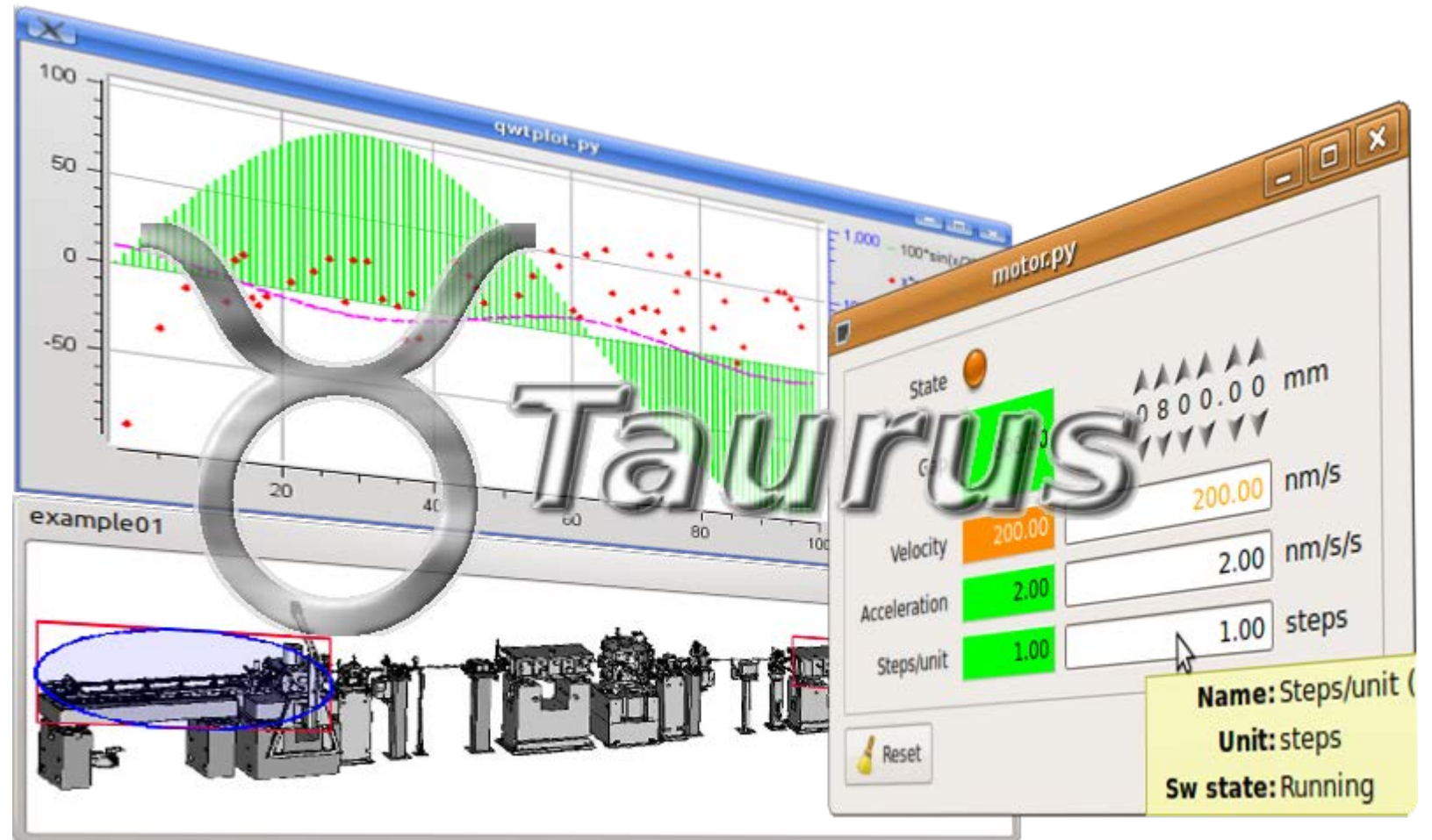




Emilio Morales
Jose A. Ramos
Zbignew Reszela
Sergi Rubio-Manrique
Oriol Vallcorba

