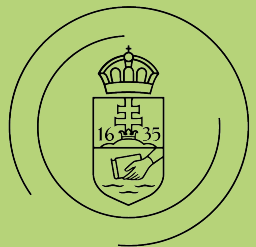


Analysis and refactoring of P4 programs

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AND INNOVATION OFFICE
HUNGARY

PROGRAM
FINANCED FROM
THE NRDI FUND

P4 language



P4 language



P4 language



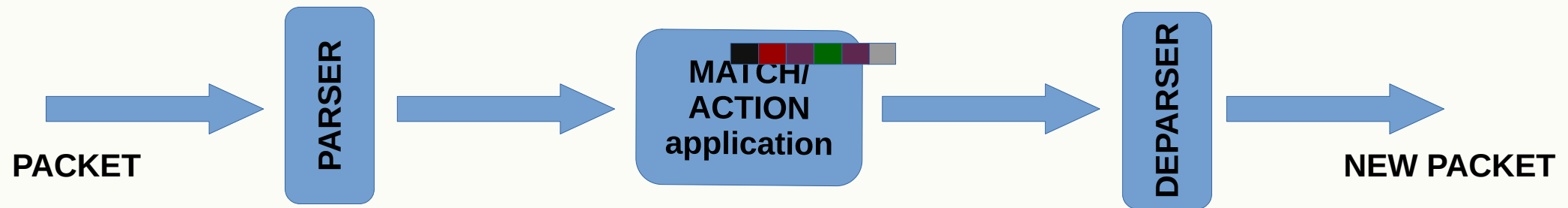
P4 language



P4 language



P4 language



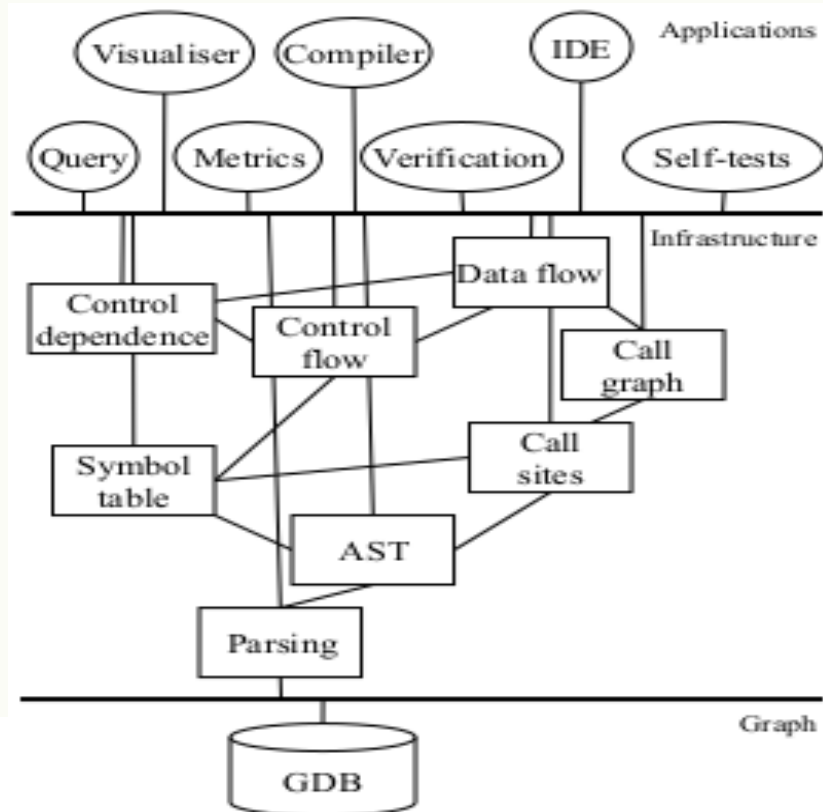
P4 language



P4 language



P4Query



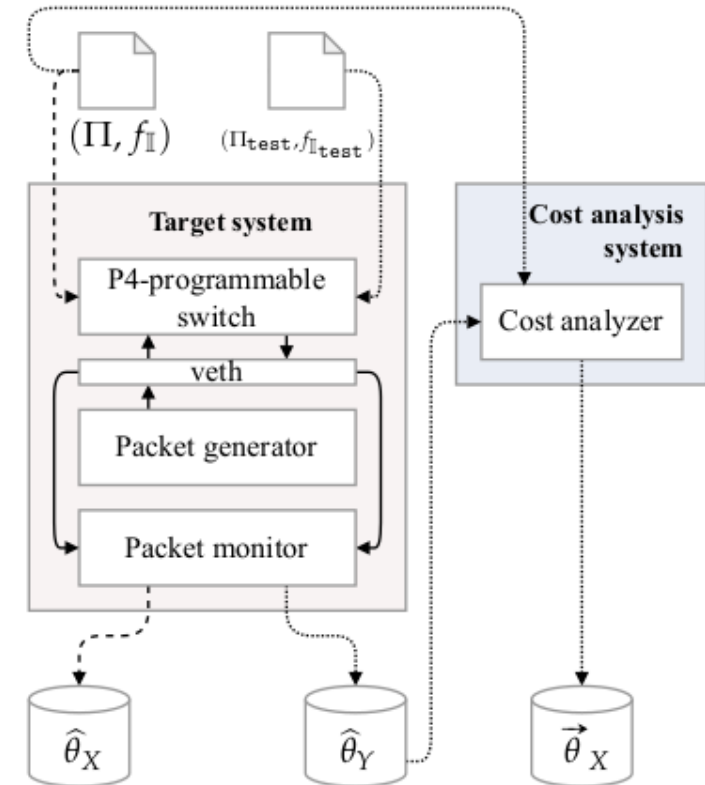
- graph based analyser framework
- common representation
- analyses can build on each other
- free software
<https://github.com/P4ELTE/P4Query>

P4Query (publication)

- Lukács, D.; Tejfel M. : *Overlaying control flow graphs on P4 syntax trees with Gremlin*
