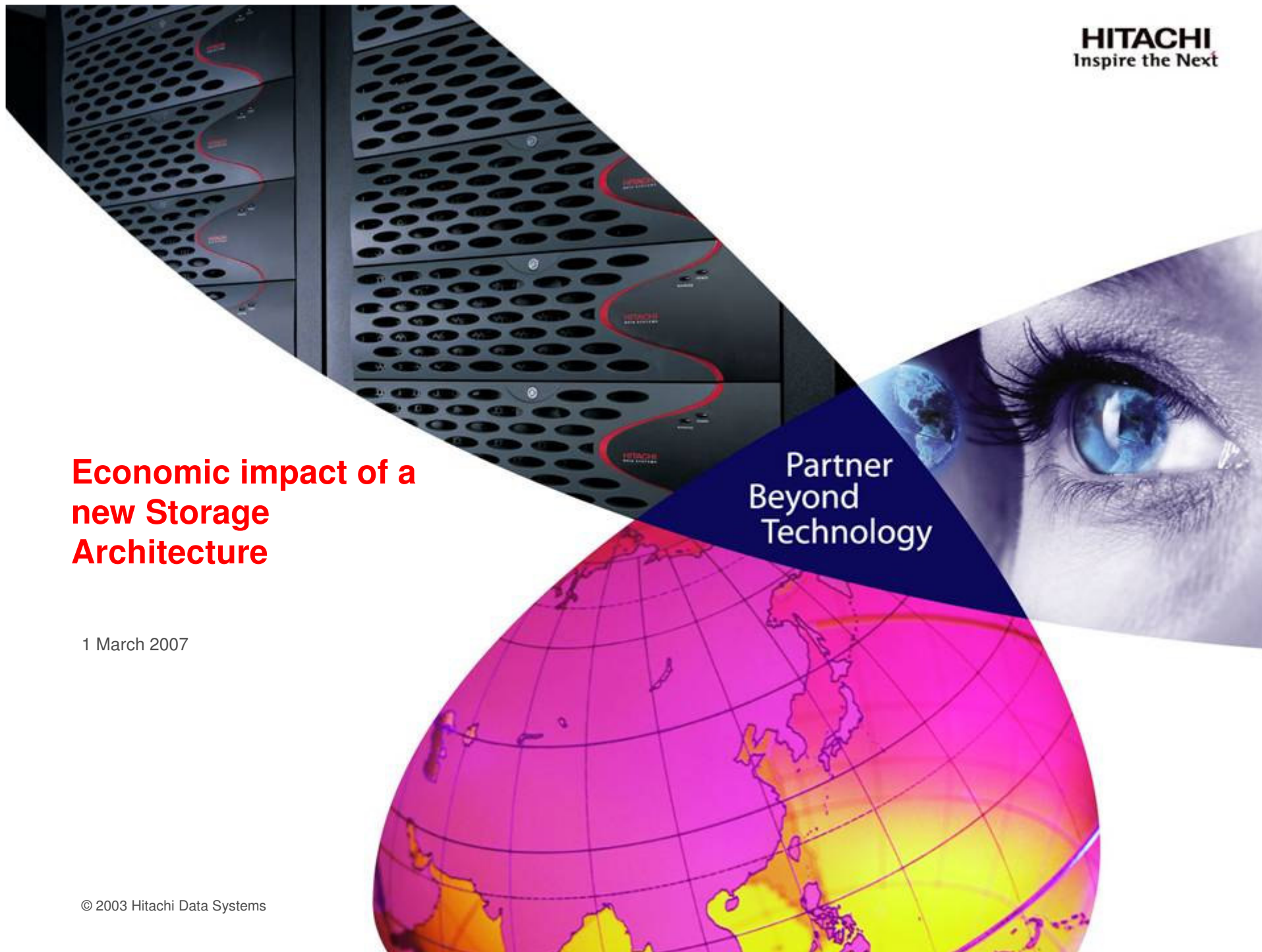


## **Economic impact of a new Storage Architecture**

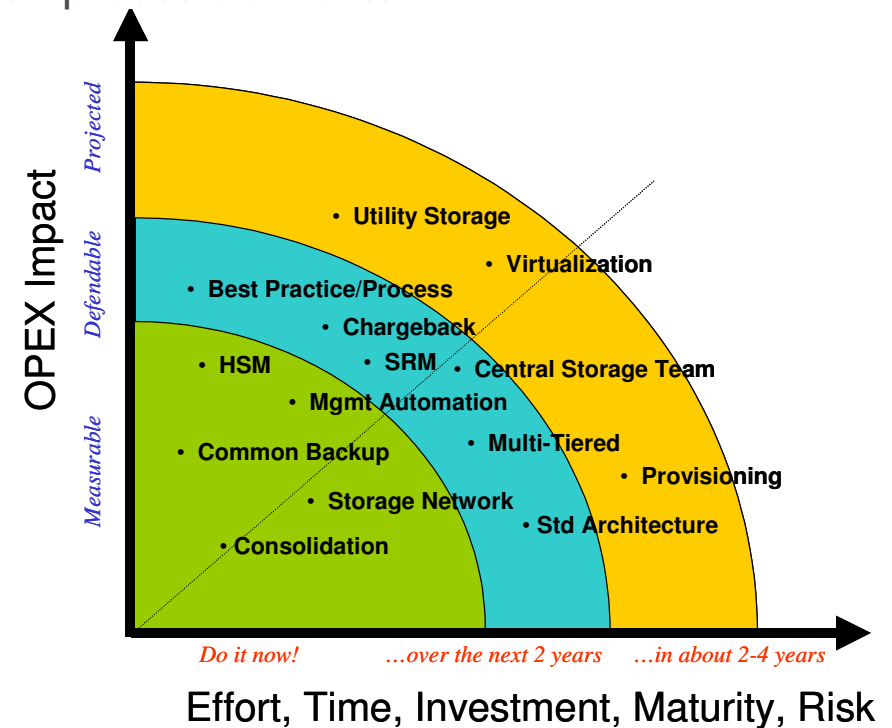
1 March 2007

Partner  
Beyond  
Technology



# Storage Economics Applied to Customer

- HDS' storage economics methodology/approach could be of interest for new storage initiatives
  - On average \$1M net OPEX reduction for every 12TB of usable capacity
  - Several investment initiatives have been proven to reduce OPEX
  - There are 32 types of storage ownership cost elements
- Recent discussions have identified areas to introduce new storage initiatives to reduce storage TCO
  - Tiered storage with controller-based virtualization
  - Advanced replication
  - Archive
  - Non-disruptive data migration
  - Improved availability



# Storage Improvement Initiatives

- **Known Customer storage plans**

- TCSO reduction
- Improved availability
- Ease of management
- Labor reduction
- Data migration simplification
- Storage on demand
- Storage costs aligned to business value
- DR/BC Requirements

- **How HDS solutions can help**

- Virtualization
- Mgmt consoles
- AOS, tiered storage
- 3DC replication
- HCAP
- Etc.

- Utilizing economic principles can help set priorities, investment justification and strategic roadmaps to systematically reduce storage-related cost over time.
- HDS wants to prove that with the flexibility and dynamic nature of our solution; we can provide Customer with the application performance and availability you need and with a 182% return on investment.

