Storage Infrastructure Optimization
Setup the scene

**4 Dimensions**
- Cost Categories
- Environment
- Time
- QoS - NFR

**Cost Categories**
- Hardware
- Software
- People
- Network
- Storage
- Facilities

**Environment**
- Production
- Online
- Failover
- Batch
- Dev
- Test
- QA
- D/R

**Time**
- Growth
- Refresh

**To run ... You need**
- The complete picture

**Availability... Security... Resiliency... Scalability...**

**QoS - NFR**
SIO – Storage Infrastructure Optimization

What is SIO?
- A programmatic, cross-brand (hardware, software, services, consultancy) execution model
- Leverages all of IBM technologies and capabilities in a single, focused approach in order to identify optimization opportunities

Objectives for the SIO:
- Reduce the overall complexity
- Improve utilization of resources
- Reduce cost of data storage
Where does all the storage go?

- **Physical** – Raw storage capacity
  - Procurement view

- **Logical** – Storage capacity available after applying data protection policies
  - Storage architect view

- **Allocated** – Storage consigned to users
  - Storage administrator view

- **Claimed** – Storage assigned to servers
  - System administrator view

- **Assigned** – Storage mounted by servers
  - Application owner view

- **Written** – % of storage actually containing data
Taking It One Step Further

- Within the occupied storage, only a small percentage of data is unique and of current value
Many organisations struggle to capacity plan effectively for storage requirements

Current State

<table>
<thead>
<tr>
<th>Value of Data</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cost of Infrastructure

RISK

WASTE

Organizations still acquire, operate and retire storage by project!

This buying behavior creates risk and generates waste.

Storage Infrastructure Optimization maps the Value of the data to the Cost of the Infrastructure and maintains Value-Cost over time
Journey Station 1 – Alignment

1. Discover (Services, Workshops)
2. Mitigate Risk
3. Reduce Waste

Storage Estate

Value of Data
- Low
- Medium
- High

Cost of Infrastructure
- Low
- Medium
- High

RISK
Excessive Service (Waste)
Journey Station 2 – Storage efficiency

Storage Estate

Value of Data
Low  Medium  High

Cost of Infrastructure
Low  Medium  High

Back-up
Tape
ProtecTier

Mid-Range
XIV, V7000,
V5000, V3700

Enterprise
XIV, DS8K, SVC
EasyTier, SSONAS

Increasing Data Value
RISK

Decreasing Data Value
Waste

Alignment
“Green”
Channel

Avoidance Zones
SIO Client Value Proposition: Holistic approach will Change the Cost Curve

- Current Plan
- Short term decisions
- Roadmap for success

Current course and speed
Take sub-optimal action
IBM approach

Investment for agility and sustainability
Transformation

SIO: Storage Infrastructure Optimization

Time
Costs
## SIO Program Focus

| **Data Rationalization** |  
|-------------------------|---
| **Increase utilization** from industry standard 35% to 70%  
| **Consolidate expensive, inefficient storage** to lower operating cost storage while increasing availability |

| **Storage Virtualization / Tiered Storage Infrastructure** |  
|-------------------|---
| **Managing tier 1 storage spend while right tiering to cost effective storage environment**  
| **Virtualize environment to manage, control & age data appropriately across storage environment per SLAs** |

| **Backup/Restore & Disaster Recovery** |  
|---------------------|---
| **Reducing CAPEX/OPEX spend on VTL and/or ATL on back-end with 12:1 reduction**  
| **Establish appropriate Recovery time & eliminate single points of failure** |

| **Archive / Retention / Compliance** |  
|-----------------------------|---
| **Improving performance by appropriately aging data across storage environment per compliance regulations** |

| **Information Management** |  
|--------------------------|---
| **Instrumentation layer that controls & automates the storage environment, supporting business needs & keeping it optimized over time** |

| **Storage Process, Organization, Technology & Governance Model** |  
|------------------------|---
| **Reducing unplanned outages from hours to minutes** |

