Enhancement of Computational Sciences and Engineering

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High Performance Computing Day
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Imperatives

• Vision 2020
  – Texas A&M University strives to be recognized as one of the ten best public universities in the nation by the year 2020; this requires cyberinfrastructure support

• National Dialogue:
  – Impact of Information Technology on the Future of the Comprehensive Research University
Hardware Infrastructure

• Data Acquisition Equipment
• Networks and Routing: LEARN and Texas GENI
• High Performance Computing
• Mass Storage Silos
• Immersive Visualization
Development of New Knowledge from Information

Acquire/Generate → Transmit → Process

Steer/Modify ← Visualize ← Store/Retrieve
Facilities–based Regional Optical Networks
Office of the Vice President for Research
Texas A&M University

Hydra and x86 Clusters
Capability/Capacity Computing
Visualization
Development of New Knowledge from Information

- Acquire/Generate
- Transmit
- Process
- Steer/Modify
- Visualize
- Store/Retrieve

Interrogate
Vision of Advanced Data Center

An Integrated Platform for Scientific Computing Data Center Management
Enables Basic and Translational Research

- Biotech, Functional Genomics, Proteomics
- Global Climate/Ocean Modeling
- Petroleum Exploration and Production
- Materials Sciences – Nanotechnologies
- Aerospace and Astrophysics Applications
- Health and Environmental Applications
- Distributed Real-Time Design
- Information Science
Information Science Research

- Digital Library Research
- Data Fusion/Metadata
- Data Interrogation
- Data Security
- Multimedia
- Informatics
Computational Sciences and Engineering Taskforce

• Interdisciplinary Task Force
  – Assess needs and directions for scientific computing
    • Hardware, Software, and User Support
  – Identify potential start-up clusters
  – Evaluate matching grant proposals
  – Assist in developing large cyberinfrastructure proposals
  – Evaluate internal research proposals – seed money
  – Advocate HPC growth and community support

• Administration funds to support user needs