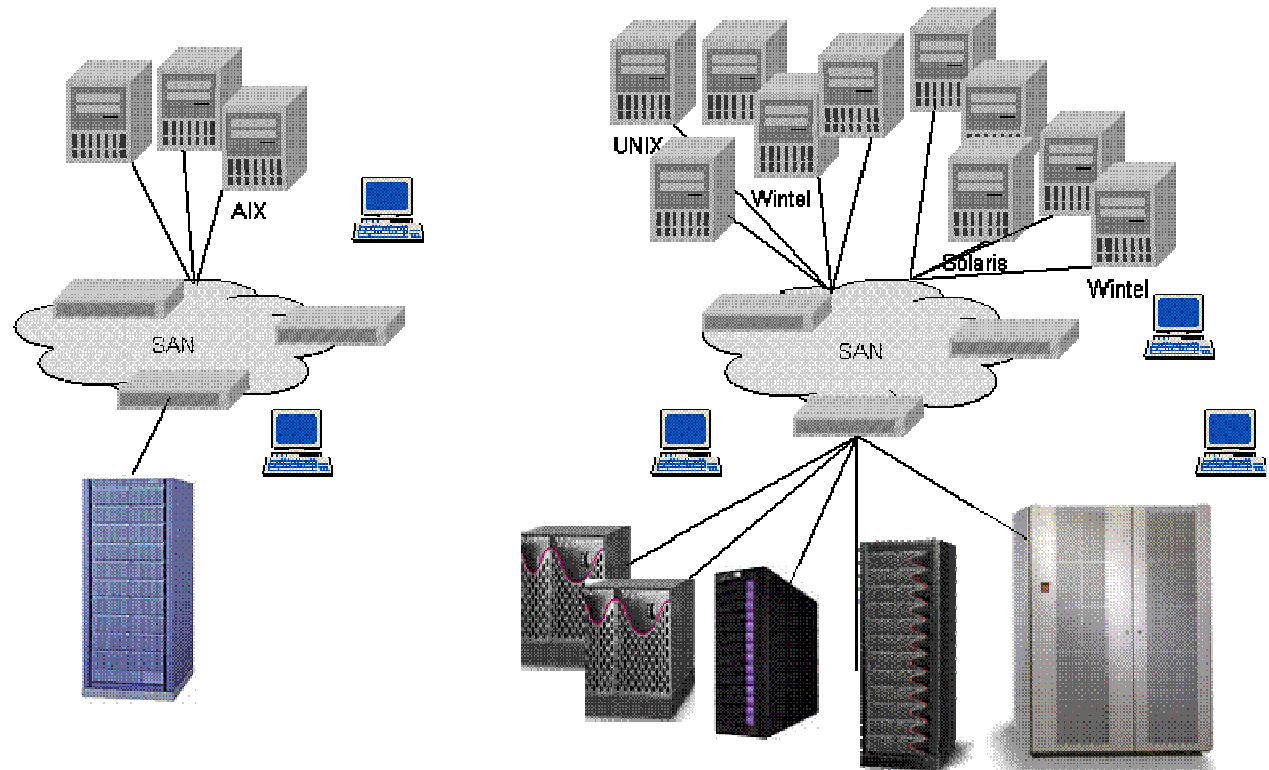
# Current Production, SAN Environment

- Storage arrays
  - 300 TB of 500TB total is on a SAN
  - (4) DMX Arrays
  - (2) 9980 Arrays
  - (3) 9985 modular
  - (4) Shark

- 250 TB ad-hoc tiers
  - 30% CAGR
  - 90% utilization
  - 1PB of tape

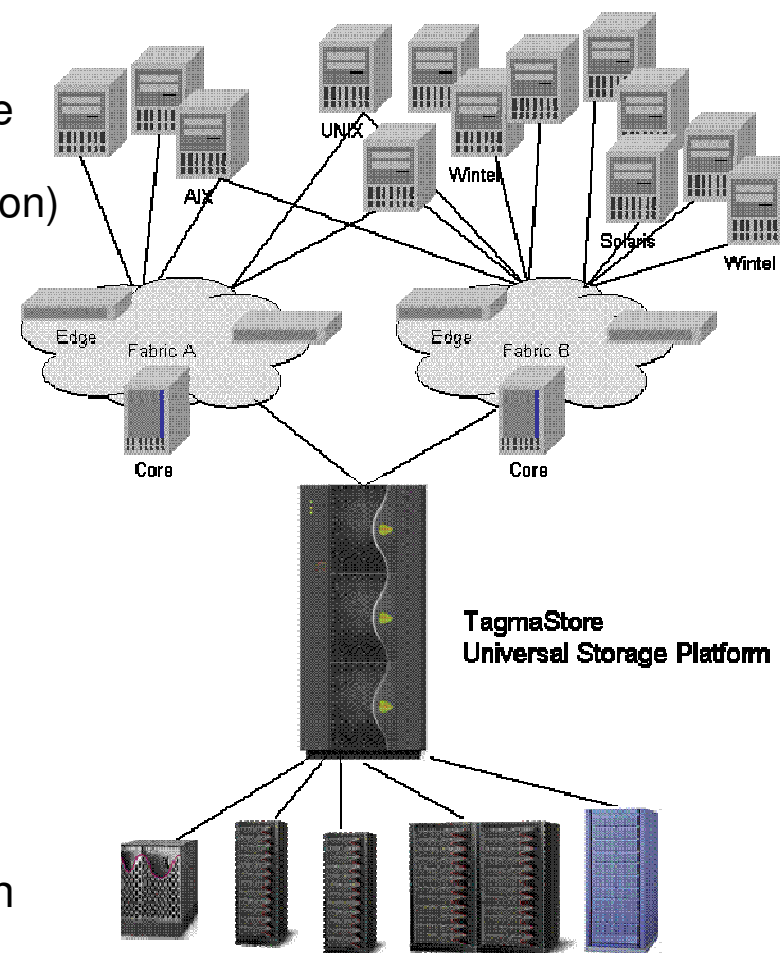
- Other information
  - Host replication
  - TSM backup
  - McData fabric