Taurus Performance Optimization



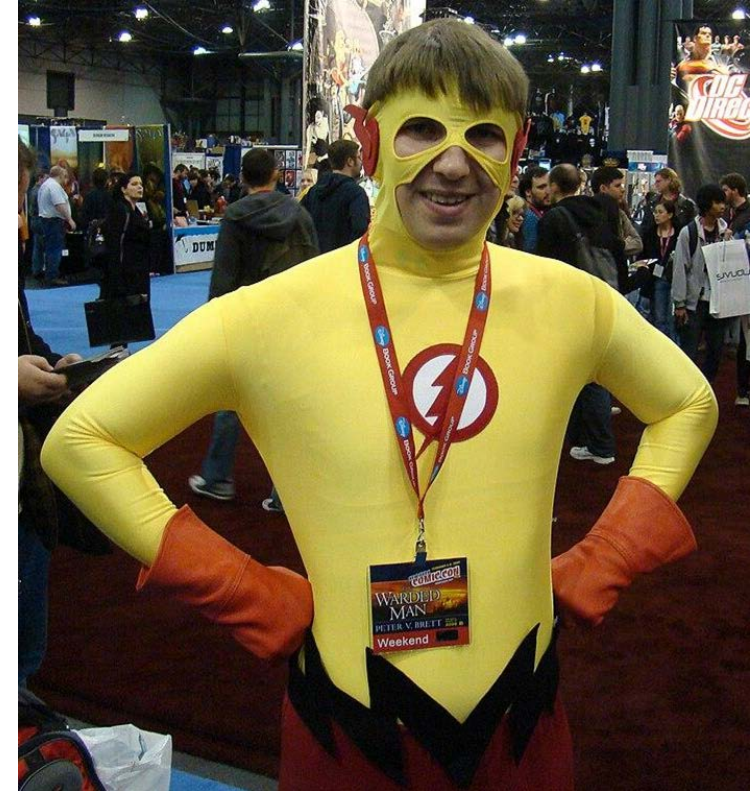
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Introduction

- Users reported slow GUI startup.
- Methods implemented in the past to mitigate this issue were not optimal and could lead to problems at runtime.
- A complete benchmark of taurus was required to understand why the startup process was taking too long.
- Project was described at TEP21.

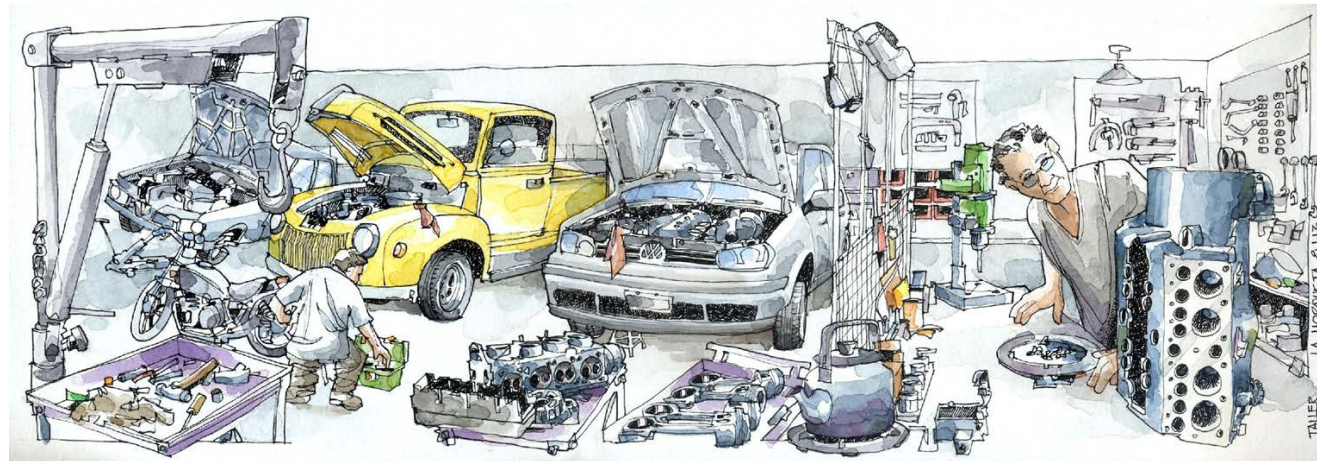


Flash kid. Credits: [Wikimedia](#)

TPO1: Overview

First step was based on taurus core optimizations. Identified areas for improvement:

- Removal of redundant method calls.
- Fixes to polling thread lifecycle.
- Improvements to read cache behavior.
- Avoidance of read operations during startup when subscription fails.



