iPST/PowSyBl roadmap 2018-2019

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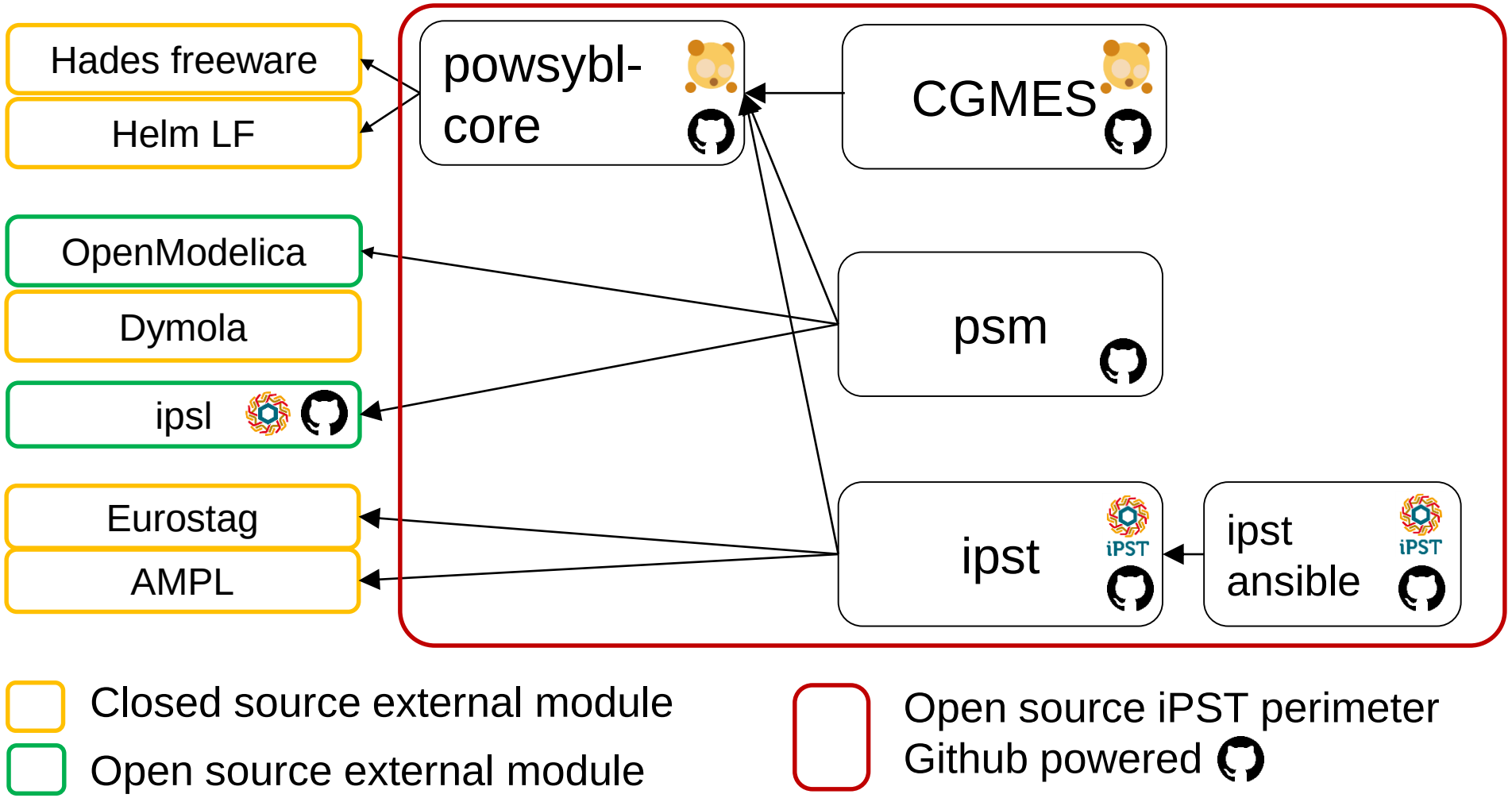
Organization

- **➔ The iPST/PowSyBl code is open-source with a commercial-friendly license (MPL V2)**
  - Presented on http://www.itesla-pst.org
  - Available on https://github.com/itesla/ and https://github.com/powsybl/
  - Main obligations:
    - To publish the modifications done to the code in order to be able to distribute it.
    - To provide the source code in the distributions.
- **➔ The partners decide on the roadmap in order to guarantee the consistence of the project.**
  - There is no need to be a partner to contribute.
  - Once a year, a governance meeting allows new partners to enter.

Functional perimeters

- **PowSyBl (Power System Blocks)**
  - Functions usable in many grid processes, partly inherited from the EU-funded iTesla project.
  - Examples: Computation distribution (HPC), network model, load-flow API, import-export formats, business data management.
- **iPST (iTesla Power System Tools)**
  - Functions used for short-term grid security analysis, inherited from the EU-funded iTesla project.
  - Historical databases, Monte-Carlo security analysis, Eurostag integration and dynamic security analysis.
- **PSM (Power Systems Modelling)**
  - Application (with GUI) dedicated to full-modelica power system simulations on small networks.

