Prototyping an Earth System Grid

A Department of Energy -- Office of Science
Next Generation Internet
Application, Network Technology, and
Network Testbed Partnership

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Overview

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Context: The Accelerated Climate Prediction Initiative (SSI)

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Why Climate Change Presents a Networking Problem

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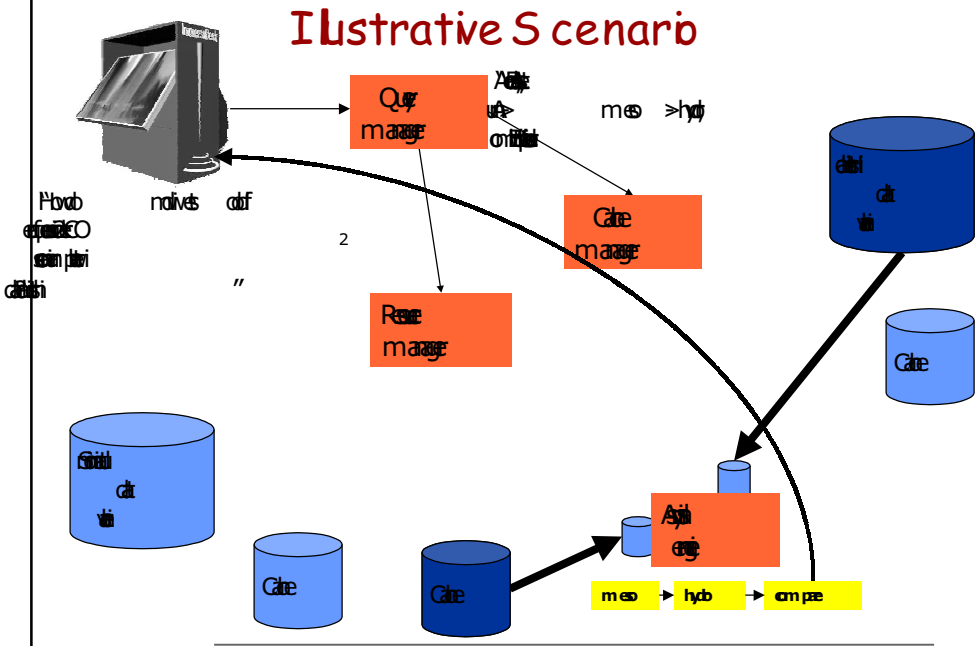
Requirements: Summary

Approach: Earth System Grid

- QoS .

Illustrative Scenario



Approach

- Cost
- Dep
  - Remedi
- Learning

Earth System Grid Architecture

Building Blocks Include

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Project Goals: Year 1

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Project Goals: Year 2

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Project Goals: Year 3

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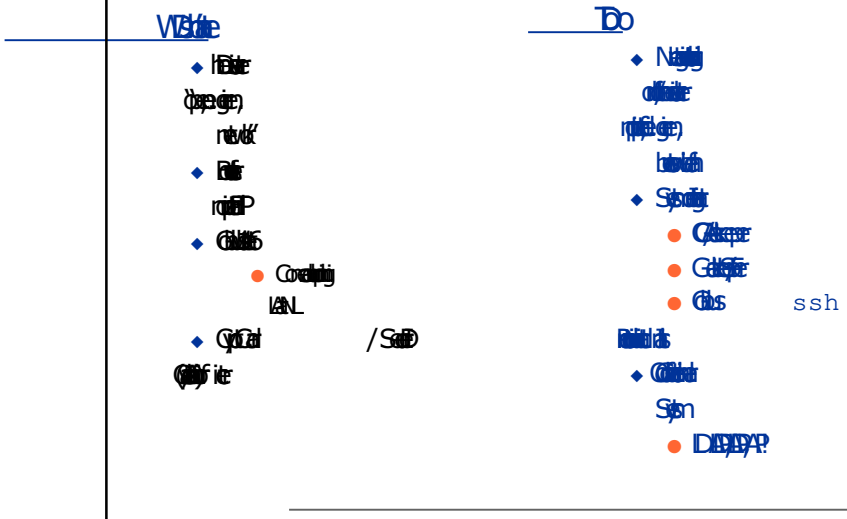
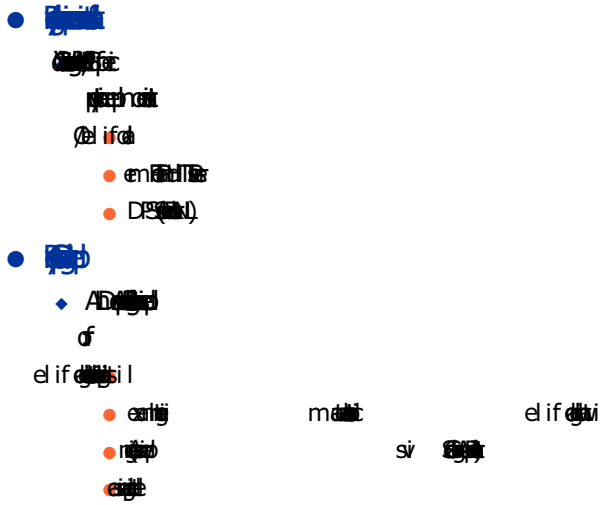
Earth System Grid Progress-Bulk data xfer LANL to NCAR



