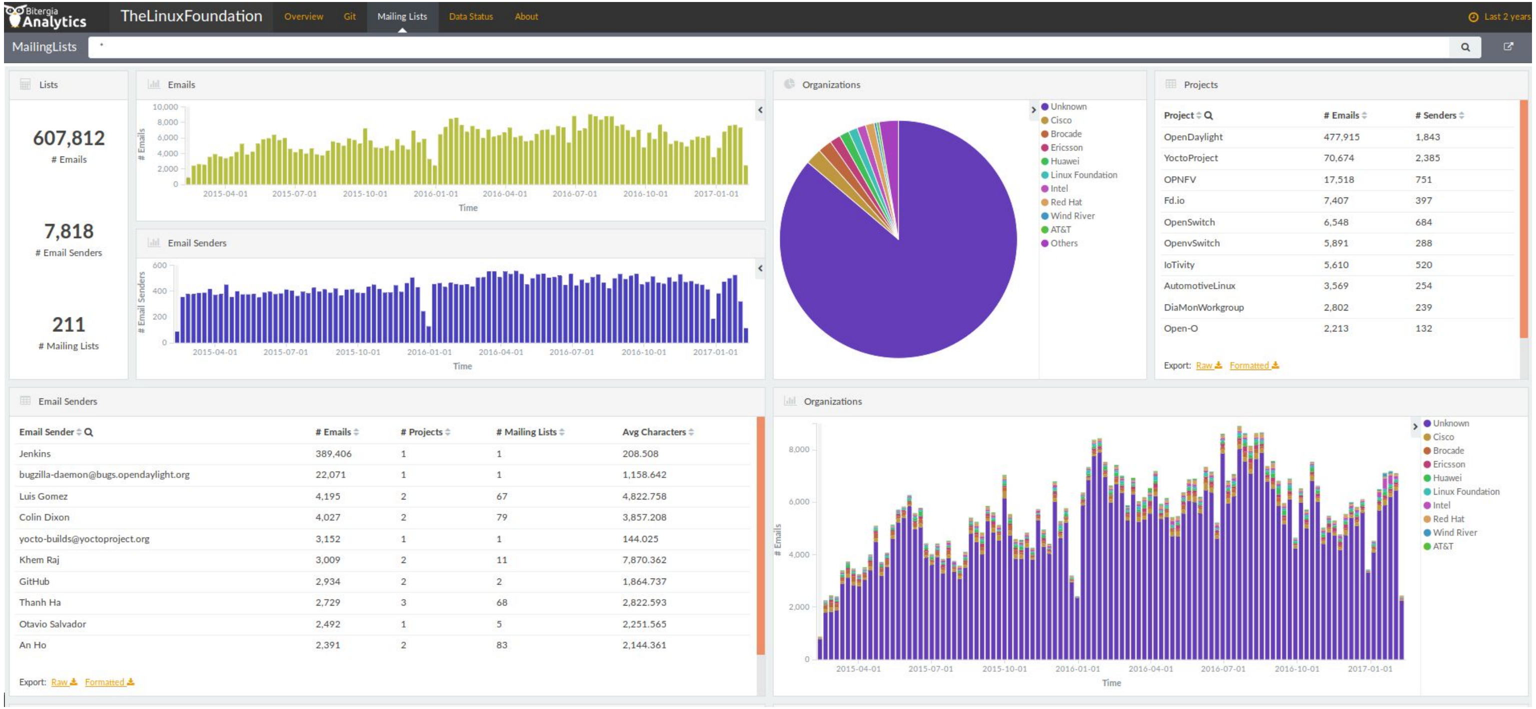
Mailing Lists



Lists

607,812
Emails

7,818
Email Senders

211
Mailing Lists

Projects

Project	# Emails	# Senders
OpenDaylight	477,915	1,843
YoctoProject	70,674	2,385
OPNFV	17,518	751
Fd.io	7,407	397
OpenSwitch	6,548	684
OpenvSwitch	5,891	288
IoTivity	5,610	520
AutomotiveLinux	3,569	254
DiaMonWorkgroup	2,802	239
Open-O	2,213	132

