



JOSM

## What's behind JOSM ?

# Intro : Quick facts about JOSM

Oldest still developed: created in 2005, only one year after OSM

Most used editor since 2010 (67 % of 2018 contributions)

Feature-rich, **extensible**

Available on Linux, Windows, macOS

Translated in 36 languages

Important community

Site : <https://josm.openstreetmap.de>



# Intro : Plan

- 1) Technologies & Extensibility
- 2) Project Management
- 3) Statistics
- 4) Work in progress & to come



JOSM

# 1. Technologies & extensibility

# Core features, formats and protocols

## Load, Edit, Render, Validate, Upload :

- OSM data: XML, JSON (*new in 2018-08*)
- Traces: GPX, NMEA, RTKLib (*new in 2019-08*)
- OSM notes: XML

## With the help of :

- Edition/Search/Filtering/Remote control tools
- OSM presets: XML
- Mappaint styles: MapCSS
- Validation rules: Java, MapCSS
- Imagery: WMS, TMS, WMTS
- Geotagged pictures: JPG, PNG
- Audio recordings: WAV, MP3/AAC/AIF (*new in 2017-06*)

# Technologies

## Java 8+ / Swing

### Very few dependencies

Apache Commons Compress : Bzip2, XZ compression

Apache Commons JCS: Imagery tile cache

Apache Commons Validator : Validation routines (URLs...)

SvgSalamander : SVG Support

Metadata Extractor : EXIF metadata reading of geotagged pictures

Signpost : OAuth authentication

Jsonp: JSON support

\* [opening\\_hours.js](#): opening\_hours syntax

\* [overpass-wizard](#): Overpass API wizard

\* = JavaScript libraries at risk

# Extensions : plugins

## More than 100 plugins adding for example:

- New data formats/ protocols :
  - *pbf, o5m, geojson, opendata* (csv, ods, xls, shapefile, kml...), *http/2* (exp.)
- New advanced tools :
  - *reverter, undelete, utilsplugin2, conflation, piclayer, todo, tag2link, ...*
  - *building\_tools, turnlanes, turnrestrictions, measurement, terracer, ...*
- Integration with ecosystem :
  - *Mapillary, Streetside, Wikipedia, Imagery\_offset\_db*
- Specialized/national/fun tools :
  - *Cadastre.fr, austriaaddresshelper, SeaChart, Kendzi3D, geochat*
- Java libraries required by other plugins :
  - *Apache-commons, ejml, geotools, javafx, jaxb, jna, jogl, jts, log4j*

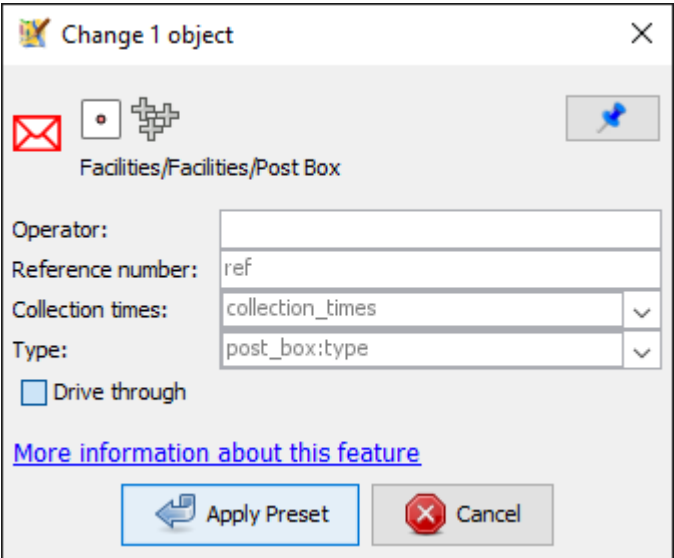
<https://josm.openstreetmap.de/wiki/DevelopersGuide/DevelopingPlugins>

# Extensions : presets (XML)

```
<item name="Post Box" icon="presets/service/post_box.svg" type="node" preset_name_label="true">
  <link wiki="Tag:amenity=post_box" />
  <space />
  <key key="amenity" value="post_box" />
  <text key="operator" text="Operator" />
  <text key="ref" text="Reference number" />
  <combo key="collection_times" text="Collection times" delimiter="|" values="Mo-Sa 09:00|Mo-Fr 17:30" />
  <combo key="post_box:type" text="Type" values="pillar,lamp,wall,meter" values_context="post_box" />
  <check key="drive_through" text="Drive through" />
</item>
```

**Simple syntax, stable for years, detailed below:**

**<https://josm.openstreetmap.de/wiki/TaggingPresets>**



Change 1 object

Facilities/Facilities/Post Box

Operator:

Reference number:

Collection times:  ▼

Type:  ▼

Drive through

[More information about this feature](#)

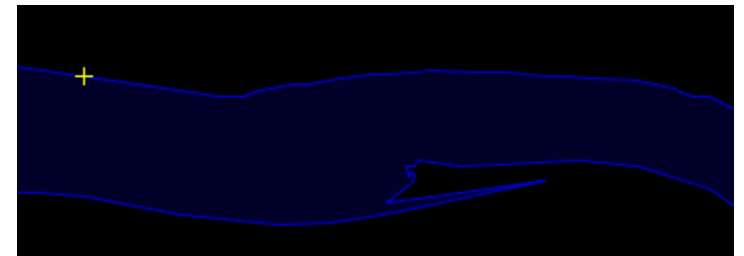
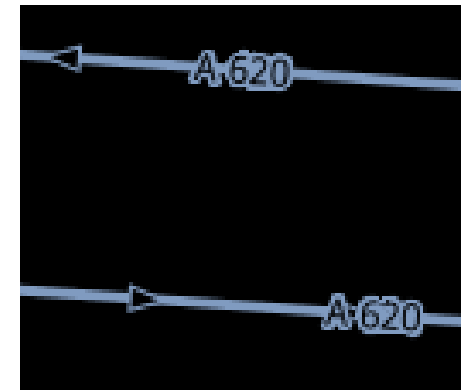


# Extensions : styles (MapCSS)

```
node[amenity=post_box] {
  icon-image: "presets/service/post_box.svg";
  set icon_z17;
}

way|z18-[highway=motorway][setting("highway_labels")]
way|z18-[highway=trunk][setting("highway_labels")] {
  text: auto;
  text-color: black;
  font-size: 10;
  text-position: line;
  text-halo-opacity: 1;
  text-halo-radius: 1.5;
}

area[waterway=riverbank] {
  fill-color: riverbank#0000cf;
  width: 1;
  color: riverbank#0000cf;
}
```



**Very powerful syntax continuously improved, detailed below:**

<https://josm.openstreetmap.de/wiki/Help/Styles/MapCSSImplementation>

# Extensions : validation (MapCSS)

```
way[waterway][oneway?] {
  throwWarning: tr("{0} is unnecessary for {1}", "{1.key}", "{0.key}");
  group: tr("unnecessary tag");
  fixRemove: "{1.key}";
}

*[addr:street =~ /(?!i).*Strasse.*]/[addr:street !~ /(?!i).*Strasser.*]/
[inside("DE,AT")],
*[name =~ /(?!i).*Strasse.*]/[name !~ /(?!i).*Strasser.*]/[inside("DE,AT")] {
  throwError: tr("street name contains ss");
  assertMatch: "way name=Hauptstrasse";
  assertNoMatch: "way name=Hauptstraße";
  assertNoMatch: "way name=Kapitän-Strasser-Straße";
  assertNoMatch: "way name=Peter-Strasser-Platz";
}

*[addr:street =~ /(?!i).*Straße.*]/[inside("LI,CH")],
*[name =~ /(?!i).*Straße.*]/[inside("LI,CH")] {
  throwError: tr("street name contains ß");
  assertMatch: "way name=Hauptstraße";
  assertNoMatch: "way name=Hauptstrasse";
}
```

