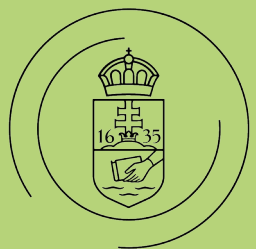


Static analysis of P4 programs

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NATIONAL RESEARCH, DEVELOPMENT
AND INNOVATION OFFICE
HUNGARY

PROGRAM
FINANCED FROM
THE NRDI FUND

P4 language



P4 language



P4 language



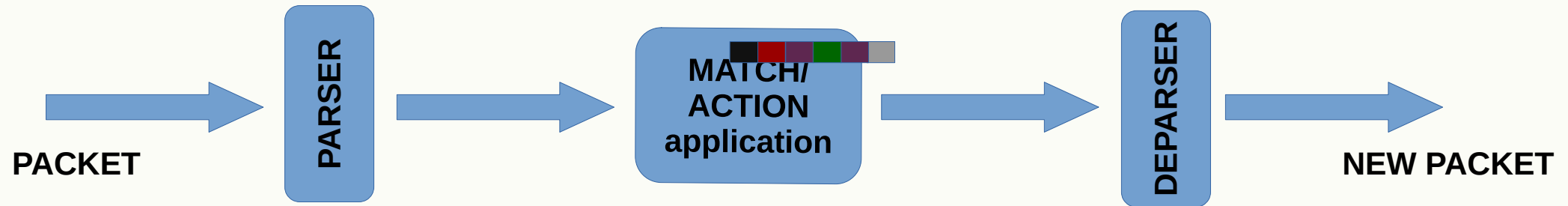
P4 language



P4 language