Volume of short papers of the 13th Conference of PhD Students in Computer Science, 2022
(Full version was submitted to Acta Cybernetica (Q3))
- Submitted (under second round review):
Lukács, D.; Tóth G.; Tejfel M. : *P4Query: Static Analyser Framework for P4*
Annales Mathematicae et Informaticae, (Q3)

Cost estimation

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



Cost estimation (publication)

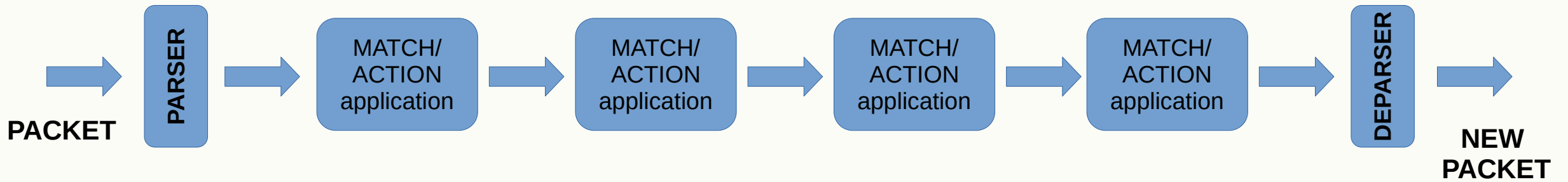
- Lukács, D.; Pongrácz, G.; Tejfel, M. *Model Checking-Based Performance Prediction for P4. Electronics* **2022**, 11, 2117. , <https://doi.org/10.3390/electronics11142117> (Q2)

