The Positioning of Optimization Services Framework in OR/MS
The Positioning of OSP Protocols (OSxL) in Computing

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>
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) -- OSAalyzer
  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
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.

Robert Fourer, Jun Ma, Kipp Martin
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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