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Email Senders

Email Sender	# Emails	# Projects	# Mailing Lists	Avg Characters
Jenkins	389,406	1	1	208.508
bugzilla-daemon@bugs.opendaylight.org	22,071	1	1	1,158.642
Luis Gomez	4,195	2	67	4,822.758
Colin Dixon	4,027	2	79	3,857.208
yocto-builds@yoctoproject.org	3,152	1	1	144.025
Khem Raj	3,009	2	11	7,870.362
GitHub	2,934	2	2	1,864.737
Thanh Ha	2,729	3	68	2,822.593
Otavio Salvador	2,492	1	5	2,251.565
An Ho	2,391	2	83	2,144.361

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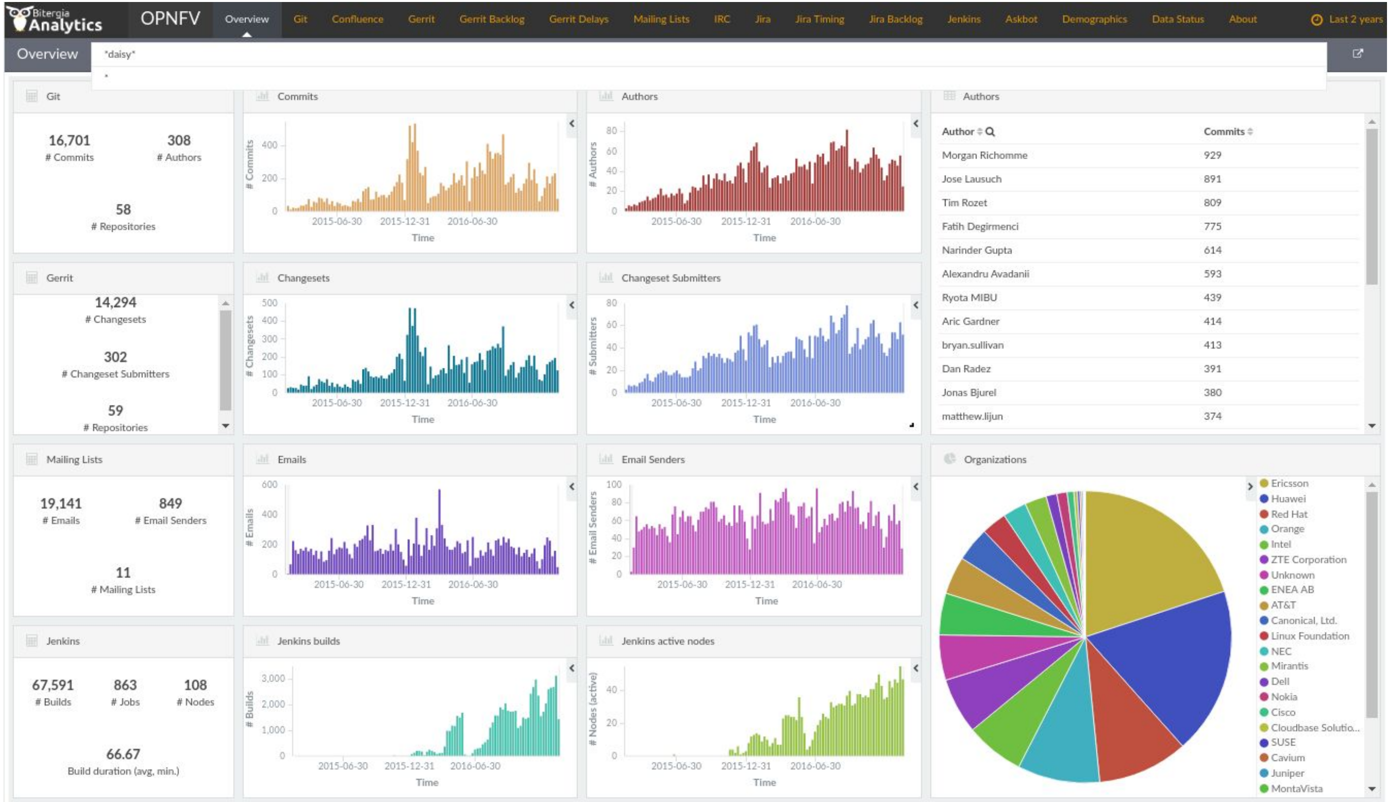
Project dashboards

Example: OPNFV



Git

16,701 # Commits
308 # Authors
58 # Repositories

Gerrit

14,294 # Changesets
302 # Changeset Submitters
59 # Repositories

Mailing Lists

19,141 # Emails
849 # Email Senders
11 # Mailing Lists

Jenkins

67,591 # Builds
863 # Jobs
108 # Nodes
66.67 Build duration (avg, min.)

