Smarter Data Protection and Storage Management Solutions

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IBM Service Management Connects all Elements of a Dynamic Infrastructure

IBM Service Management provides solutions and expertise you need to design, build and manage a dynamic infrastructure. IBM connects all elements of the dynamic infrastructure so that organizations can:

• Leverage and integrate IT and 'smart' business assets to deliver next generation services.

• Respond rapidly to change and support new business needs through greater agility

• Deliver higher quality service to customers and business partners at a lower cost

IBM Service Management and Information Infrastructure

IMPROVE SERVICE
REDUCE COST
MANAGE RISK

Virtualization

Security

Energy Efficiency

Service Management

Business Resiliency

Asset Management

Information Infrastructure

Key Offerings

- Tivoli Storage Manager, TotalStorage Productivity Center, IBM System Storage hardware, IBM Storage Enterprise Resource Planner (SERP) 5.0,

Customer Benefits:

- Gain rapid recovery, data reliability and integrity across the Information Infrastructure
- Can now effectively prevent disruptions due to data loss
- Are able to manage storage more efficiently to reduce costs
- Gain built-in data de-duplication to reduce secondary storage capacity requirements and improve recovery time
- Now have complete management of the storage infrastructure including
  - Storage systems
  - Storage networks
  - Replication services
  - Capacity management

The Tidal Wave of Data Continues …

- The amount of digital information continues to grow exponentially …

- And we need to keep more of it, longer …

- And the costs of losing data are unacceptable …
  - Lost revenues
  - Lost customer confidence
  - Embarrassment in the market
  - Fines from contracts, government agencies
  - CEO and CFO could go to jail

