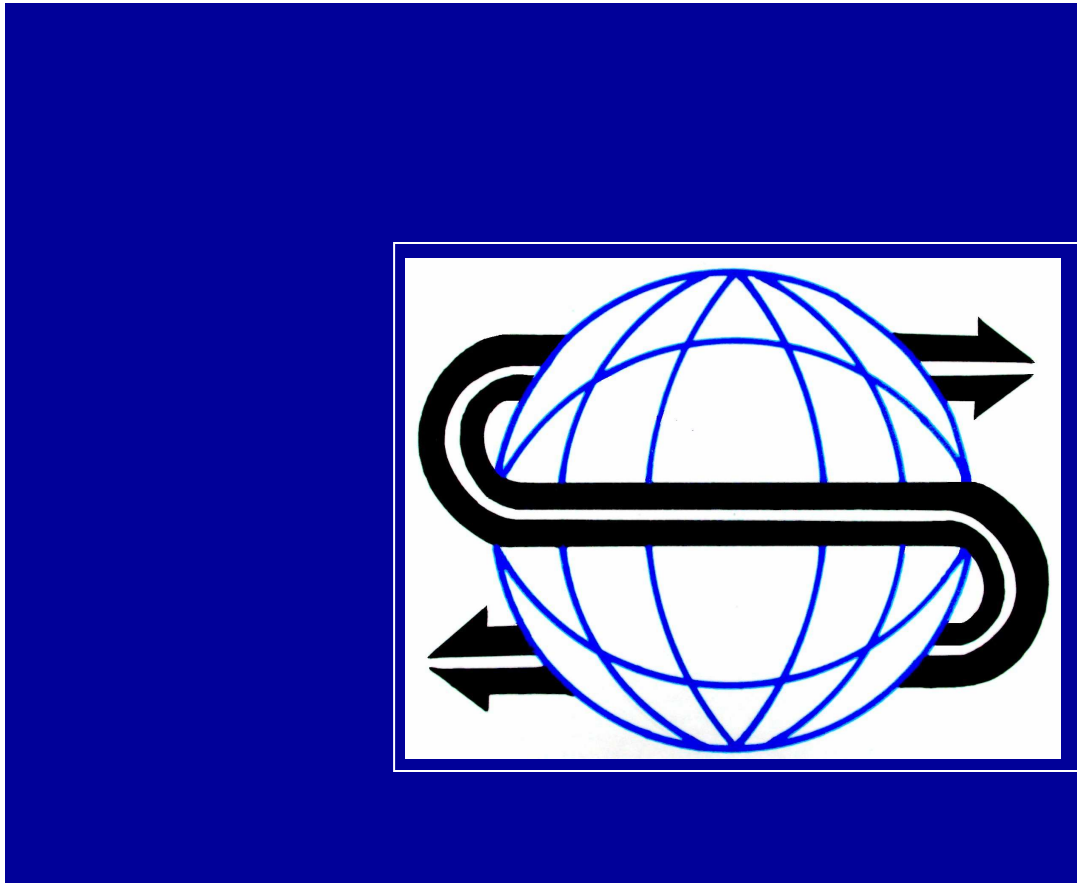

Optimization Services (OS) -- The Internet for OR

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