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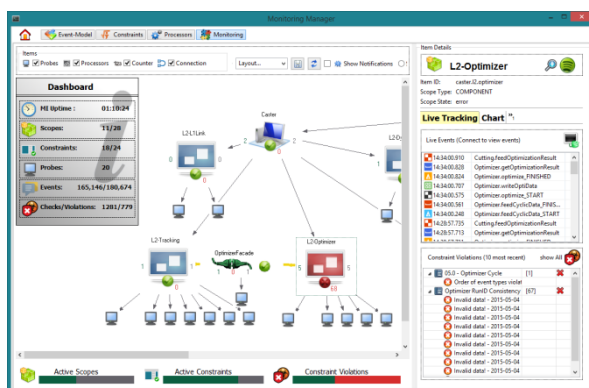**Bachelor's Thesis (or Project for a PR or Master Thesis)**

## Runtime Data Visualization

## for the REMINDS Monitoring Framework

REMINDS (http://mevss.jku.at/reminds) [1] is a tool-supported framework for monitoring systems of systems at runtime. It comprises a flexible runtime monitoring infrastructure providing support for different roles and a requirements monitoring model covering the requirements to be monitored, the constraints checking adherence of a system's behavior to its requirements, the events and data produced by systems at runtime, and the probes instrumenting systems to intercept events and data at runtime.



So far we have implemented various views for visualizing events and the attached event data.

Additionally, to provide a comprehensive view on certain events and data at runtime, the goals of this thesis/project are:

- Investigate/find potential libraries for visualizing data in Java / Eclipse SWT.
- Develop an extension for our Eclipse-based runtime monitoring client:
    - Implement a visualization extension that shows events and data, as well as violations that are related to those events.
    - Update the visualization at runtime, as new events and/or violations occur.
    - Integrate the extension with the existing REMINDS monitoring tools by using the APIs provided.
- Create a showcase visualizing different types of data and events for a predefined scenario, e.g., to visualize trends.
- The visualization could be (but does not have to be) a graph and or several diagrams.
- It must be possible to integrate the visualization into the REMINDS monitoring client as an Eclipse Plug-in. Extension Points have already been prepared.

[1] M. Vierhauser, R. Rabiser, P. Grünbacher, K. Seyerlehner, S. Wallner, and H. Zeisel, "ReMinds: A Flexible Runtime Monitoring Framework for Systems of Systems," Journal of Systems and Software, 2016 (http://dx.doi.org/10.1016/j.jss.2015.07.008).