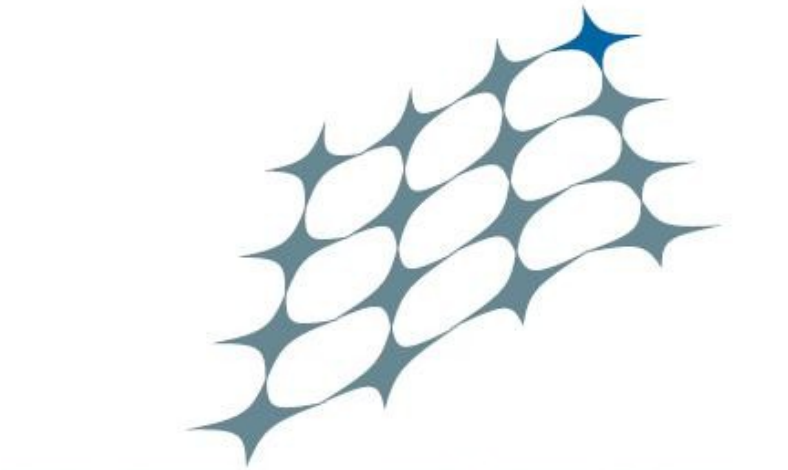

BE06 / Groundwater Modelling

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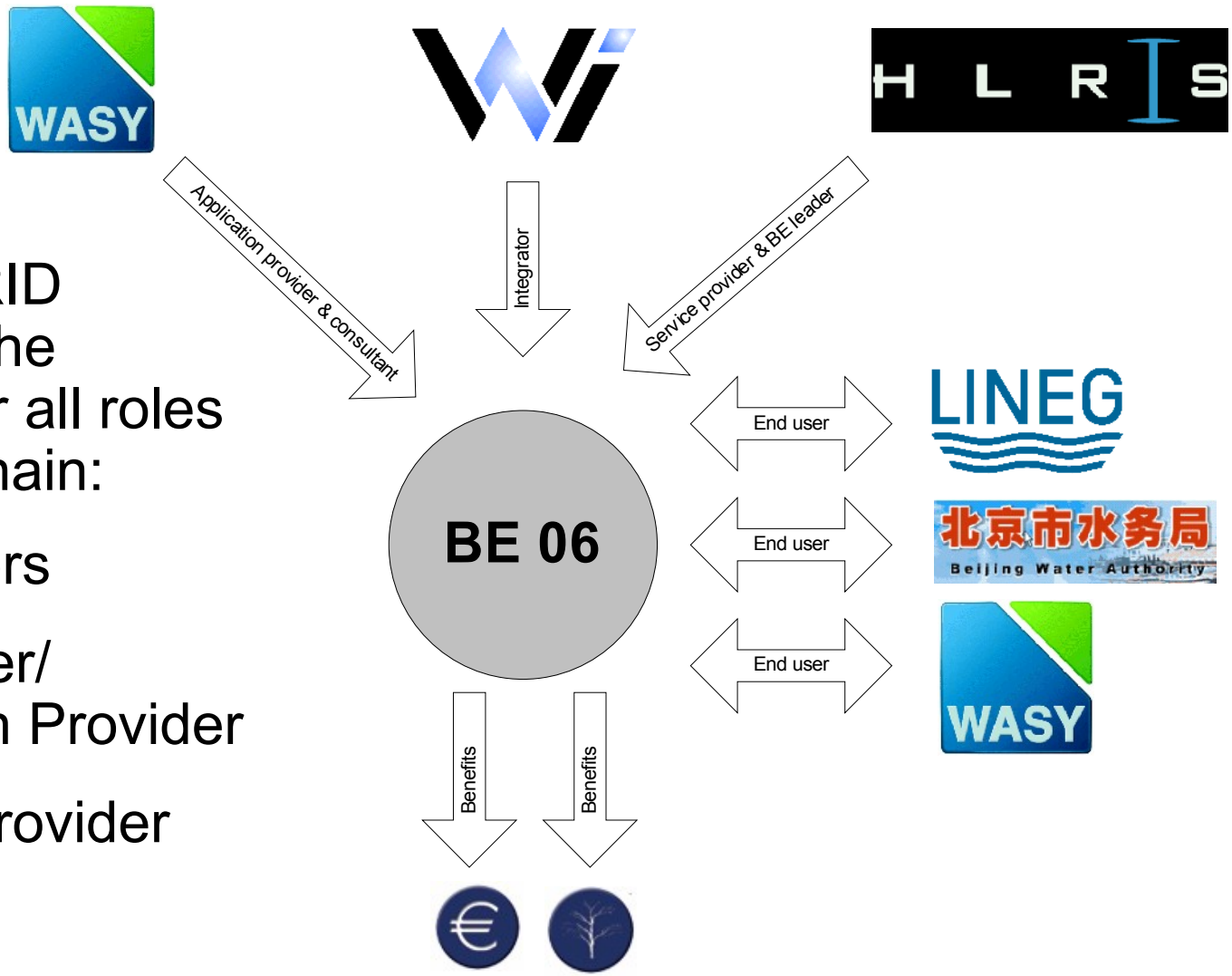
Partners in BE06

As all BEinGRID Experiments the partners cover all roles in the value chain:

- 2 End-Users
- 1 End User/ Application Provider
- Service Provider
- Integrator



Outline

- **Why is it needed?**
- **How has it been done?**
- **Conclusions**

Outline

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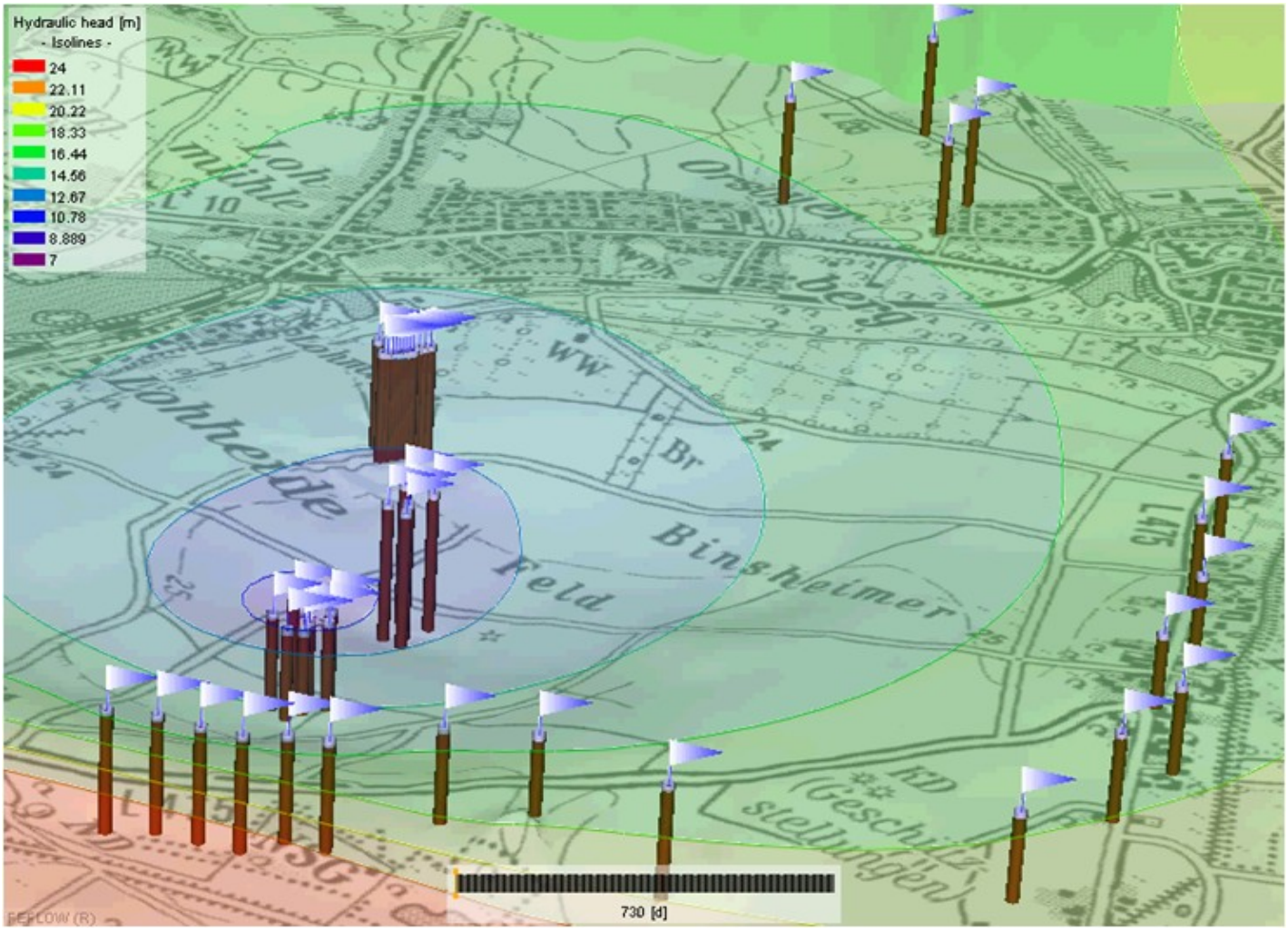
The application case



The application case

LINEG manages and regulates impacts of salt and coal mining in the Ruhr industrial area:

- Regulation of water outflow
- Maintenance of surface water bodies
- Regulation of groundwater levels
- Avoiding and compensating changes relating to water management

⇒Energy costs to operate pumping stations about **1,000,000 €** per year

End User Perspective

Technical model-based optimization may be used to

- Minimize number of pumping stations and pumping rates
- Optimize the control of pumping stations
- Optimize the location of pumping stations
- Foster further planning of e.g. new pumping stations