**Syntax similar to rendering MapCSS, with a few validator extensions:**

<https://josm.openstreetmap.de/wiki/Help/Validator/MapCSSTagChecker>



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## 2. Project Management

# Current team

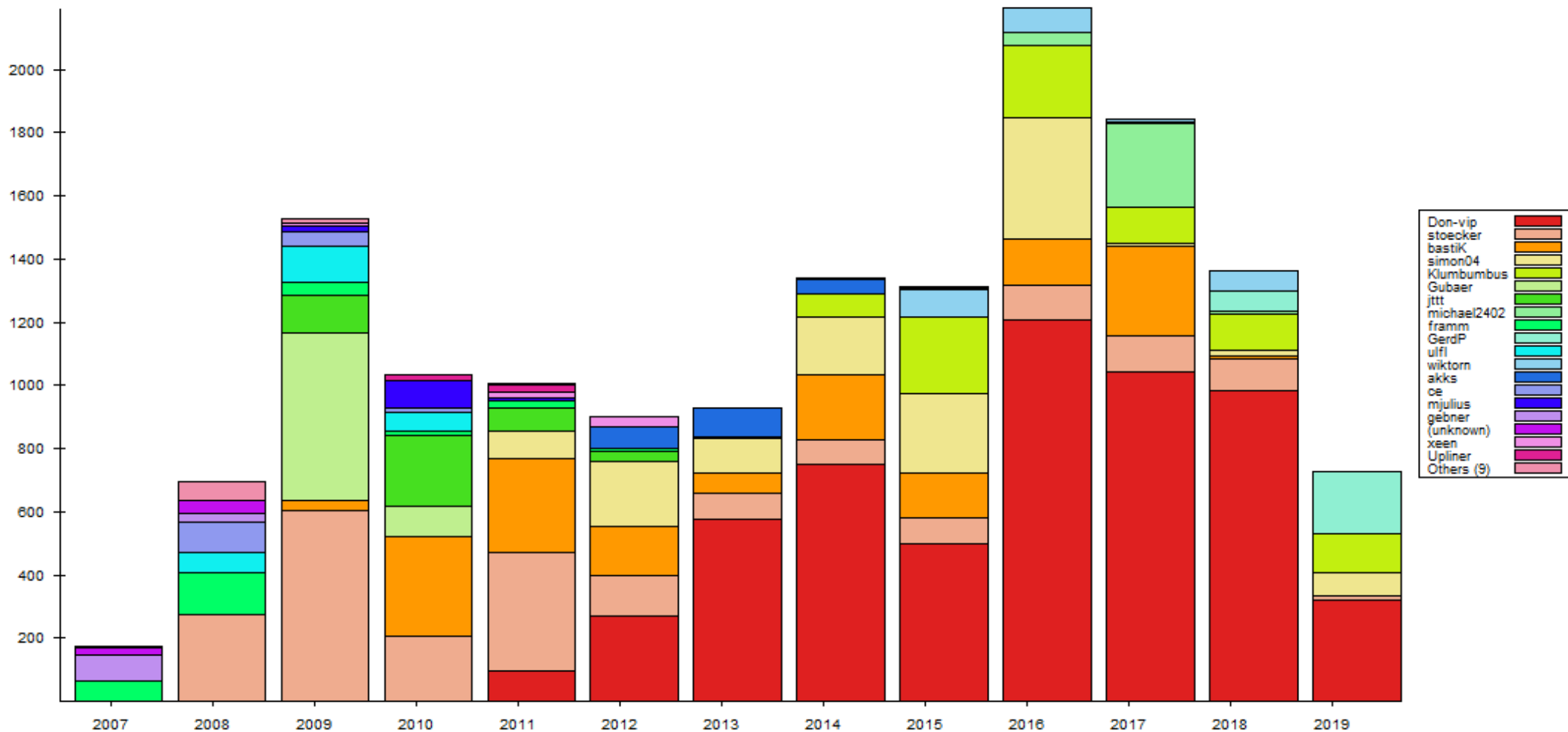
[2018-2019] : 9 developers (~2000 commits) :

Vincent, Gerd, Stefan, Dirk, Simon, Wiktor, Paul, Michael, Florian



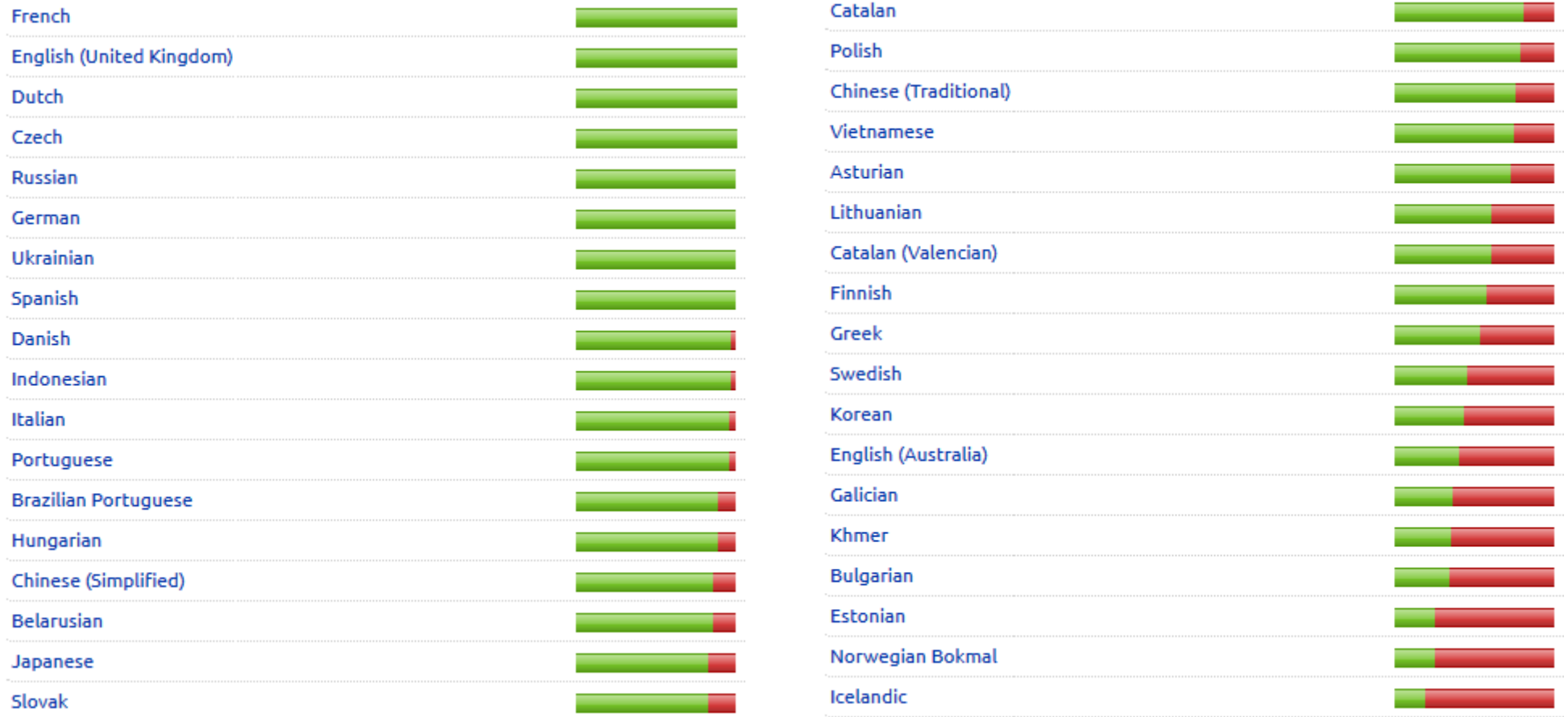
# Historic team

[2005-2019] : 29 developers have contributed (15351 commits)