Authors

Author	Commits
Morgan Richomme	929
Jose Lausuch	891
Tim Rozet	809
Fatih Degirmenci	775
Narinder Gupta	614
Alexandru Avadanii	593
Ryota MIBU	439
Aric Gardner	414
bryan.sullivan	413
Dan Radez	391
Jonas Bjurel	380
matthew.lijun	374

Organizations

- ● Ericsson
- ● Huawei
- ● Red Hat
- ● Orange
- ● Intel
- ● ZTE Corporation
- ● Unknown
- ● ENEA AB
- ● AT&T
- ● Canonical, Ltd.
- ● Linux Foundation
- ● NEC
- ● Mirantis
- ● Dell
- ● Nokia
- ● Cisco
- ● Cloudbase Solutio...
- ● SUSE
- ● Cavium
- ● Juniper
- ● MontaVista

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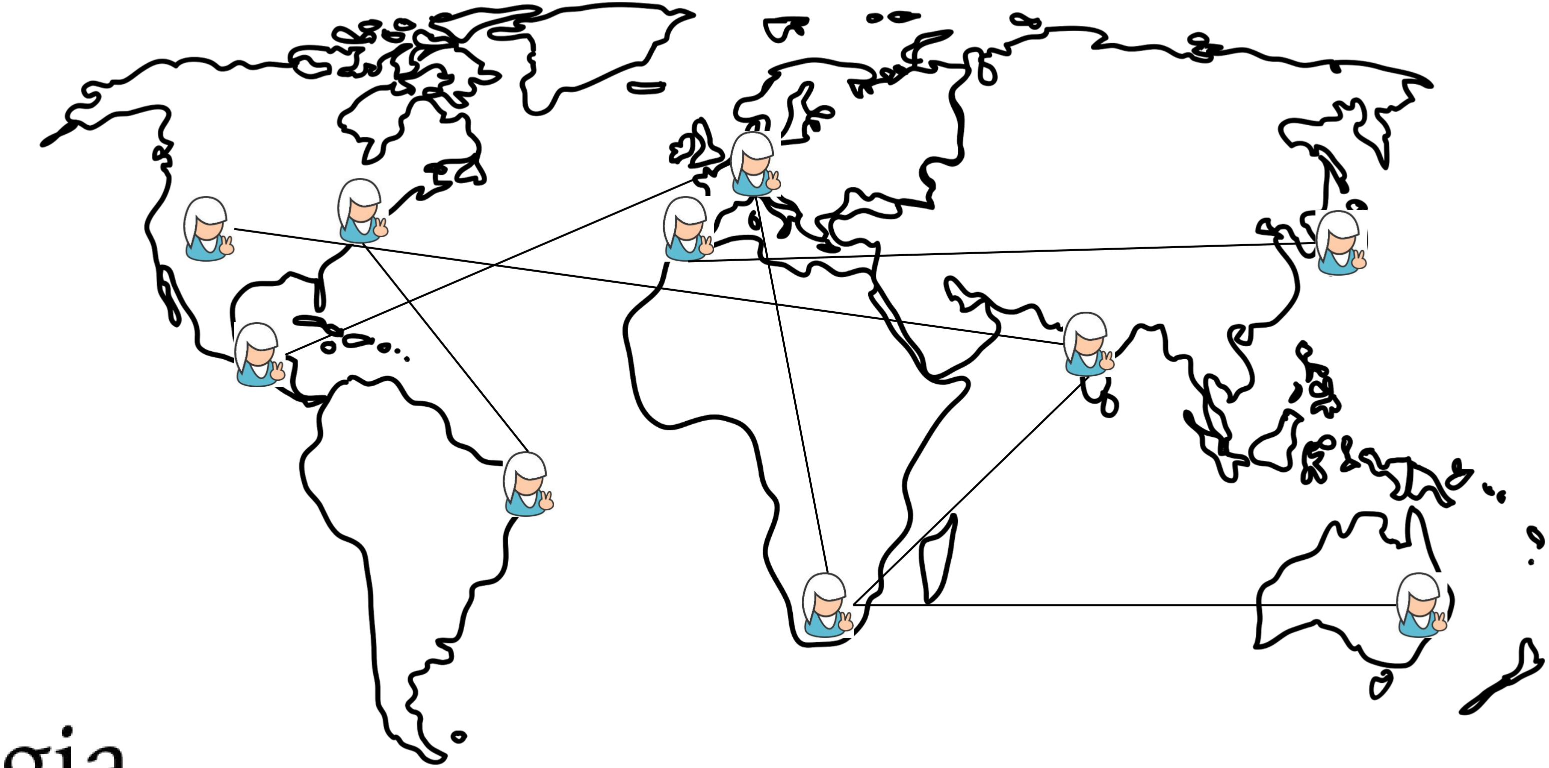
http://opnfv.biterg.io

