

Taking Command of Skyrocketing Growth

Bryan Pretre
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Orbital



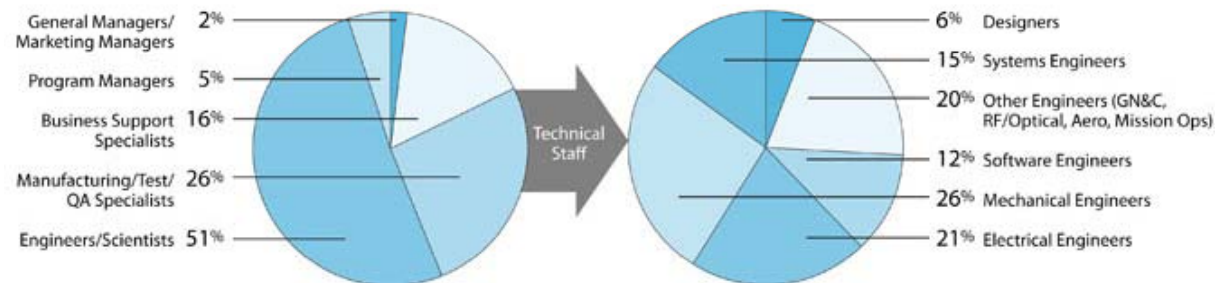
Agenda



Company Overview

- Leading developer and manufacturer of smaller satellites and launch vehicles
- About 900 satellites and launch vehicles built since 1982
- 3,500 employees and 1.35M ft² of state-of-the-art facilities
- Revenues of \$1.17 billion in 2008, aiming for ~10% annual long-term growth

3,500 Employees with 1,760 Engineers/Scientists
(as of November 1, 2009)



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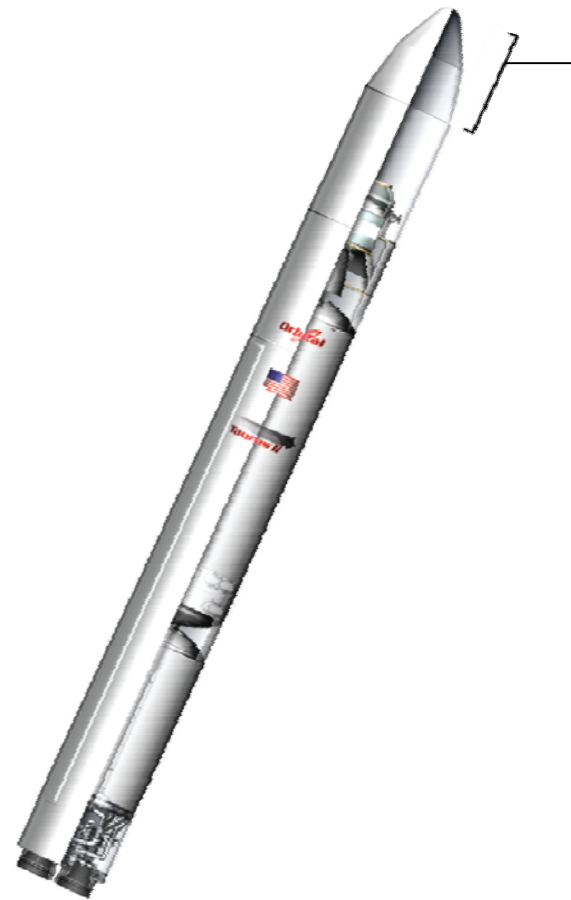


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How Our Business Affects Retention of Data



Users and applications

- 3,500 employees
- Four business groups
- Major operations in VA, AZ, MD, CA

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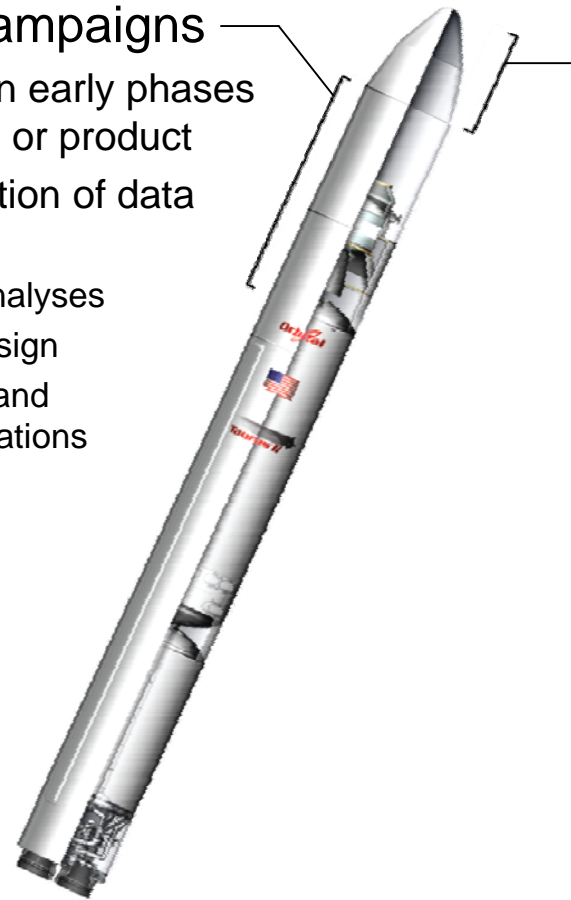
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How Our Business Affects Retention of Data

