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
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:
  - *Cadastrefr*, *austriaaddresshelper*, *SeaChart*, *Kendzi3D*, *geochat*
- Java libraries required by other plugins:
  - *Apache-commons*, *ejml*, *geotools*, *javafx*, *jaxb*, *jna*, *jogl*, *jts*, *log4j*

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
Extensions: styles (MapCSS)

```css
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)

```plaintext
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";
    assertNoMatch: "way name=Hauptstrasse";
}
```

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

https://josm.openstreetmap.de/wiki/Help/Validator/MapCSSSTagChecker
Current team


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)

<table>
<thead>
<tr>
<th>Language</th>
<th>Progress Bar</th>
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<tbody>
<tr>
<td>French</td>
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<td>English (United Kingdom)</td>
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<td>Dutch</td>
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<td>Norwegian Bokmal</td>
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<td>Icelandic</td>
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Developement 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-

FOSSGIS: code signature certificate / 2016-

JetBrains: IntelliJ IDEA licences / 2016-

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-
JOSM server: services

Project website (Trac): [https://josm.openstreetmap.de](https://josm.openstreetmap.de)

Tickets system (bugs, feature requests, admin tasks)

SVN repository: [https://josm.openstreetmap.de/svn](https://josm.openstreetmap.de/svn)

Online help (multilingual wiki)

Message of the Day, changelog

JOSM extensions (plugins, imagery, styles, presets)

Jenkins, SonarQube, Nexus, PPA Ubuntu

70,000 visitors, 400 Gb/month (without bots)
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

Travis CI / AppVeyor: Linux, macOS, Windows
Checking of imagery sources validity

~800 sources are checked daily

Ungrateful work of reporting errors and fishing for information

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Graph showing the number of sources checked over time. The number of sources checked daily fluctuates around 800.

- @PDOK_online: we can't access this link anymore, is the NGR down?
  [nationaalgeoregister.nl/geonetwork/srv...]

- @Agenzia_Entrate: we can't access WMS service anymore: [wms.cartografia.agenziaentrata.gov.it/inspire/wms/ow... returns no content]

- @GovSC: where can we find the “Termo de utilização dos dados do SIGSC”? It was previously available at [sigsc.sds.sc.gov.br/download/termo...], but the link is dead since a few days.
3. Statistics

Commits by Top Contributors

Number of Contributors

Usually about 4/5 people contributing to JOSM each month
Since 2007, never less than 2 people!

- 2005-10:
  - 5,912 lignes
  - 3,205 loC

- 2019-06:
  - 333,751 lignes
  - 217,526 loC
2011: Goodbye XML styles, hello MapCSS :)

~1 Mb/year:
- Code
- Icons
- Presets
- Translations
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
• 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
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)
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

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@josmeditor

Slides available in CC-BY-SA 4.0 below:

https://commons.wikimedia.org/wiki/Category:JOSM_presentations