

# Cyberinfrastructure – the **NEOS** Project

- Turn a jumble of software into a **resource**
  - Target: Large-scale optimization
  - Components: *modeling languages* as well as *solvers*
- Widely disseminate the **resource** via the Web
- Provide related educational tools
  - NEOS Guide
  - LP & NLP Frequently Asked Questions
- **Scale it all up**
  - Centralized scheduler, distributed solvers
  - 2000-3000 submissions/week, peaks over 5000
  - Callable version (the *Kestrel* client)

# Cyberinfrastructure

## – **current NEOS research**

- Standards for problem representation
- Problem analysis and solver choice
- Documented callable interface (API) for the Server
- “Web service” interfaces
- Benchmarking and verification

# Cyberinfrastructure

## – visions for DMII

- *Software* as well as hardware
  - Finding “idle cycles” to run solvers
  - Supporting the whole *modeling life-cycle*  
(building – solving – analyzing – revising)
- Resources for exponentially hard problems
  - Link modeling tools to high-performance computers
  - Devise economic foundations for solver services
- Education & dissemination
  - Online guides, case studies, listings
  - Integration into new courses and fields  
(in science, engineering, business)