Projects and campaigns

- Rapid ramp up in early phases of a new service or product
- Large accumulation of data from:
 - Computation analyses
 - Engineering design
 - Thermal, flight and structural simulations



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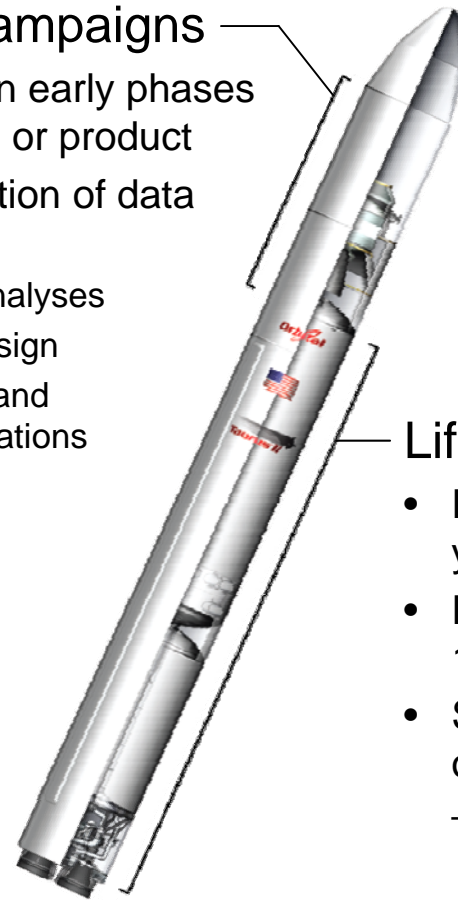
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Lifecycles of our products

- Products can take two or more years to develop
- Production cycles can extend to 15 or more years
- Subsequent products often based on prior designs
 - Can result in wholesale duplication of data for new program

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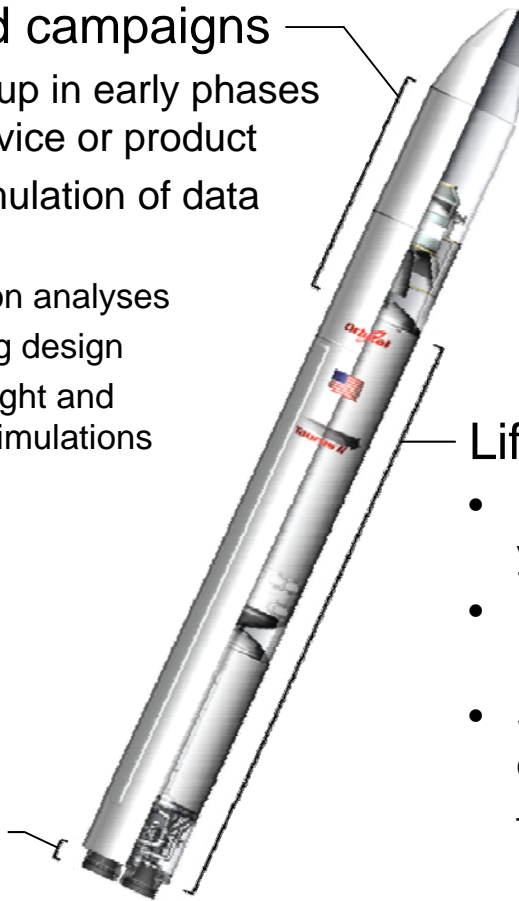
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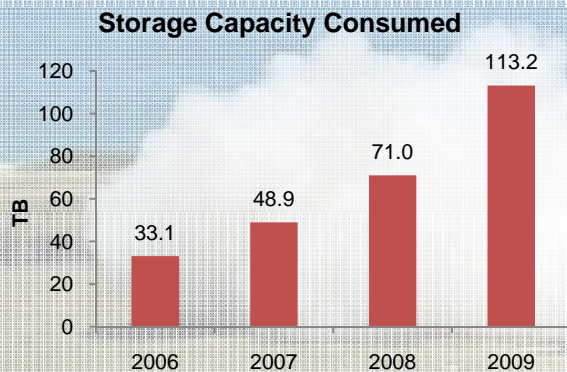
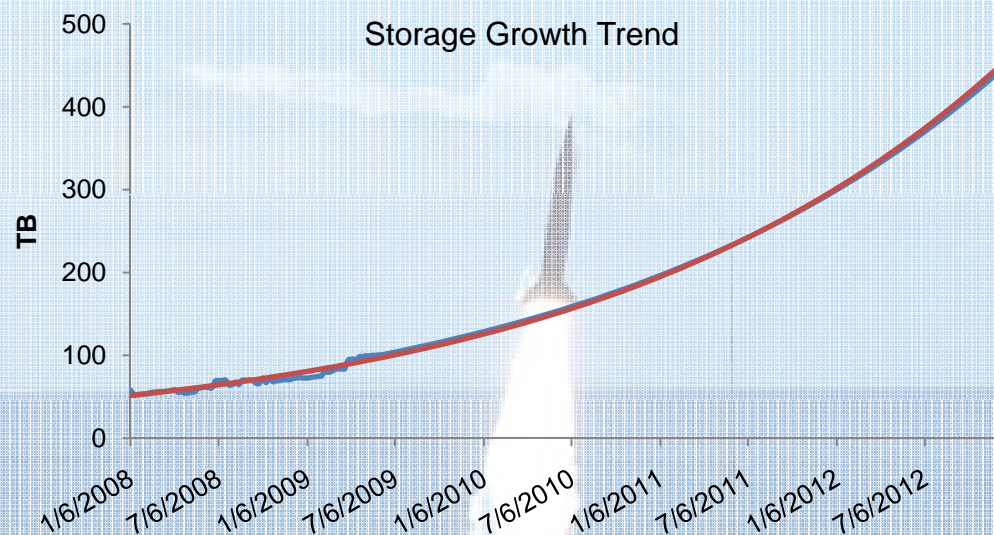
60% annual data growth





