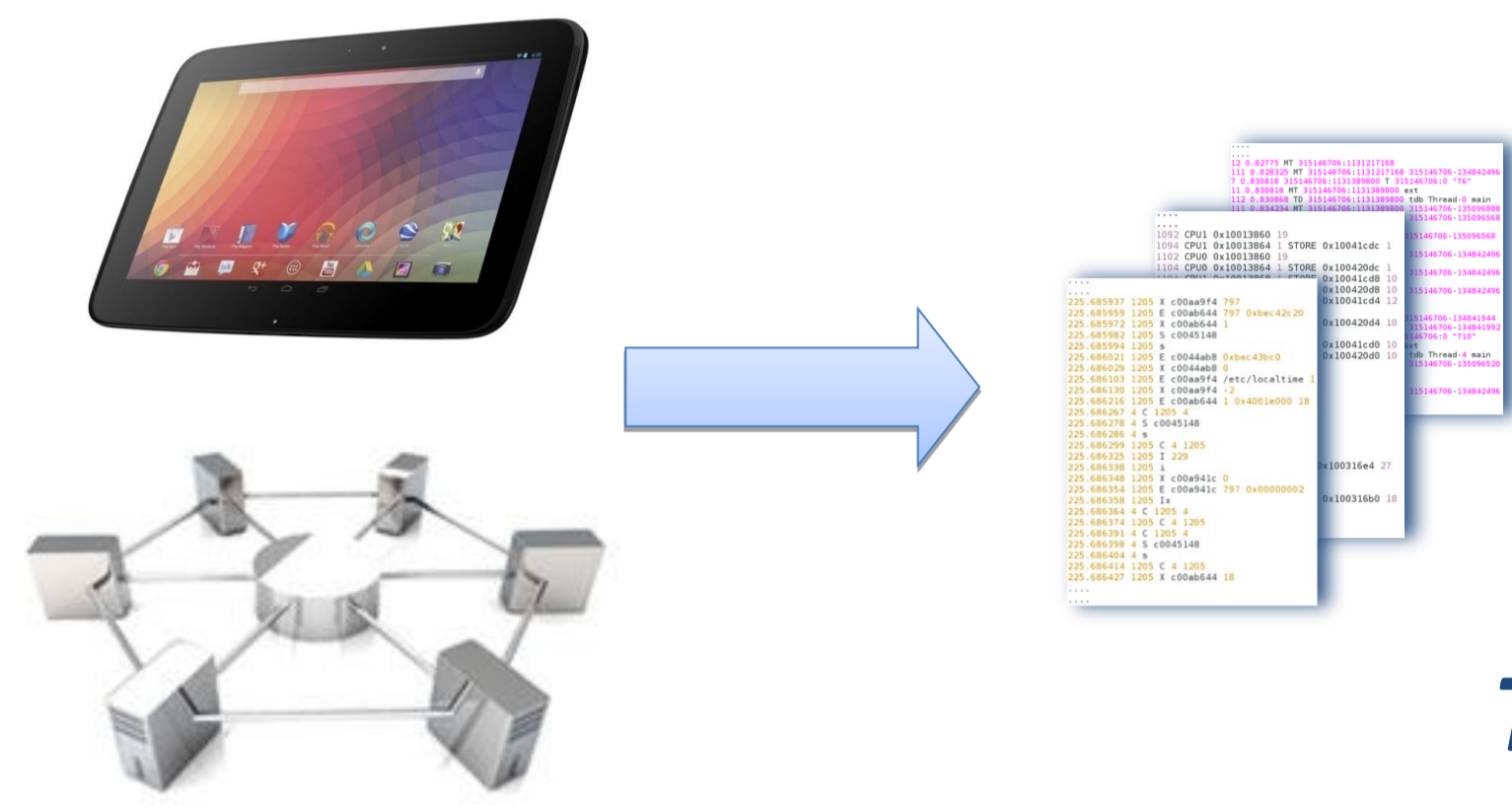


The FrameSoC Software Architecture for Multiple-View Trace Data Analysis

Generoso Pagano, generoso.pagano@inria.fr
 Vania Marangozova-Martin, Vania.Marangozova-Martin@imag.fr
 Inria
 Univ. Grenoble Alpes, LIG, F-38000 Grenoble, France
 CNRS, LIG, F-38000 Grenoble, France