Repairing and optimizing. Credits: [Wikimedia](#)

TPO1: Implementation

5.1.7

- Avoid unnecessary polling thread creation.

5.2.0

- Infinite startup cache for timeout attributes.
- Deferred polling activation until GUI-ready.
- Optional initial attribute read.
- Startup-aware cache optimizations.
- Configurable force-read behavior on subscription failures.

5.2.3

- Safe polling thread finalization.
- Polling lifecycle fixes and stabilization.

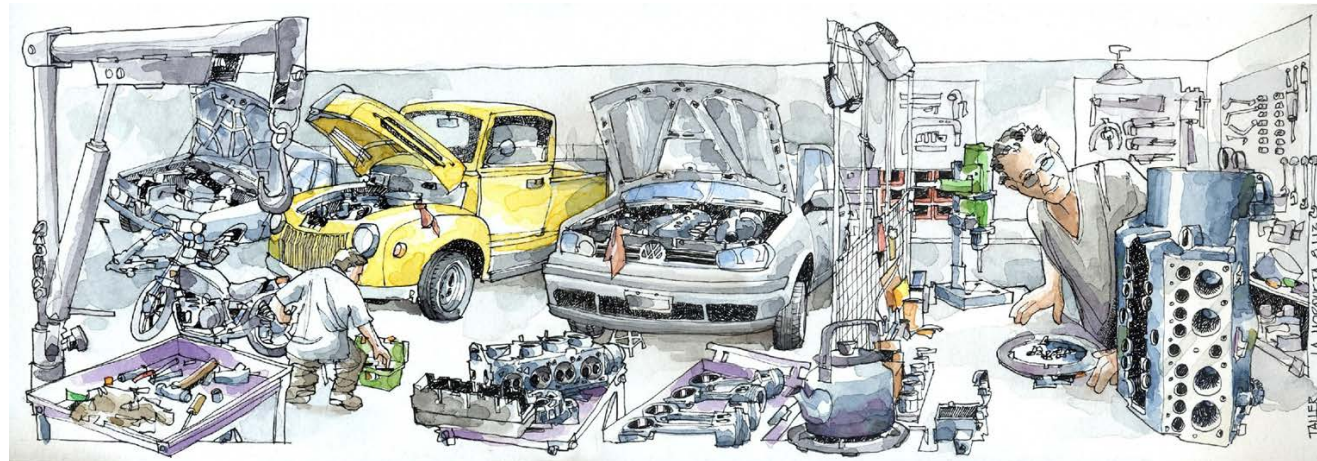


Number one. Credits: [Wikimedia](#)

TPO2: Overview

Avoidance of synchronous reads performed by Tango during event subscription. Three implementation approaches were considered:

- Internal asynchronous subscriber in Taurus.
- Tango Event Subscription without initial read.
- Asynchronous event subscription in Tango.



Repairing and optimizing. Credits: [Wikimedia](#)

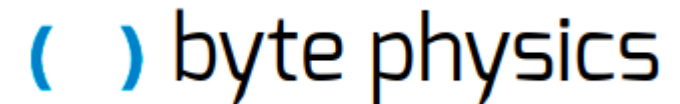
TPO2: Tango Community Support

- Taurus submitted a new feature request to the Tango community.
- ALBA, with the approval of the Tango community, take the lead and contract Byte Physics to develop the new features.