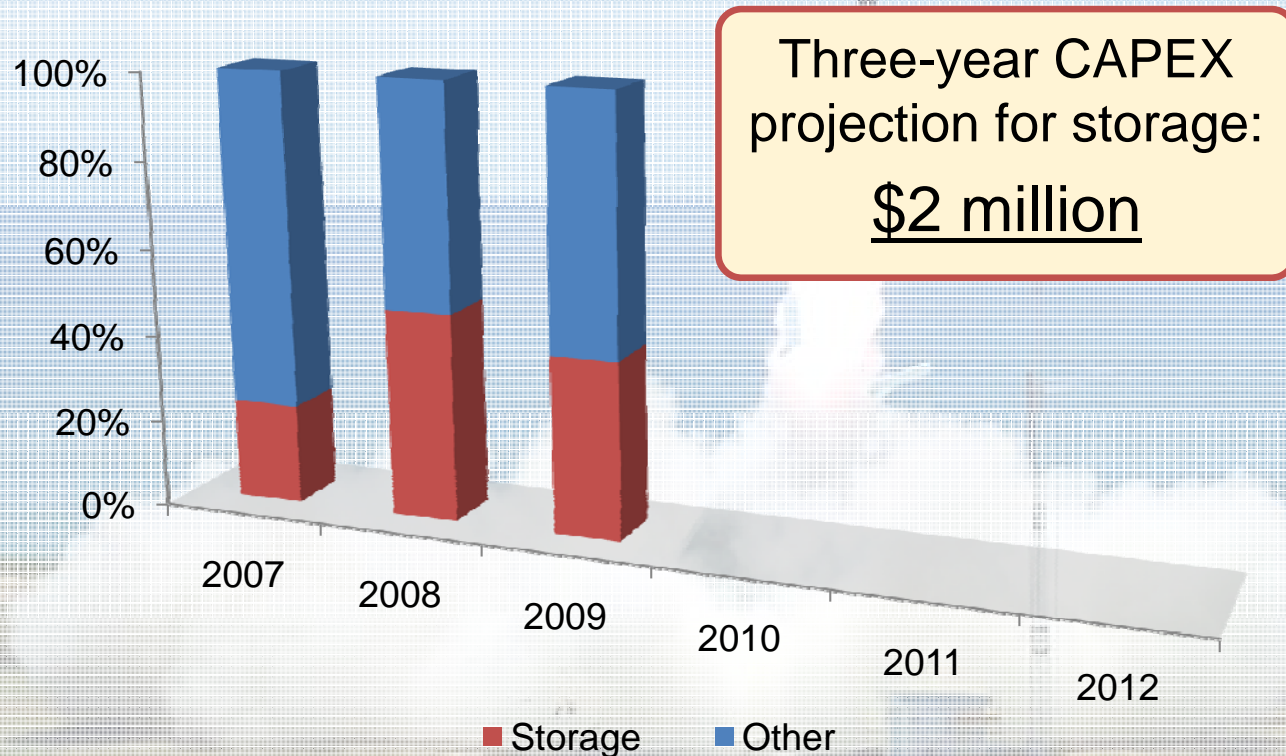
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Skyrocketing Storage Growth