# Translation teams

[2005-2019] : 1000+ translators have contributed (36 langs, 11000+ strings)



# Development cycle

**1** release *latest* each night (3am CEST)

**1** release *tested* ~ last Sunday of each month

Tests OK, no known regression, translations up to date

**N** releases *hotfix* – for critical bug / external problem (API, Debian...)

## Distribution modes

Java WebStart (preferred) : light, fast, multi-platform

Windows Installer (NSIS) / macOS package

Jar file / scripts

Ubuntu PPA / Linux native packages (Debian, Ubuntu, etc.)

# Governance

## Independent project

Benevols / not on behalf of OSMF, WG, local chapters, private companies...

But some sponsoring (direct / indirect)

## OSM community before all

Everything is publicly discussed on the bugtracker

Anonymous tickets allowed, even if we prefer when they're not :)

**We don't create tags ourselves!**

Presets choices guided by OSM wiki, Taginfo, @tagging mailing list, etc.

Java migrations performed if transparent for > 90 % of our user base



## Direct sponsors: JOSM core

Hetzner : server / 2013-2019



Google : Summer of Code / 2015-



Google Summer of Code

FOSSGIS : code signature certificate / 2016-  
server / 2019-



JetBrains : IntelliJ IDEA licences / 2016-



IntelliJ IDEA

YourKit : Java Profiler licences / 2018-



# Indirect sponsors: JOSM plugins & extensions

Skobbler/Telenav : plugins *TurnRestriction*, *OpenStreetCam*, *ImproveOsm*, *GeoHash*...



Apple : *Atlas* plugin / 2017-



Microsoft : *StreetSide* plugin / 2018



GitHub/DigitalOcean : HacktoberFest / 2018, *GeoJson* plugin



Mapillary: *Mapillary* plugin / 2019-



# Continuous Integration

**Jenkins : Unit tests / integration OpenJDK 8, 11, 12, 13-ea, 14-ea**

## **Integration tests with ecosystem:**

APIs: OSM, Mapillary, Wikipedia, Wikidata...

Popular tag handling (> 10,000 in Taginfo)

TLD (IANA) for URL validation, ELI synchronisation...

## **Daily check of:**

Translations (double quotes): **we fix them**

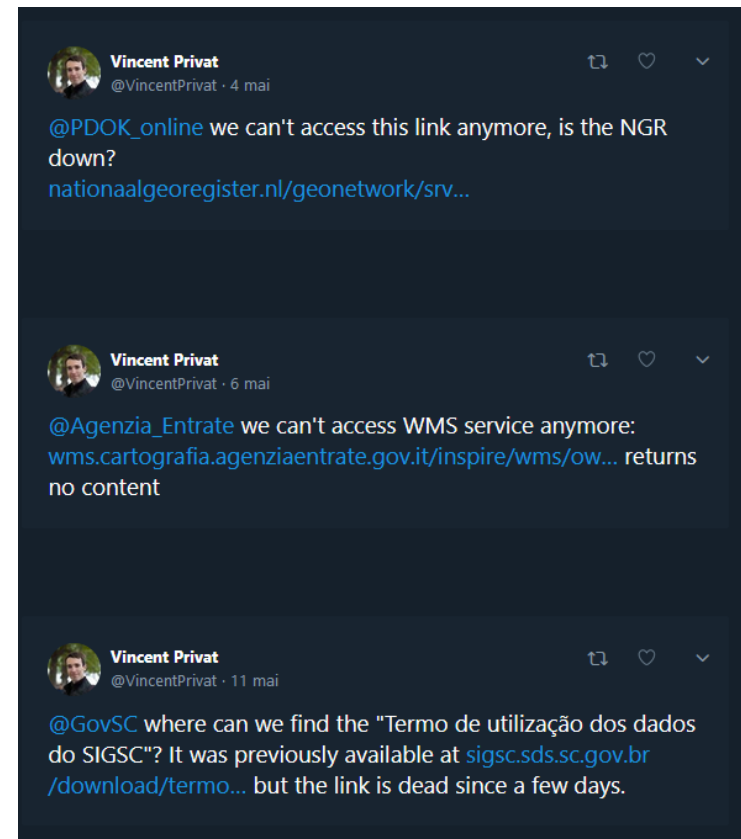
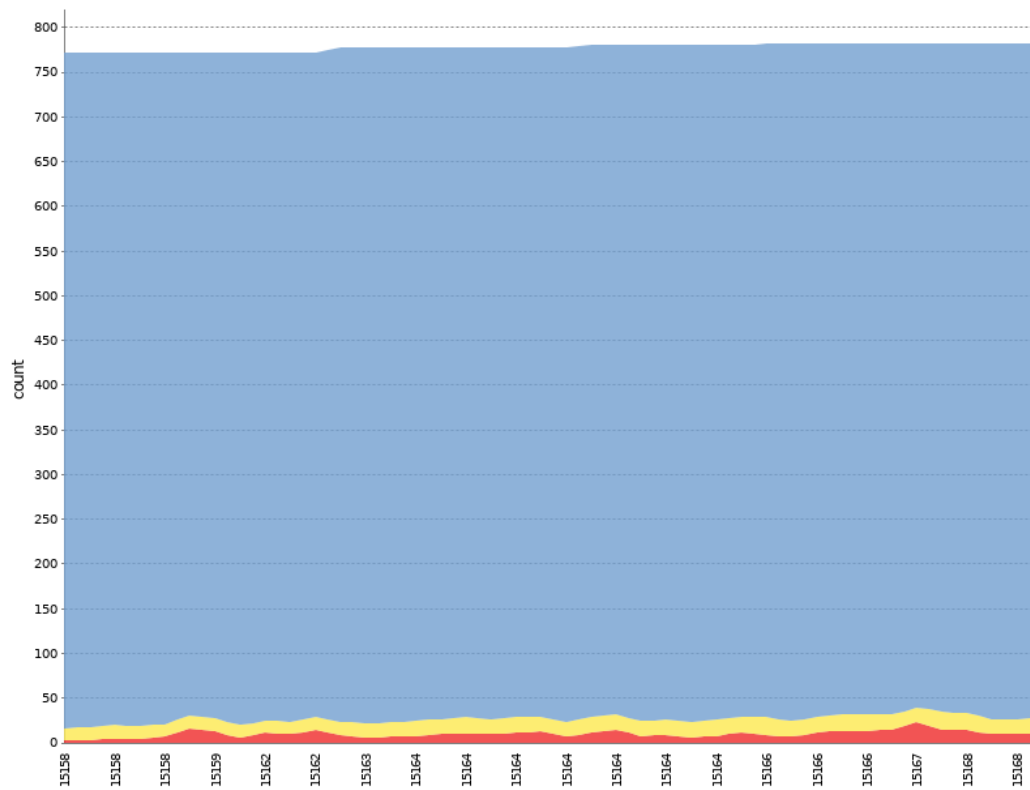
Internal extensions (official plugins, styles/presets on JOSM wiki): **we fix them**