Execution Trace Analysis

- Execution traces help the understanding of application behavior – *debugging, profiling*



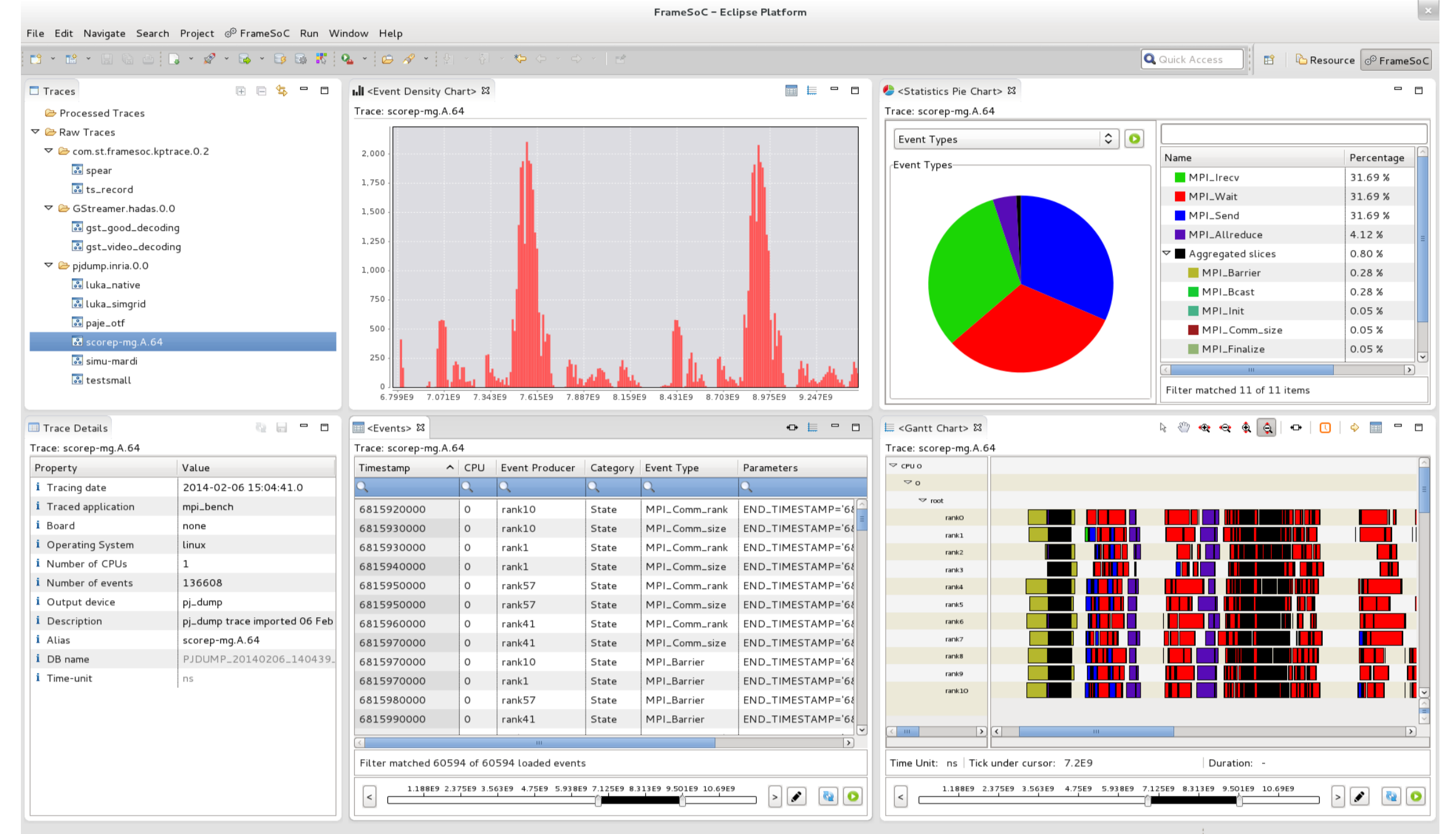
Issues

- huge amount of data
- complex information
- heterogeneous formats

Traces are difficult to analyze!