Features available since cppTango **10.1.0**



Tango Controls. Credits: [Wikimedia](#)



Tango Controls. Credits: [Byte Physics](#)

TPO2: Tango Community Support

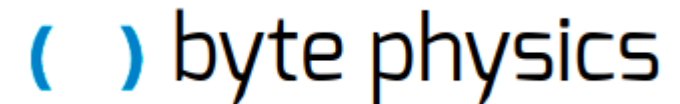
- New enumeration class *EventSubMode*:
 - *EventSubMode.SyncRead*
 - *EventSubMode.AsyncRead*
 - *EventSubMode.Sync*
 - *EventSubmode.Async*
 - *EventSubMode.Stateless*
- New parameter *sub_mode* at *subscribe_event()* method with default value *EventSubMode.SyncRead*

More details: [here](#)

Thank you to all colleagues involved!



Tango Controls. Credits: [Wikimedia](#)



Tango Controls. Credits: [Byte Physics](#)

TPO2: Implementation

- 5.4.0
 - Support for Tango EventSubMode
 - Selection of subscription mode from custom settings, CLI, or code.
 - New default mode AsyncRead when Tango supports EventSubMode.
 - Explicit handling of SubSuccess, Update, and SubFail.
 - A Taurus-side first read background helper for modes without initial read (Sync and Async).



Stamp. Credits: [Wikimedia](#)

TPO2: How to use it

Using CLI

- `--tango-event-sub-mode {Sync, SyncRead, Async, AsyncRead, Stateless}`
- `--disable-tango-event-subscription` → To disable this feature.

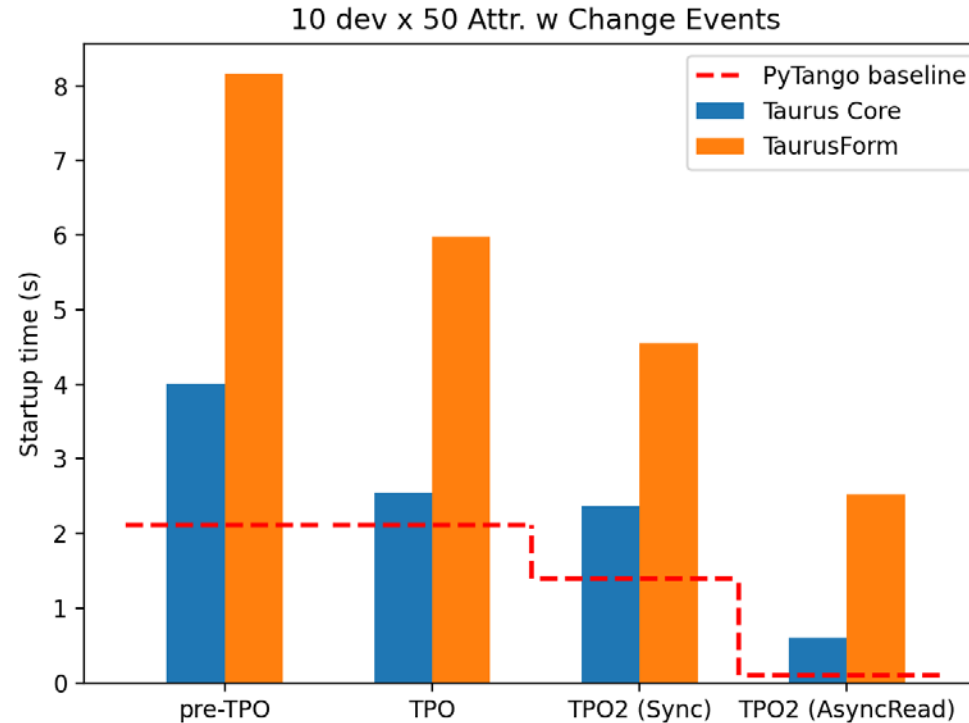
Using TaurusCustomSettings

- Override `TANGO_EVENT_SUB_MODE` at TaurusCustomSettings file.
 - Details in how to override it [here](#).