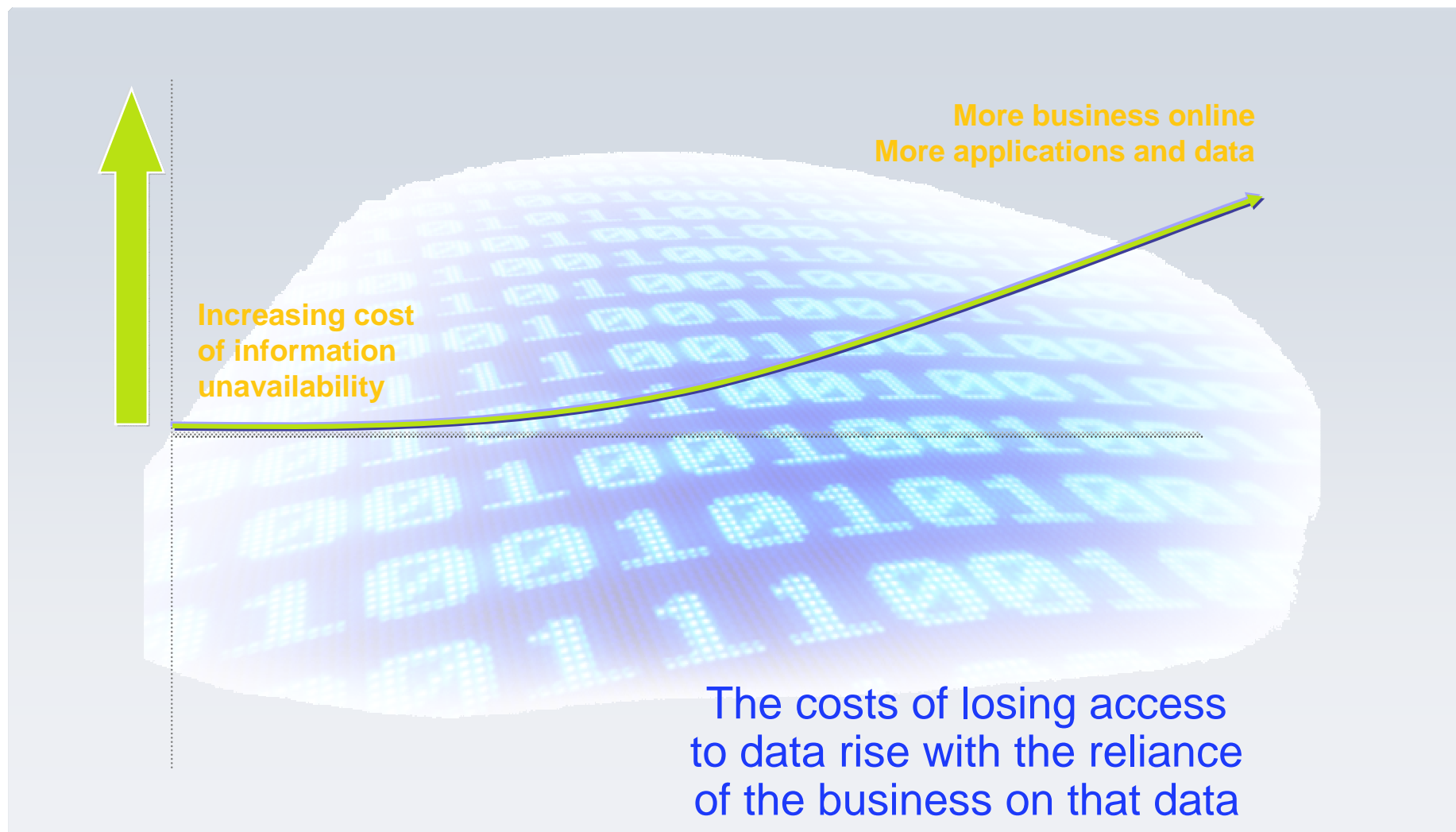2005   2006   2007   2008   2009   2010
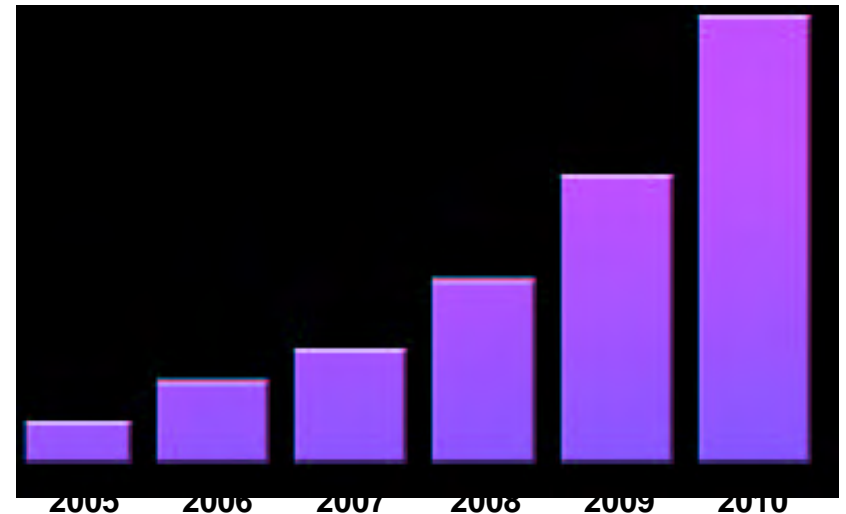
Data created and copied