We need an effective analysis environment

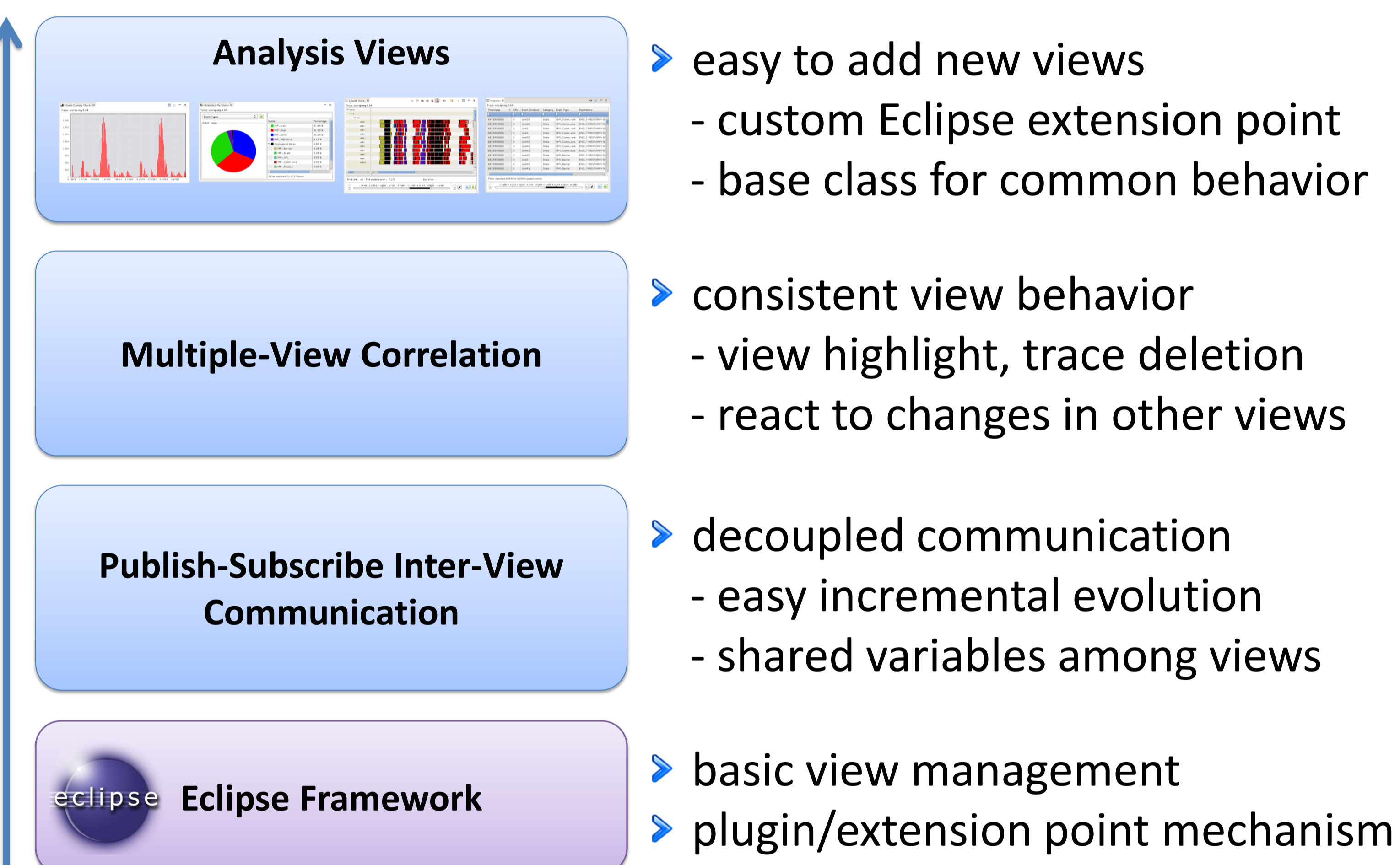
FrameSoC User Perspective



- Multiple-view graphical user environment for trace analysis
- Software infrastructure for building new analysis views

