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)