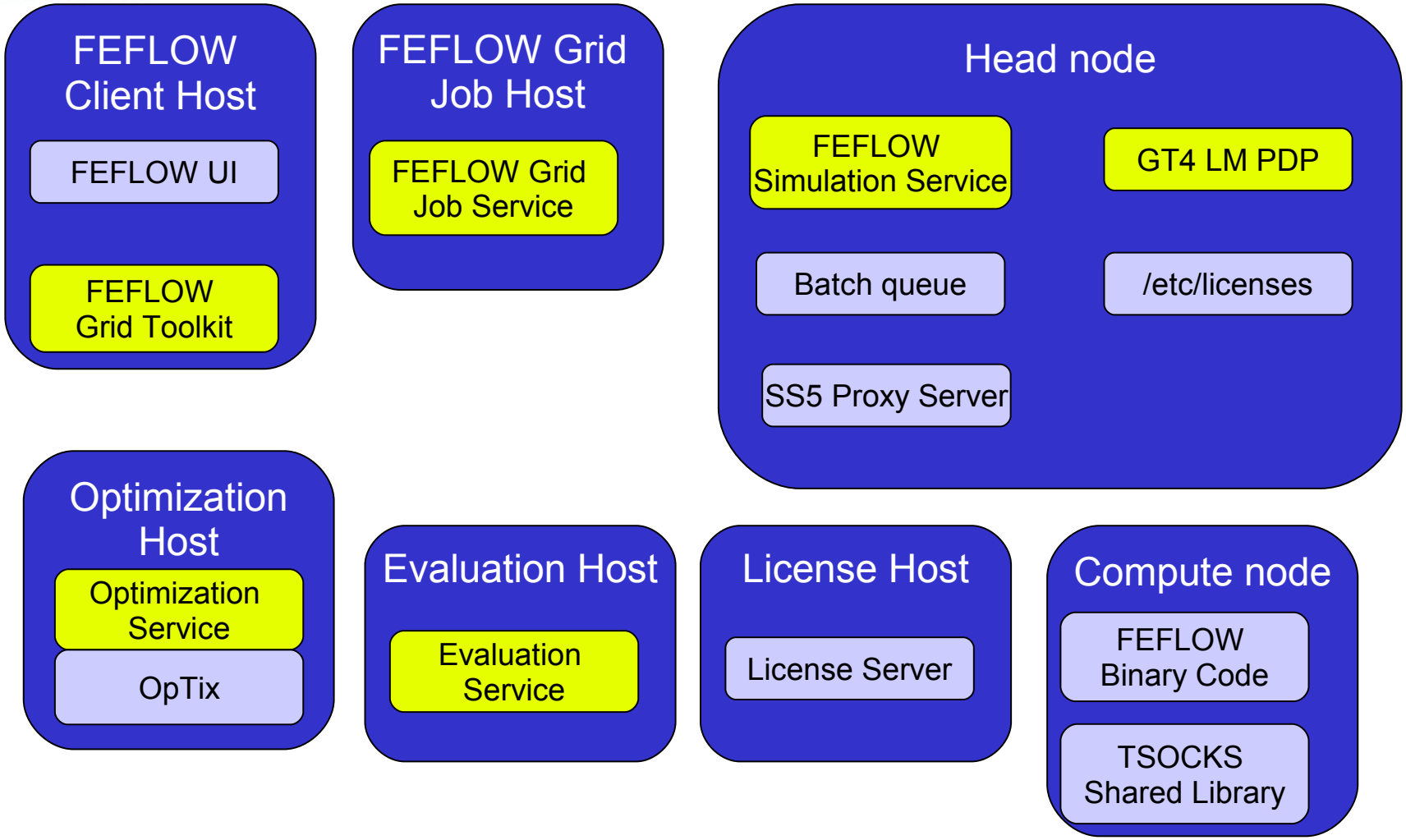
⇒ The potential reduction of energy costs using optimization is about 20-30%, thus at least 200,000 € per year!

Outline

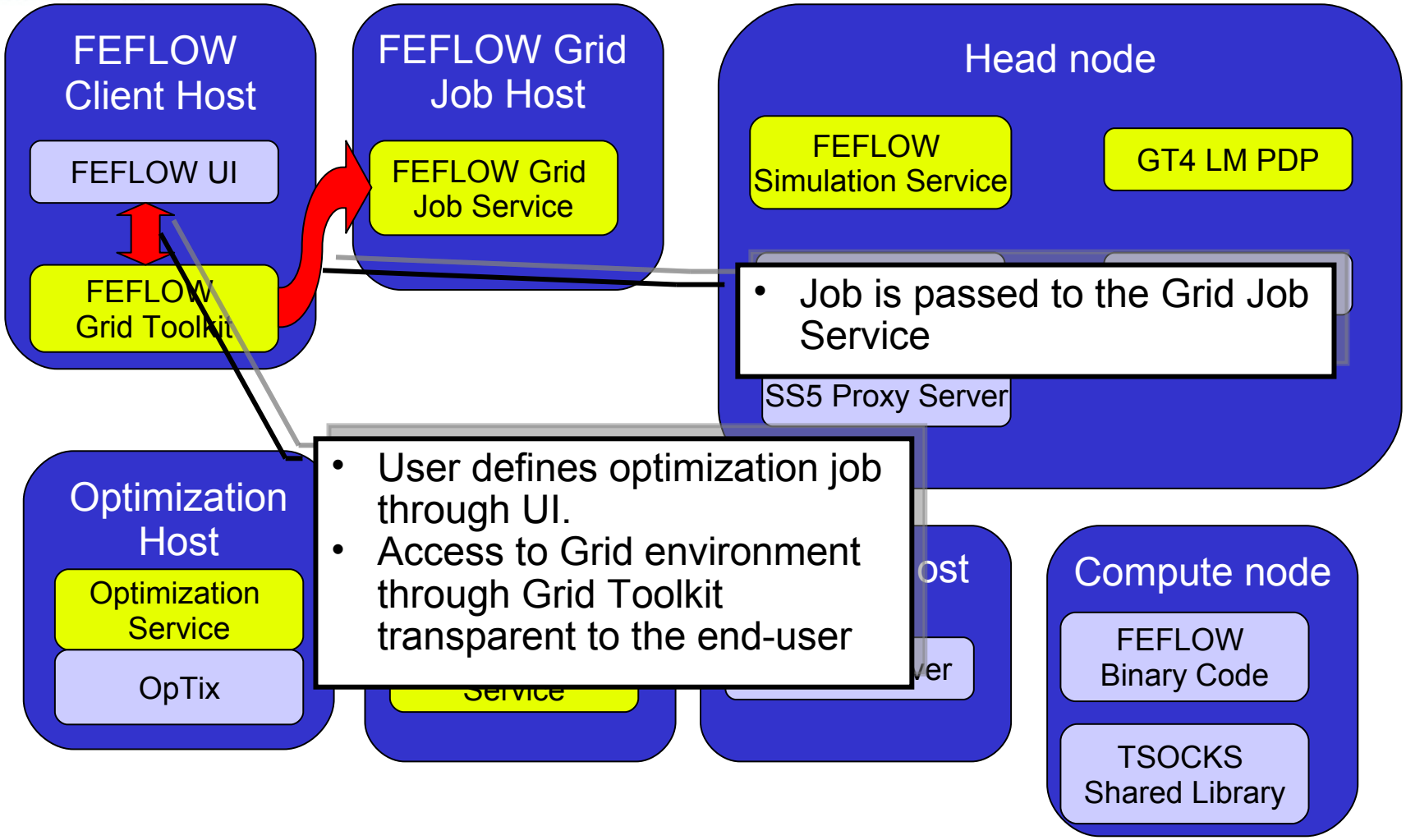
- Why is it needed?
- **How has it been done?**
- Conclusions