Default behavior

- `TANGO_EVENT_SUB_MODE = EVENT_SUB_MODE.ASYNCREAD`

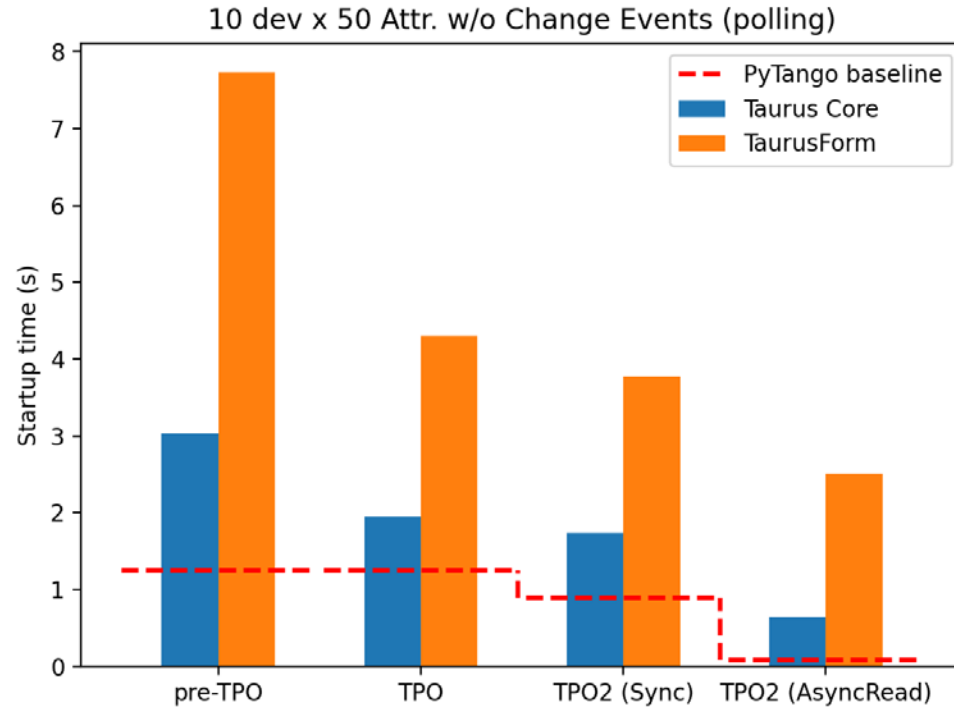
TPO1 & TPO2: Some numbers



	Tango Core	Taurus Core	Taurus Label	Taurus Form
Pre-TPO	2.11	4.01	4.06	8.16
TPO1	2.11	2.55	2.93	5.98
TPO2	0.10	0.60	0.62	2.52

