Multigraph

Mattia Zago

Project for Master Thesis

Computer Science and Engineering – Cybersecurity Specialization

Joint Project

University of Verona and University of Murcia

Motivation and Objective

Design a data structure for understanding and testing different decision model in cyber risk management

Starting from the state of the art we found that the majority are not complete and these research papers don't include all the data structure related.

For these reasons the main objective is define a new simulator, powerful enough to permit smart interrogation and comparison between different models.

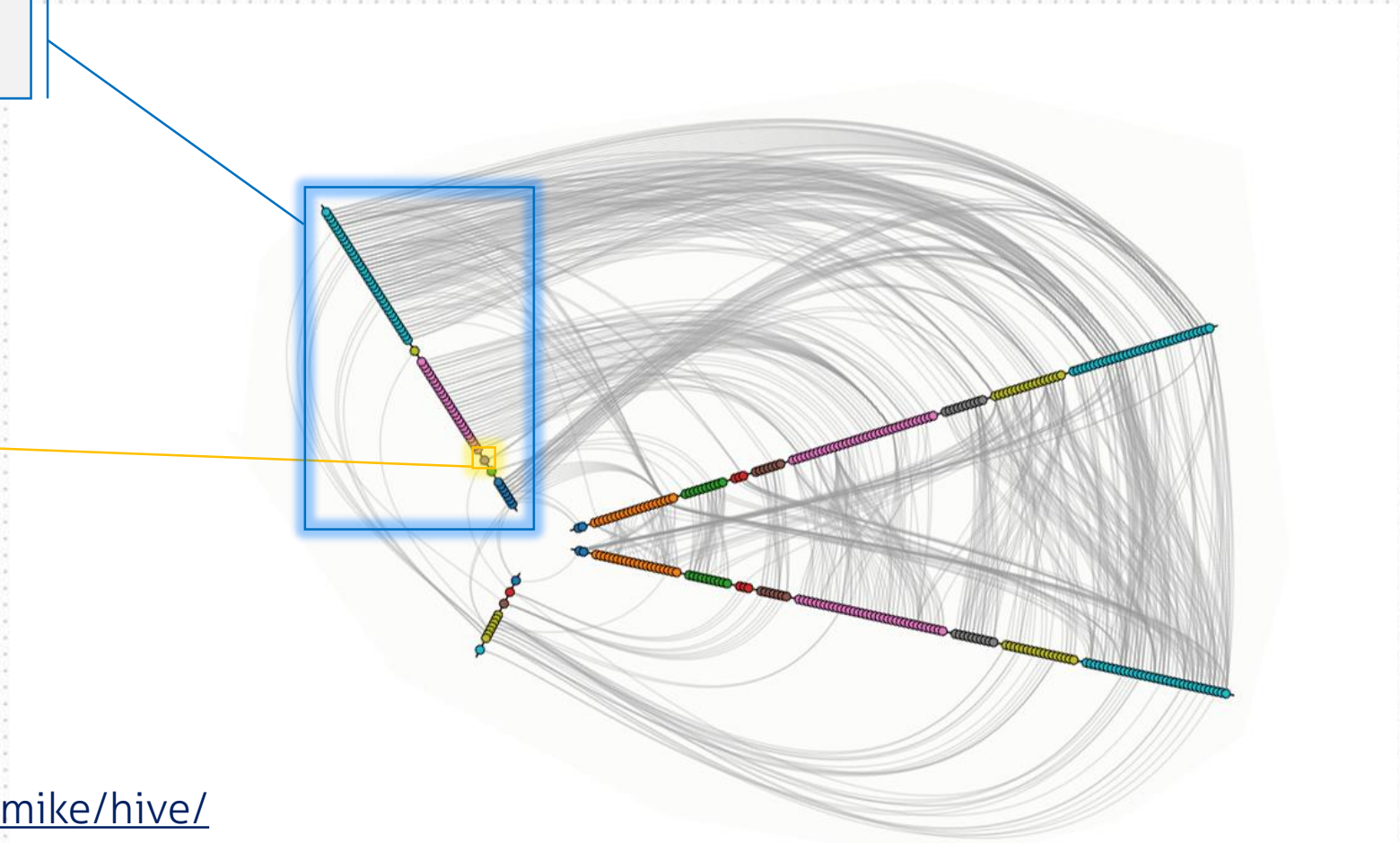
In future it will be able to perform a vertical analysis.