Attention! Details ahead!

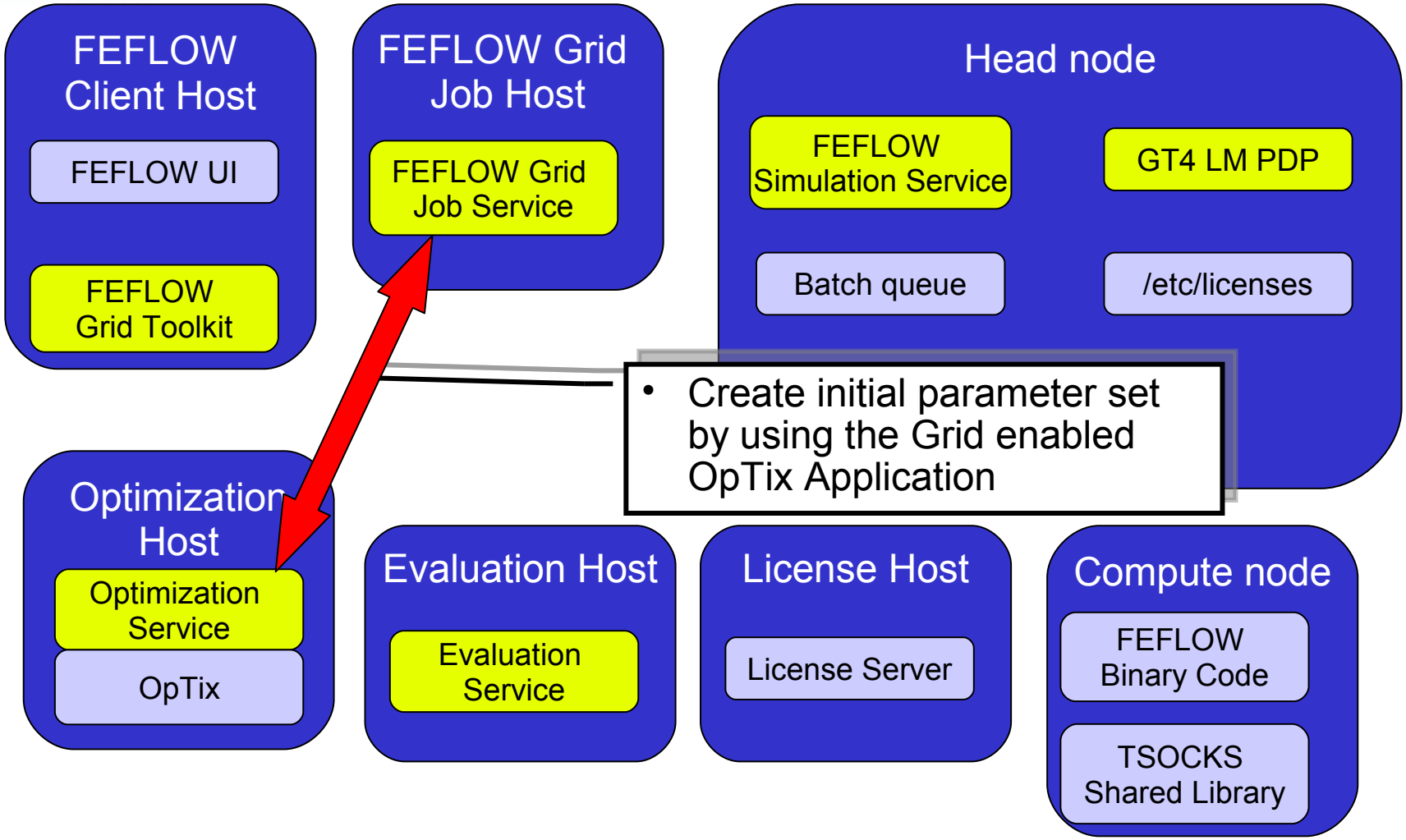
BE06 System Overview



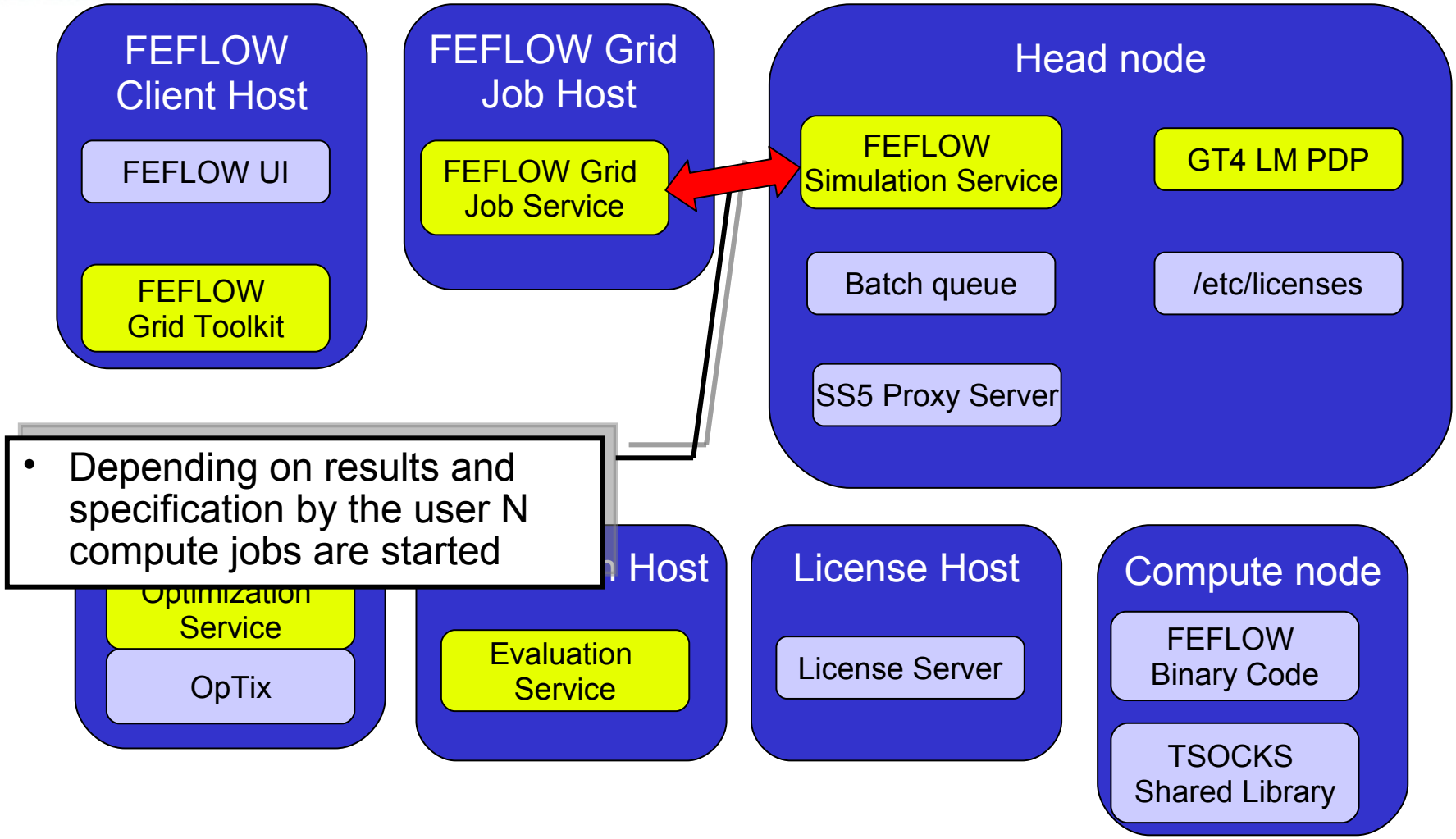
BE06 System Overview



BE06 System Overview

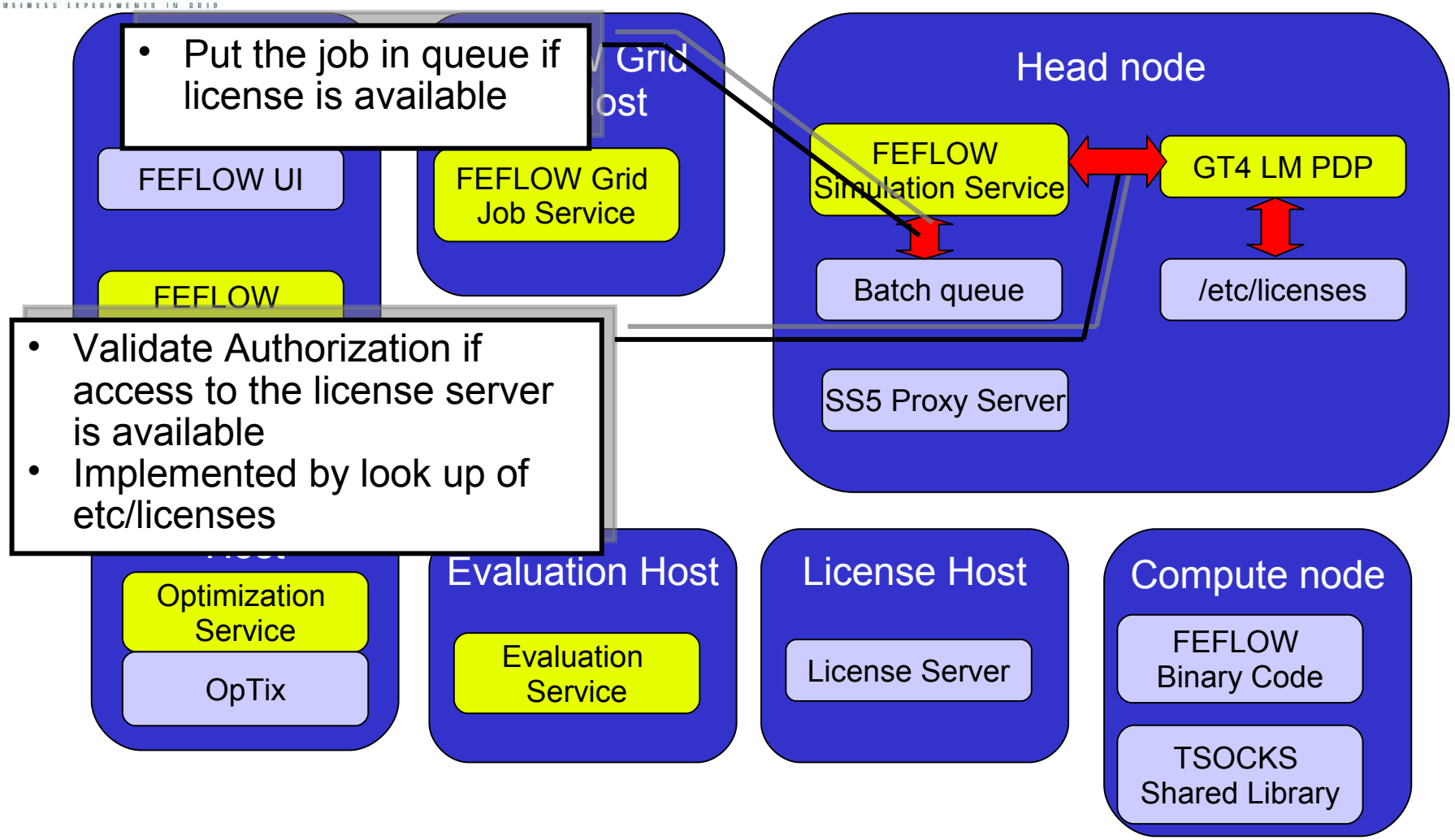


BE06 System Overview

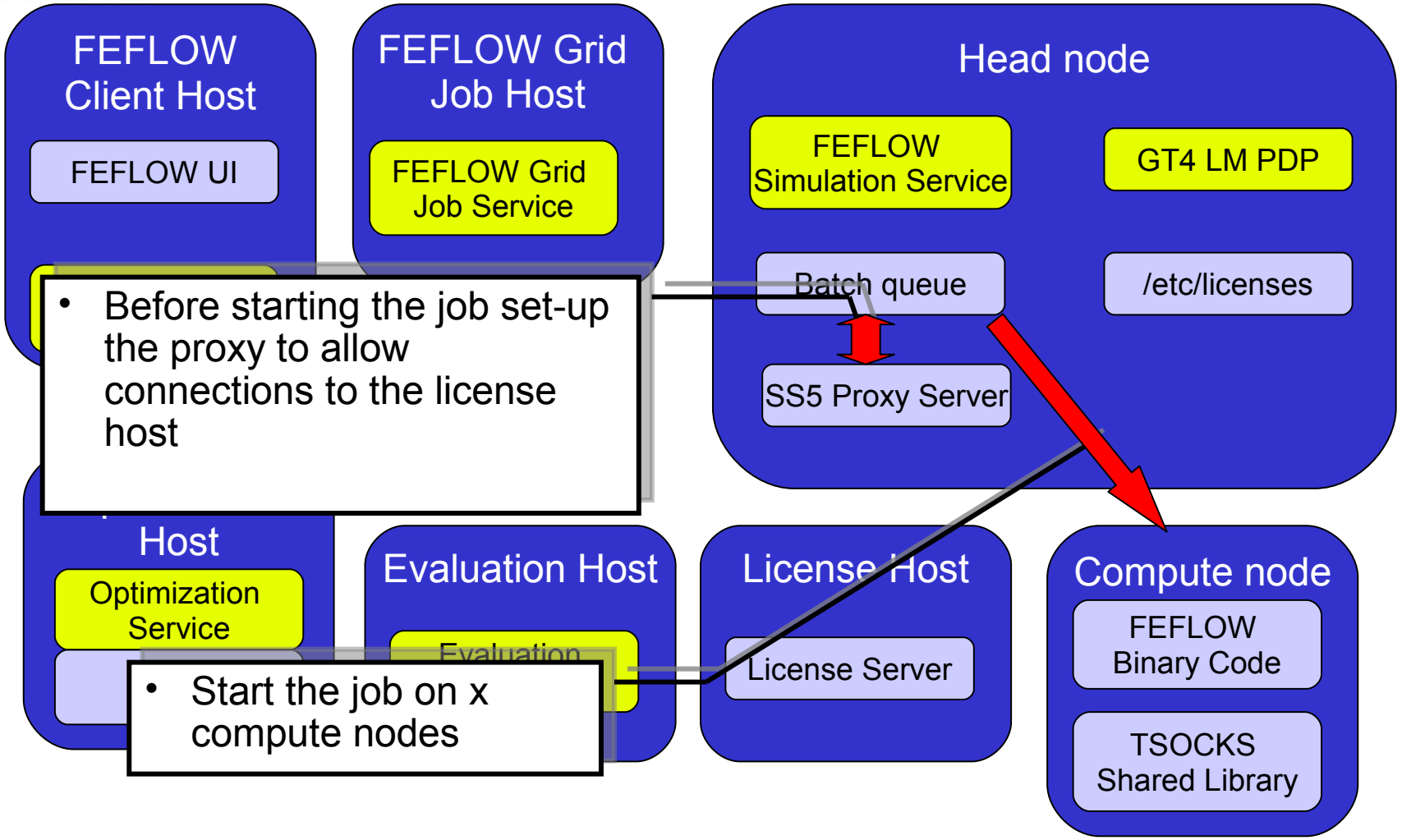


- Depending on results and specification by the user N compute jobs are started

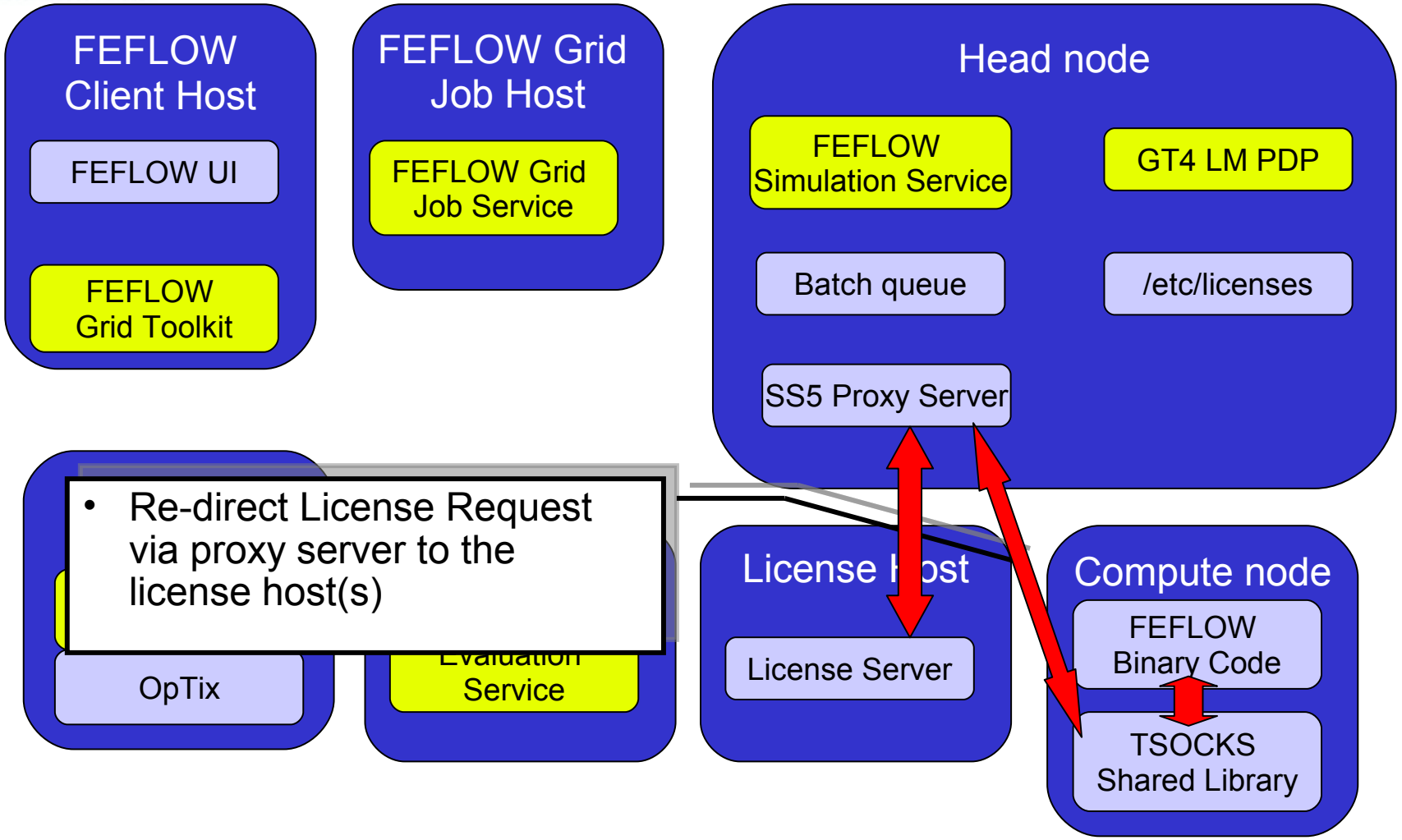
