

NETWORLD+INTEROP

NETWORK STORAGE DAY 2004



Budget Cuts
Data Growth
Staffing & Training
Technology Change
Strategic Direction
Lack of Standards
Tactical Requirements
Proprietary Lock-In

**ADDRESSING
THE
STORAGE
SCHISM**

Slow Economy
Downsizing
Build or Buy
Cost-Cutting
Regulatory Compliance
Financial Performance
Supply Chain Issues
Revenue Growth

Prometheus **Midas**

**IS THERE ANY
HOPE OF ALIGNING
STORAGE TECHNOLOGY SPENDING
WITH BUSINESS OBJECTIVES?**

**N+I
2004**

**Opening Keynote
Presented by
Kevin Daly, CEO
Avamar Technologies**



NETWORLD+INTEROP

NETWORK STORAGE DAY 2004



Aligning Storage Technology with Business Objectives

Kevin C. Daly
CEO
Avamar Technologies



According to UC Berkeley SIMS

- We create 5,500PB of new information annually
 - » 2,000PB (37%) on hard disk
- The Internet represents an information flow of 500PB annually – all of it digital
- The telephone represents an information flow of 17,300PB annually – mostly analog, but rapidly becoming digital
- (... and, I would add) Internal data networks (LANs & SANs) represent an information flow of 400,000PB annually



But ...

- We have 40,000PB of disk
 - » 10,000PB (25%) in shared environments
- We are consuming an additional 20,000PB of disk annually
- Most organizations have far more (5x-10x) data on tape than they have on disk

Why do we have so much data?