Open Source
and
Inner Source

OSS



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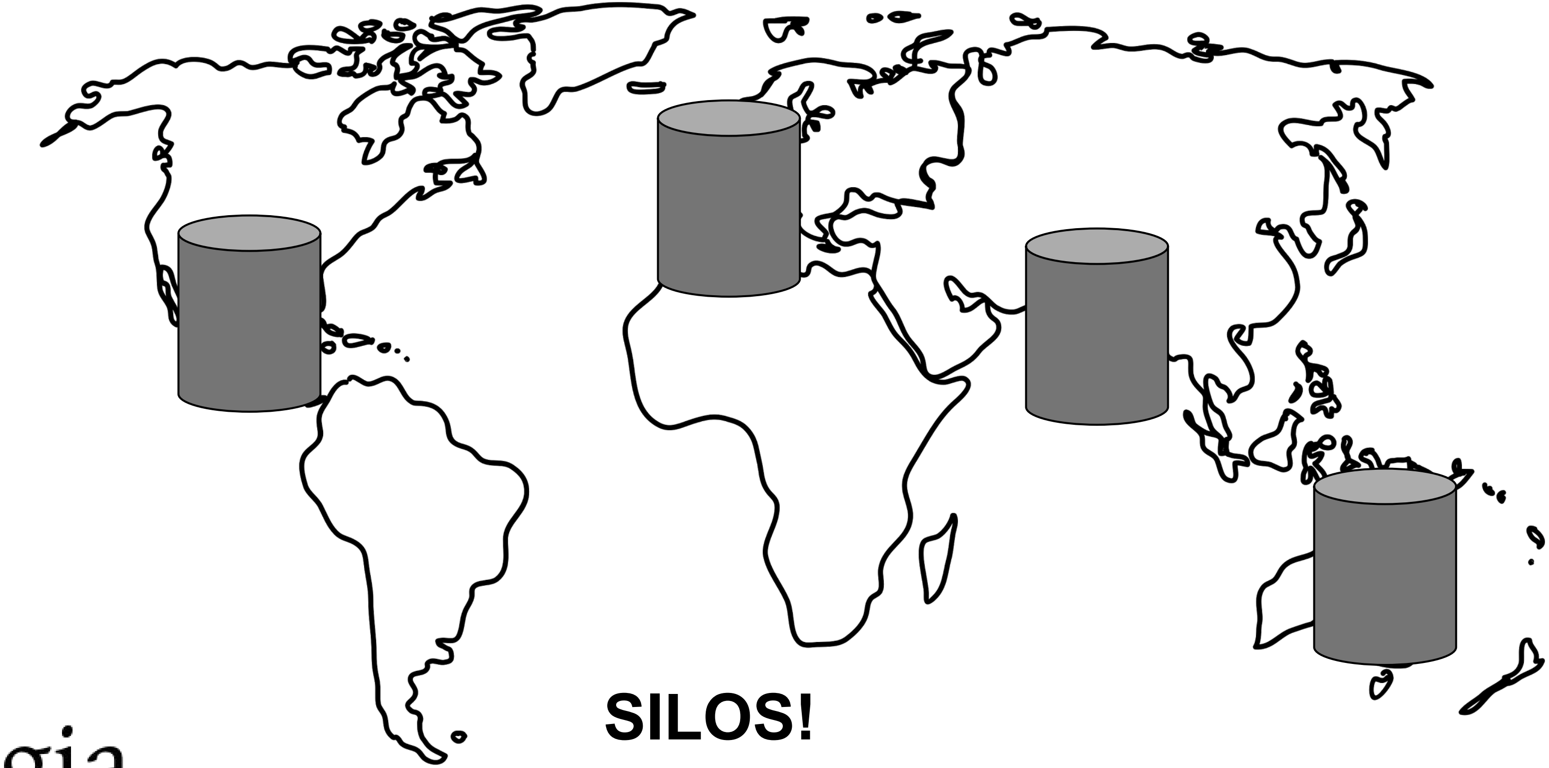
IS



SILOS!