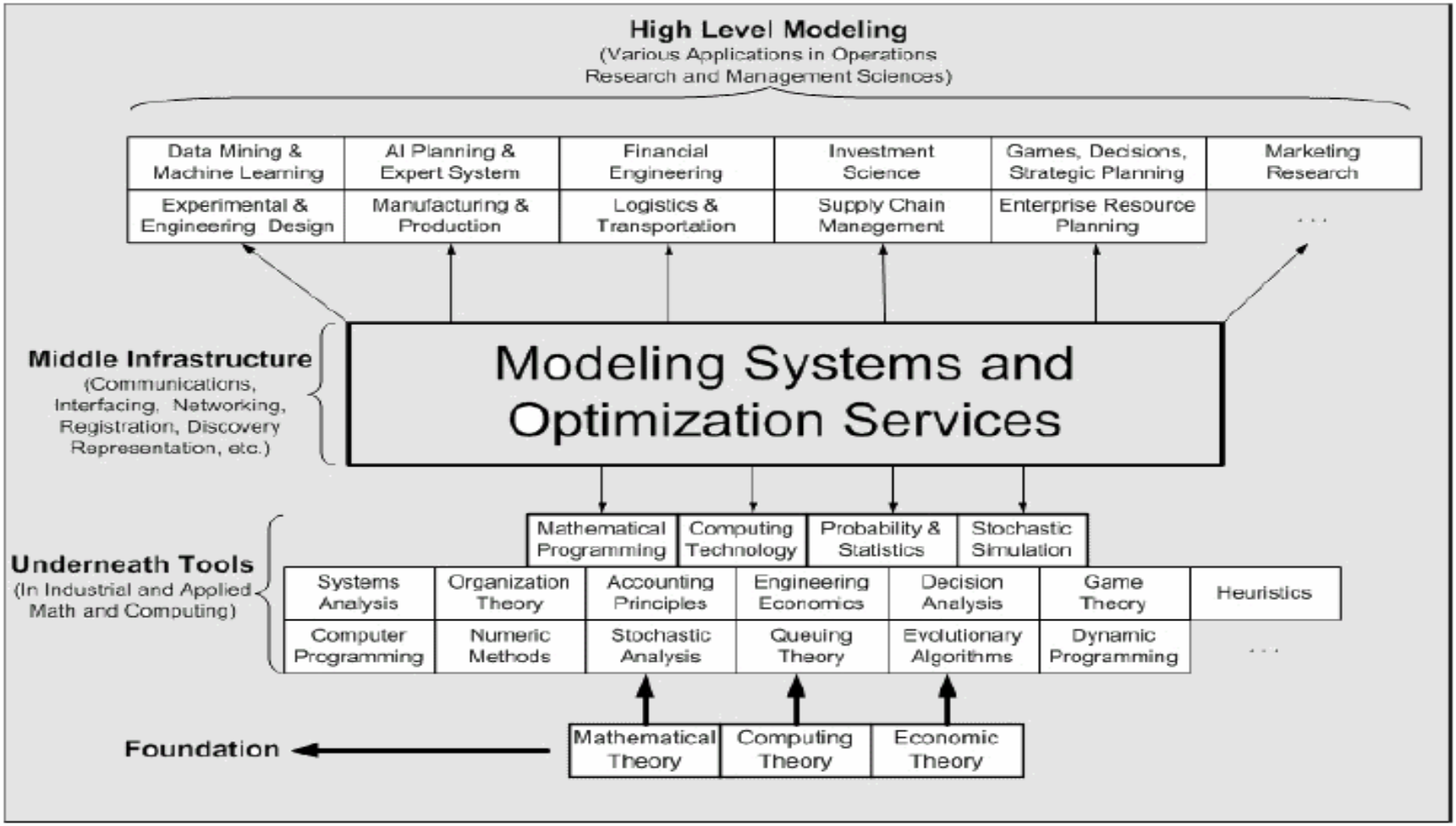
The Positioning of Optimization Services Framework in OR/MS