HTML/JS Graph Visualization

Folded Structure (3rd Layer)

Custom Group

On Mouse Over

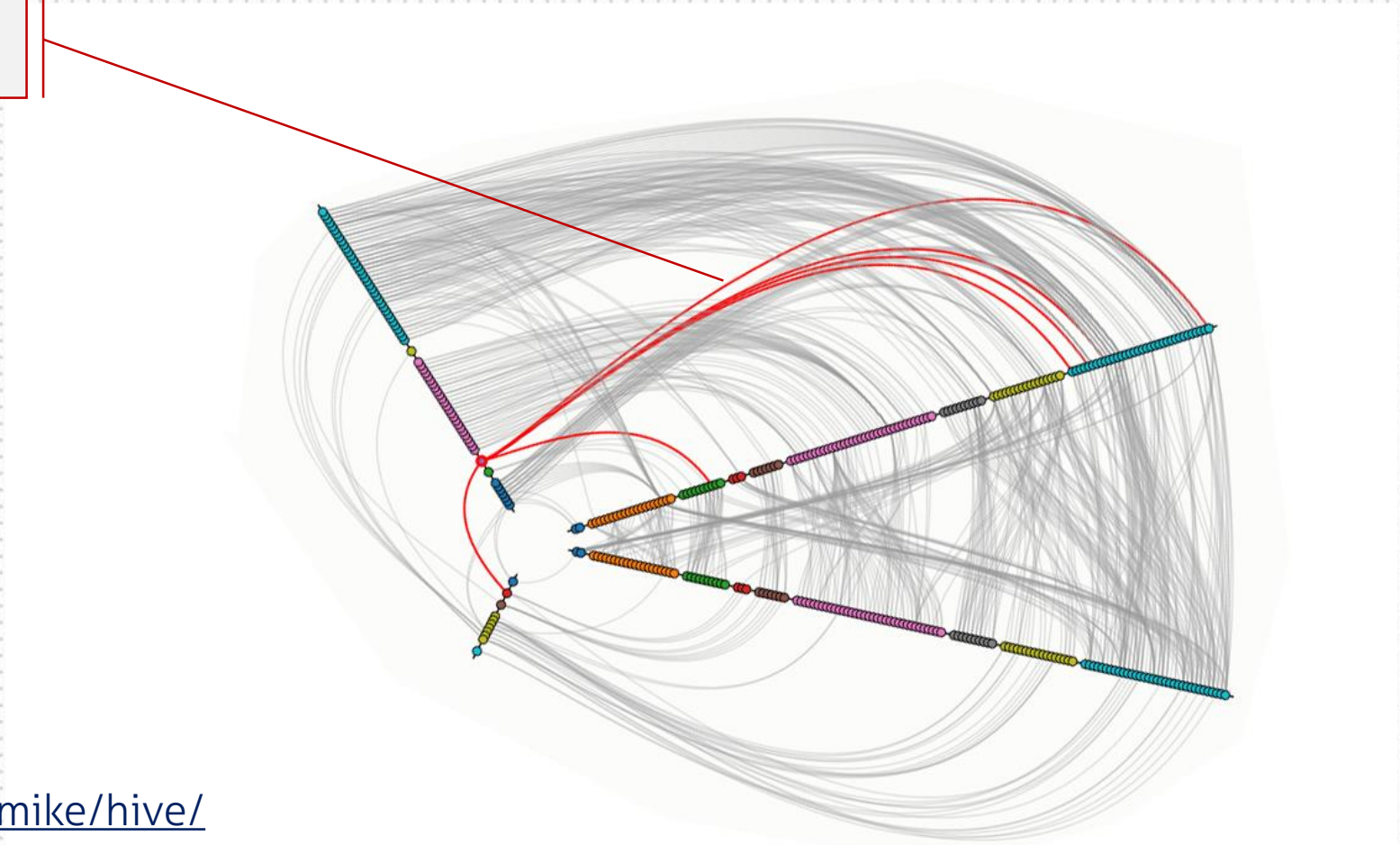


Live:
http://bost.ocks.org/mike/hive/

HTML/JS Graph Visualization

Folded Structure (3rd Layer)