FrameSoC System Perspective

Easy engineering of a dynamic set of analysis views

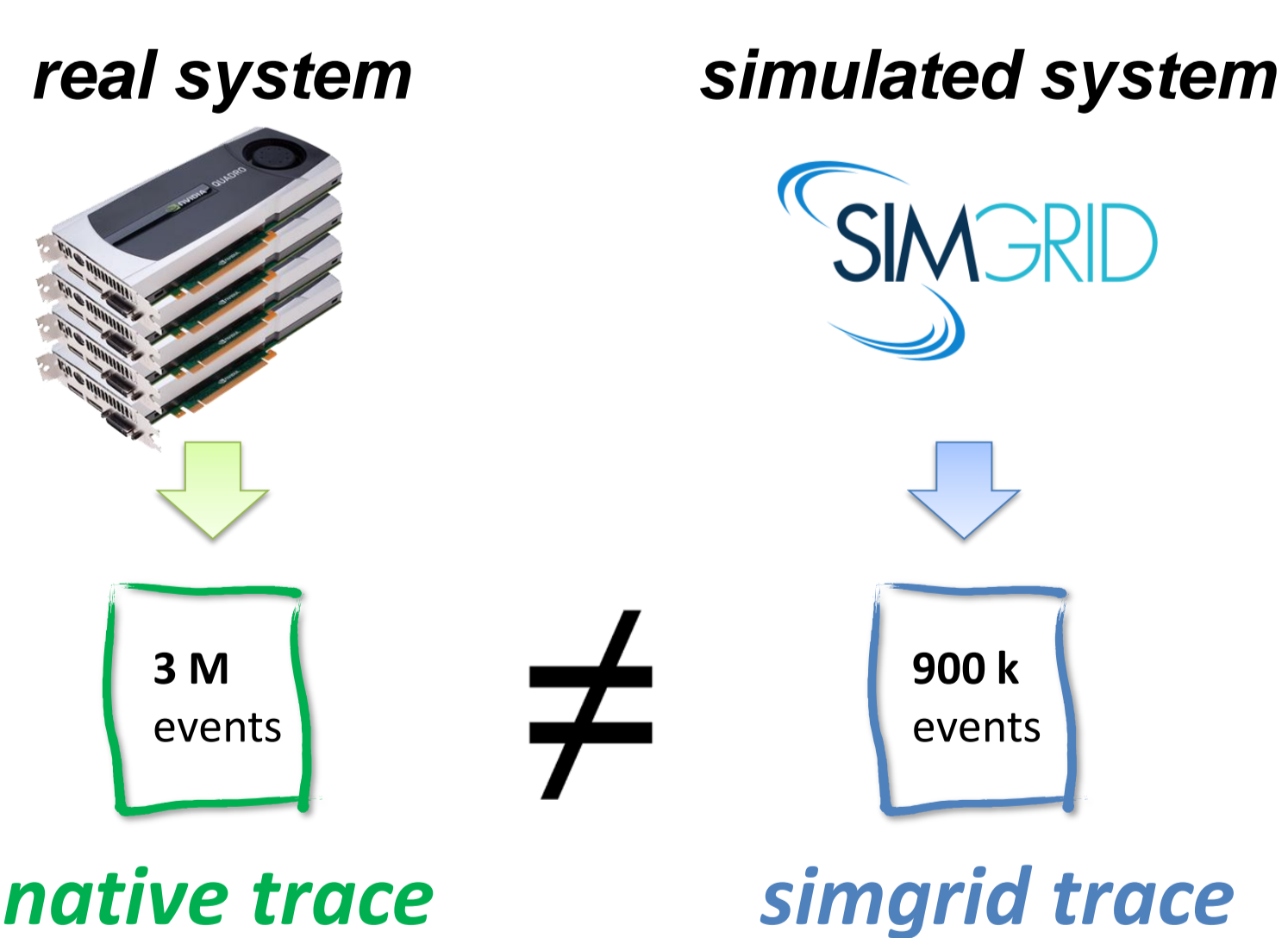


Achieved goals

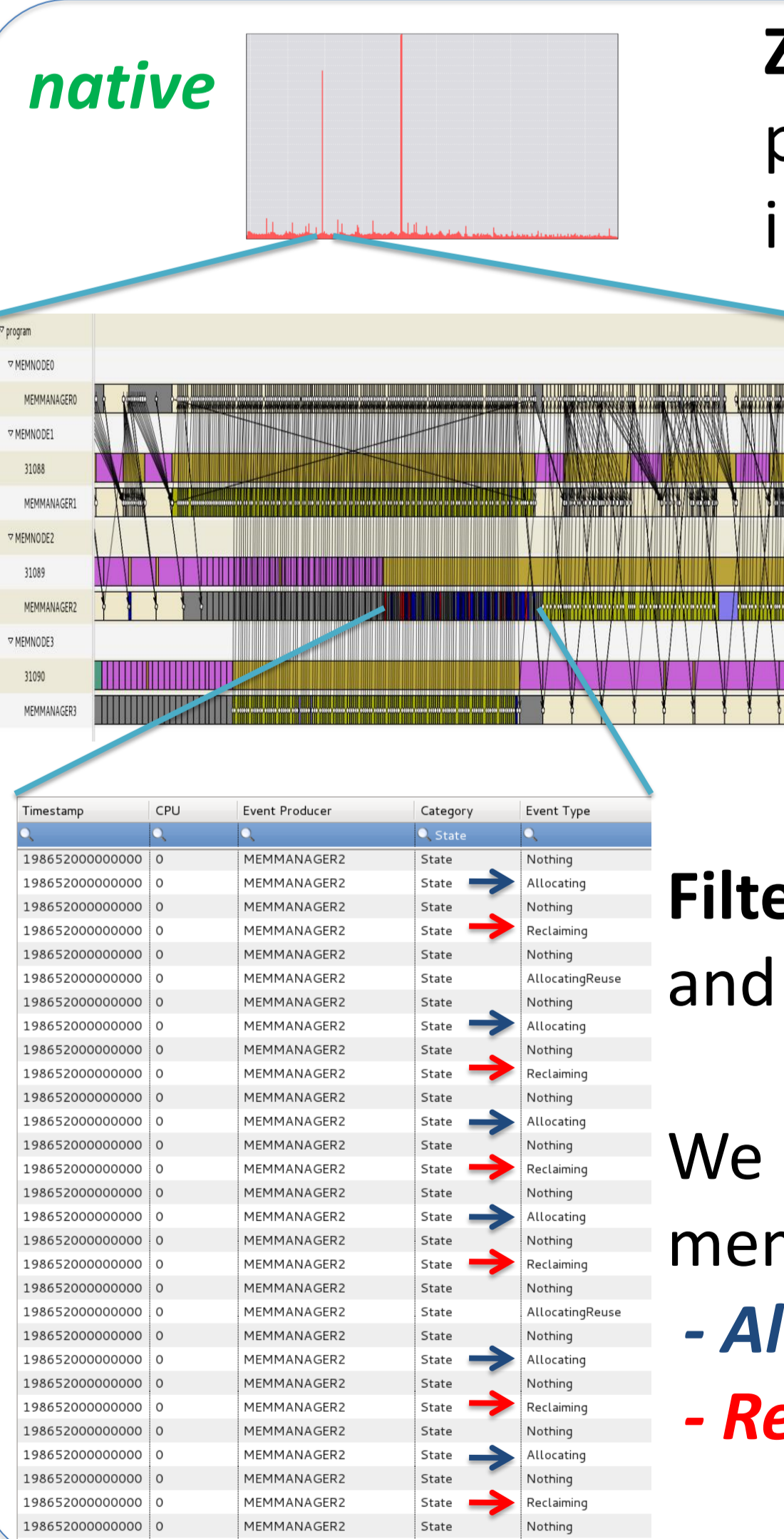
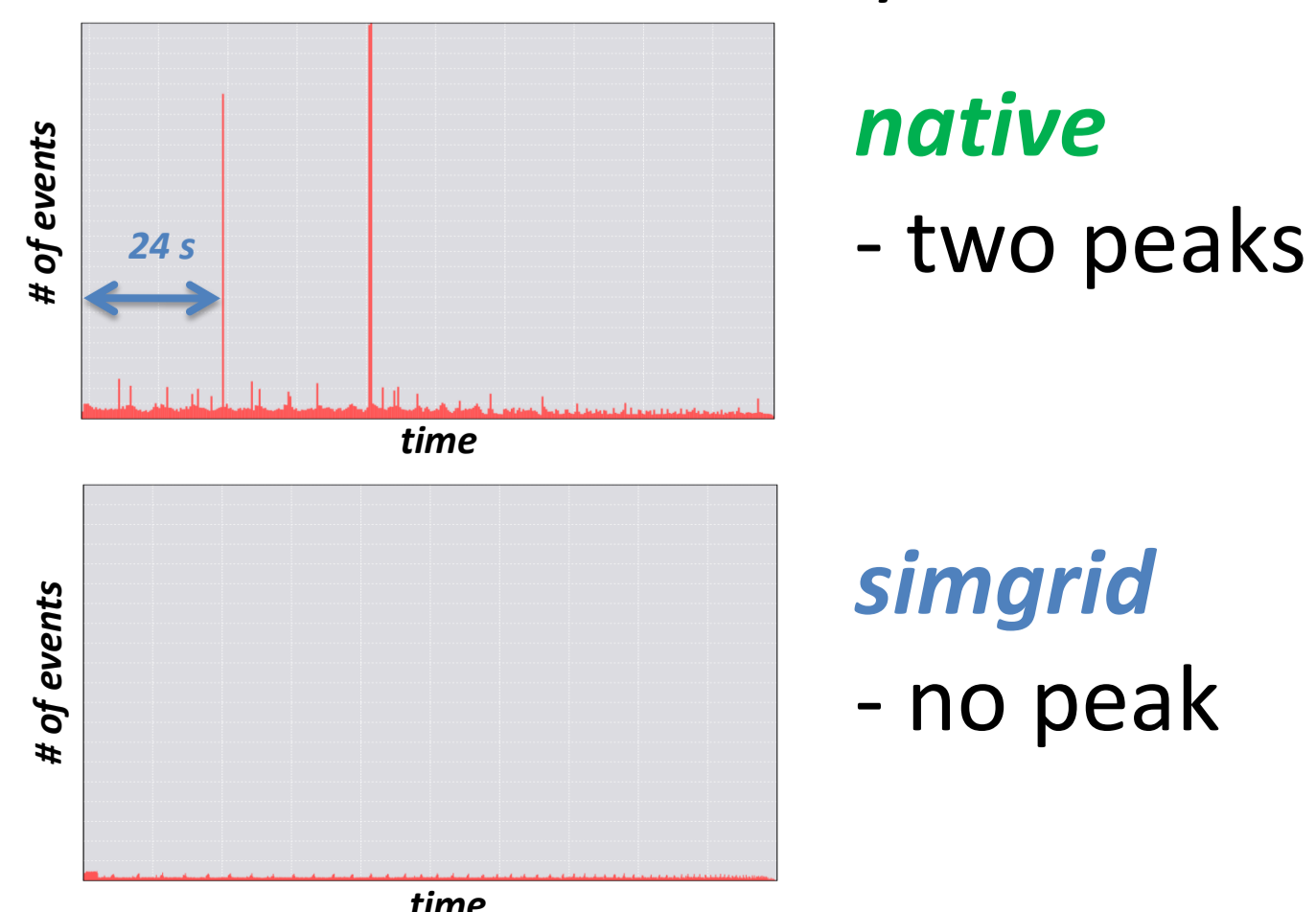
- ✓ Multiple views on trace data
 - ▶ see trace data from different perspectives
 - do not skip relevant information
 - ▶ have different levels of abstraction
- ✓ Global view consistency
 - ▶ different views on data are consistent
 - same color code, same time interval
 - ▶ uniform behavior
- ✓ Modular design and easy development
 - ▶ decoupled view communication
 - ▶ easy to add new analysis views

FrameSoC in action!

