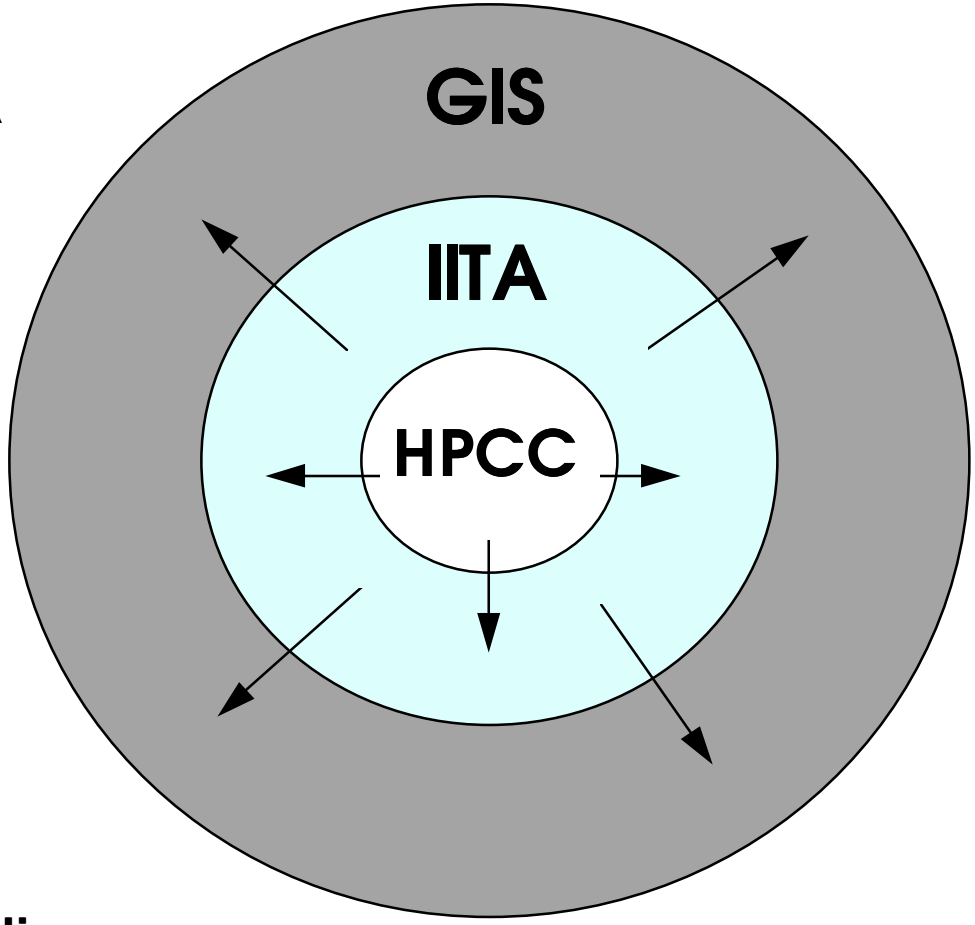
DOE NII Program Layers

NII subsumes HPCC program

Technology flows from the HPCC programs to the IITA and GIS programs.



GIS = Government Information Services

IITA = Information Infrastructure Technology and Applications

HPCC = High Performance Computing and Communications

Overview of Program

- Scope of NII program
  - existing and future HPCC work
  - information infrastructure technology and applications component
  - government information services component
- Focus:
  - DOE mission critical programs
  - DOE outreach activities
  - technology research and development
- Leverages existing infrastructure and HPCC research programs
- DOE's contribution to a multiagency program

Benefits to DOE

- New foundation for departmental openness
- Provides new ways of doing business that:
  - save money and improve capability
  - improve service and visibility to the public
  - makes DOE more responsive to future challenges
- Continues historical leadership in science and technology including critical computing and communications technologies
- Necessary for DOE mission critical applications

Advanced HPCC Program

- Applications driven by core DOE mission areas
  - development of environmentally sound energy sources
  - environmental restoration and monitoring
  - stockpile stewardship & virtual prototyping
  - basic science and technology
- Advanced computational and communications technology research and development
- Access and research centers for HPCC systems
- Methods development for information intensive computing systems
- Testbeds for information infrastructure development
- Participation in multiagency PETAflops initiative