Dependencies



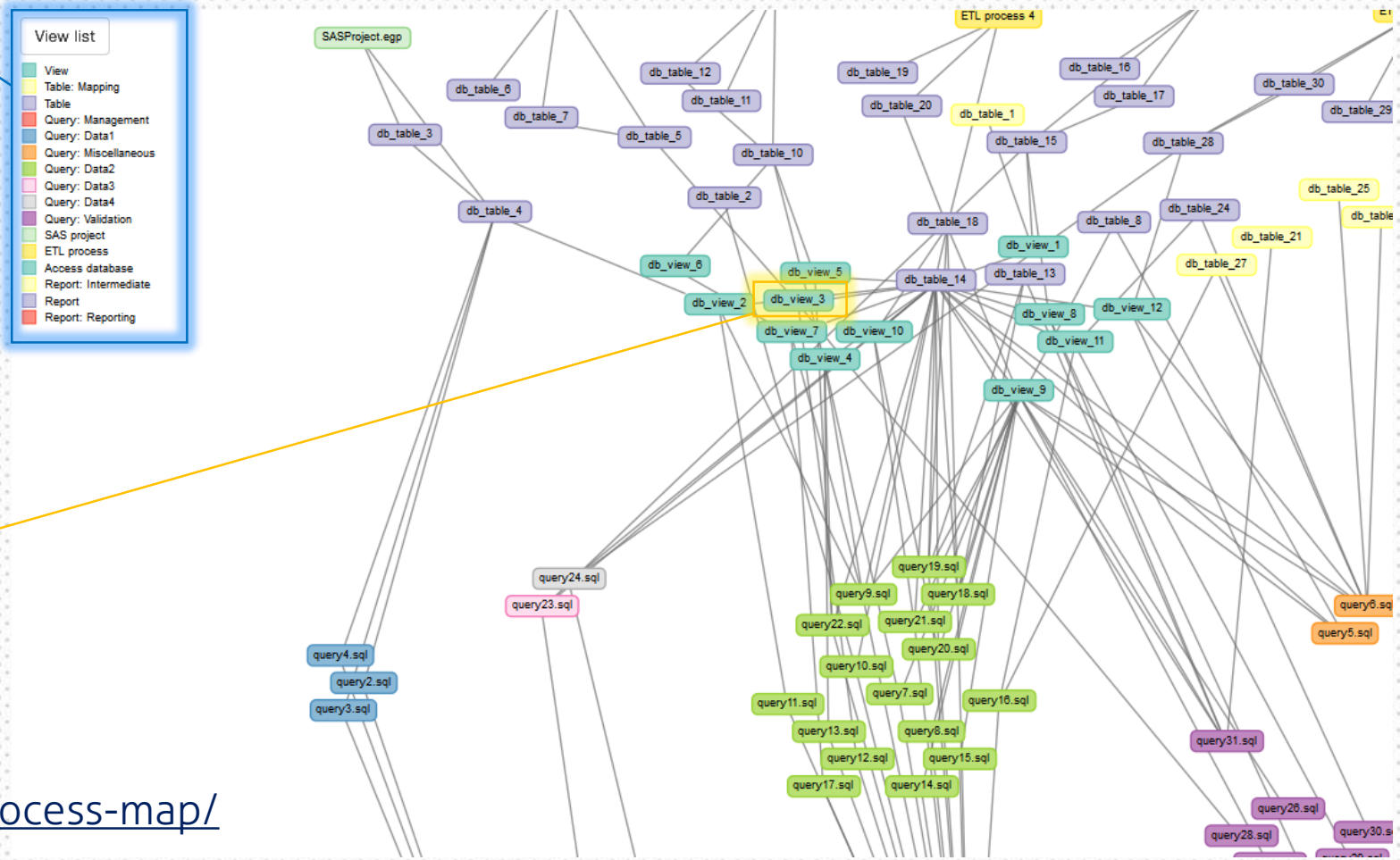
Live:
http://bost.ocks.org/mike/hive/

HTML/JS Graph Visualization

Unfolded Structure (2nd Layer)