is expected to grow at 57% CAGR through 2010
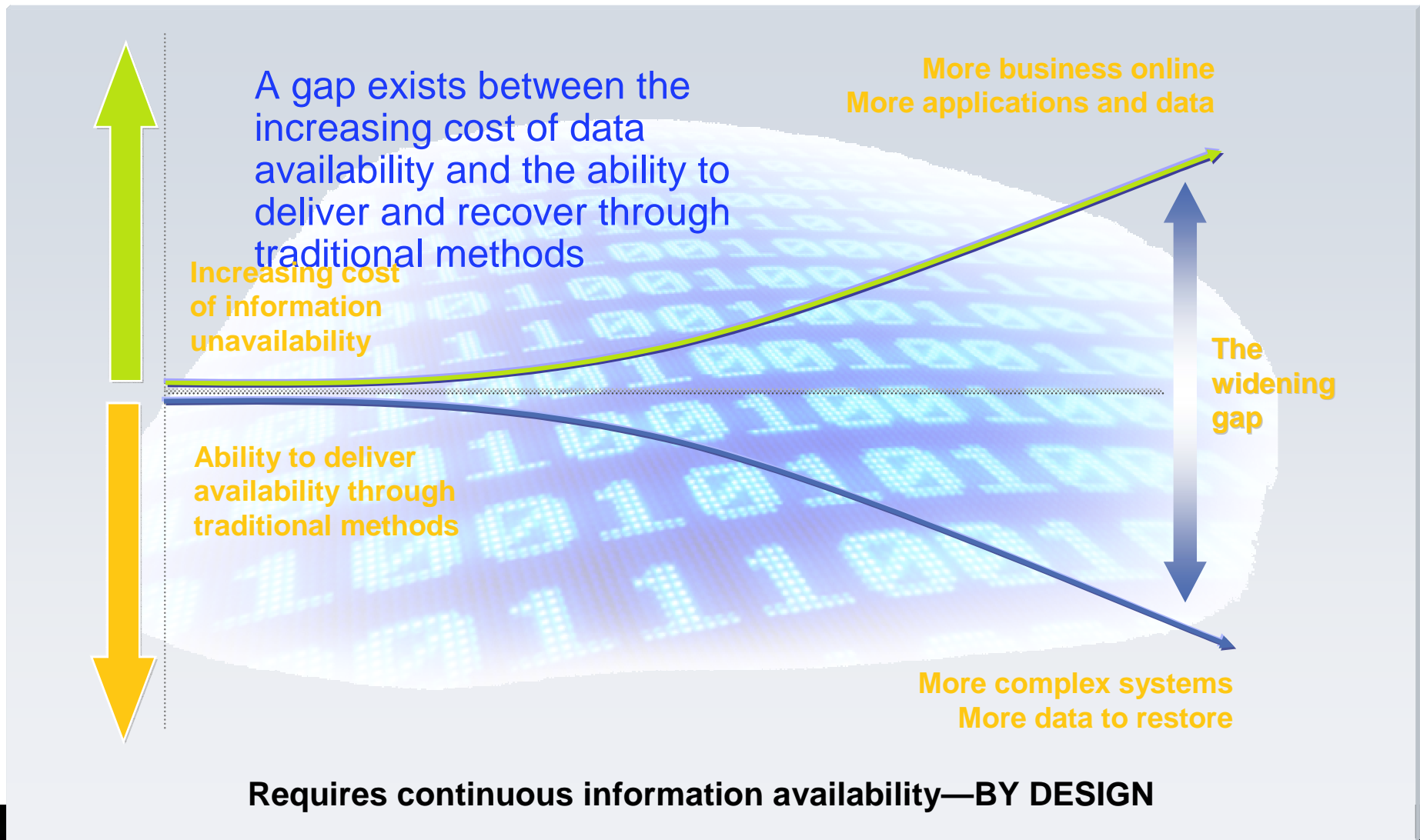
We Need to do More with Less, and we need to do it smarter