- 10 Staff



# Proposing a New Customer Storage Architecture

- Consolidation & Virtualization
  - 250TB to be virtualized with HDS architecture
  - 50 TB net-new, in cabinet
  - 200TB of existing arrays (investment protection)
- Tiered Storage
  - Tier 1 is for 50TB
  - Tier 2 is for 100 TB
  - Tier 3 is used for 100TB
- Tape Reduction
  - Not part of initial proposal
  - Suggest HDS/Diligent VTL discussion
- Single management console if needed
  - Effective use of Staff
- DR/BC improvements by replicating from high cost tier to lower cost tier
- Total Investment is \$2.8M



# Impact of a new Tiered/Virtualized Architecture

- **Technical Benefits**
  - Provide the capability to replicate from higher cost tier to lower cost tier.
  - Ability to migrate data seamlessly from one tier to another
  - Consolidate the islands of storage
- **Operational Benefits**
  - Manage storage from a single pane of glass
  - Better manage capacity requirements
  - SLA management
  - Less data migration activity and effort
  - Less provisioning headache with head-room growth in lower tiers
- **Business Impact**
  - Better Asset utilization
  - Move data around based on value of data
  - Investment protection of current storage assets

## Economic Impact and Business Justifications

- Several sources of savings to enable increased technical and operational capability while providing excellent ROI
- Savings have been projected to come from several areas (of the 32)
  - Lower CAPEX costs for storage growth, purchase avoidance
  - Lower hardware and software maintenance
  - Reducing storage software license fees
  - Storage management efficiencies, able to manage more in the future with the current staff
  - Reducing stranded storage capacities
  - Business impact with reduced schedule and unscheduled storage outages
  - Reduced environmental costs (floor space, electricity, AC)
- Secondary, non-financial benefits will also emerge from these plans
  - Service based storage delivery, matching business SLA
  - Higher performance
  - Faster provisioning of storage