Color Map

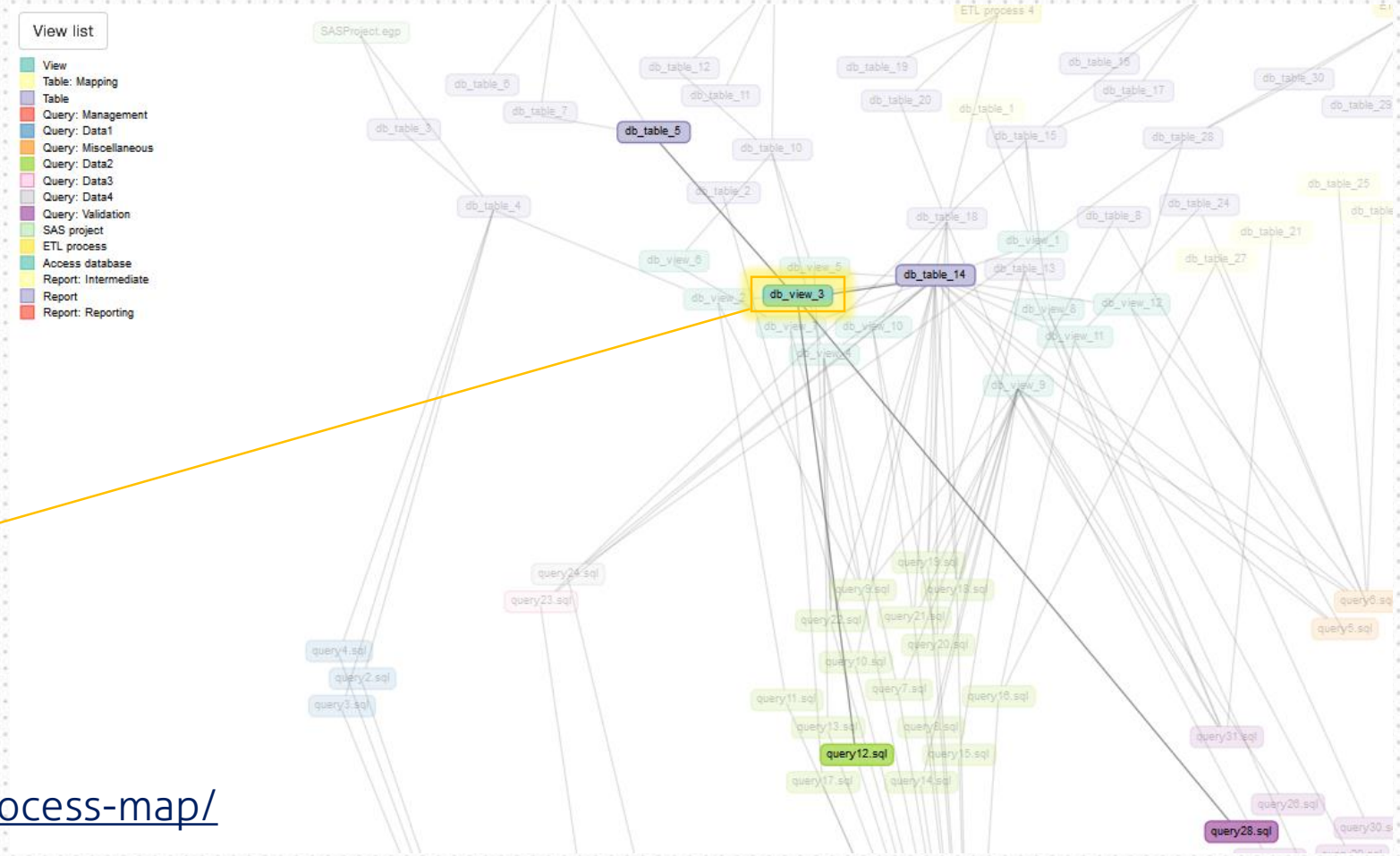
On Mouse Over



Live:
http://nylen.tv/d3-process-map/

HTML/JS Graph Visualization

Unfolded Structure (2nd Layer)