We trace a parallel application on both a real system and in *Simgrid*.



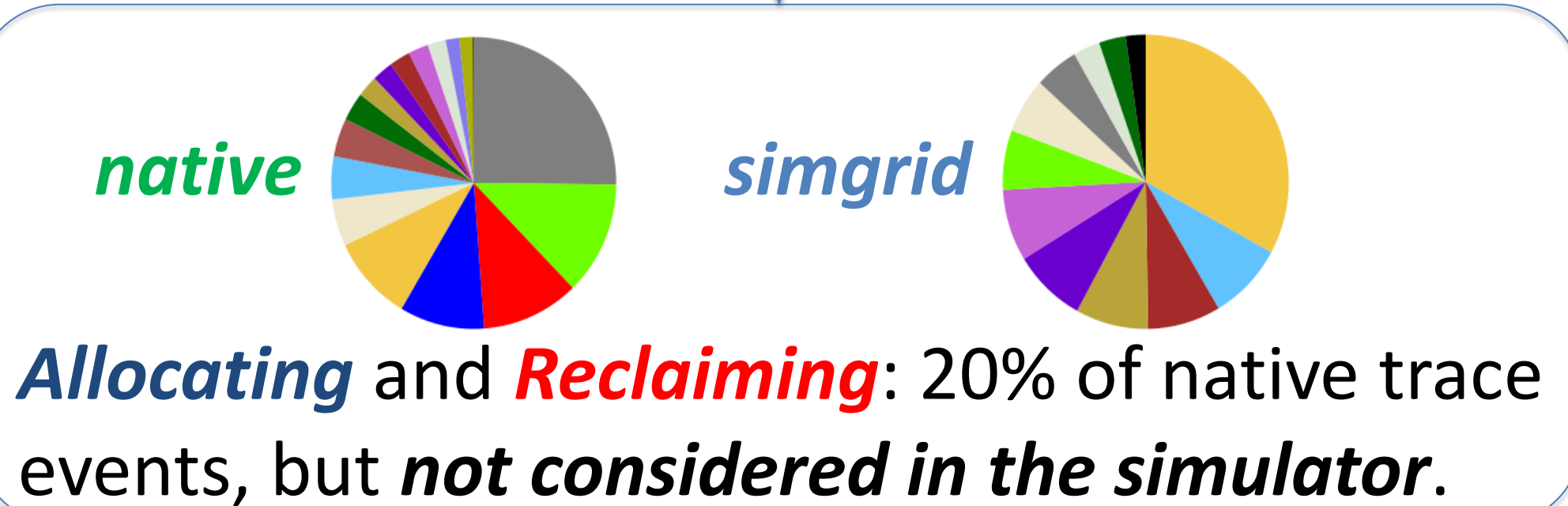
We get an **overview** of both traces with the event density chart.



Filter on state transitions and inspect event details.

We identify a pattern of memory-related events:

- **Allocating**
- **Reclaiming**



Well-defined top-down analysis workflow

FrameSoC multiple-view correlation

- ✓ **Isolate the problem to the memory model**

Analyst's knowledge of the system

- ✓ **Problem found!**

- *Simgrid* made the hypothesis of infinite memory, thus ignoring swapping operations
- Removing this hypothesis solves the problem

Future works

- Validation with new concrete use cases
- New analysis views
- Diagnosis tool tracking user interactions
- Automatic definition of analysis workflows

First FrameSoC open-source release at the end of June 2014