© 2013 IBM Corporation
What to expect from an SIO assessment and solution

Implement proven technologies and realize savings in the following areas

**Storage Virtualization**
- Offload both local and remote replicas from **expensive disk to low cost alternatives**

**Thin Provisioning**
- Allows for better utilization of historically **underutilized capacity**

**Data Deduplication**
- Removes multiple instances of the same data

**Cloud Storage**
- Provides simplified access to data and frees IT staff to focus on core business

**Storage Service Catalog**
- Prevents wasteful provisioning practices such as assignment of unnecessary replicas and excess primary storage

**Data Archiving**
- Removes outdated records to make better use of assigned storage

**Content Expiration**
- Purge unneeded data

**Advanced Storage Reporting**
- Facilitates the **reuse of existing capacity**, reducing purchasing requirements, power consumption and floorspace sprawl

**Realize savings on:**
- **Storage Costs**
- **Power Costs**
- **Floorspace Costs**
- **Operational Costs**
- **Tape Costs**
- **Array Maintenance Costs**
## Business challenges encountered at SIO accounts

### Government
- Low overall storage utilization
- Challenges managing data value over time
- Storage growth
- Lack of migration strategy and tools
- Extended backup windows for some applications

### Telecom
- Lack of Centralized Storage Management
- Challenges managing data value over time
- Storage at capacity
- Data backups frequently impacting production
- Comprehensive Disaster Recovery strategy not in place

### Finance
- Out of facilities space in data centers
- Lack of data valuation capabilities
- Managing data growth in the environment
- Storage Tiering does not exist – Excessive use of Tier 1 storage increasing costs and consuming valuable floorspace
- Large backup volume causing increased costs and excessive backup windows
Storage Infrastructure Optimization Program Client Benefits

IBM identifies areas where savings can be achieved through infrastructure optimization

- IBM’s approach will reduce overall organic growth while dramatically lowering management costs
- Savings typically range from a 20% - 25% reduction in new storage spend in year one, to a 50+% reduction in spend in over 3-5 years (including power, floorspace hardware opex)

IBM optimized solution is over 2x more effective than business as usual storage costs

- Dramatic increase in utilization of “data on disk” - increased 15 - 20%
- Painless right-tiering and archiving based on application service levels
- Advanced storage reporting brings financial transparency and true capacity planning
- Aggressive data rationalization will remove unnecessary data and wasteful replicas
- Smart demand management augmentation will arrest growth rate of expensive storage
Current Storage vs. Future Storage

Reduce High cost storage used and increase lower cost storage over 5 year timeframe
Current Environment vs. Optimized Environment

![Graph: Business As Usual EOY Usable Disk Stg](image)

![Graph: New Environment EOY Usable Disk Stg](image)
Financial Analysis of Costs, Benefits, and ROI

Breakeven (New Costs vs New Benefits)

Annual Benefit of New Environment

Net Difference BAU vs. New Environment
SIO assessment overview

Interviews to conduct
- Typically 60-90 minutes long (dependent on interviewee role)
- Typical interviewees include:
  - Storage Manager
  - Storage Architect
  - Storage Admin
  - Backup Manager
  - Backup Architect
  - Backup Admin
  - Other personnel – consumers of storage:
    - Storage consumers (System Administrators, DBAs, etc.)
    - Application Owner
    - Capacity Planning Manager

IBM team includes:
- Project Manager
- Storage Consultant
- Senior Consultant
- Product Specialists

Deliverables include:
- Project Plan and Schedule
- Kick-off Presentation
- Storage Infrastructure Optimization Report
  - Executive Report including financials and ROIs
The five pillars of Storage Infrastructure Optimization

1. Reclaim, Rationalize & Plan
2. Virtualize & Tier
3. Backup/Restore & Disaster Recovery
4. Storage Process & Governance Model
5. Archive / Retention / Compliance