IS Goals

Inner source aims at bringing OSS method to the enterprise

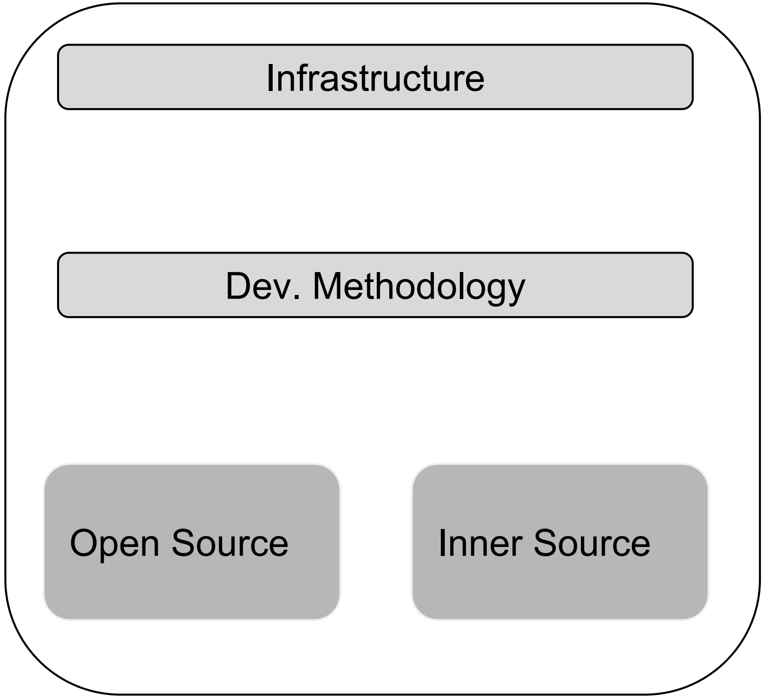
IS Goals

Inner source aims at bringing OSS method to the enterprise

Some advantages:

- Reduce time to market
- Share costs and maintenance
- Engagement
- Increase code quality (code review, CI)
- Allow innovation

OSS vs IS



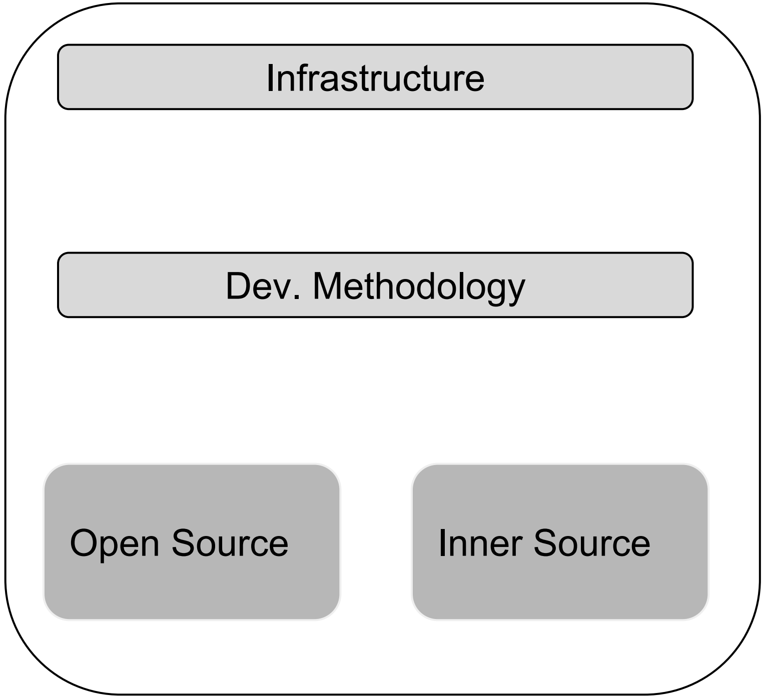
Infrastructure

Dev. Methodology

Open Source

Inner Source

OSS vs IS



Gitlab, GitHub Enterprise, Atlassian, in house services, mailing lists

Code review, CI, Dev. documentation, governance, meritocracy

OSS vs IS

Inner source is not open source! (but they’re similar)

Some examples

Open source

- OSS license
- Open development
- Anyone is welcome
- Foster adoption

Inner source

- Deal with licenses
- Open development in house
- Anyone in the org. Is welcome
- Foster internal use and reusability

Measuring Inner Source

IS Metrics

Different initial goals in open and inner source projects.