Increasing Storage Costs

- Increasing costs for storage are a significant part of our capital expenditure (CAPEX) budgets:





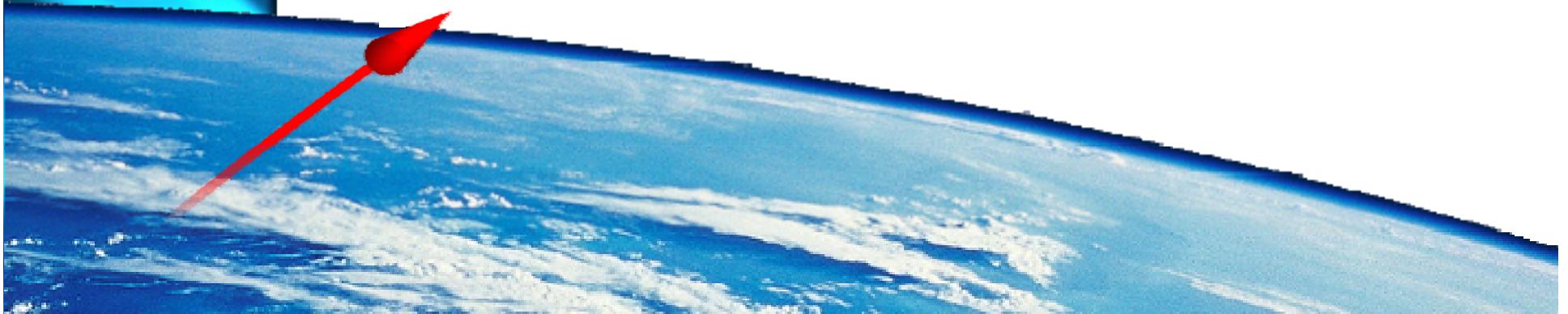
Other Challenges

- Data classification relies on a broad understanding of our intellectual property
 - Usage characteristics
 - Legal and regulatory (SEC- and government-driven)
 - Line of Business (program- or contract-driven)
 - Business Impact Analysis (internally-driven by multiple expectations)
- Backup strategy and ability to scale
 - Backup windows impacted by amount and co-location of unchanged data
 - Disk- vs. tape-based backups
 - “Contamination” of data and consequences to backup and recovery
- Volume size limitations
 - Impact on presentation of file structures
 - Deduplication of large volumes
- DR capabilities
 - RTOs when critical and non-critical data are co-located on recovery media
 - Fiscal impact to approach recovery without considering data criticality



Creating a Smarter Strategy

1. Don't focus on what you can't control
 - Data will grow as the business grows
 - Look for solutions that help you manage that data growth flexibly and cost-effectively