More information is created in digital-only formats

Increasing cost
of information
unavailability

More business online
More applications and data

The costs of losing access
to data rise with the reliance
of the business on that data

More Data = Longer Recovery Times

A gap exists between the increasing cost of data availability and the ability to deliver and recover through traditional methods

More business online
More applications and data

Increasing cost of information unavailability

The widening gap

Ability to deliver availability through traditional methods

More complex systems
More data to restore

**Requires continuous information availability—BY DESIGN**

Key Objectives in Data Protection and Storage Management

- Optimal utilisation of Storage Resources
- Storage Operations Optimisation
- Control over Compliance
- Ensuring Data Security
- Availability and Visibility of Storage
- Application Availability & Performance

Data and Storage Infrastructure

Host Host Host

SAN

Storage
Infrastructure
Management

Physical Storage

Data Data Data

Data Protection and Management
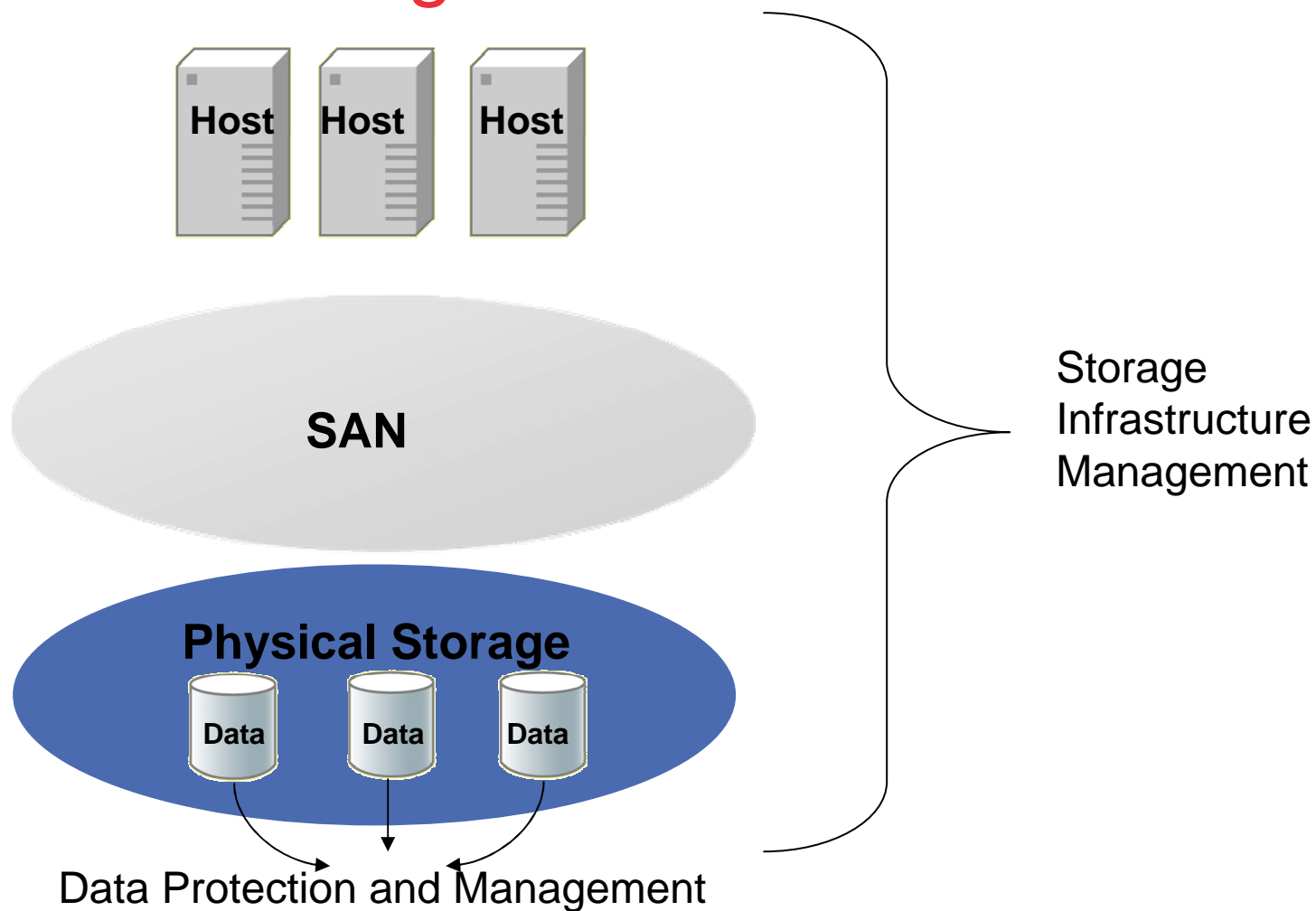
Design Considerations in effective Data Protection

- Classification of Data & Data Value
  - Stop protecting employee home movies, last years news
  - Not all data assets are created equal
- Existing Infrastructure
  - Understand your network, hosts, applications
- Recovery Time Objective (RTO)
  - Speed of Recovery
  - How much does it cost to be down?
- Recovery Point Objective (RPO)
  - Amount of Data Loss
  - How far back in time to recover data?
- Service Level Agreements