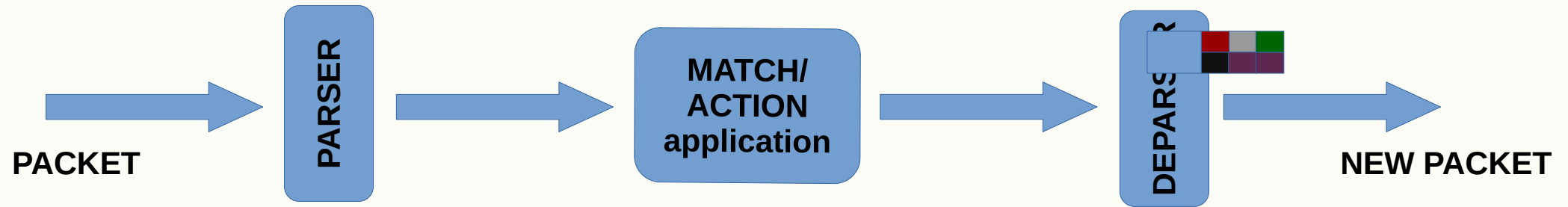
P4 language



P4 language

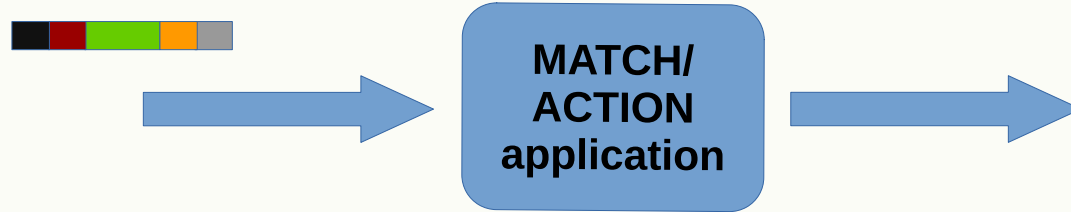


P4 language



P4 language

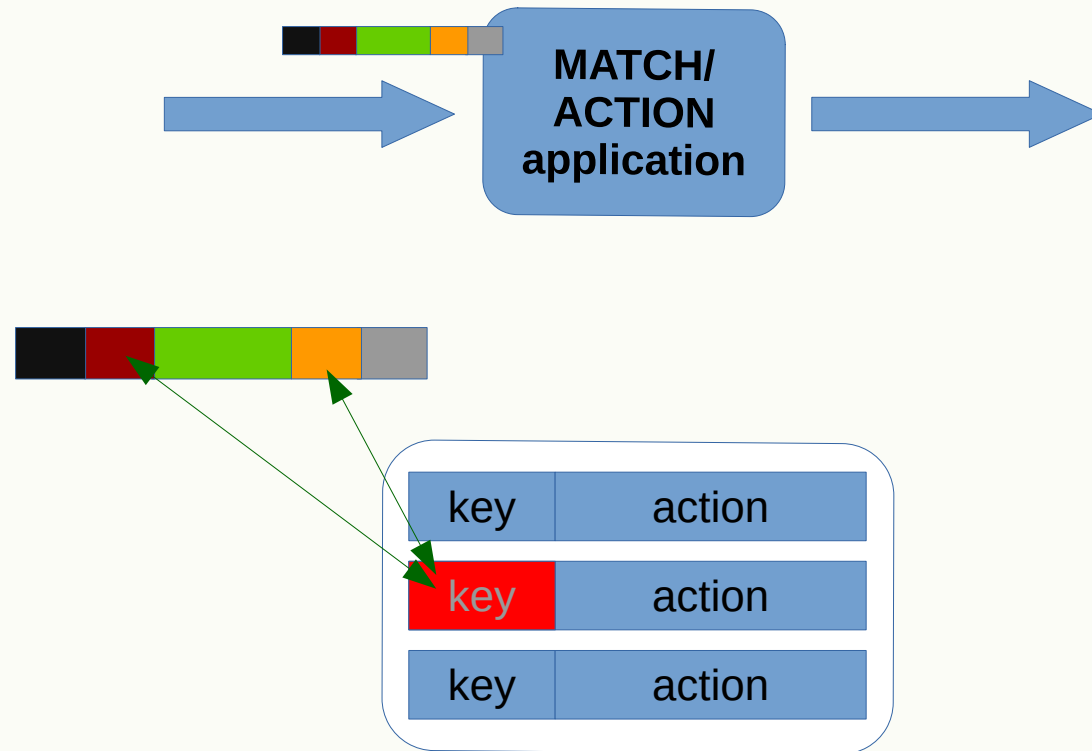






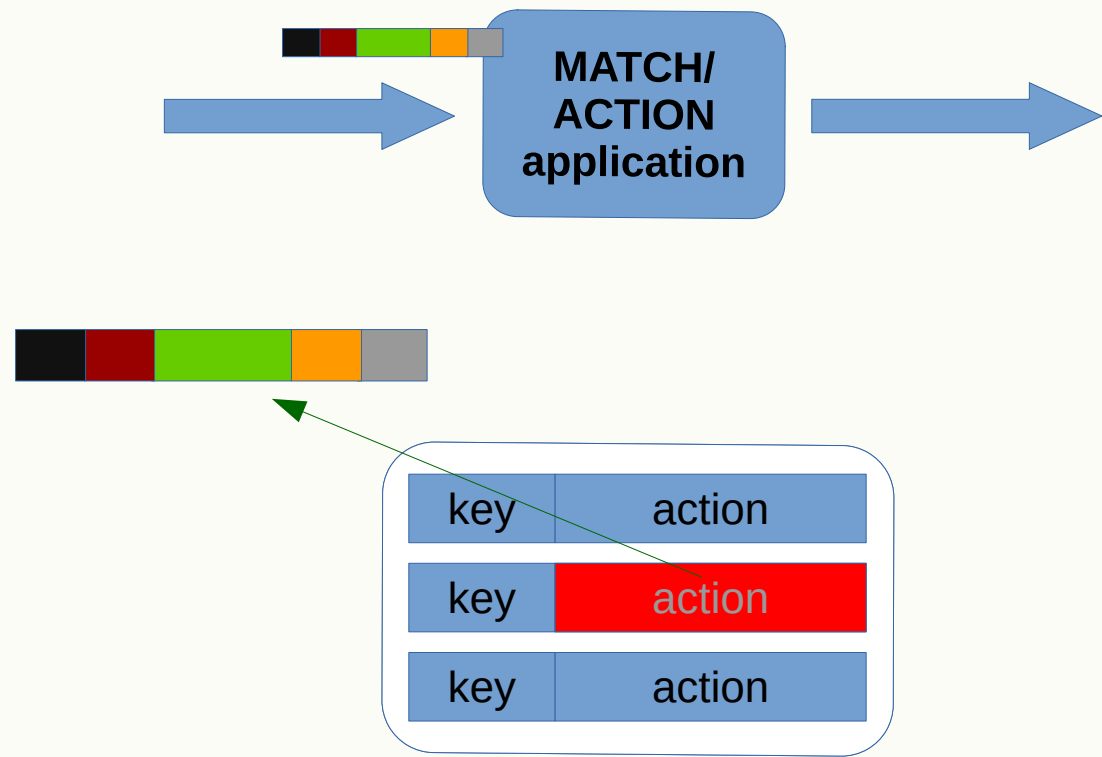


key	action
key	action
key	action





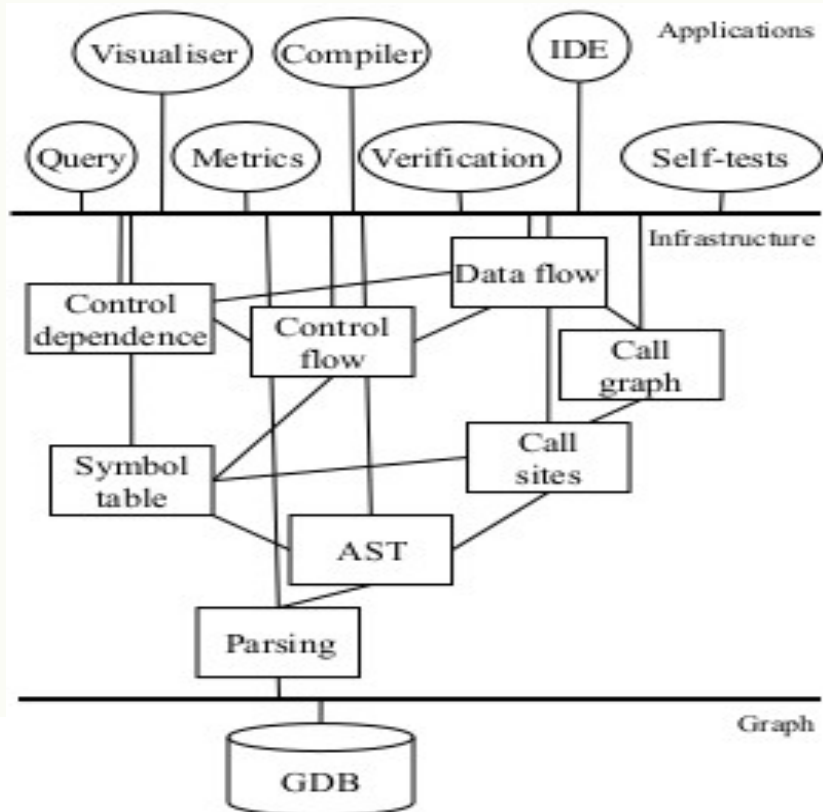
key	action
key	action
key	action