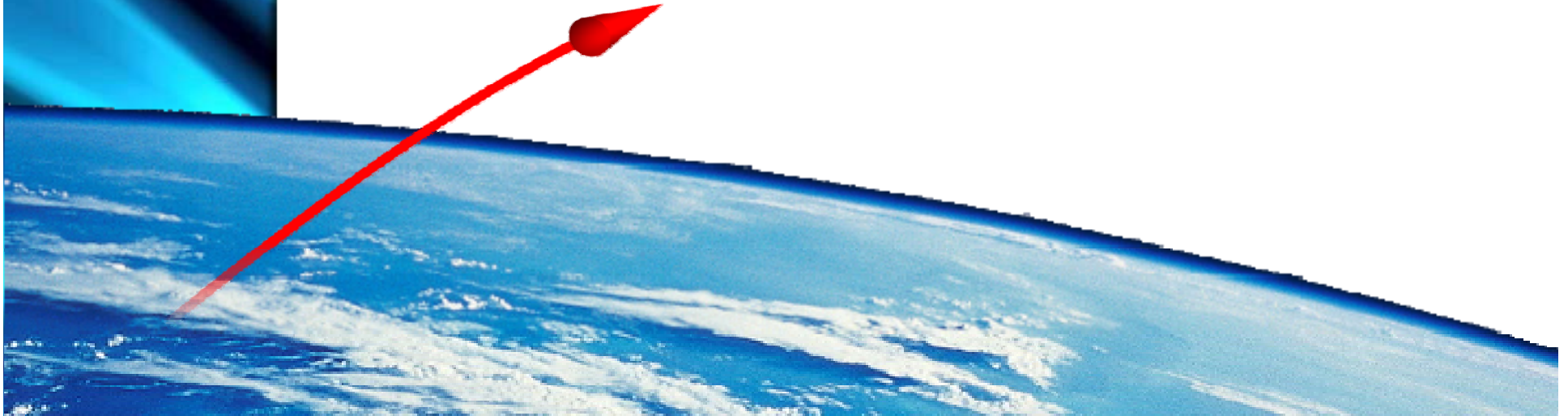


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Creating a Smarter Strategy

2. Virtualization enables data mobility

- Ability to move file data without disruption makes it easier to respond to changing storage requirements
- Aggregating multiple physical volumes provides relief from volume size limitations





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Creating a Smarter Strategy

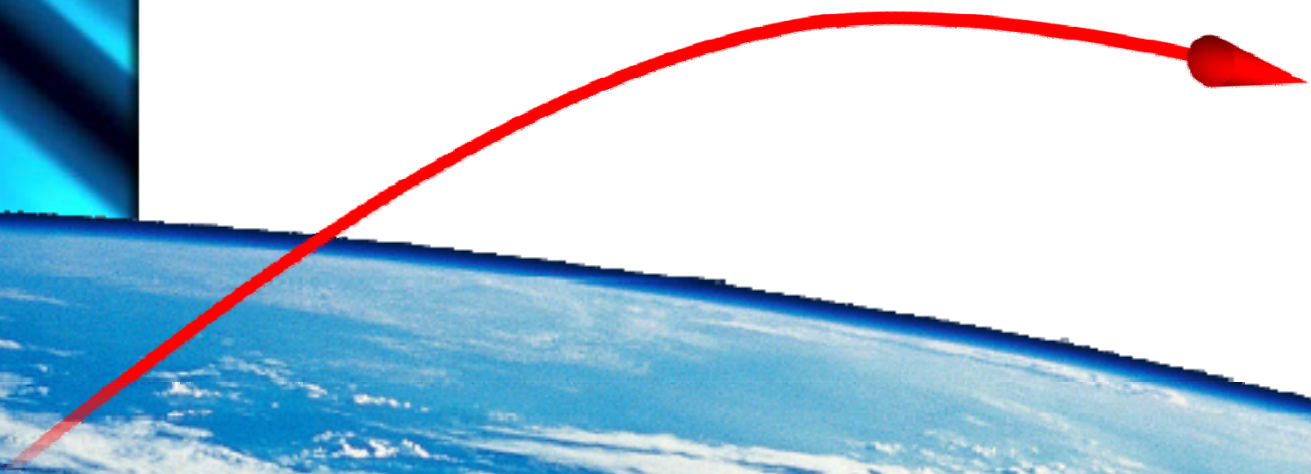
3. Understand your data and how changes
 - Classify file data based on business value
 - Determine performance requirements for different data classes
 - Understand criticality of each data class for backup and recovery





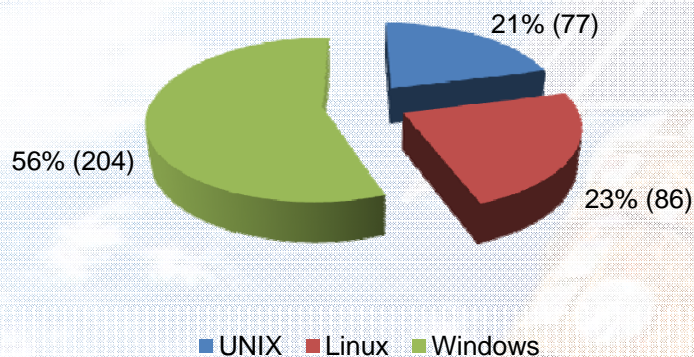
Creating a Smarter Strategy

4. Match data to storage and backup processes
 - Determine the most appropriate tier of storage for each data class
 - Policy-based management to automatically identify and move files between tiers as appropriate
 - Establish backup processes that reflect criticality of data on each tier