## Economic Modeling Assumptions

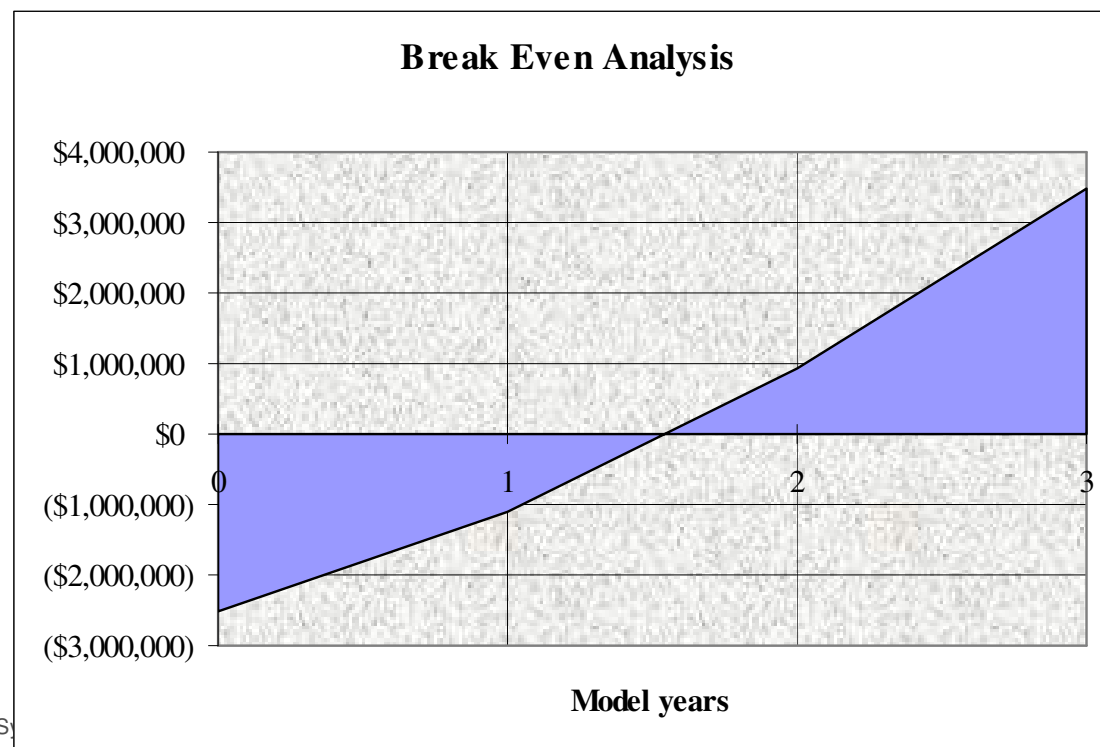
- HDS Business Consultants have not had the opportunity to develop intimate economic models at this time. Several assumptions to the following ROI models had to be made
  - 4 year depreciation, SL, 0 salvage value
  - 200TB of the current storage arrays would be virtualized, asset protection
  - 3 tiered design
    - Tier 1 with 50 TB
    - Tier 2 with 100 TB
    - Tier 3 with 100 TB
  - CAGR is 30% uniform for all 3 tiers, target utilization rate will be 65%
  - Cost of storage admin (fully burdened) is \$150K/year
  - Customer target IRR is 10%
  - Cost of floor space is \$30/m<sup>2</sup>/month
  - Cost of unscheduled outage is \$100K/hour (1/4 industry avg)
  - Scheduled outages occur 6 times/year, with a business cost of \$10K/hr

# Classes of Data, Storage

	<b>GOLD</b>	<b>Silver</b>	<b>Bronze</b>
Data path availability	<1 hour year	<10 hours year	<100 hours year
Data Path Performance	Very high	Very high	High
Mean-time to install new storage	2 weeks	1 week	2 hours
Backup Frequency	Continuous	Daily	Weekly, never
RPO, RTO	<2 hours	<8 hours	<2 days
Replication option available	Yes	Limited	None
Secondary protection, security	Very secure	Limited	None
Disk Performance	Very high	High	Medium High
Disk Availability	Highest	Highest	Highest
Cost per GB/month Example	\$15	\$11	\$6
Escalation Process	Immediate	Immediate- ASAP	Best Effort

## Tiered Storage Architecture ROI Results

- **Given the previous assumptions:**
  - An investment of \$1,918,000 yields savings of \$5,410,064 in 3 years
  - NPV of the total savings is \$2,283,121
  - IRR of this investment is 9.3%
  - Payback estimated in 17 months
  - ROI (NPV method) is 182%