Information Infrastructure Technology and Applications

- Develop technology for base for NII applications
  - information analysis and navigation tools
  - databases and storage environments
  - collaboration and telepresence technologies
  - internetworking and information surety
- Focus on "National Challenge" problems
  - energy demand management
  - environmental monitoring
  - education and outreach
  - medical databases and electronic imaging
  - agile manufacturing and electronic commerce
- Develop NII testbeds linking DOE resources and facilities
- Develop collaborative environments for DOE and industry

Government Information Services

- Targets for DOE information services
  - businesses, hospitals, libraries and schools
  - general public and state and local governments
  - DOE offices and laboratories
- Goals for GIS
  - greater energy efficiency
  - improved environmental quality
  - access to software, data and facilities
  - access to business opportunities
  - better education and training
- Based on distributed internet resources
- Provides DOE's electronic window to the world

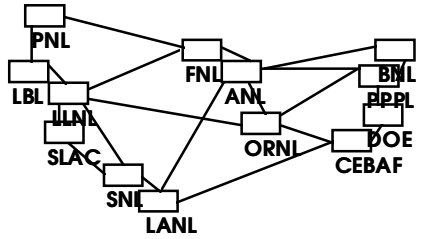
Example Projects

The purpose of the examples are to illustrate the types of programs that would be supported under the NII program

- DOE meta-laboratory system
- DOE internet science education program
- DOE system wide environmental contamination and cleanup databases
- Remote operation and access to DOE facilities
- DOE - Industrial Partner infrastructure linkage

DOE Meta-Laboratory System

NII testbed linking major DOE sites



- Gigabit/s networks
- Shared filesystems
- Shared computing facilities
- Common user simulation environment
- Mechanisms for supporting shared DOE databases
- Distributed collaborative work environments

Creates the foundation for virtual laboratories and ad hoc teaming for problems

DOE Internet Based Science Education Program

- Laboratory/K-12/University partnership
- Provides high-quality interactive science programs/courses
- Supports mentoring by real scientists
- Integrated with existing DOE educational programs
- Available to all via the internet
- Supports multiple types of programming and media

Environmental Databases

- Open databases of DOE sites and environmental status
- Provides public access to modeling and analysis environments and data
- Acts as a model for other agencies
- Integrated with DOE public communications
- Provides multiple levels of interpretation to public and business
- Can be used in education
- Supports DOE science programs and public outreach

On-line Facilities

Makes DOE's unique large-scalefacilities more accessable and valuable by putting them on-line

- Supports remote operation and telepresence
- Facilitates private use of DOE resources via Internet networks
- Educational use of DOE facilities
- Includes: X-ray sources, microscopes, accelerators, neutron sources, databases, etc.

Provides a way to embed DOE infrastructure in to the industrial and educational infrastructures

DOE-Industrial Partner Linkage

Creating strong infrastructure connections between DOE laboratories and industrial partners

- Distributed collaborative work environments
- Common user simulation environment
- Mechanisms for supporting sharing databases
- Gigabit/s networks
- Shared filesystems
- Shared computing facilities

Creates the foundation for DOE-Industry teaming for advanced industrial problem solving

Funding Requirements

	HPCC	IITA	GIS	Total
FY95	$124	$0	$0	$124
FY96	$150	$50	$5	$205
FY97	$165	$75	$15	$255
FY98	$175	$100	$30	$305
FY99	$185	$120	$60	$365
FY00	$200	$130	$120	$450
Total	$999	$475	$230	$1,704

Conclusions

- DOE NII program will be an instrument of change
- NII can revolutionize DOE's internal processes and DOE's external image
- NII provides a mechanism for government services integration
- NII supports DOE openness and access to information and resources
- NII is critical for the success of DOE's overall mission

Next Steps

- Plan a coordinated DOE wide starting in FY96
- Pursue startup projects with existing funds FY94
- Purse supplemental funds for FY95
- Develop an aggressive Multiyear DOE program for NII technology development and deployment FY96 and beyond
- Coordinate the DOE effort with other federal agencies