External extensions (often on GitHub): **we report**, **sometimes PR**, **otherwise blacklist**

# Checking of imagery sources validity

~800 sources are checked daily

Ungrateful work of reporting errors and fishing for information



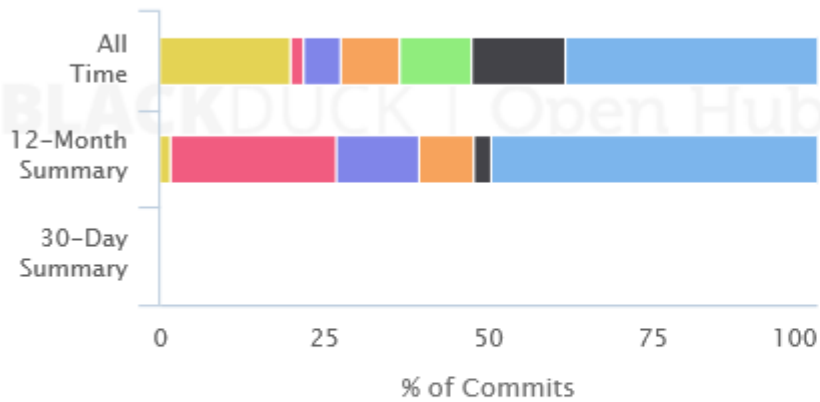


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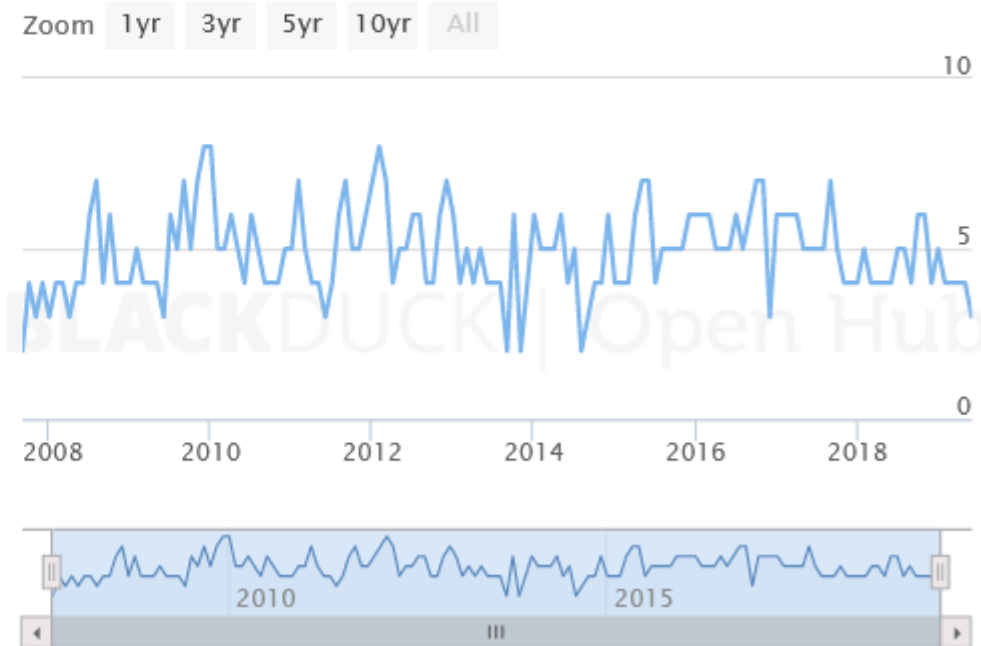
## 3. Statistics

# Statistics : contributors [2007-2019]

Commits by Top Contributors



Number of Contributors

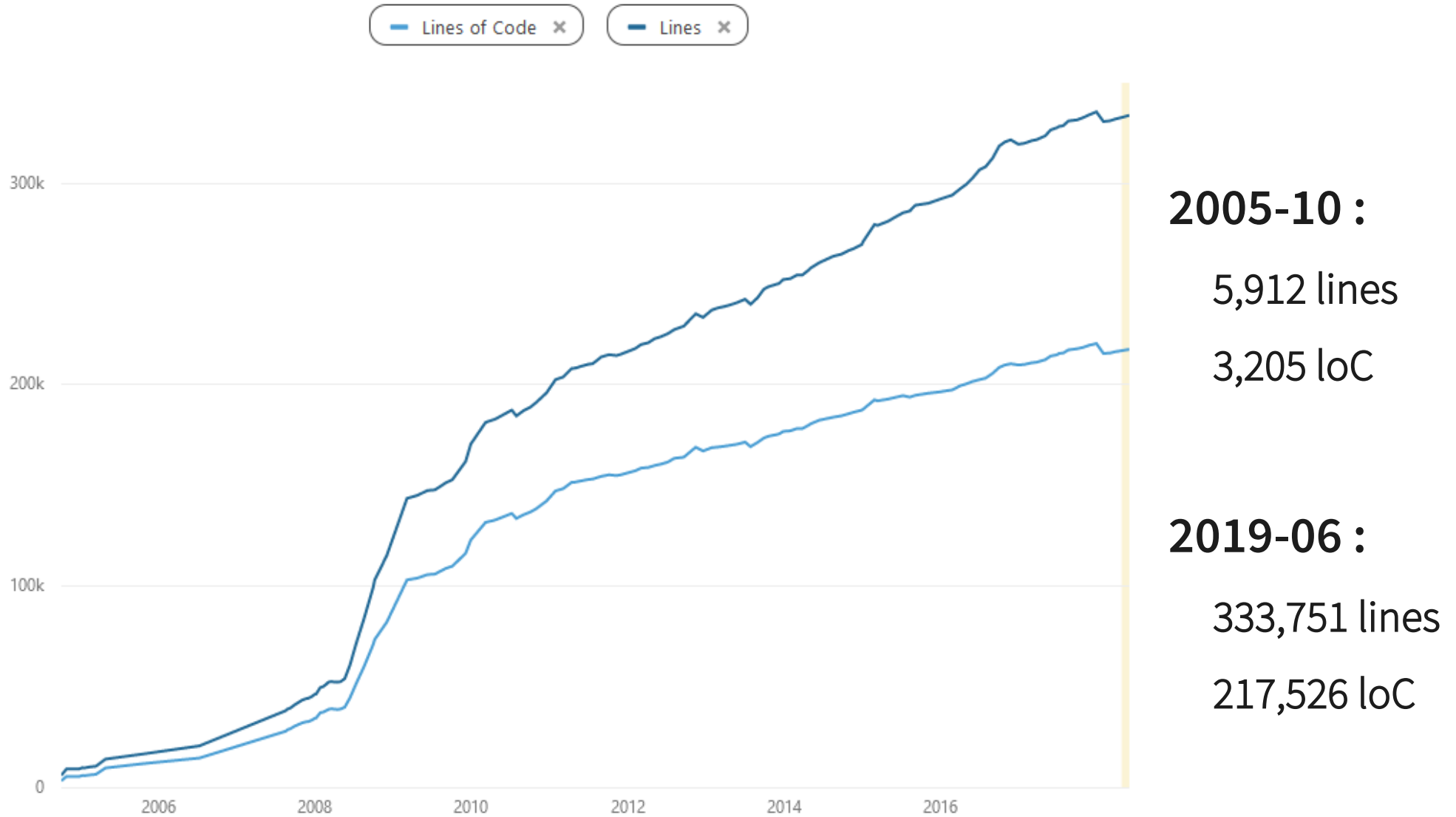


Usually about 4/5 people contributing to JOSM each month

Since 2007, never less than 2 people!