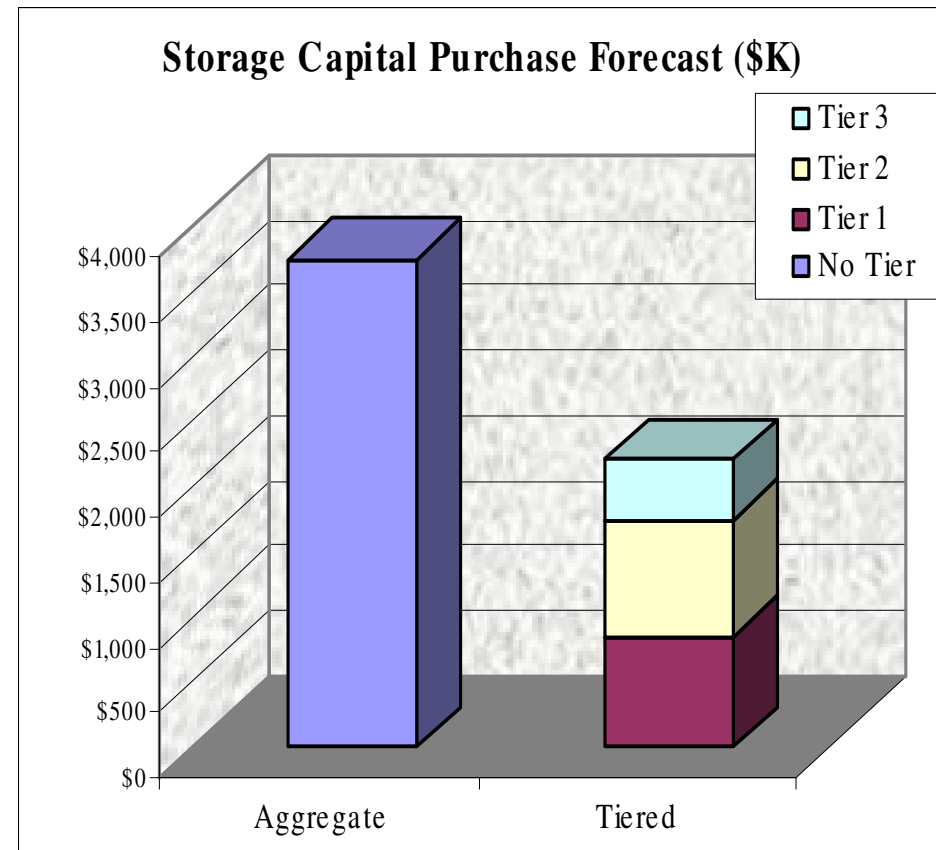


# Tiered Storage ROI Details

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	
<b>Cash investment</b>	(\$2,506,000)	\$294,000	\$294,000	
<b>Savings</b>				<i>Use Case Totals</i>
Administrative savings	177,188	508,528	864,095	1,549,810
Data path availability savings	43,800	43,800	43,800	131,400
Environmental savings	60,767	81,367	108,951	251,085
Hardware maintenance	168,750	211,781	259,331	639,862
MTS - Purchase avoidance effect	489,000	513,825	535,937	1,538,762
Scheduled downtime	253,545	190,667	254,933	699,145
Data Migration, Remastering	200,000	200,000	200,000	600,000
<b>Net cash flow</b>	<u>(\$1,112,950)</u>	<u>\$2,043,968</u>	<u>\$2,561,047</u>	
<b>Cumulative cash flow</b>	<u>(\$1,112,950)</u>	<u>\$931,017</u>	<u>\$3,492,064</u>	
<b>Total investment</b>	\$1,918,000			
<b>Total savings</b>	\$5,410,064			
<b>Client-supplied Internal Rate of Return</b>	10.00%			
<b>Calculated Internal Rate of Return</b>	9.37%			
<b>NPV of savings</b>	\$2,283,121			
<b>ROI Method 2 - Benefit over Investment</b>	182%	Savings - Investment / Investment		
<b>Estimated payback period</b>	17 months			