Classification of Data

Classification of Data is probably the most important design consideration and one that should play a key role in technology selection
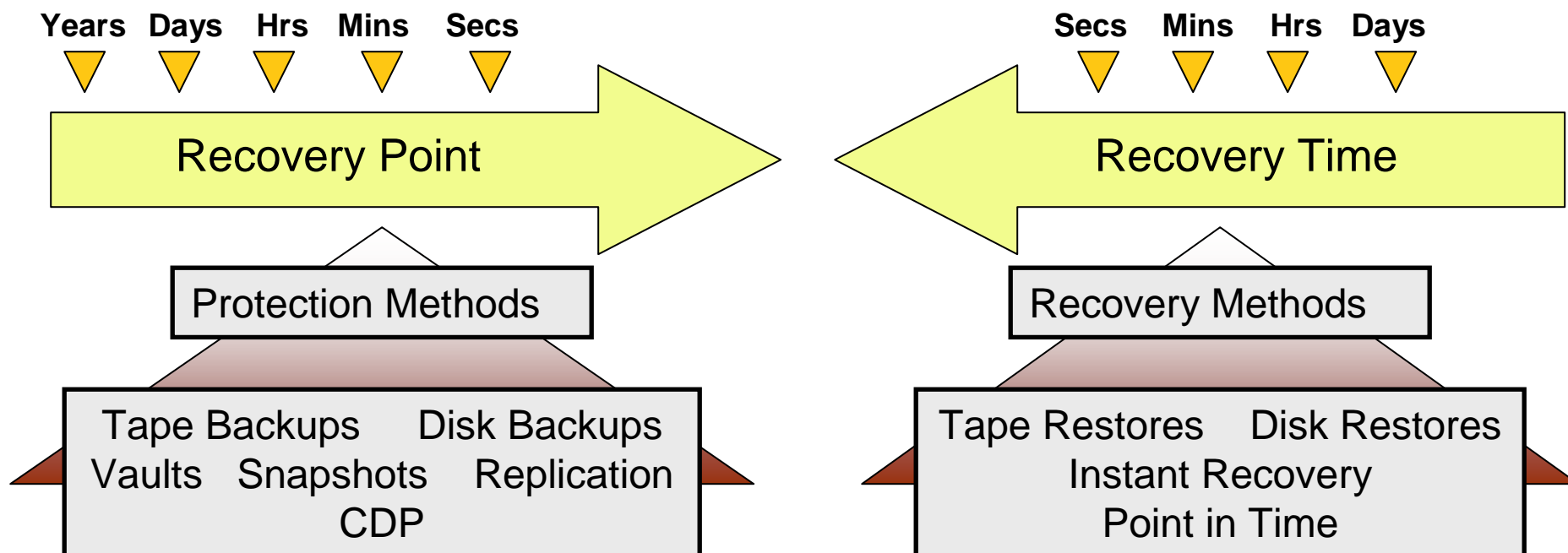
Web content | Media | E-mails | Reports | Documents
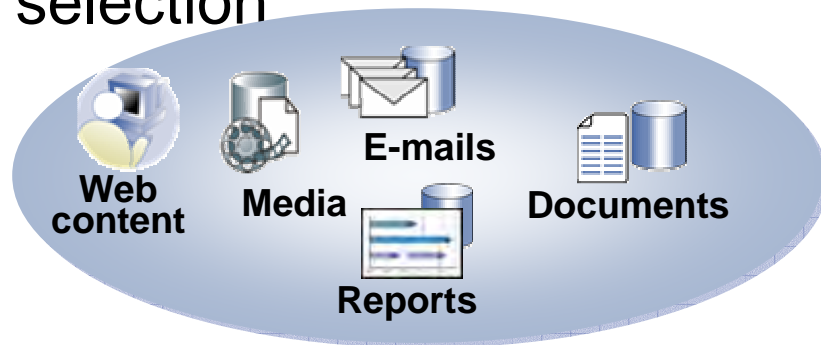
2 dimensional classification

Application Classification		
Business Classification	SAP	Mail
Retail Business		
Consulting Business		

- Add multiple of dimensions
- In each dimension add multiples
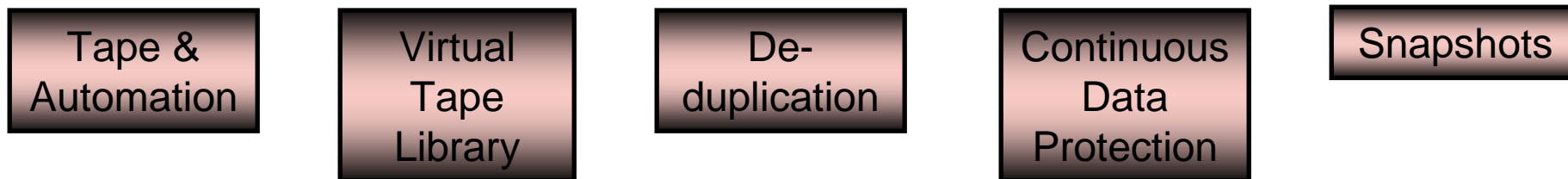- For each sub class add tens of policies