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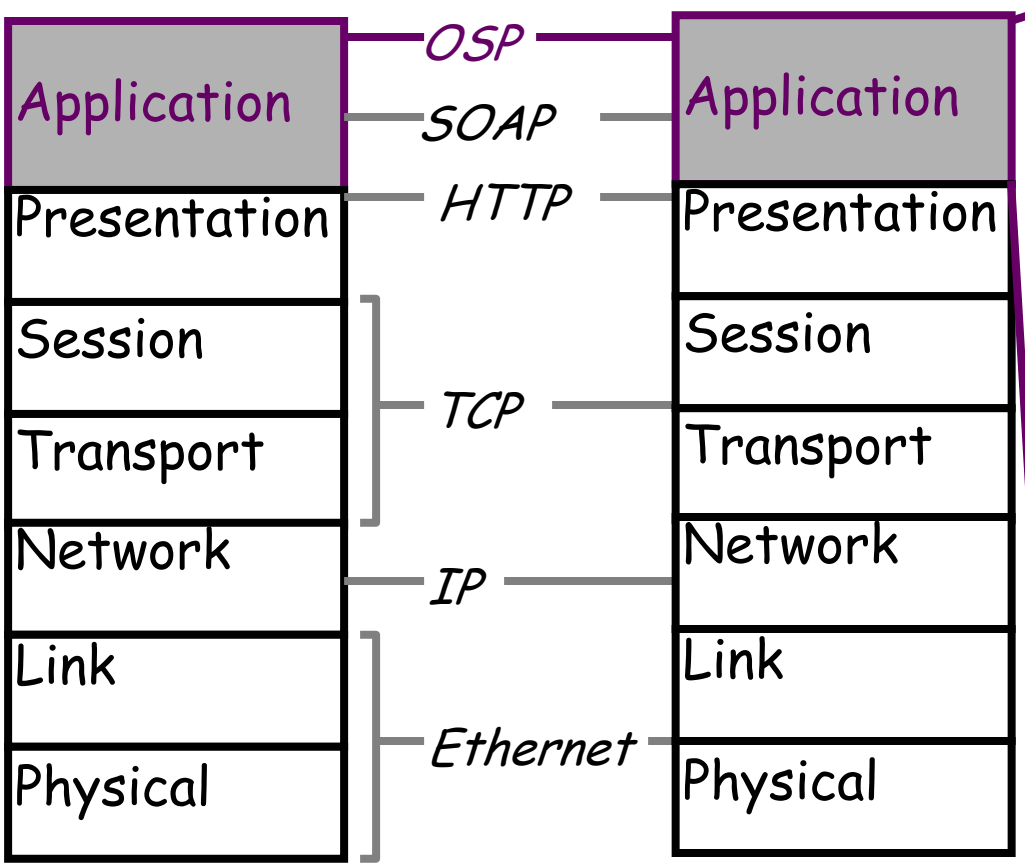
The Positioning of OSP Protocols (OSxL) in Computing



The 7-layer OSI Model

The 4-layer Internet model

```
GET /xt/services/ColorRequest HTTP/1.0
Content Length: 442
Host: localhost
Content-type: text/xml; charset=utf-8
SOAPAction: "/getColor"
```

```
<soap:Envelope>
  <soap:Body>
```

OSP – specifies soap content

Communication Interface Representation

e.g. hook (“<OSiL> … </OSiL>”)

```
  <soap:Body>
</soap:Envelope>
```

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Optimization Services (OS) Framework

- A framework, NOT a system
  - cf. constitution, NOT government/Court System. Only that the framework specifications are written in XML languages (NOT English).
  - But we are in the middle of developing the modeling system according to this framework.
  - We are also building libraries for other people to put up their optimization services.
- Distributed environment (Local environment being just a special Case)
- Service Oriented, Optimization Centered, Decentralized Architecture.
- Optimization Services Components

1. Modeling Language Environment (MLE) (e.g. AMPL, OSmL) -- OSModel
2. Optimization Registries (e.g. The next generation NEOS) – OSRegistry
3. Analyzers/Preprocessors (e.g. Mprobe, Dr. AMPL) -- OSAnalyzer
4. Optimization Solvers (e.g. Lindo) -- OSSolver
5. Simulation (e.g. Finite Element Analysis) -- OSSimulation
6. Communication Software Agent – OSAgent
7. All of the above are communicating in a common language -- OSCommon