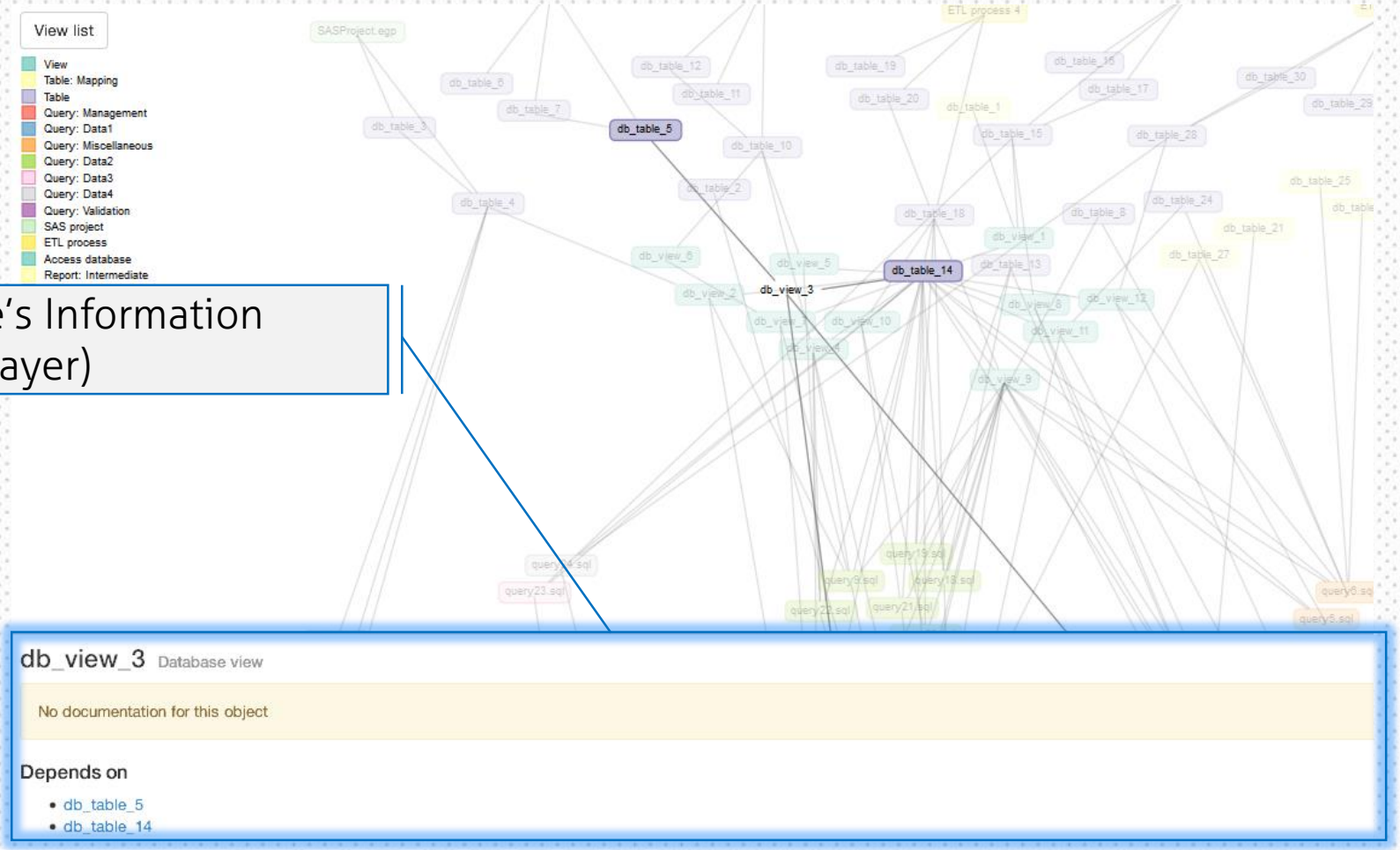
On Click

Live:
http://nylen.tv/d3-process-map/

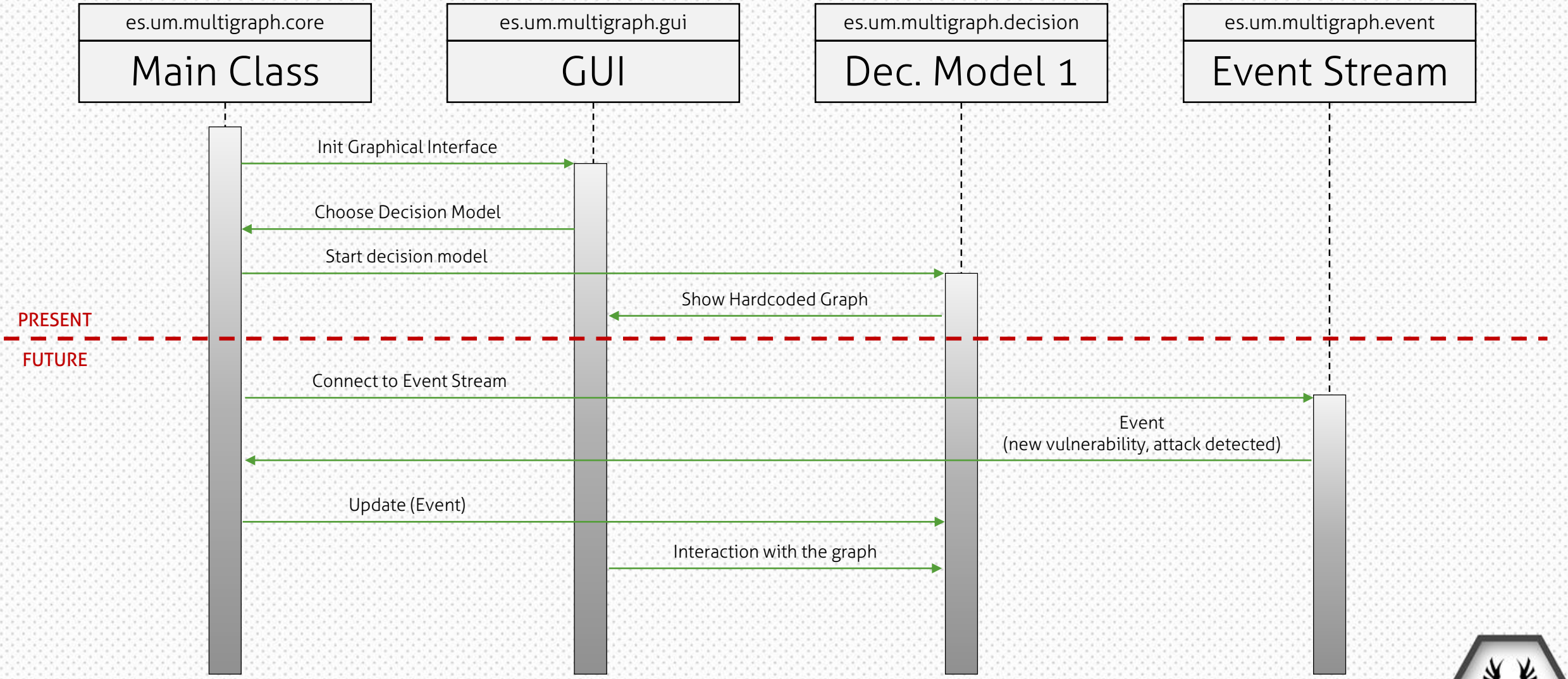
HTML/JS Graph Visualization /5

Unfolded Structure (1st and 2nd Layer)

Specific Node's Information
(1st layer)



Control Flow