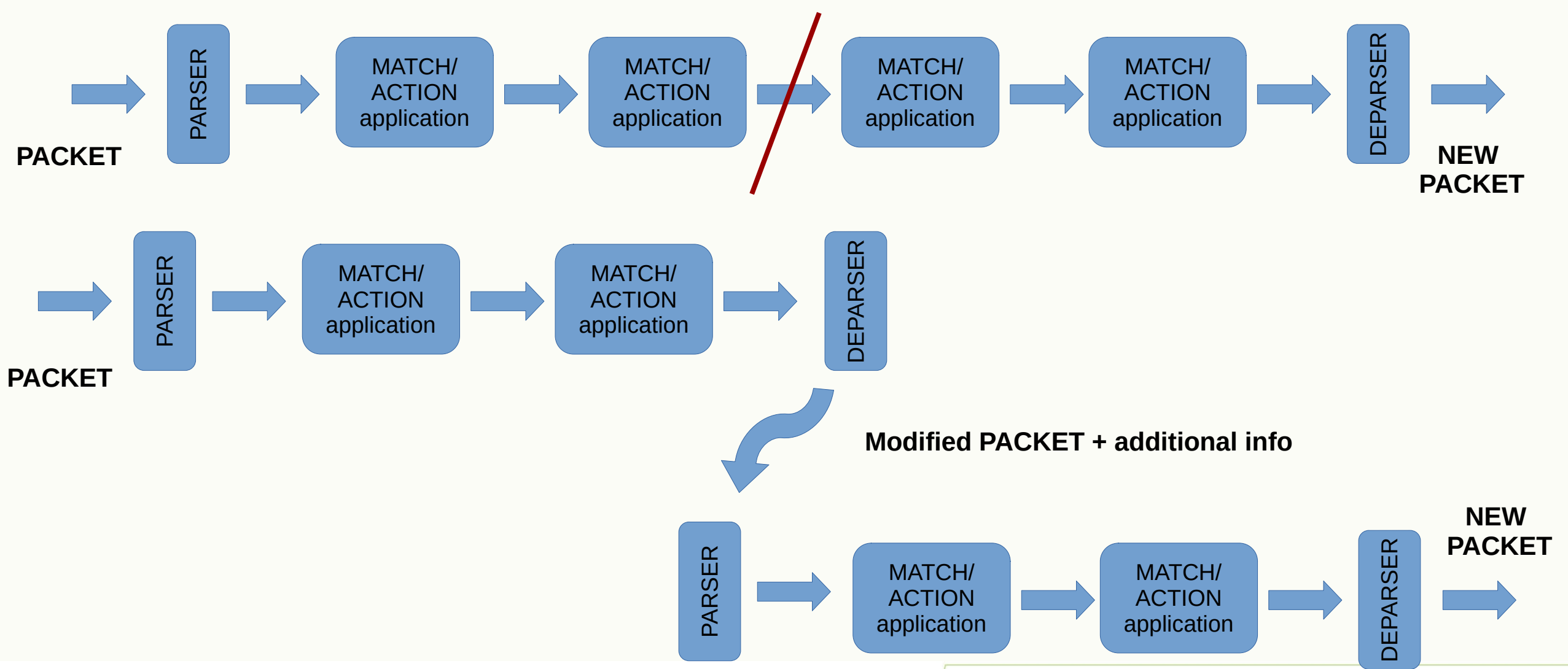
Refactoring steps / transformation

- Changing execution order of match/action tables
- Creating source code from internal representation of P4Query

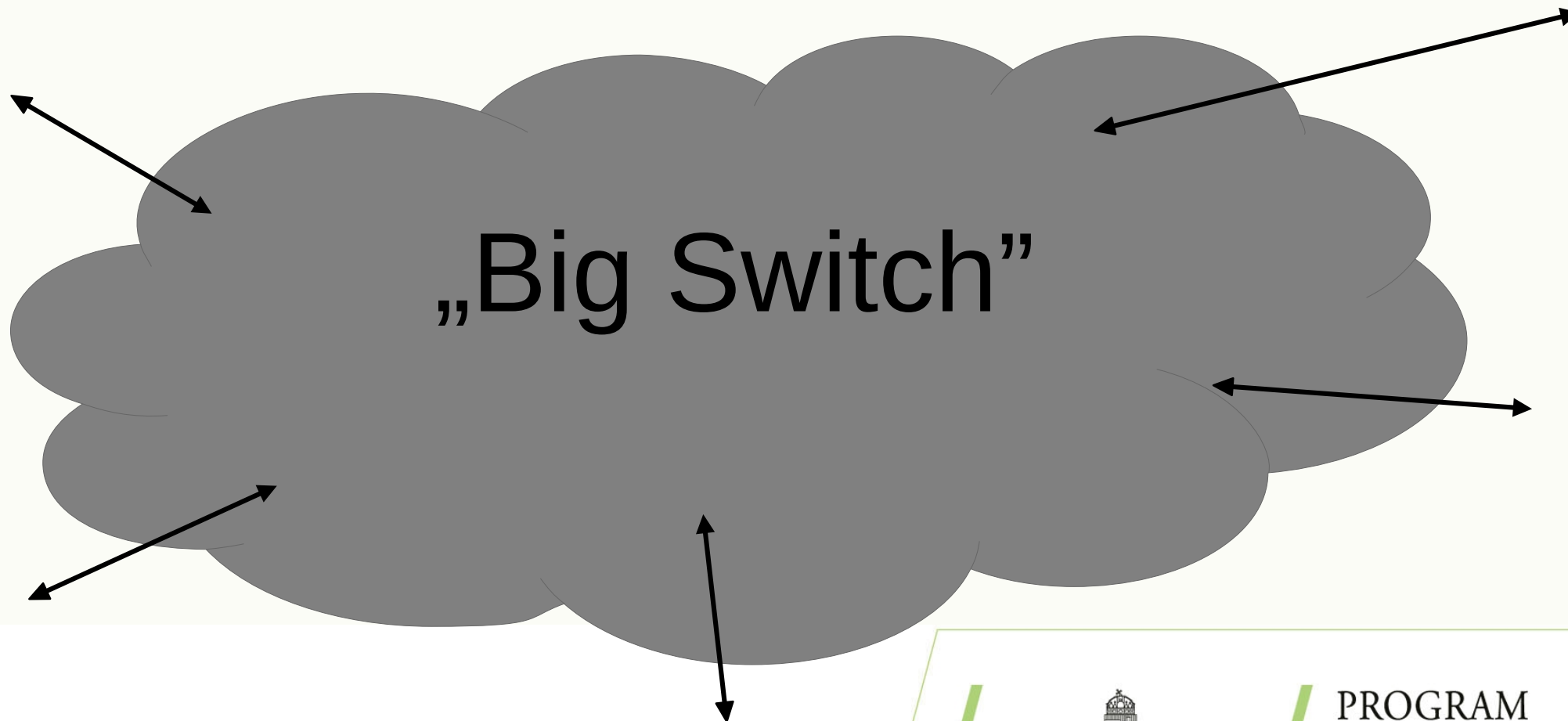
Decomposition of P4 programs (joint work with Sándor Laki)