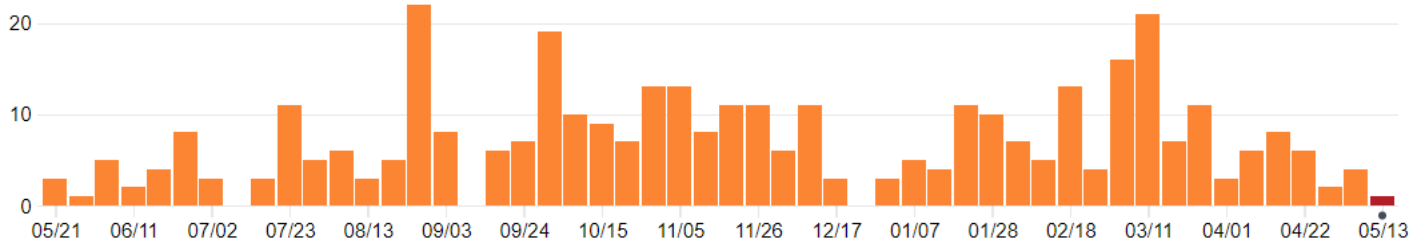
iPST consortium governance perimeter (as of may 2018)



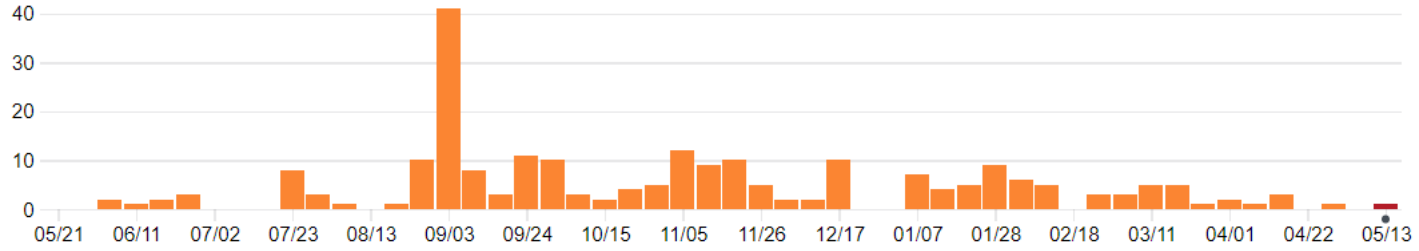
Activity

➔ Active contributors: RTE, AIA, TechRain, RSE

PowSyBl commits per week:



iPST commits per week:



Previous targets (1/3)

➔ **Industrial implementation of standard security analysis:** ✔

- New com.powsybl.security package
- AFS-based application server with HPC capabilities
- Thermal and voltage limit violations with Hades freeware or Helm LF.
- Curative remedial action with iAL (iTesla Action language
- Operational deployment target at RTE: mid-2019.

Previous targets (2/3)

→ Load-flow validation tool: ✓

- New com.powsybl.loadflow.validation package
- Project goal: Integration into the ENTSO-E platform used to validate exchanged CGMES files.
- *[Details in specific presentation]*

→ CGMES importer /exporter:

- Already usable for the following use-case:
  Read CGMES file → compute load-flow → export CGMES file with load-flow results. ✓
- Not yet usable for conversion to CGMES (from other formats ✗

Previous targets (3/3)

➔ **iTesla Action Language (iAL)** ✓

- New feature: testing of alternative actions

➔ **Forecast Error Analysis model improvements** ✓

- Multimodal variable handling

➔ **Usability**

- User documentation and training ✗
- Developer training (this afternoon) ✓
- No binaries available ✗

Other activities

- **PowSyBl:**
  - AFS (Application File System) for business data management.
  - Time Series management
  - Groovy scripts, javascript and shell
  - Slurm based computation manager for HPC.
  - Windows compilation
- **iPST**
  - New mapDB-based HistoDB implementation to store historical network states (in addition to the freeware version developed by Pepite).
  - Eurostag exporter (cross-regulation, HVDCs)
- **PSM**
  - Maintenance and cleaning for open-sourcing.

2018-2019 roadmap

- **Follow-ups:**
  - Security analysis: tests and robustness
  - CIM CGMES: new use cases:
    - CGMES export "from scratch"
    - Merging
  - LF validation: Missing tests (HVDC, 3-w tsfos…)
  - iAL:
    - Best action selection
    - Use of N-1 state variable for rule activation
- **New fields:**
  - PSM:
    - Integration of an hybrid modelica-C++ dynamic simulator
  - Graphical User Interface
    - Cartography and substation visualization
- **Usability:**
  - User-oriented tutorials (based on GUIs and not only command line)

Conclusion: iPST/PowSyBl

- An open-source toolkit dedicated to large power grid simulations and security analysis.
- Aiming at industrial grade quality for core functionalities while allowing prototyping.
- New partners welcome (TSOs, academics, IT providers)!