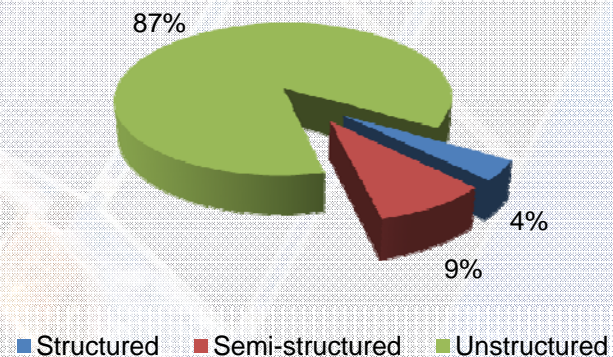


Understanding Our Data

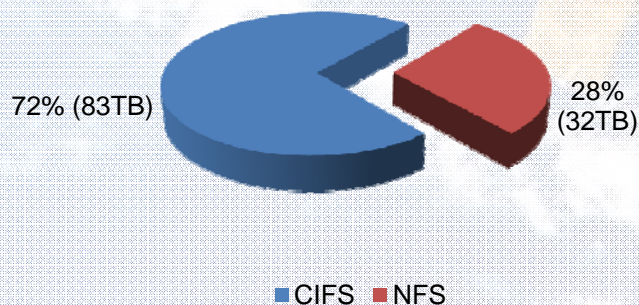
Server and HPC Platforms



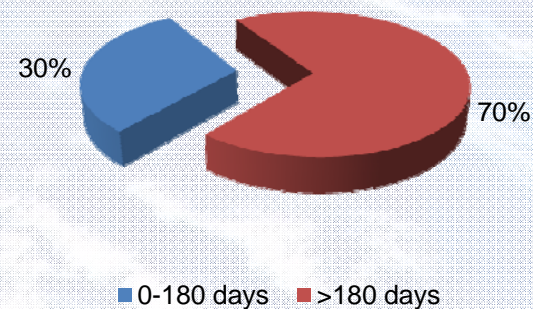
Data by Type





File Data by Type
 (115TB total utilized)



File Aging
 (88,567,468 total files)







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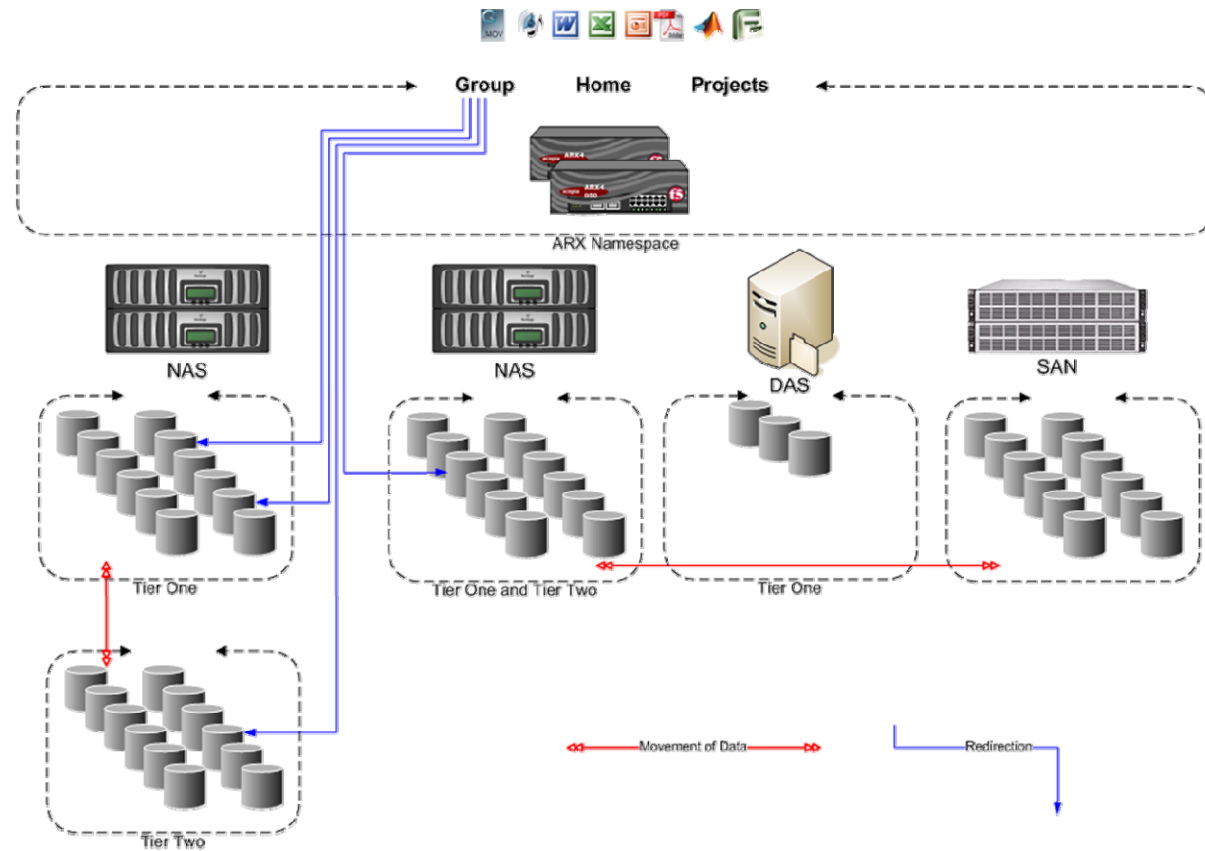
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Technology Environment