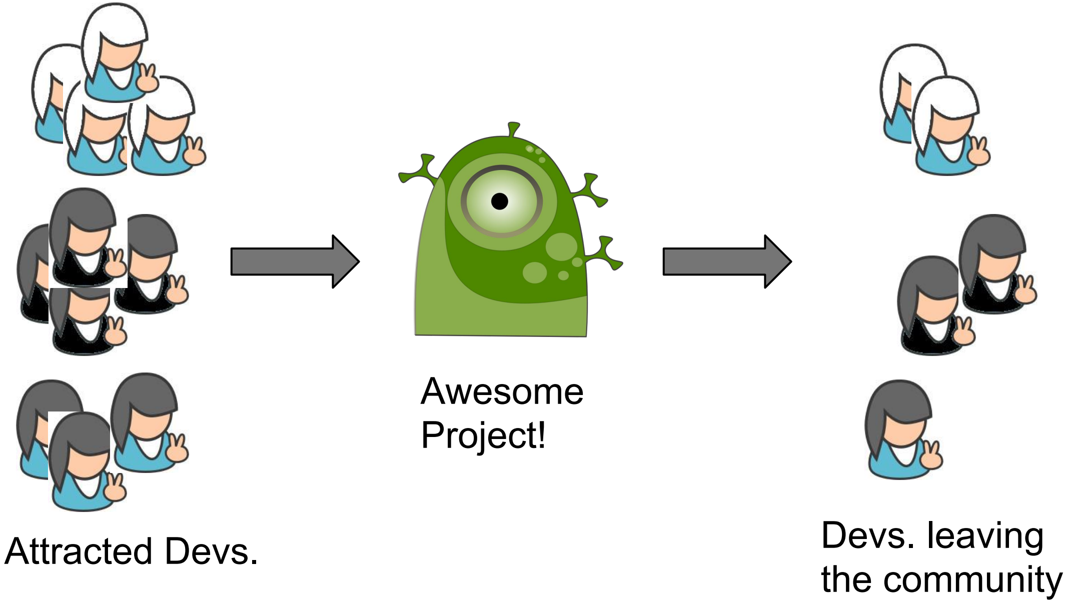
But, similar development method and infrastructure!

And, similar analysis.

Most of the OSS metrics are useful for IS communities

Let’s measure!

Attraction/Retention



Attracted Devs.

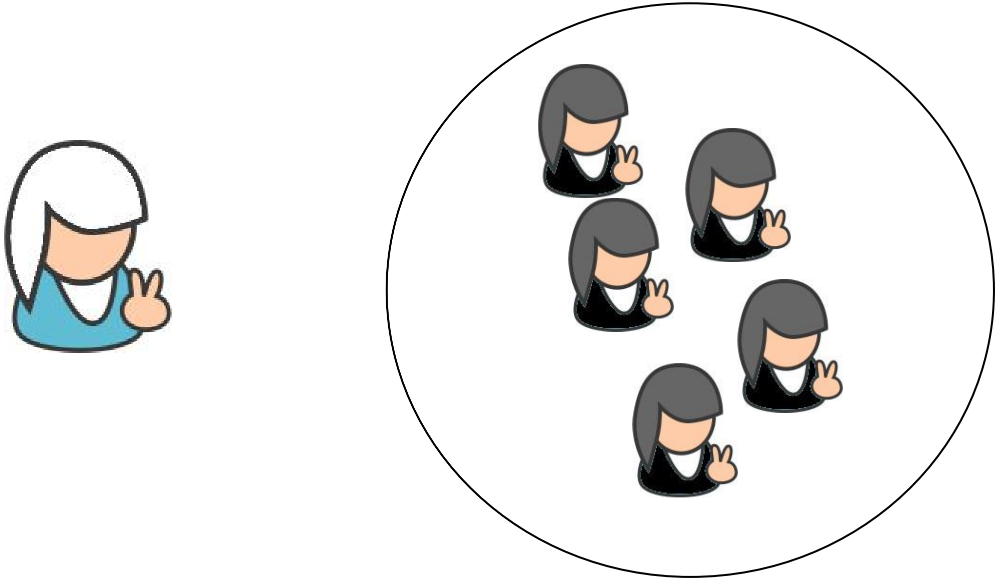
Awesome
Project!