<https://www.openhub.net/p/josm>

# Statistics : lines of code [2005-2019]



**2005-10 :**

5,912 lines

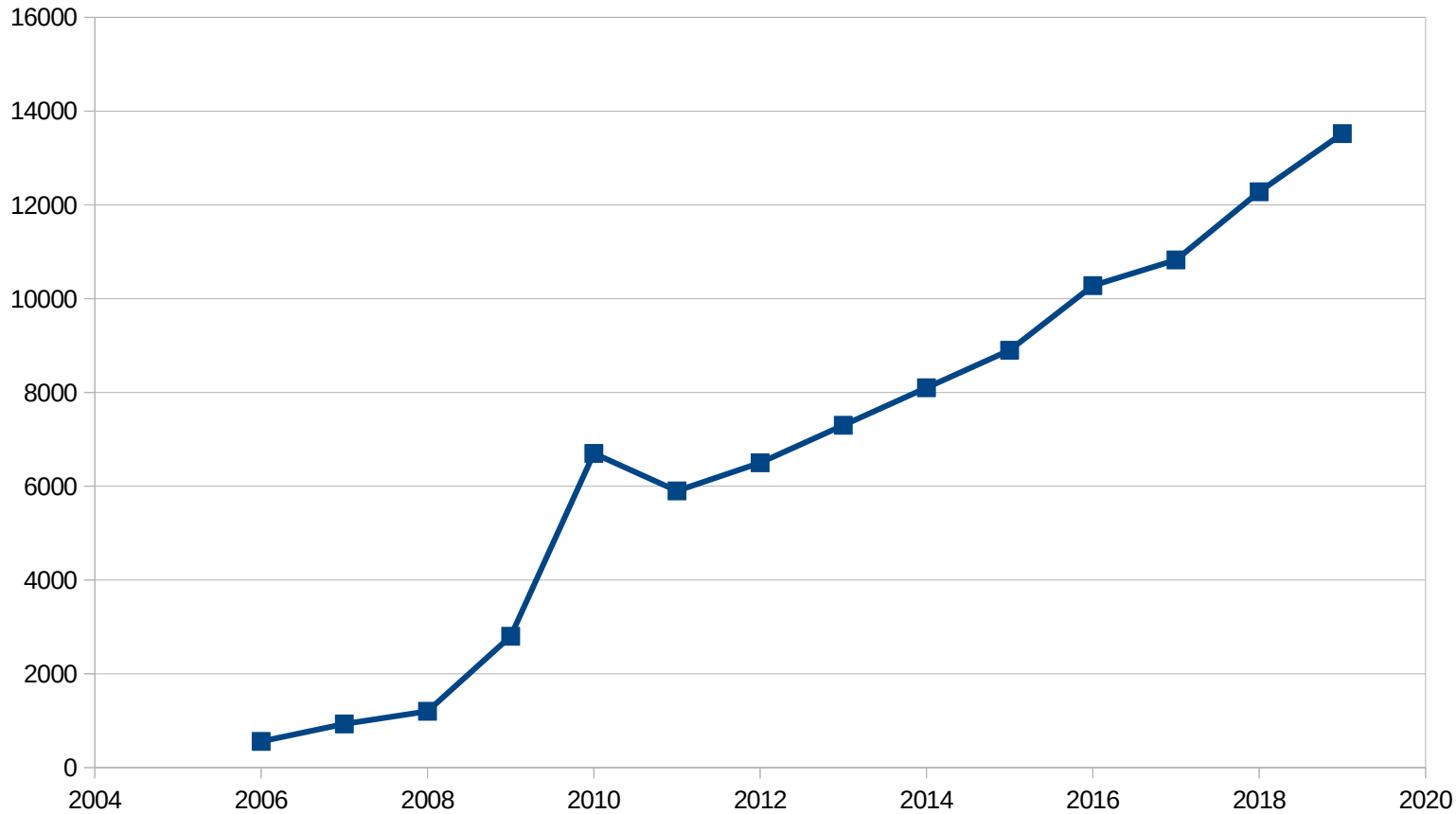
3,205 loC

**2019-06 :**

333,751 lines

217,526 loC

# Statistics : binary size (Kb)



~1 Mb/year:

Code

Icons

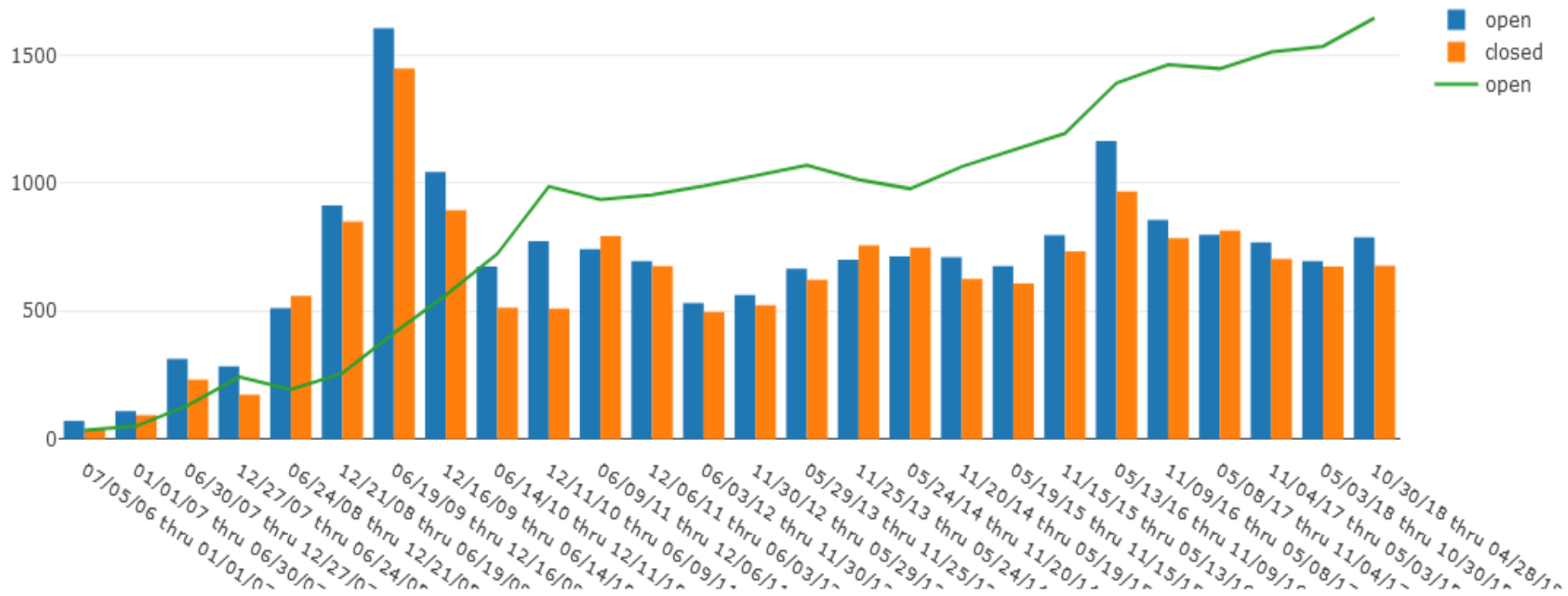
Presets

Translations

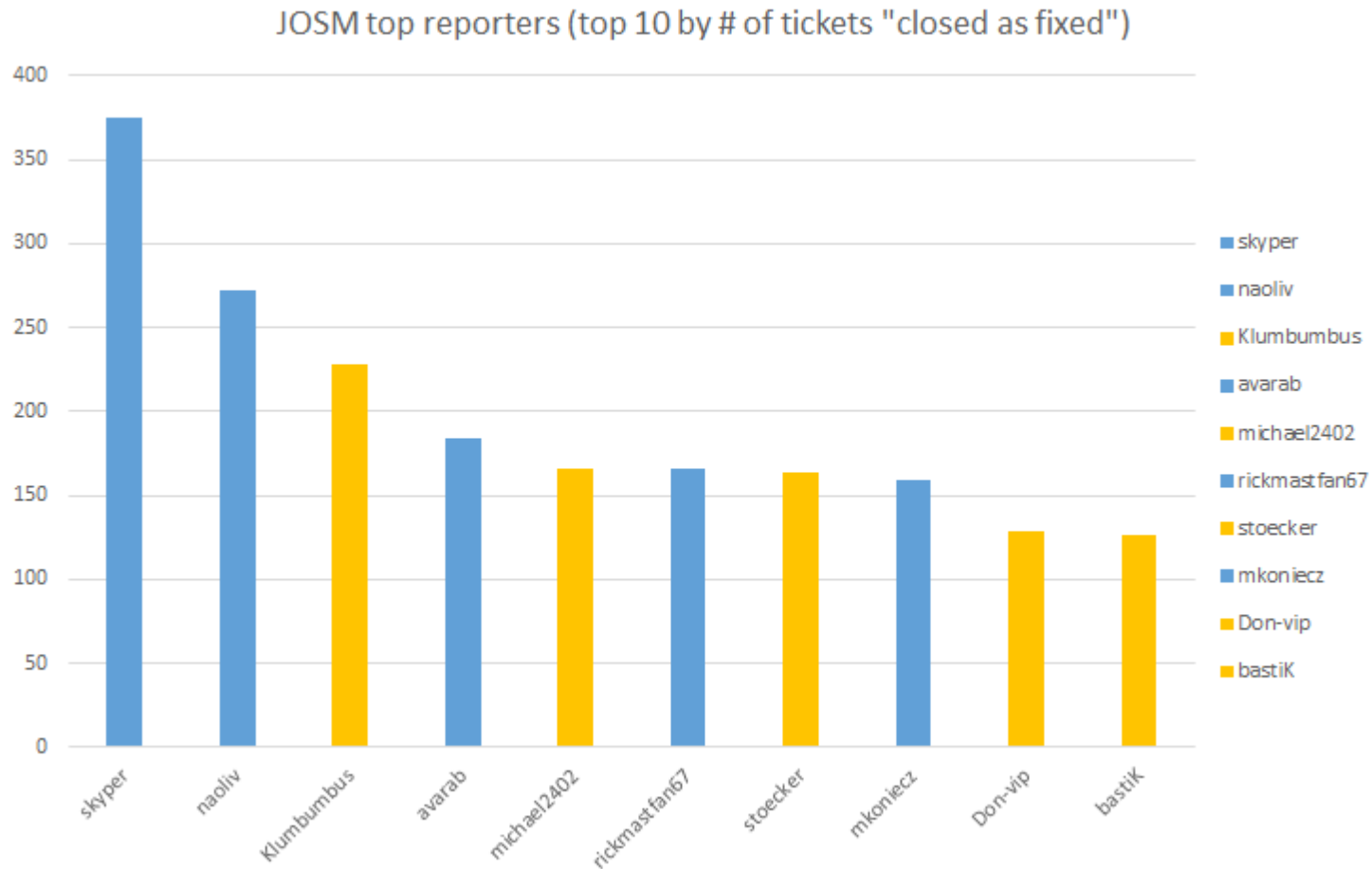
2011 : Goodbye XML styles, hello MapCSS :)