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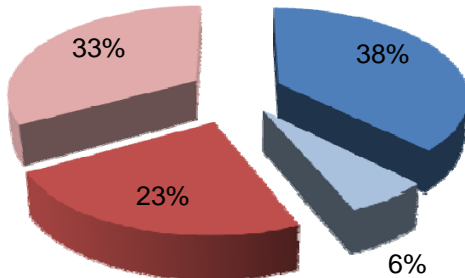
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Impact of Storage Tiering

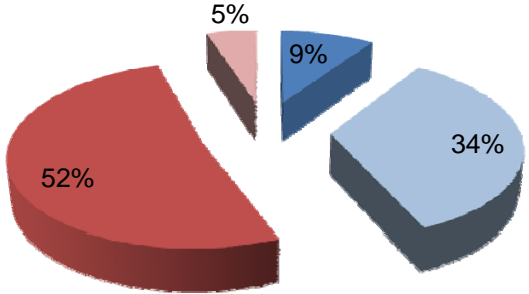
Pre Migration Distribution



■ Tier 1 used ■ Tier 1 available
■ Tier 2 used ■ Tier 2 available

| Pre Migration | | |
|------------------|-----------------|-------|
| Tier 1 used | 69.80 TB | 38.5% |
| Tier 1 available | 11.30 TB | 5.8% |
| Tier 2 used | 43.30 TB | 22.0% |
| Tier 2 available | 61.50 TB | 33.7% |

Anticipated Post Migration Distribution

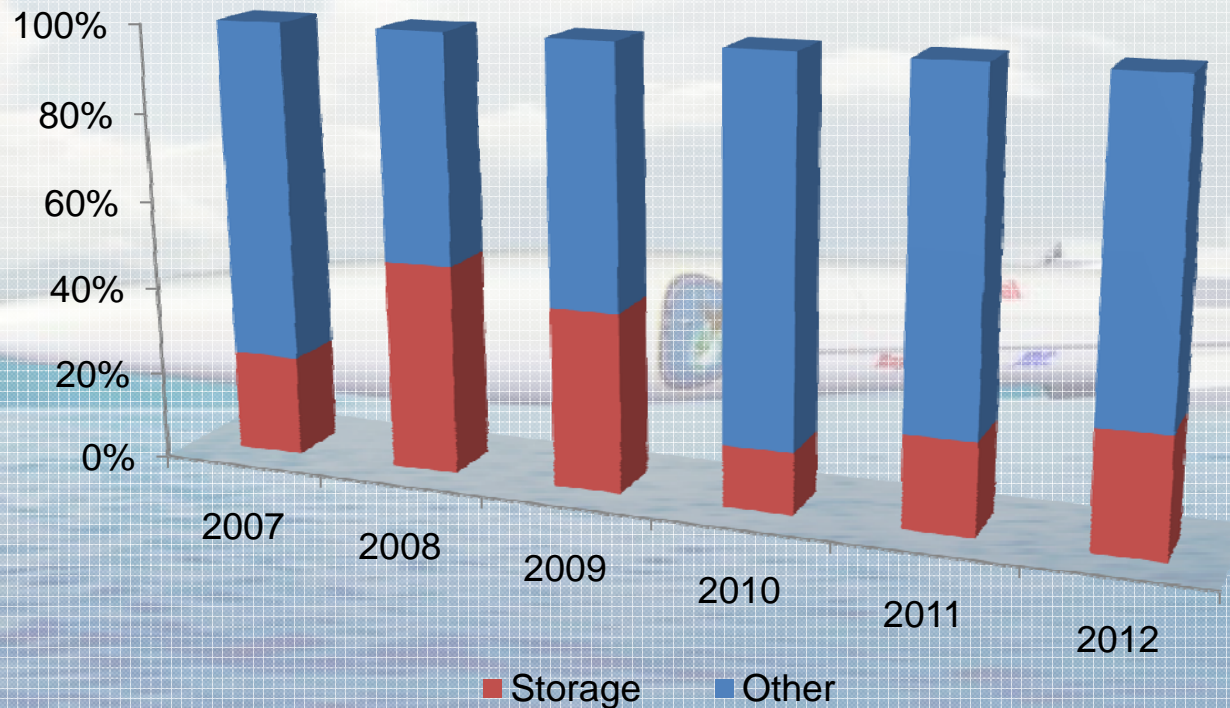


■ Tier 1 used ■ Tier 1 available
■ Tier 2 used ■ Tier 2 available

| Post Migration | | |
|------------------|-----------------|-------|
| Tier 1 used | 17.45 TB | 9.6% |
| Tier 1 available | 63.65 TB | 34.6% |
| Tier 2 used | 95.65 TB | 50.9% |
| Tier 2 available | 9.15 TB | 4.9% |