Simulator Features

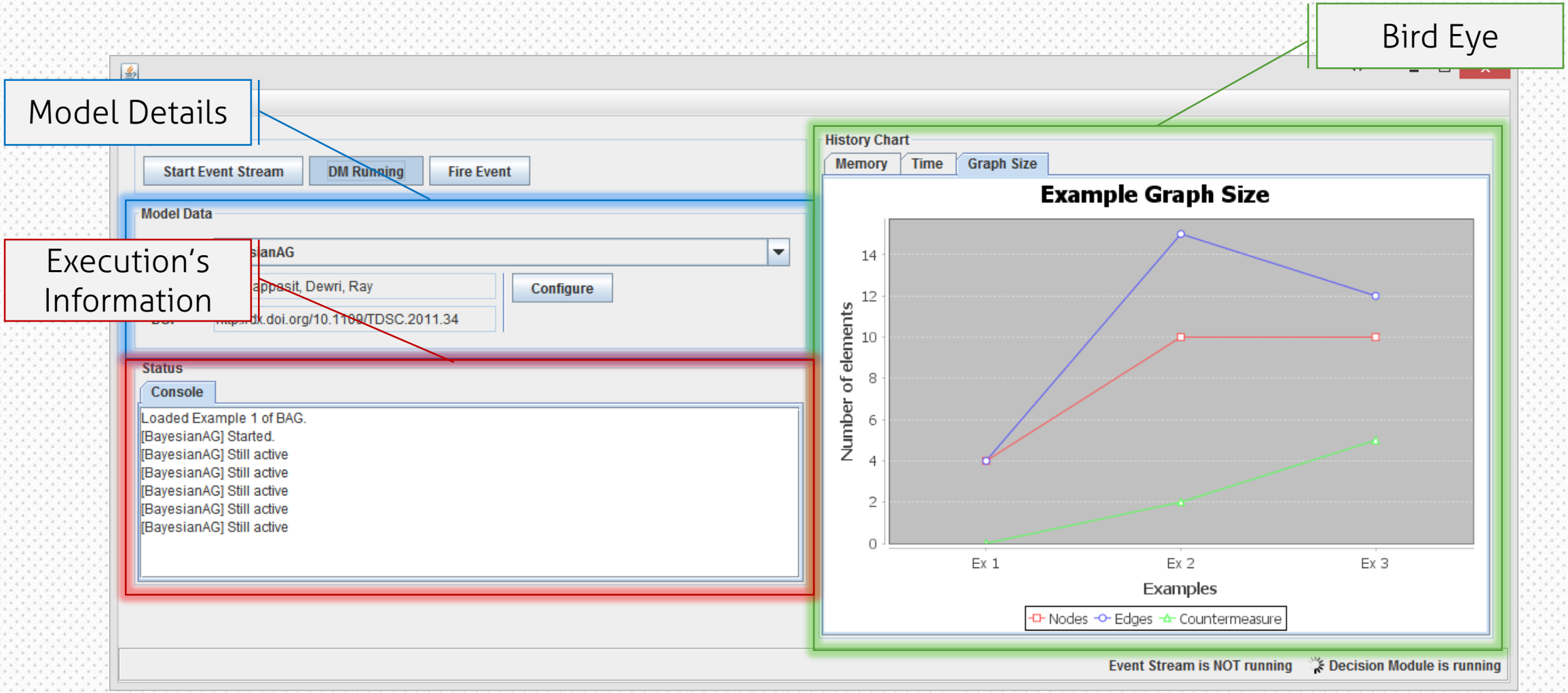
- ✓Load single module (a.k.a. published paper)
- ✓Graph Visualization (1st detailed level)
- ✓User interaction (configure model before execution)
- ✓Manage external events (predisposition)