# Statistics : tickets [2007-2019] (bi-annual)

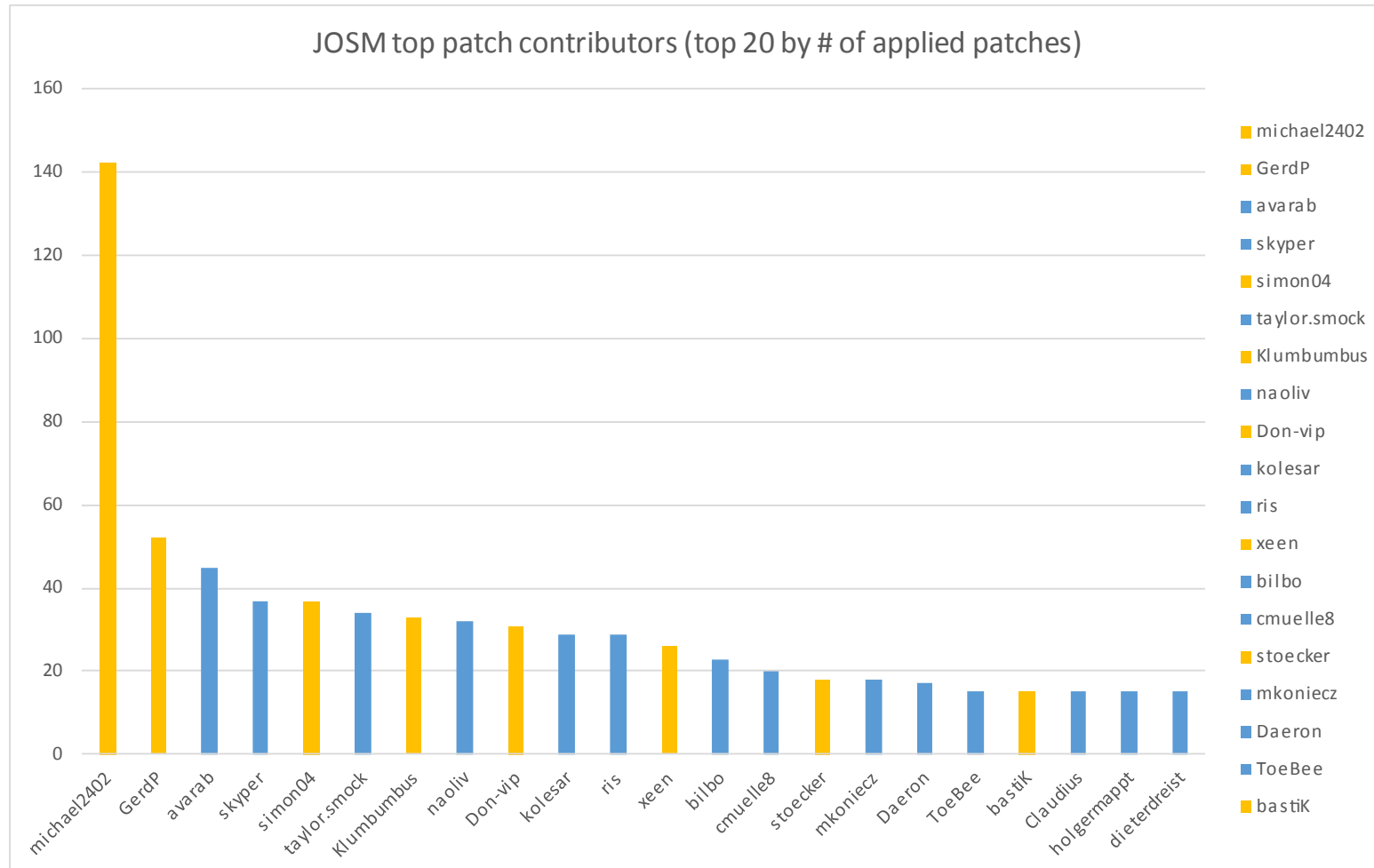


# Statistics : Hall of Fame : reporters



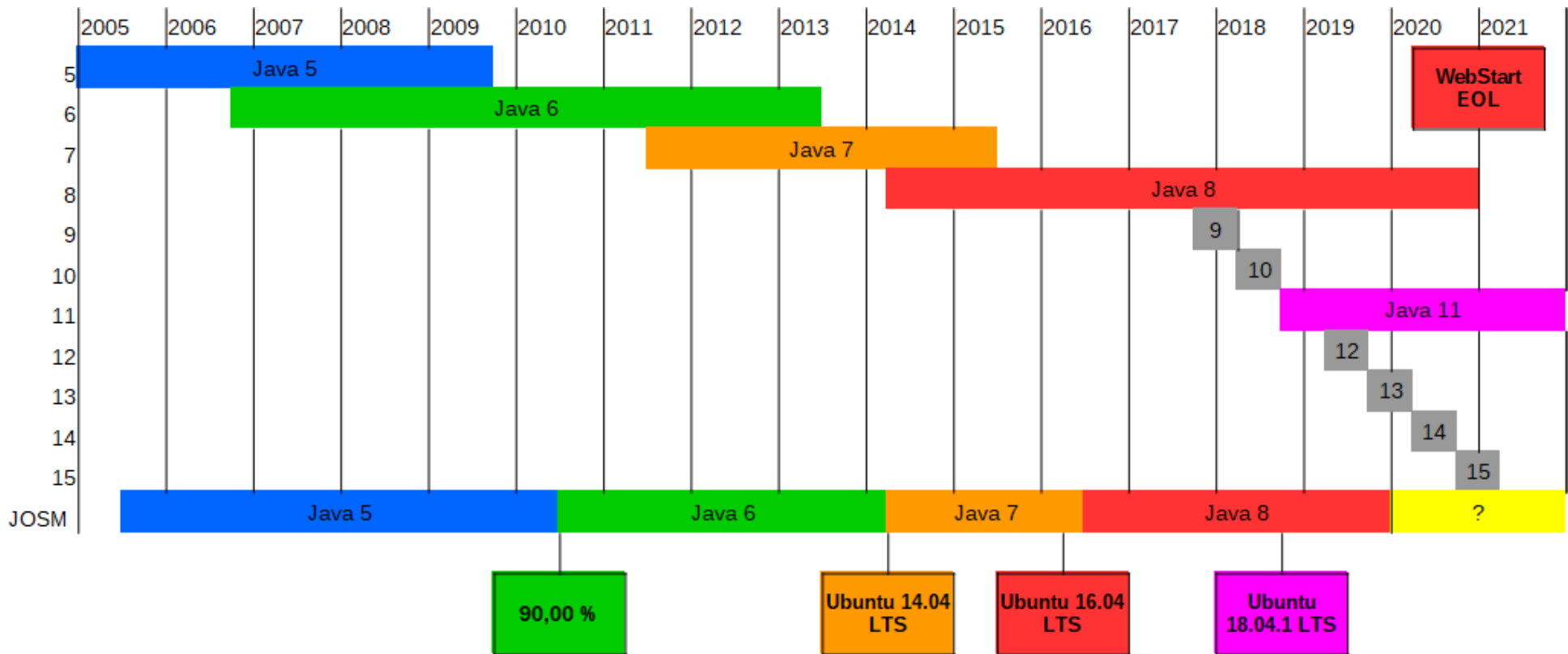
5 users (in blue) have each created at least 150 valid tickets that have been fixed

# Statistics : Hall of Fame : patch contributors



7 users (in blue) have each created at least 20 patches that have been applied

# Statistics : Java versions



- JOSM migrations done when about 90% of users run the target version
- Twice blocked by the availability of Java in Ubuntu LTS
- Current migration needs a lot of work due to major changes in Java governance



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**4. Work in progress & to come :)**

# Modernisation

New server : **done** (thanks FOSSGIS & OSM-FR)

SVN → Git

Scattered repositories → Centralization on dedicated Gitlab

Launchpad → Transifex

Ant → Maven/Gradle

PNG → SVG

(Hack week-end 2018)

Ticket ▲	Résumé
#6887	GitHub out of date
#8645	Migrate translation to www.transifex.com
#15229	modular structure for JOSM core
#16857	Set up gitlab
#16858	Moving jmapviewer to a separate repository
#16859	Tagging nice GSOC tickets
#16860	[PATCH] Remove svn:external for jmapviewer and use Apache Ivy to download jar
#16866	Remove getopt
#16867	Define list of official supported plugins
#16869	Unify preferences API
#16870	JOSM versioning
#16871	Infrastructure migration
#16872	Serialize imagery preferences to string containing XML conformant to maps.xsd
#16944	svn -> git migration script

# Modularisation

JOSM is a very big monolith, even with the plugin system

In progress: modularization of core components

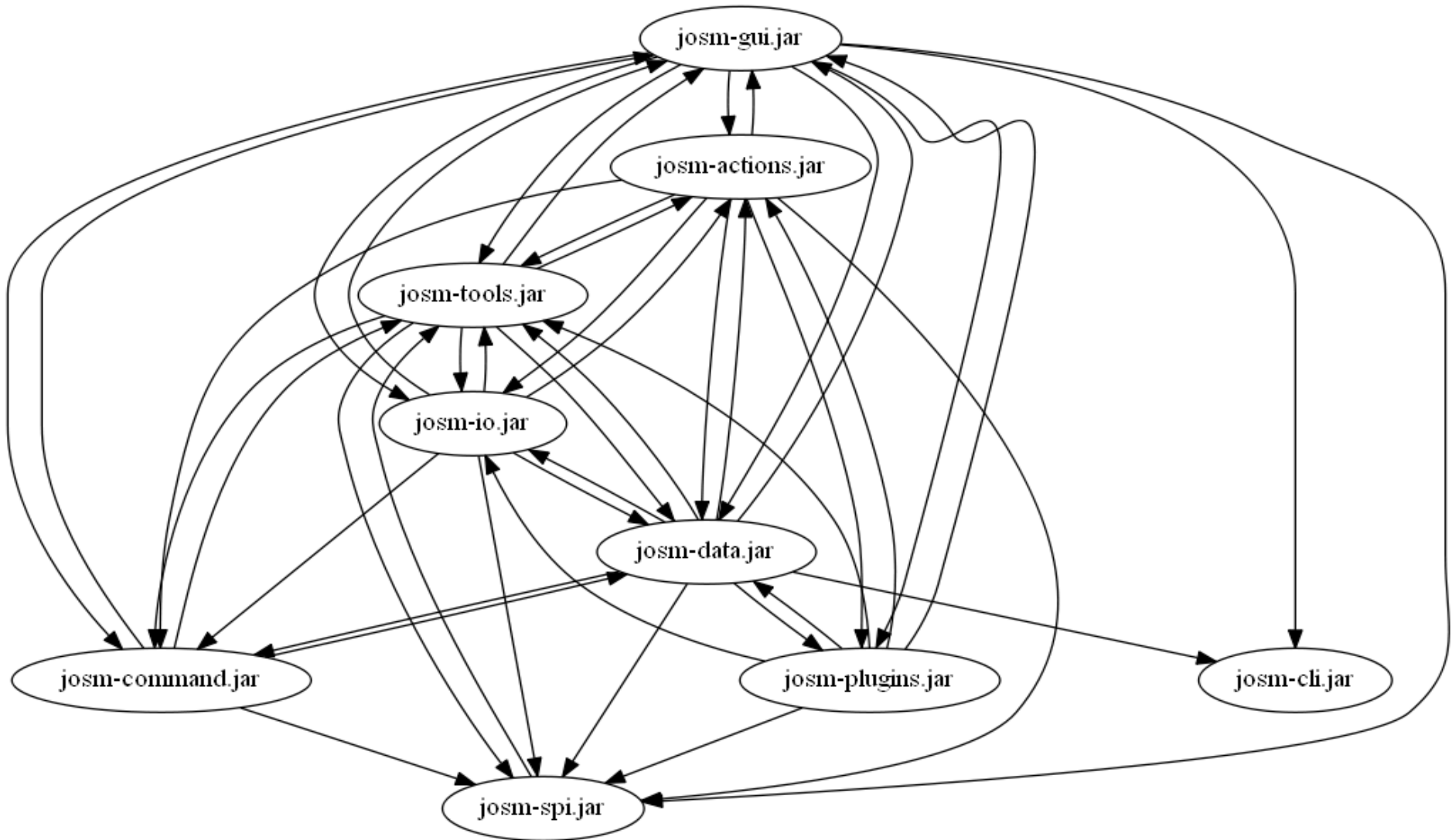
HUGE work (several years)

