

Data Proliferation: STOP THAT

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Preface

- This presentation *Data Proliferation, STOP THAT* was prepared for the THIC Technical Symposium, Theme: *Towards PetaByte Archives* Boulder, Colorado; 11-12 June 2002.
- The authors wish to thank THIC for providing a forum where technical ideas can be exchanged.

Why are PetaBytes of Storage Needed?

- The Information Age (Data Explosion)
 - Internet Access Speed Improvements
 - DSL / T1 / Cable Modem
 - Personal Storage Affordable
 - Hard Drive = 80 GByte, 8 msec access, \$105
 - Enterprise Structures Access Data Faster
 - Storage Area Networks (SAN)
 - Full-Fabric Fibre-Channel, 2-GBytes/sec

Performance Improvement Ideas

- **Technology vs. Discipline**
- **Reduce Data Movement**
- **Improve MetaData Structures**
- **Improve File Transfer Structures**

Technology vs. Discipline

- Technology

- Storage

- More Density
- Faster Access
- Affordable

- Networks

- Modern Architecture
- Faster Access

- Discipline

- File Management

- Minimize Replication

- Personal

- Trust in the Process
- Move Only What You Need

Reduce Data Movement

- **Install “processing applications” where the data resides and “display results” (remote processing).**
 - **Applications need to better utilize technology (smarter applications software).**
 - **Don’t move it / Use it.**

Improved MetaData Structures

- MetaData need not only describe “envelope information”.
 - **Recognize file size, provide a file index to desired portion of file, by size (file partition; e.g., 1/10, 1/20, 1/50, etc.).**
 - **Recognize file content, provide a file index to desired portion of file, by content.**

Improved File Transfer Structures

- **Permit user to start using “first data” prior to “end of file marker”.**
 - **Recognize file size, smartly subdivide file into smaller files.**
- **Incorporate “loss less data compression” techniques during file transfer.**
 - **Storage access speed and processing speed are now faster than network speed, compress and un-compress as part of the file transfer process.**

Summary

- Storage technology alone is not the solution.
- Applications must better utilize modern technology.
- Reduction of data movement is needed.
- Improved metadata structures are needed.
- Improved file storage/transfer structures are needed.
- User education/discipline is needed.