Pre-Execution License Validation



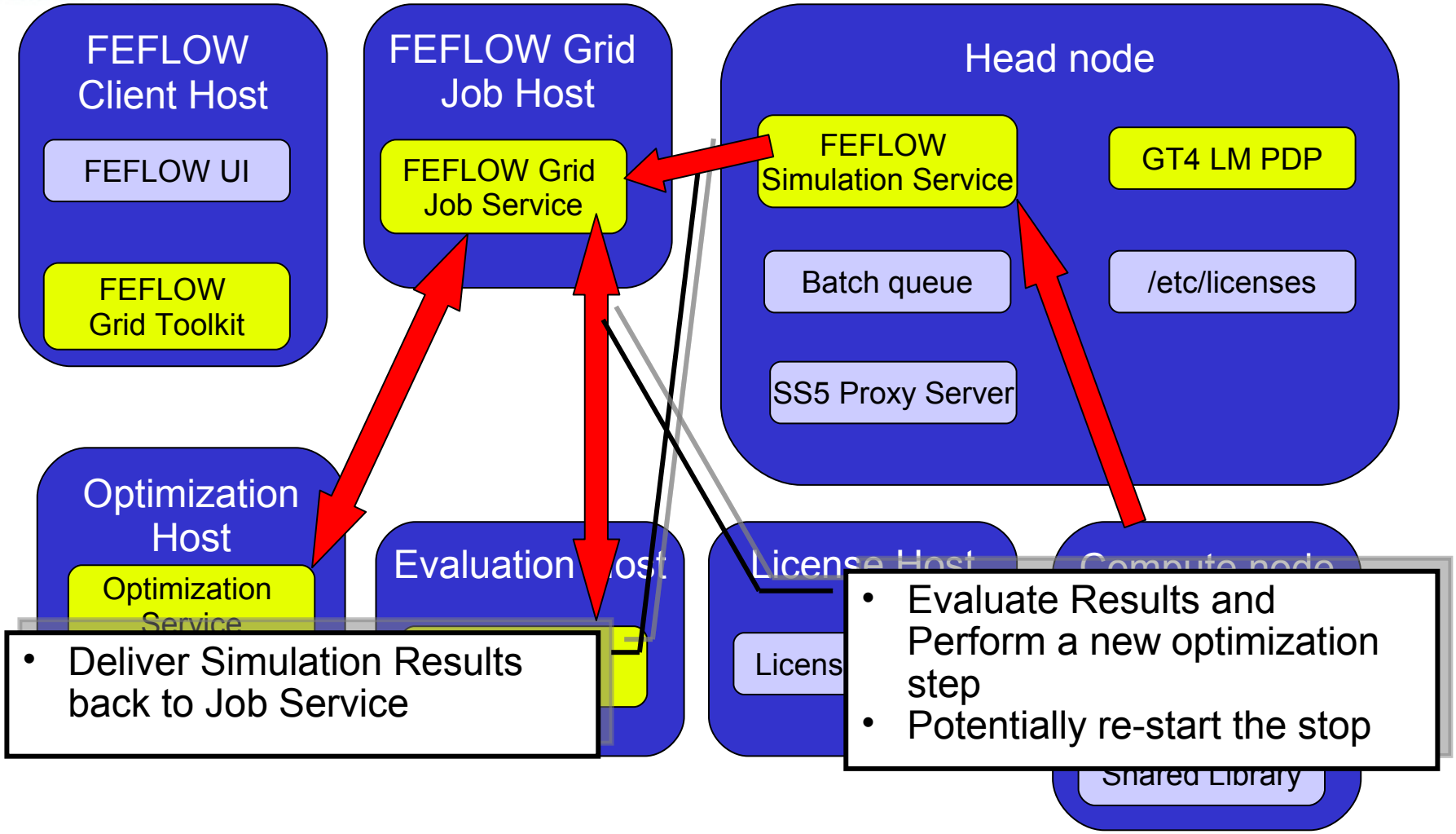
Job Execution



Runtime License Validation



Results delivery, evaluation and re-optimisation



License Management Key Features

License Management Implementation in BE06 ...

- ...reuses legacy license management (FEFLOW NetLM)
- ...considers constraints of compute environments for commercial users (e.g. restricted network access)
- ...exemplified using GT4 but not conceptually limited to it
- ...supports pay per use license models such as a License coin model (under development)
- ... supports multiple license servers (license aggregation)

Outline

- Why is it needed?
- How has it been done?
- **Conclusions**

Benefits ...

For WASY:

- Tighter customer relationship and gaining new customers
- Increased service portfolio
- Increased license sale
- Entering new markets

For Service Providers:

- New domain for HPC-usage
- Offer of complex services beyond compute and data services e.g. optimization services

Benefits ...

For end users:

- Enables optimization of large problems without owning HPC or license resources
- Cost and time reduction of optimization tasks
- Reduction of energy costs, environmental impacts, etc.

You:

- Design pattern abstracted from this case-study
- Reference Implementation from BEinGRID Activity 1 under development
- Checkout http://www.gridipedia.eu and http://www.beingrid.eu

Thanks for your interest!

Contact us:
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http://www.hlrs.de
http://www.beingrid.eu

Backup and Manual Slides ...