Inspired by Java 9 (Jigsaw project)

→ Maintenance, reuse

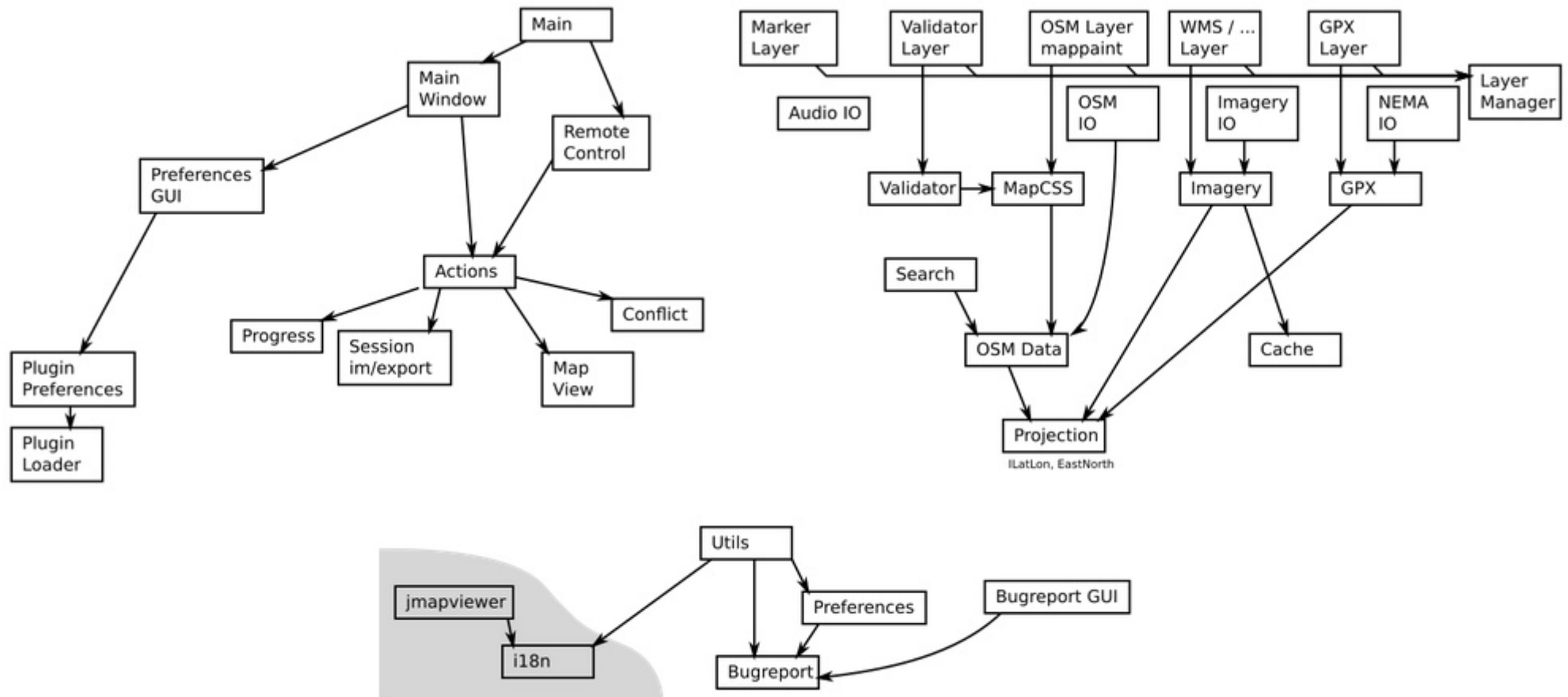
→ <https://josm.openstreetmap.de/ticket/15229>

# Modularisation : current state...





# Modularisation : target!



# Deployment / Java 11 and beyond

Major changes in Java governance (Oracle / OpenJDK)

WebStart (*shamefully*) abandoned by Oracle and **not open source!**

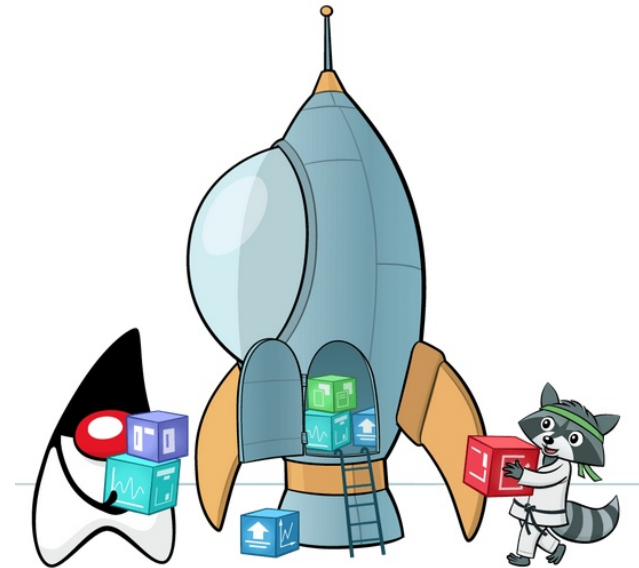
End of Java 8 support for Windows/Mac end users : end of 2020

Options:

AdoptOpenJDK + IcedTea-Web = OpenWebStart

Java 11 Migration + jlink : standalone image

Windows Store + App Store deployment?



# Links & Contacts

<https://josm.openstreetmap.de>

<https://en.wikipedia.org/wiki/JOSM>

<https://wiki.openstreetmap.org/wiki/JOSM>

<https://github.com/JOSM>

 #josm / OFTC

 josm-dev@openstreetmap.org

 @VincentPrivat

 @josmeditor

Slides available in CC-BY-SA 4.0 below:

[https://commons.wikimedia.org/wiki/Category:JOSM\\_presentations](https://commons.wikimedia.org/wiki/Category:JOSM_presentations)