key	action
key	action
key	action

P4Query

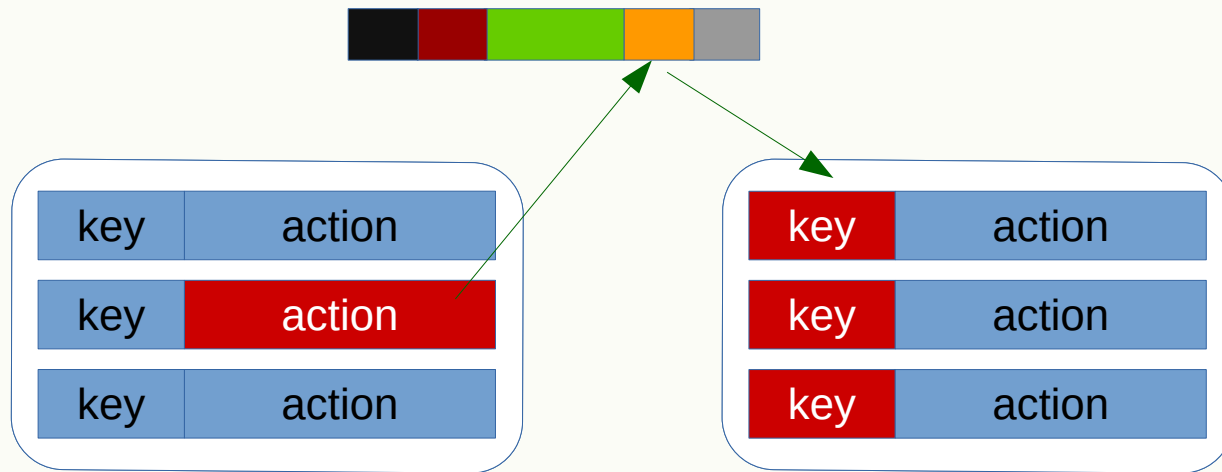


- graph based analyser framework
- common representation
- analyses can build on each other
- free software
<https://github.com/P4ELTE/P4Query>

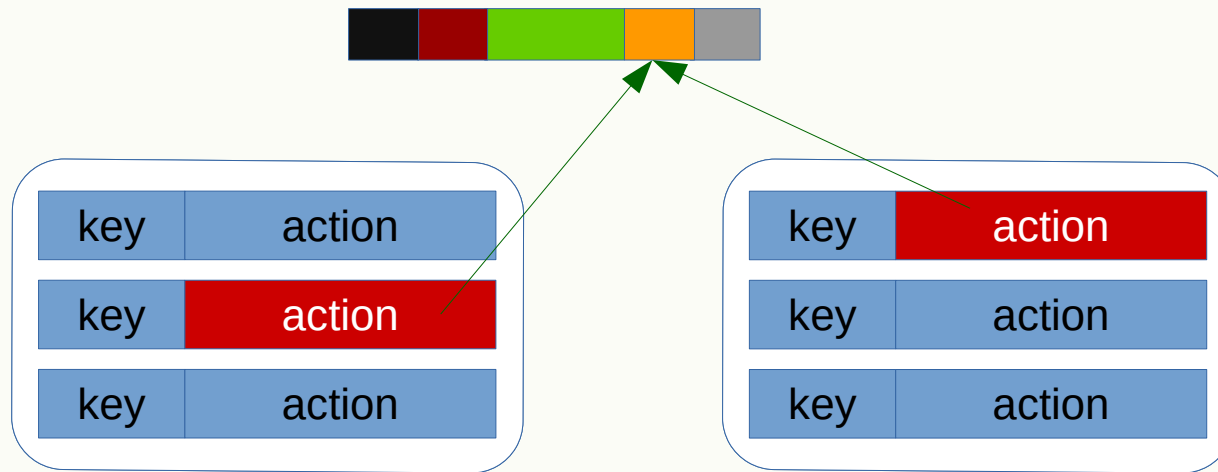
Dependency analysis

- Dependencies between match/action tables