Devs. leaving
the community

Attraction/Retention

- How good is the community attracting/retaining devs?
  - Number of newcomers
  - Number of retaining devs
- Understanding how some policies affect the attraction/retention rate

Mentorship



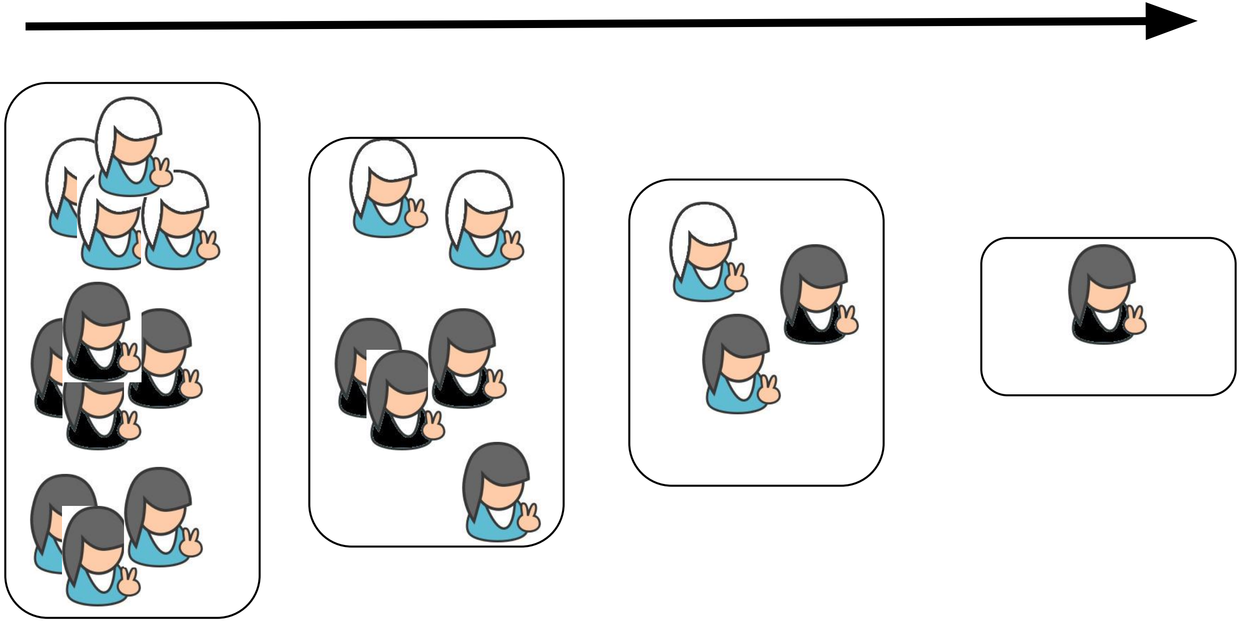
Mentorship

Mentorship and helping newcomers

- Mentors are key to help newcomers
- Who are they? And their workload?
- Does the community need more mentors?
- How many people are leading?

Contributors Funnel

From users to core reviewers



Contributors Funnel

- Help to understand how the community evolves
- From the first traces (eg email) to become a core reviewer
    - How long does it take?
    - What % of people reach that core level?

Development Cycle

- This helps to measure the time since the user story till the code is merged
    - How fast is the process?
    - Median time to merge, iterations, developers involved, CI, code review bottlenecks
- We know the time to deployment, and the time to close a user story brings the whole picture

Spreading the Knowledge

- Turnover happens
- How are developers connected?
- Fill orphaned areas left by a senior developer
- Territoriality: files touched by just one developer

Some anti-patterns

Do not measure people unless you want to (undesired situations)

- ‘Tell me how you measure me, and I will tell you how I will behave’ - Eliyahu Goldratt, The Haystack Syndrome

Team performance, not people

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Conclusions

Summary

Inner source can be compared to OSS projects

You can benchmark your performance with any OSS project of reference (TLF, ASF, OpenStack)

Inner source can learn a lot from OSS (and vice versa)

Success depends on the goals of your organization (but you can benchmark!)

Dashboards are useful to lead that process improvement

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