PRESENT

FUTURE

- ×Load multiple modules
- ×Full graph visualization (multilayer with abstraction)
- ×User interaction (fire event, change values)
- ×Manage external events (new vulnerability, attack detected)

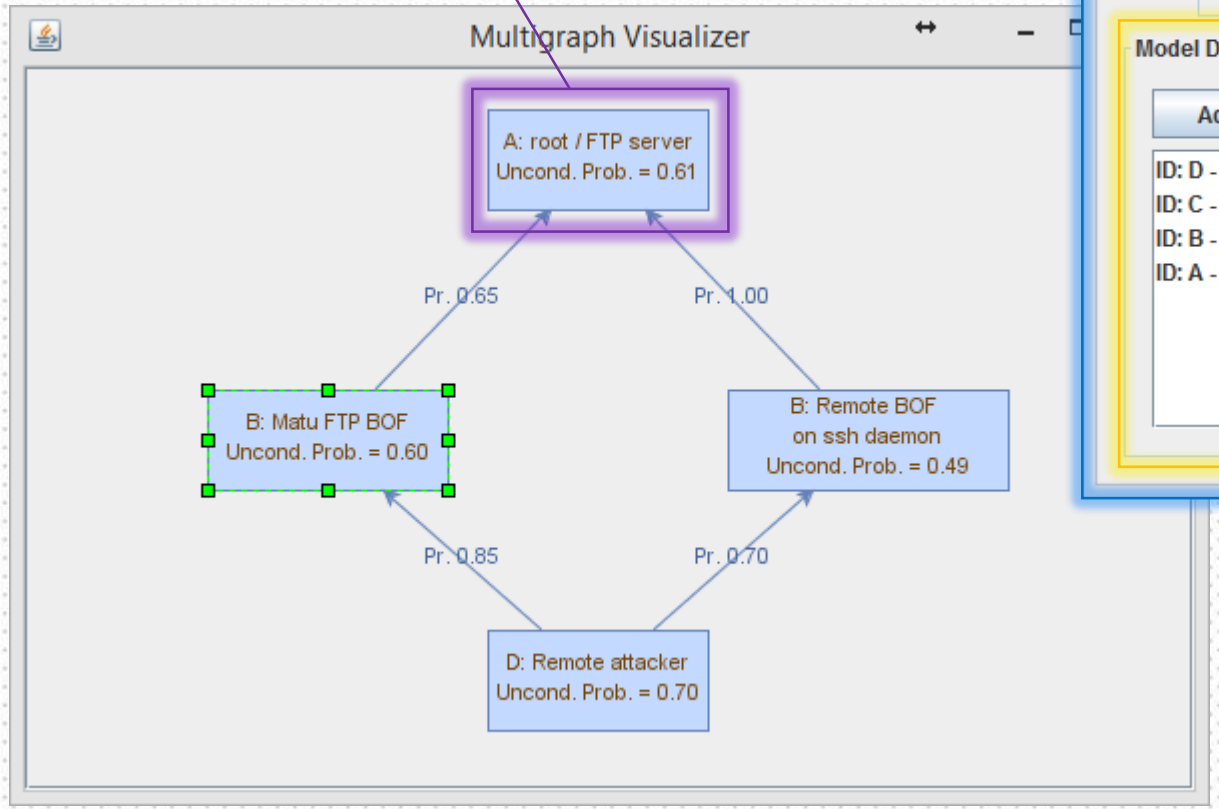
The Simulator

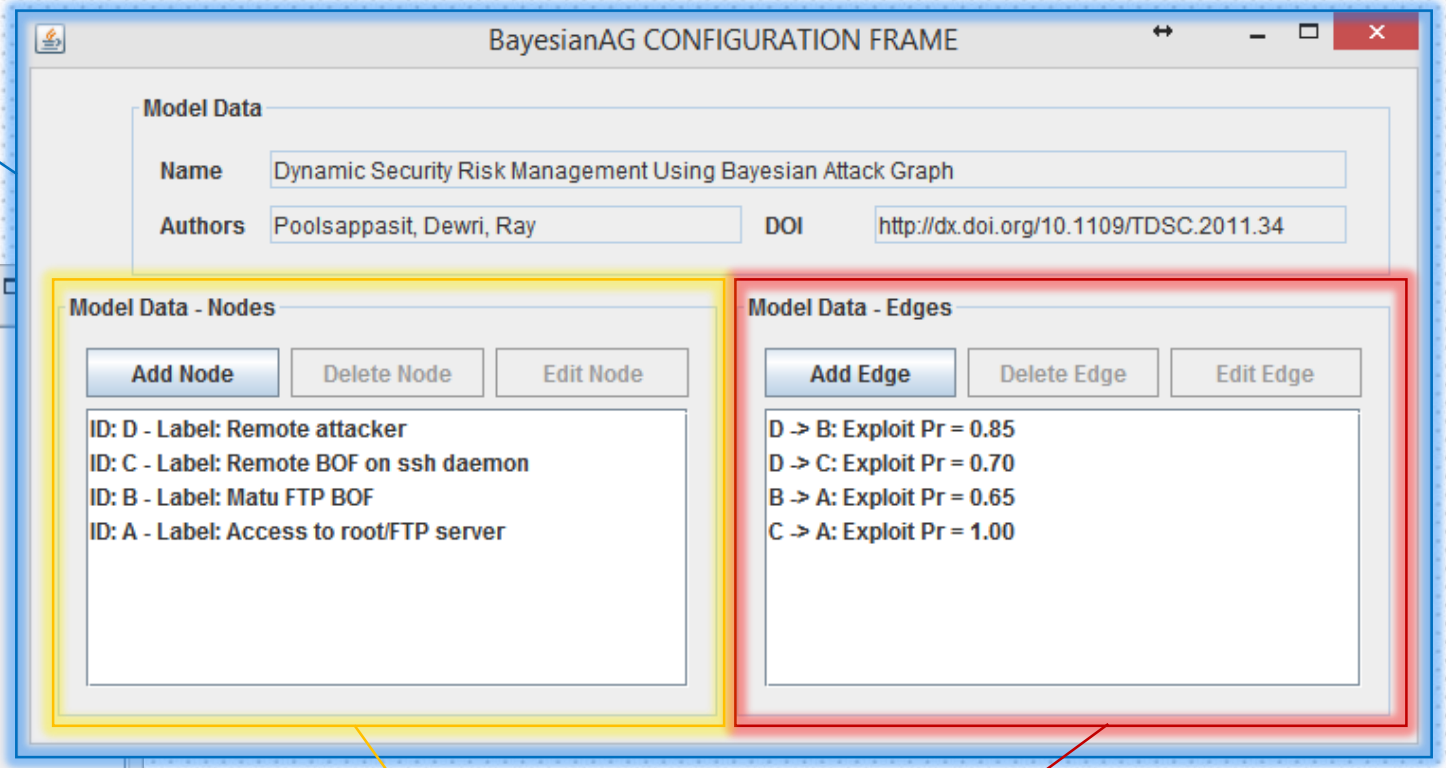


The Simulator

Configuration

Graph View(1st Layer)





Edges List

Nodes List