- Required distance / parallel execution
- Optimal stage definition
- Cooperation: BME, ELTE TTK

Dependency analysis



Dependency analysis



Refactoring steps for P4

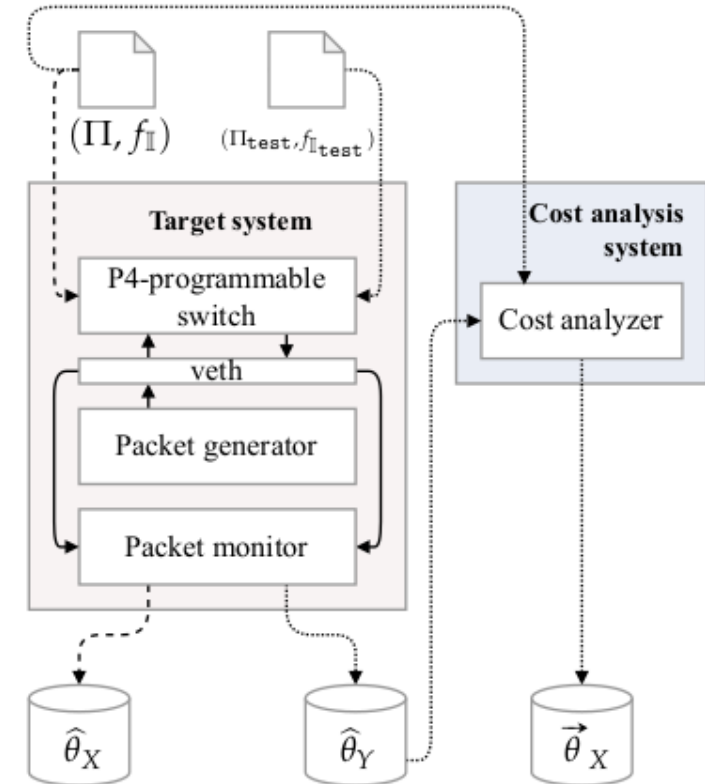
- Generic refactoring steps
 - renaming, adding/deleting parameters etc.
- P4 specific steps
 - split/merge match/action tables