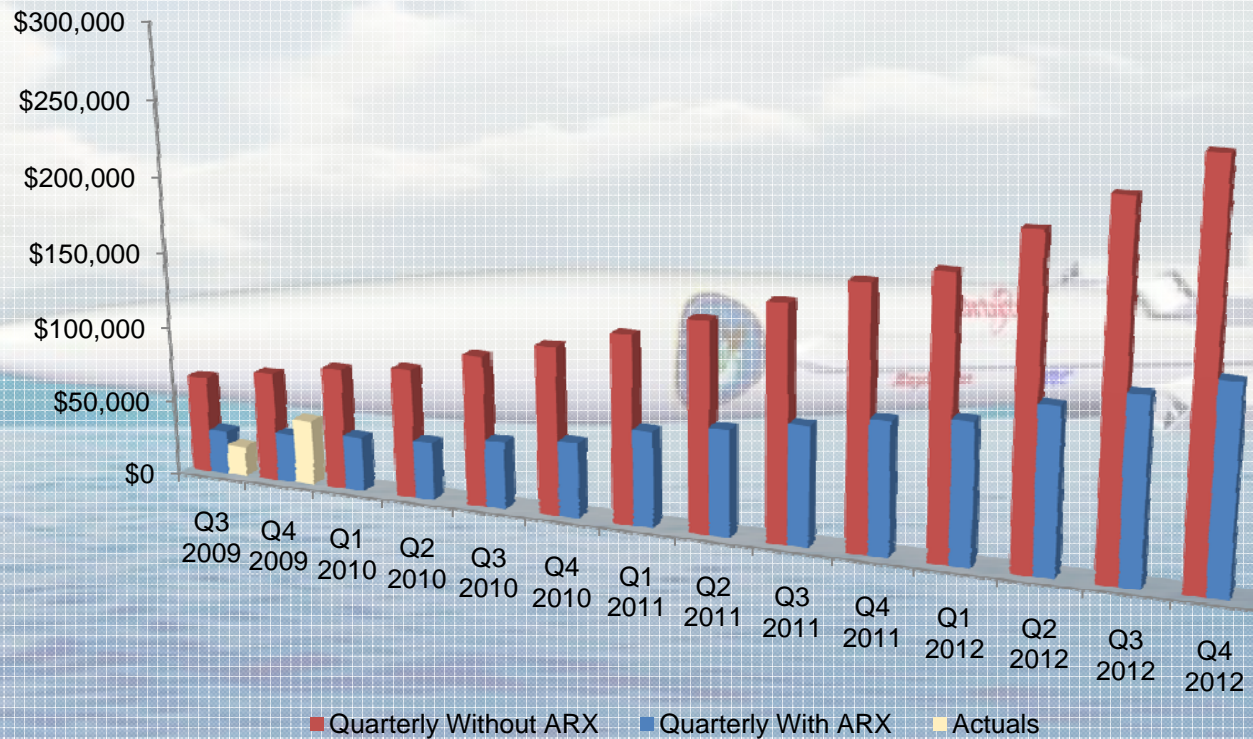
Tier 1 Avoidance

- Reduced the storage contribution to our CAPEX budgets with a three-year avoidance of Tier 1 capacity purchases:



Projected Cost Savings

- Overall reduction in total spend in storage
- Projected quarterly disk spend before and after ARX:



Other Benefits

- Less downtime:
 - Movement of data can be done transparently during business hours
 - On-demand volume / aggregate management
- Relief from the impact of volume size limitations:
 - Ability to sustain a consistent presentation to users
 - Volume size limitations of de-duplication
- Optimized backup and recovery:
 - Backup windows:
 - Less Tier 1 data is backed up daily/weekly
 - Tier 2 data backed up only periodically to refresh offsite copies
 - Can make disk-based backup and recovery more practical, relying on tape for longer RTO's
 - DR capabilities:
 - Can focus immediate recovery efforts on Tier 1
 - Contamination:
 - Backup sets more granular and loss of tapes less detrimental



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Looking Ahead

- Refine and expand tiering policies
 - Measure impact of tiering on user access and adjust if necessary
 - Expand tiering policies beyond file age:
 - For example – move all PST files to separate volumes to simplify e-discovery
- Virtual snapshots
 - Coordinates scheduling of multiple physical snapshots provided by storage devices
 - Aggregates physical snapshots to match virtual namespace
 - Allows users to more easily self-restore files
- Other



Thank You