- Analyzing dependencies between match/action tables
- Searching optimal breakpoints
- Creating two valid representation (ongoing)
- Creating two independent P4 source code

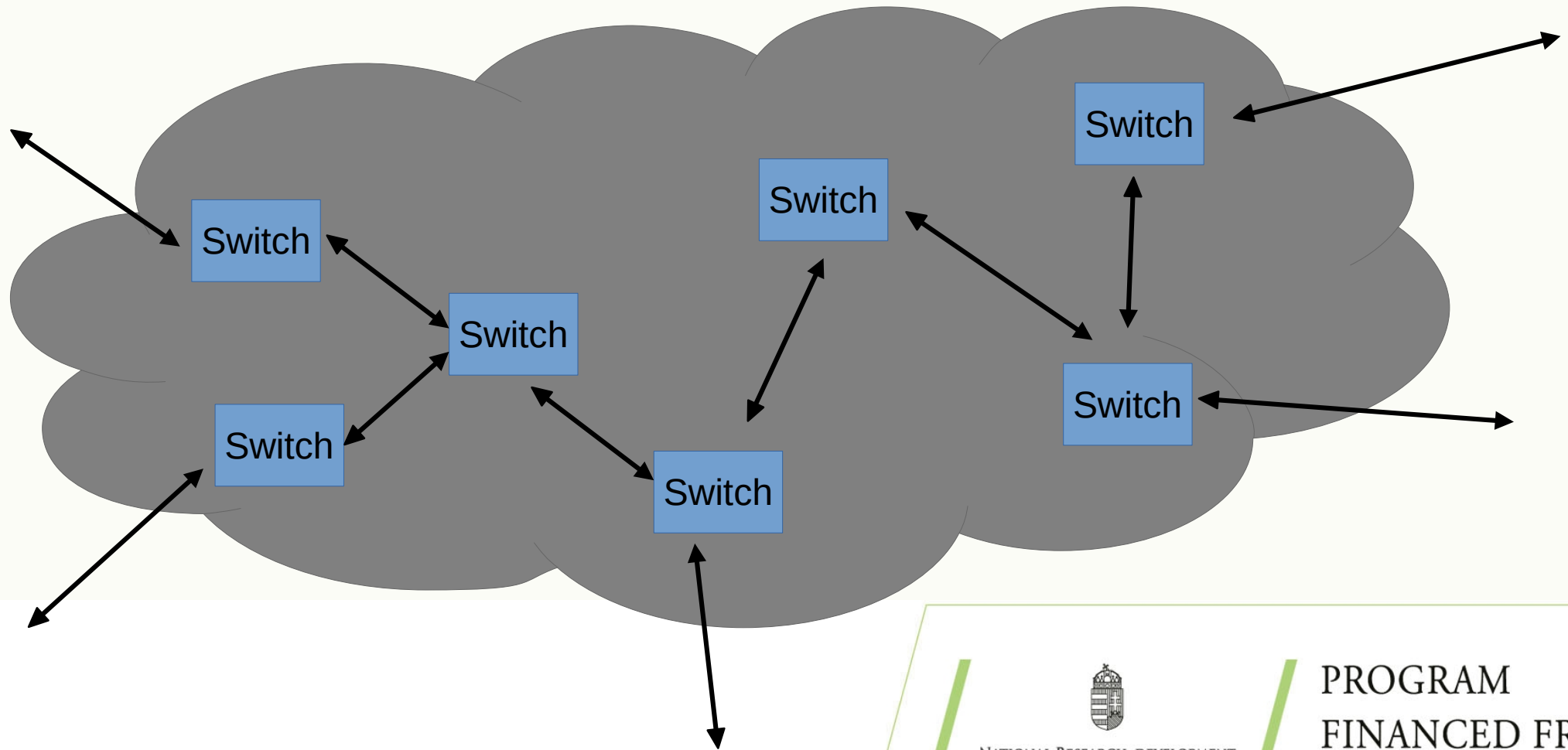




Plans for 2023