Aligned and Optimized Cost

Reduce Storage Growth
The five pillars of Storage Infrastructure Optimization

Key objectives for reclaim, rationalize & plan
- Reclaim trapped storage LUNs - extend life of existing storage arrays
- Historical capacity planning reduces unnecessary purchases
- Increase storage utilization through visualization of current and historical use rates
- Allow chargeback and/or showback of LIO storage utilization against allocated storage
- Performance-based recommendations concerning the proper placement of virtual tiered storage
- Analyze customer file based data amount to determine importance

Key objectives for virtualize & tier
- Combine storage capacity from multiple disk systems into a reservoir of capacity that can be better managed as a business resource and not as separate boxes
- Help increase storage utilization by providing host applications with more flexible access to capacity
- Help improve productivity of storage administrators by enabling management of heterogeneous storage systems using a common interface
- Support improved application availability by moving host applications from expensive to less expensive storage systems
- Enable a tiered storage environment in which the cost of storage can be better matched to the value of data
- Support advanced copy services from higher- to lower-cost devices and storage systems from multiple vendors

Key objectives for backup/restore & disaster recovery
- Improved architecture to increase scalability, reduce server hardware and lower costs
- Improved tape processing efficiency
- Storage capacity reduction through multiple data reduction techniques
- Improve disaster recovery operations through native automated replication
- Reduce bandwidth requirements by incorporating data reduction technologies into replication at both primary and secondary sites to bandwidth requirements
- Increased resiliency and ability to achieve RTO/SLA parity through online deduplication
- Reduce cost of transportation of physical cartridges while reducing security risk with virtual tape

IBM 2009 CIO Study:
76% of CIOs cited “implementing a virtualized computing environment” as part of their visionary plan to enhance competitiveness

Key objectives for storage process & governance model
- Properly align business requirements of data to appropriate service levels “right pricing”
- Provision storage based on application data type with predefined solution set
- Maintain matrix of defined data types facilitating automation integration
- Storage Service Catalog provides technologies and services to meet the Data Type business requirements
- Right pricing ensures cost controls are in place preventing over utilization of space
- Storage management framework ensures the successful adoption of right pricing
- Prevent wasteful provisioning practices such as assignment of unnecessary replicates and excess primary storage capacity for applications
- Request Logic and Business Process automatically reference the matrix and for each request, saving time

Key objectives for archive / retention / compliance
- Removes outdated records from structured data sources thereby optimizing application performance, reducing growth and driving applications to make better use of assigned storage
- Migrate data from unstructured data sources to lower tiers of storage
- Archiving process reduces cost to house outdated information via a lower tier of storage
- Seamlessly integrates into business continuance and disaster recovery models
- Increase database performance/response time and minimize batch windows
- Rotate applications while leaving data available and online

© 2013 IBM Corporation
## SIO Assessment Focus Areas

The following data gathering point to understand your IT Infrastructure:

<table>
<thead>
<tr>
<th>Required Key Data Points</th>
<th>Environment Overview</th>
<th>Virtualization adoption</th>
<th>Storage Tiering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archiving</td>
<td>Data Maintenance</td>
<td>Storage Reclamation</td>
<td></td>
</tr>
<tr>
<td>Reporting</td>
<td>Hardware Refresh</td>
<td>Power</td>
<td></td>
</tr>
<tr>
<td>Floorspace</td>
<td>Types of Data</td>
<td>Initiatives</td>
<td></td>
</tr>
<tr>
<td>Operational</td>
<td>Products</td>
<td>Financial data</td>
<td></td>
</tr>
</tbody>
</table>
Next steps

- Plan and propose IBM SIO to entities with growing storage demand and complex management
- Proposal acceptance and agree on the execution date
- Perform data gathering
  - Complete questionnaire
  - Group interviews
  - Individual interviews
  - Provide reports that may be requested in interviews