P4 specific metrics

- Usable metrics for P4
- Creating P4 specific Halstead metrics
- Analysing usability

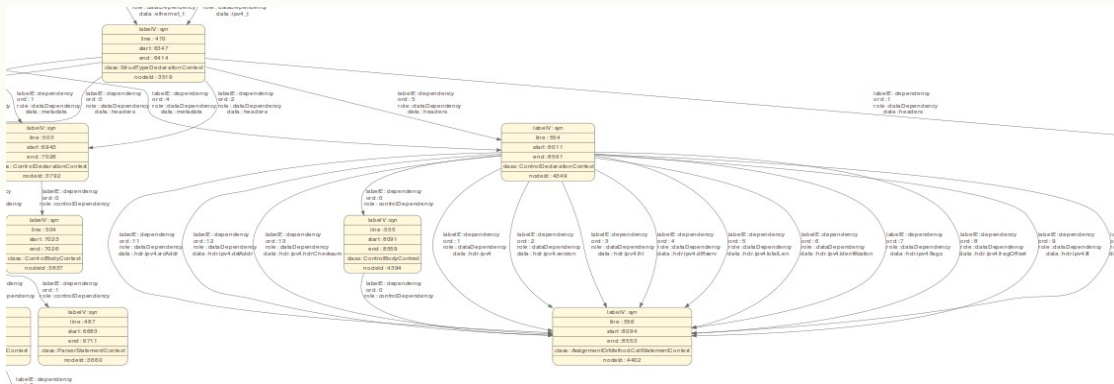
Cost estimation

- Formal methodology
- Control flow based estimation
- Probabilities of different execution paths
- Using costs of basic instructions



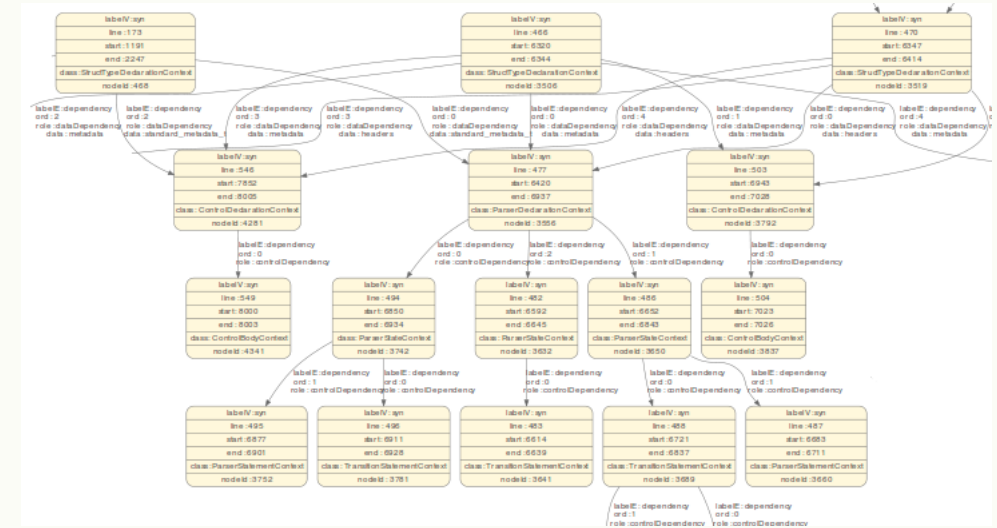
Publications

- CSCS short paper
- 2 submitted journal paper
- 1 related PhD thesis, 2 related MSc thesis



Summary

- Analyser framework for P4
- Dependency analysis
- Refactoring steps
- P4 metrics
- Cost analyzer method for P4



Thank you for your attention!



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