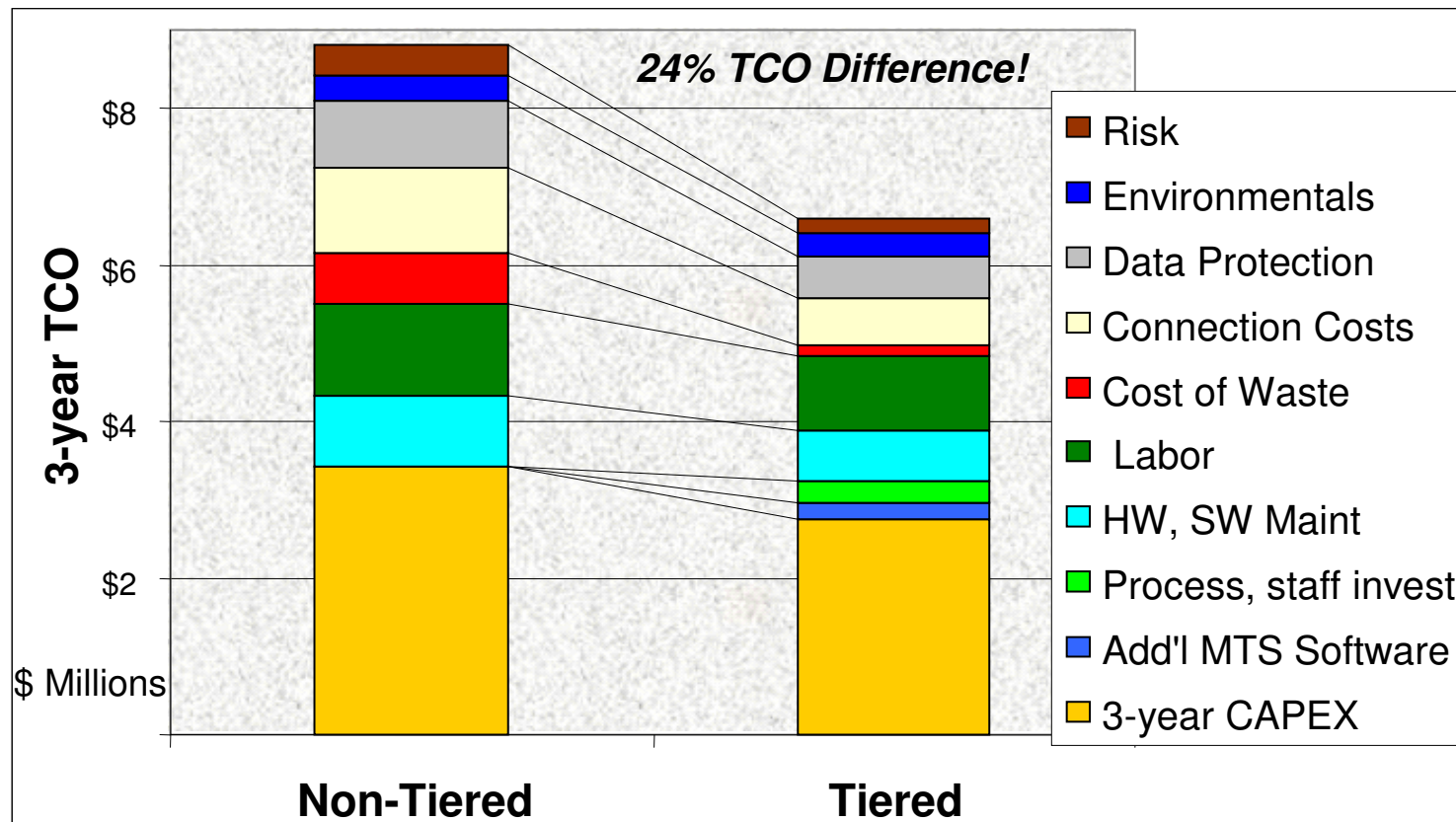
# Tiered Storage Enables CAPEX Avoidance

- Segmenting data into different tiers allows the enterprise to grow at the same rate, but at different price/cost points
- Price erosion, utilization, growth rate for each tier is different
- Effect is a lower cost of growth, over time, while keeping the same storage appetite



# Advanced Storage Architecture TCO Results

- With more information and cost intimacy, HDS can produce comparative TCO results, such as the following



## Next Steps

- Tiered Storage Proof of Concept
  -
- Other initiative
  - Tiered Storage Economic Analysis (TCO or ROI)
  - Comparative TCO with current growth models
- Consider a formal SES service is designed to discover, quantify and justify Tiered storage infrastructure investments. This is an up-stream offering that focuses on business issues of cost, best practices and operational optimization to reduce storage OPEX. Service Deliver Phases
  1. **Discover** understand the storage environment already in-place, non-intrusively
  2. **Assess** your tactical and strategic storage needs via workshop, interviews
  3. **Design** storage architecture(s) to meet business requirements, infrastructure
  4. **Analyze** and compare ROI for design options, show the OPEX saving potential
  5. **Report** findings in a format to help with business cases and justification