ANL, LANL, LBNL, LBNL, NCAR, USC/ISI, Wisc.

Earth System Grid Progress



ANL, LANL, LBNL, LBNL, NCAR, USC/ISI, Wisc.

Earth System Grid Progress

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Earth System Grid Progress

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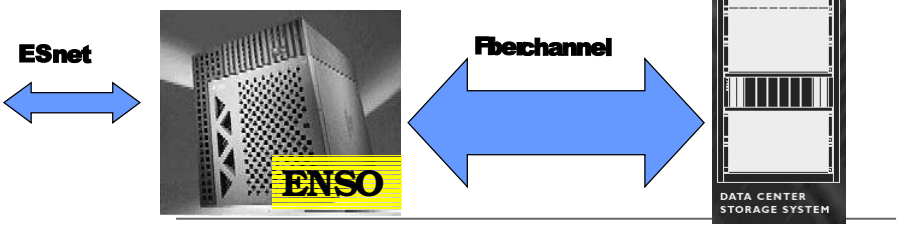
PCM DI data cache to serve the diagnostic community

PERFORMANCE/CAPACITY:
Maximum I/O rate (burst I/O per sec.) 30,800
Maximum I/O rate (sustained I/O per sec.) 12,000
Maximum transfer rate (MB/sec.) 154.36
Number of drives 40 - 100
50 GB drives 7,200 rpm drives 3.0 TB - 5.0

4 processor Sun Enterprise 450



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Earth System Grid Progress

- OpenDAP
- OpenDAP
- OpenDAP
- OpenDAP

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Earth System Grid Progress

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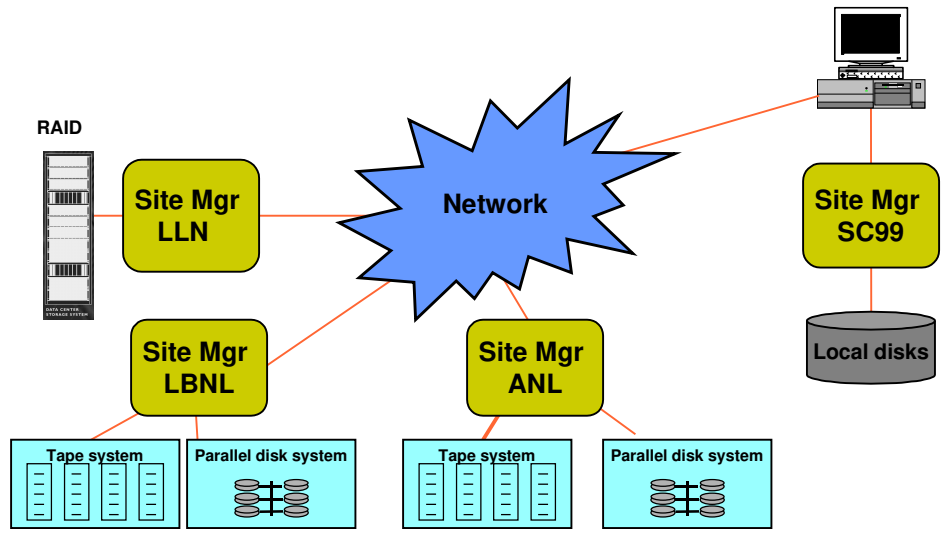
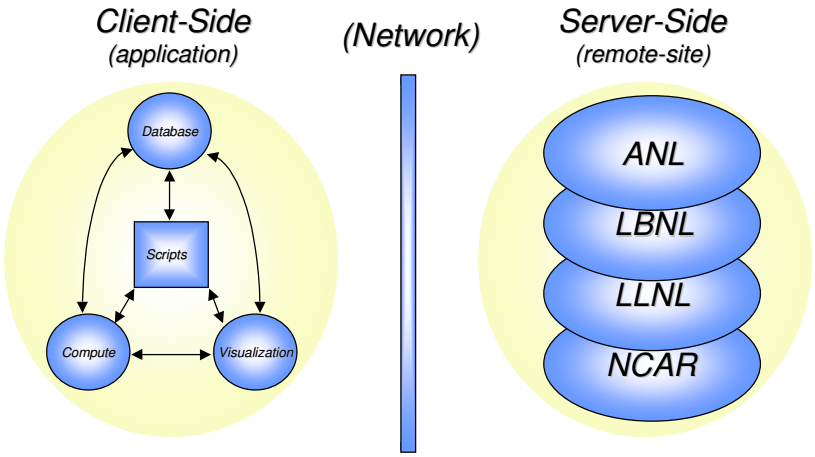
Supercomputing 99 Demo