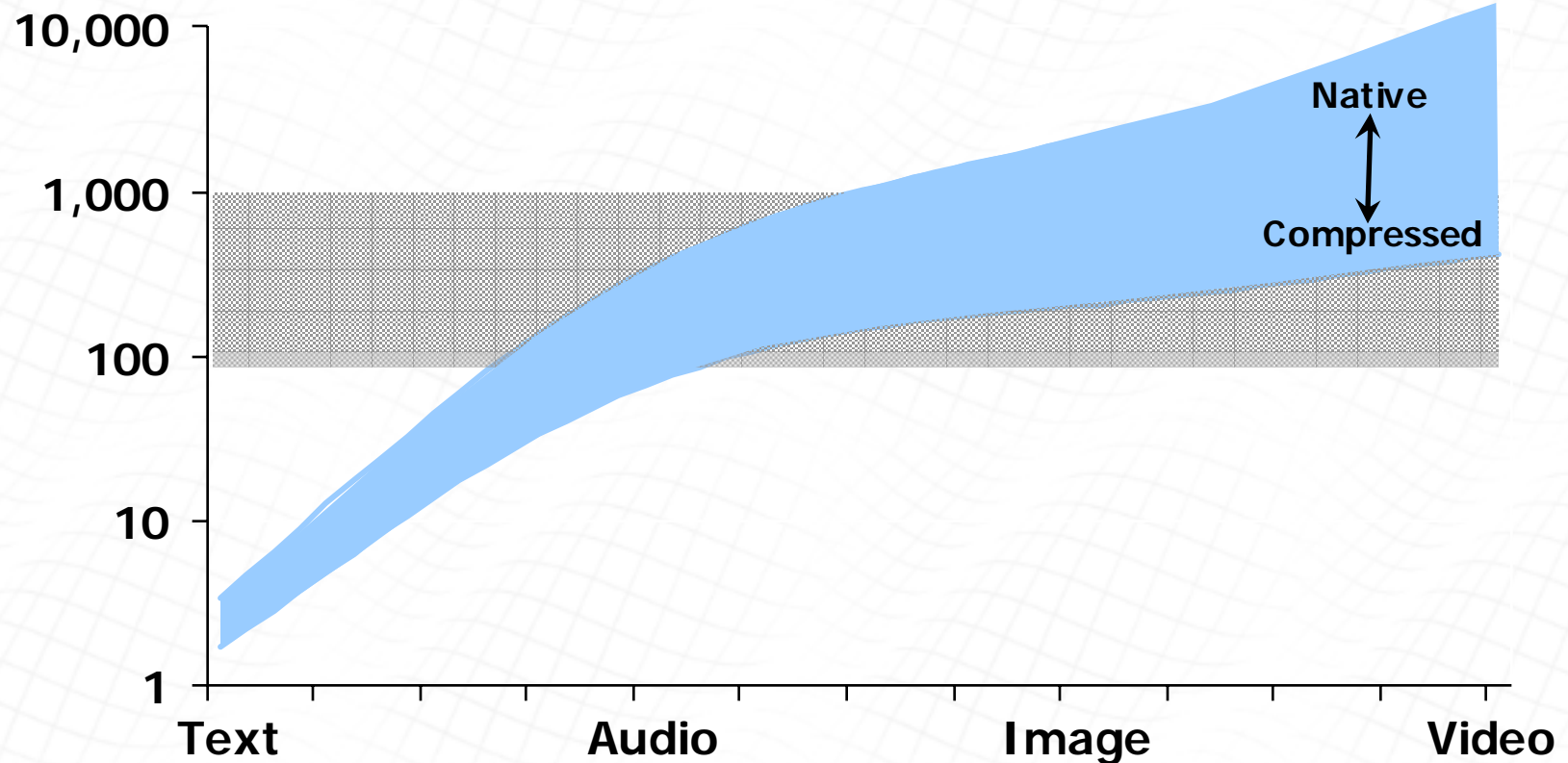
The Data Glut

- We (humans) prefer information-poor data representations
- We (IT Professionals) make matters worse to make our lives *easier*
- As a result
 - » The Information Density of data at rest is low: $\ll 10\%$
 - » The Information Density of data flows is even lower: $\ll 1\%$
- *However:* it's information, not data, that's valuable
- *Although:* the vast majority of all data we *manage* – and *pay for* – bears very little information



The Inexorable Trend of Data Inflation

Data Inflation (bit/bit)





Economic Realities – Each GB of Storage

- Disk \$ 2 - \$ 10
- Storage System \$ 20 - \$ 50
- Annual TCO \$200 - \$500
(Protection \$ 60 - \$120)
- WAN Transfer \$ 10 - \$ 20 *[each time]*

- The median storage under management
 - Mid-Tier Enterprise: 1,000-2,000 GB
 - Large Enterprise: ~50,000 GB



Today's Business Considerations

- Typical IT spending 2%-3% of revenue
 - » Storage 30%-50% of total IT spending
- Pressure on G&A spending
- Several years of deferred capital investments
- Early in a recovery period, capital additions represent a lower risk than staff additions



New Considerations

- IT productivity benefits are becoming evident (even to the economists)
- Critical data has diffused from the data center
 - » 30% of critical data is *out there*
- Data loss events are no longer inconceivable
- WAN bandwidth costs are declining ... but they are still high
- New service provider models are emerging
- ... and then there's compliance



IT Trends (A Contrarian View)

- ATA, sATA – now everyone can acquire more storage than they can possibly manage
- iSCSI – no SAN is an island, or even a fort for that matter
- WAN bandwidth costs are decreasing – but they are still 100x LAN costs
- Compliance
 - » (a) Everything can be digital
 - » (b) If it is digital you must be able to produce it
 - » (c) If in doubt – see (a)



What This Means for Storage

- Capital investment levels are increasing
 - » 63% plan increased spending in 2004
- Spending on disk systems, in particular, will increase
 - » Higher primary storage utilization rates
 - » Disk-based data protection
 - » Fixed content
 - » Compliance
- Staffing levels are very vulnerable
- Storage management tools are attractive in concept, but have been disappointing in practice



Caution

Keep that damn horse out of here.

(Rough Translation)
Laocoon & Cassandra

- Low acquisition costs often mask high ownership costs
- Efficiency is important – *brute force* solutions are getting too expensive
- Effective operation requires discipline – not just management
- There is no magic pill



Systems to the Rescue?§

- Systems tend to grow to fill the known universe (#1)
- Complex systems produce unexpected results (#5)
- A complex system designed from scratch never works and cannot be patched up to make it work (#16)
- Complex systems usually operate in the failure mode (#22)
- Great advances are not produced by systems designed to produce great advances. (#30)
- Loose systems last longer and work better. (#32)

§ Ref: Systemantics, John Gall, Quadrangle 1975



Conclusions

- Storage will continue to increase as a percentage of overall IT spending
- Storage management will remain a professional responsibility of IT organizations for a while yet
- Investments in IT in general, and storage in particular will be viewed as strategic
 - » Financial Return
 - » Operational Improvements
 - » Business Effectively