Case 1:10 devices with 50 attributes each device with events

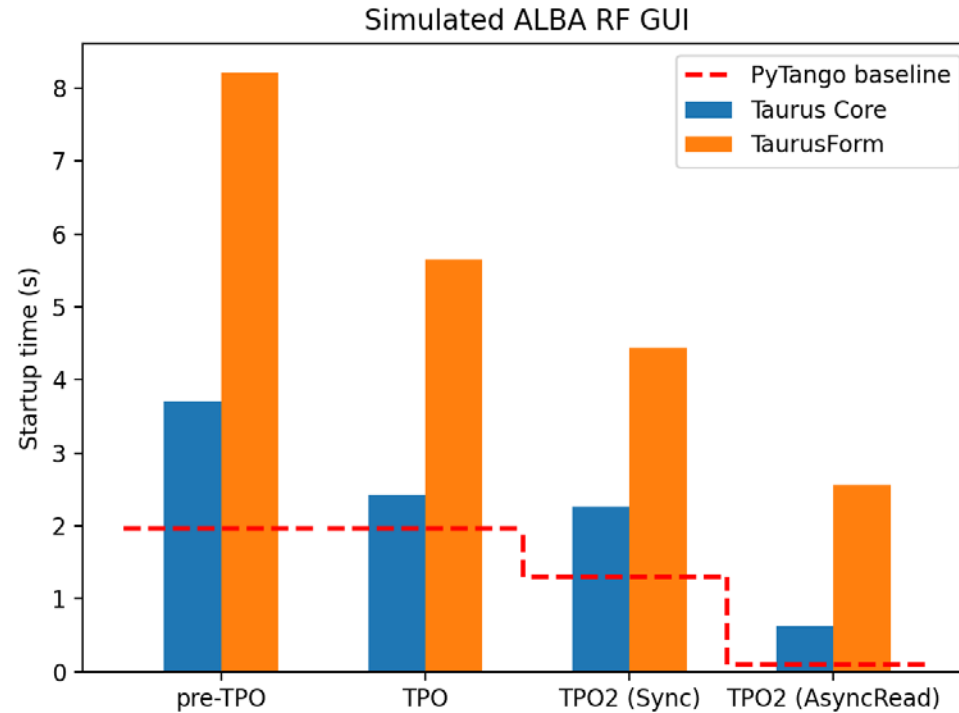
TPO1 & TPO2: Some numbers



	Tango Core	Taurus Core	Taurus Label	Taurus Form
Pre-TPO	1.25	3.03	3.07	7.73
TPO1	1.25	1.95	1.92	4.3
TPO2	0.08	0.64	0.66	2.51

Case 2:10 devices with 50 attributes each device without events

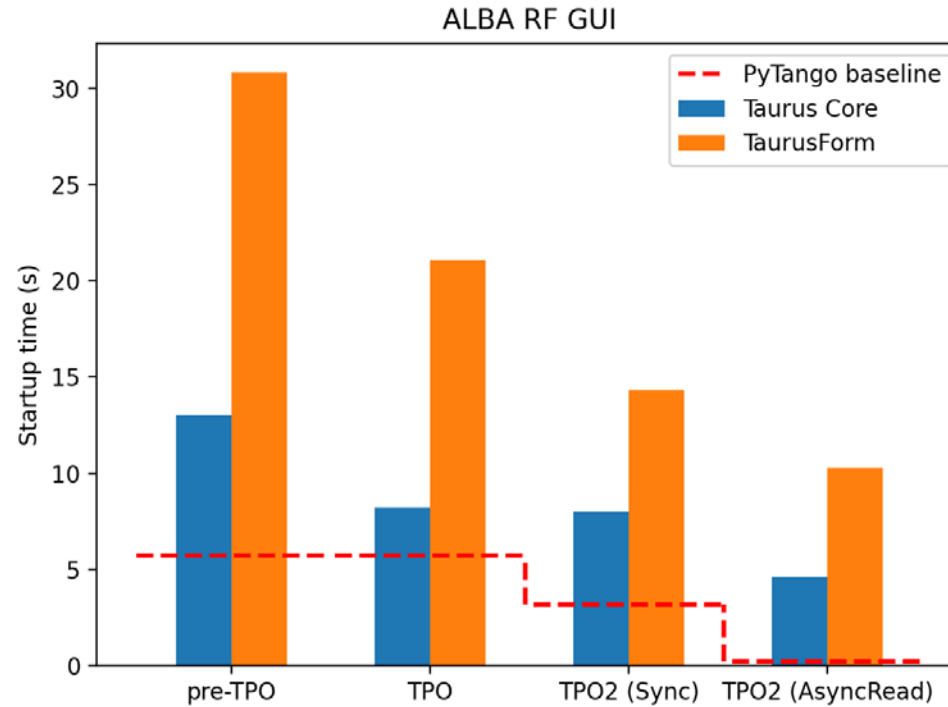
TPO1 & TPO2: Some numbers



	Tango Core	Taurus Core	Taurus Label	Taurus Form
Pre-TPO	1.96	3.7	3.84	8.2
TPO1	1.96	2.42	2.78	0.65
TPO2	0.1	0.63	0.65	2.56

Case 3: Simulated GUI with 496 attributes w. events, 81 w/o. events and 7 with exceptions.

TPO1 & TPO2: Some numbers



	Tango Core	Taurus Core	Taurus Label	Taurus Form
Pre-TPO	6.83	13.03	23.68	30.86
TPO1	6.83	8.2	12.11	21.09
TPO2	0.18	4.57	3.813	10.29

Case 4: Real RF GUI.

Phase 3: Proposal to the community

Summary

- The taurus core was improved → **TPO1**
- GUI startup performance was optimize → **TPO2**

However, some questions remain:

- What happens when application is started?
- Does the user still need to wait as in the previous startup scenario?
- Further improvements are required in attribute handling once the GUI is operational.



The proposal. Credits: [Wikimedia](#)

Questions?



Question mark. Credits: [Wikimedia](#)