Distributed Databases - Inquire & Ingest Data



Other Issues

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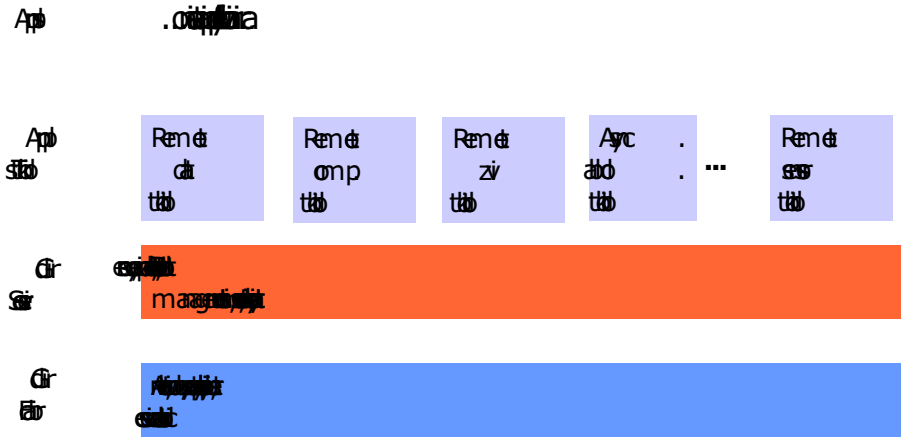
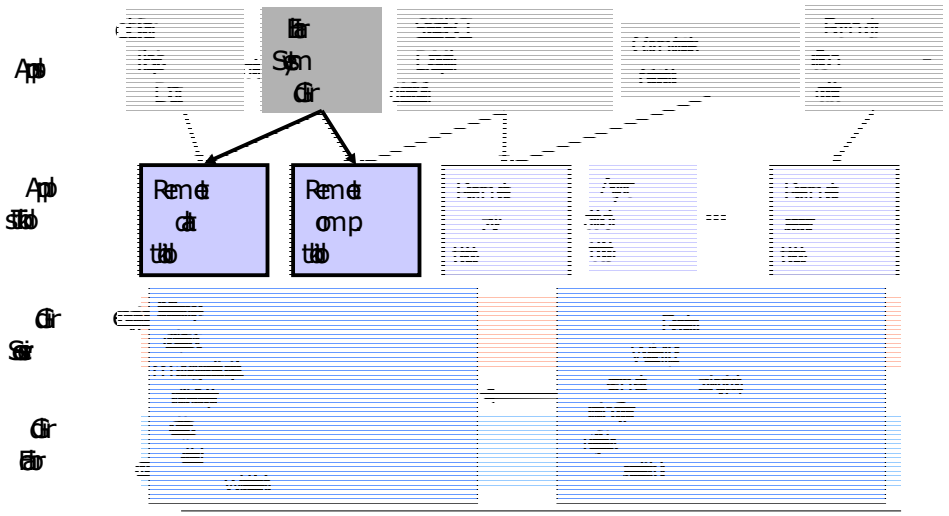
Other Issues, cont

- Requirements
  - Security management
  - Grid Information Services
    NCAR
- Tools and Services
  - Grid Information Services
    "new" and "old"
    UCE

DOE's NGI Program: Building An Integrated Grid Architecture



The Earth System Grid and DOE's SciDAC Program



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Summary

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