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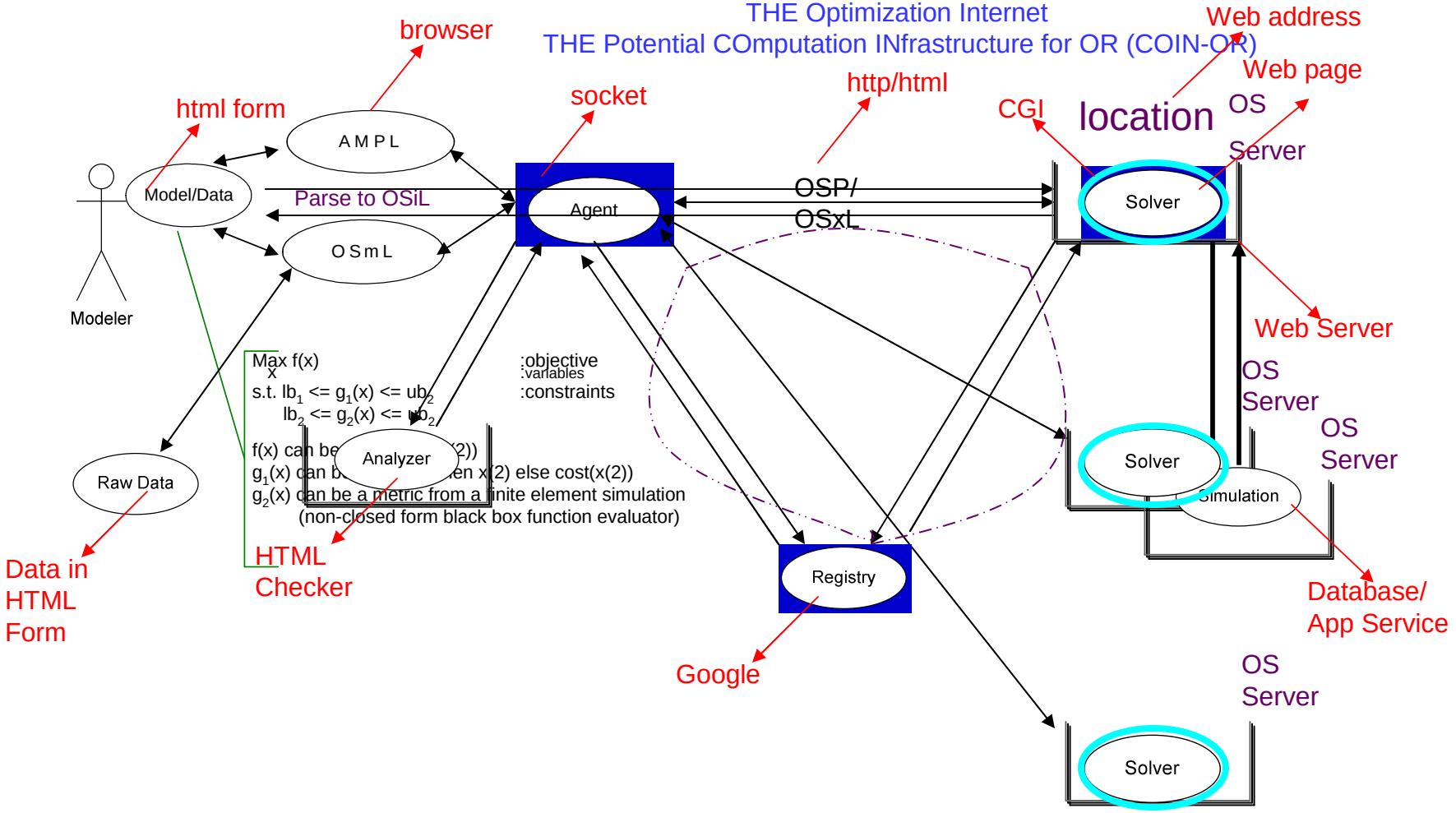
XML-based standard

Optimization Services (OS) Framework

The next generation NEOS – possibly donated to COIN/Apache/Source Forge

THE Optimization Internet

THE Potential COmputation INfrastructure for OR (COIN-OR)



[Standard, Simple, Scalable] => Smooth

- **The General and Universal Framework for Optimization in Local and Distributed Environment.**
- **Combining Optimization with Modern Computing Technologies.**
- **A Next Generation Modeling System as An Internet Resource.**
- **Standardization of Optimization Representation, Communications, Registration, and Discovery**
- **Using Optimization Computing Tools Just Like Daily Utility Services.**

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User Experience

- Open Environment
- Convenience just like Using Utility Services
- No High Computing Power Needed
- No Knowledge in Optimization Algorithms and Software (solvers, options, etc.)
- Better and More Choices of Modeling Languages
- More Solver Choices
- Solve More Types of Problems
- Automatic Optimization Services Discovery
- Decentralized Optimization Services Development and Registration
- More Types of Optimization Services Components Integrated (Analyzers/Preprocessors, Problem Providers, Bench Markers)
- Smooth Flow and Coordination of Various Optimization Services Components.
- A Universal, Scalable and Standard Infrastructure that promotes Collaboration and Other Related Researches
- Concentration on Good Modeling