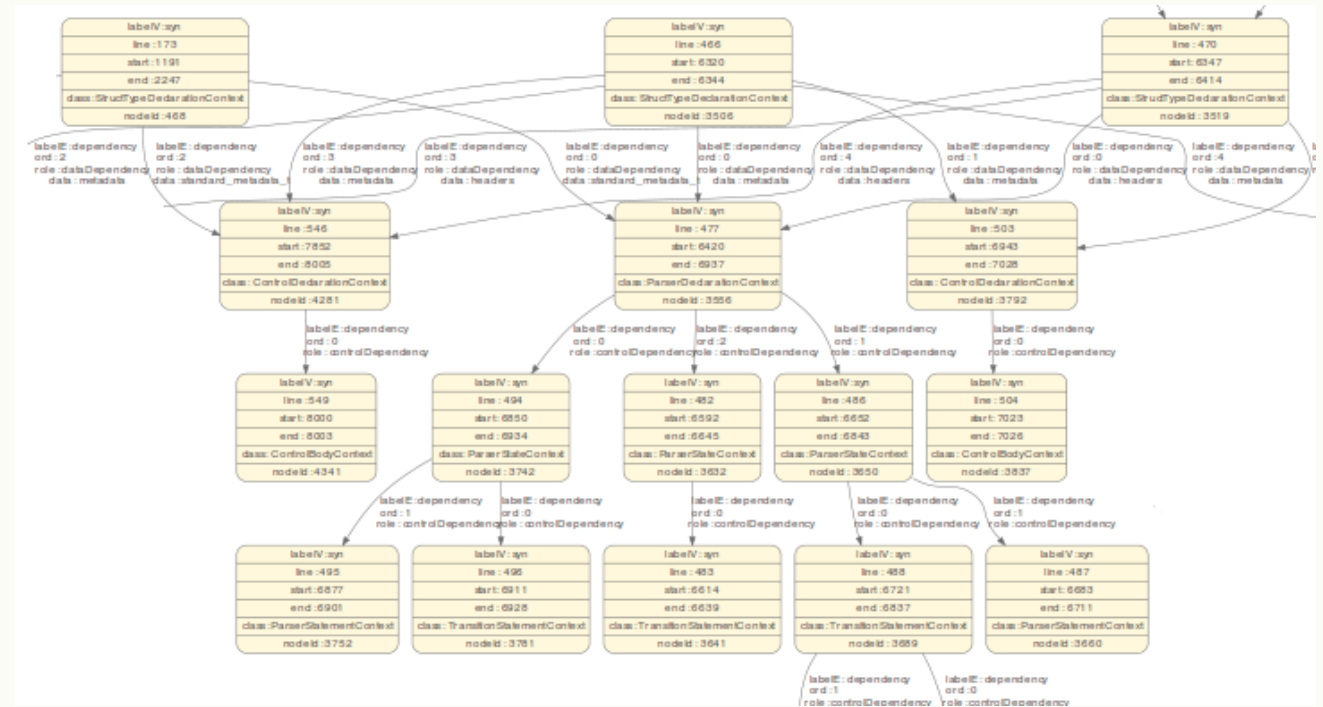


Plans for 2023



Summary

- P4Query
- Cost estimation
- Refactoring steps
- Decomposition



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Thank you for your attention!



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