Management of Complexity

Need of the hour – Multi-level & Multi-dimensional Classification and Policy definition
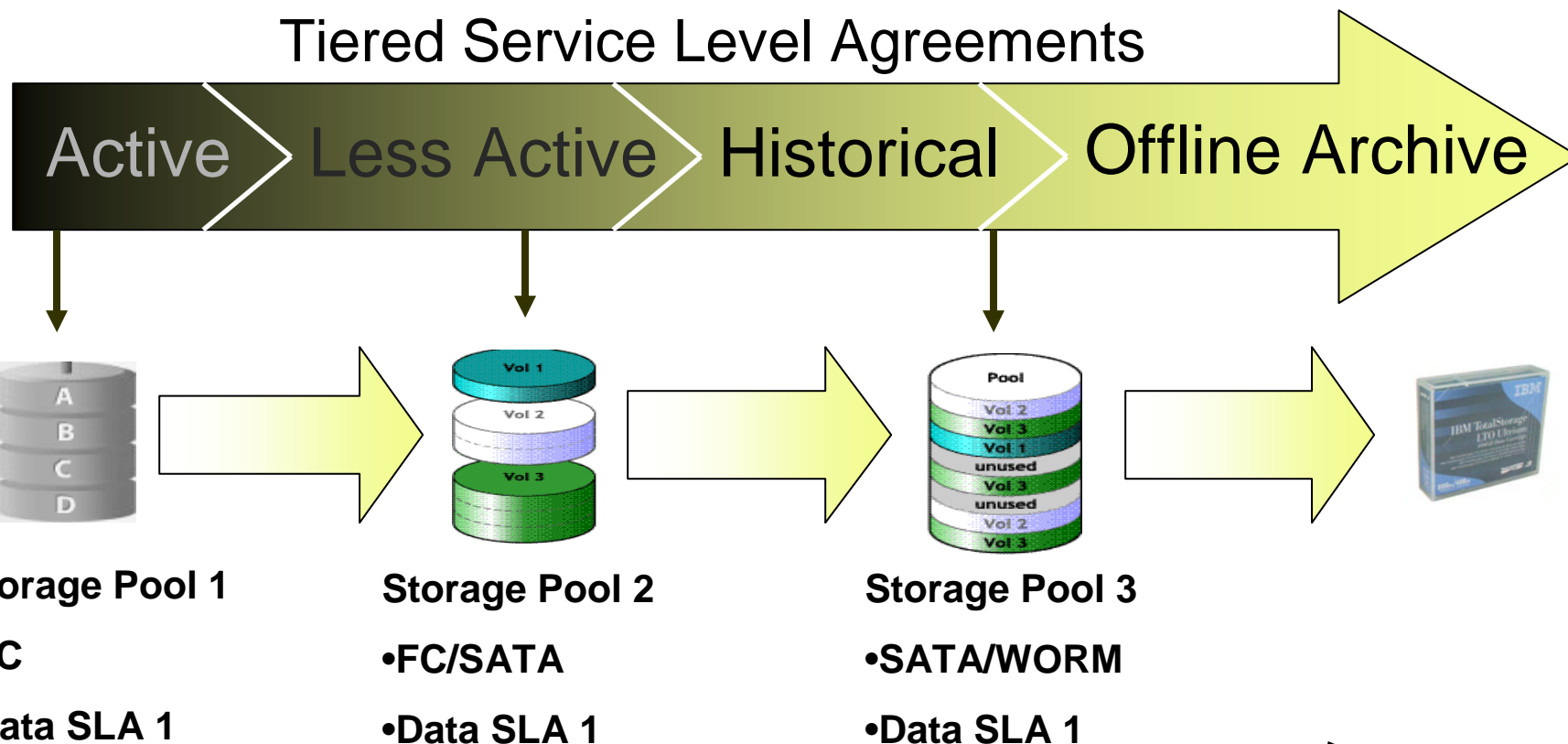
Protection based on Recovery

Years	Days	Hrs	Mins	Secs
▼	▼	▼	▼	▼

Recovery Point →

Secs	Mins	Hrs	Days
▼	▼	▼	▼

← **Recovery Time**

Protection Methods

Tape Backups   Disk Backups
Vaults   Snapshots   Replication
CDP

Recovery Methods

Tape Restores   Disk Restores
Instant Recovery
Point in Time

Enabling Technologies

Tape & Automation	Virtual Tape Library	De-duplication	Continuous Data Protection	Snapshots

Matching SLAs to Information Lifecycle

Tiered Service Level Agreements

Active ➤ Less Active ➤ Historical ➤ Offline Archive

Storage Pool 1

•FC

•Data SLA 1

Storage Pool 2

•FC/SATA

•Data SLA 1

Storage Pool 3

•SATA/WORM

•Data SLA 1

Use ITIL style catalogs and processes to develop a dynamic and consolidated storage service

Design Considerations lead to Critical factors

- Multi level and Multi dimensional policy
  - Ability to define policies
  - Ability to edit and update retro actively
- Hierarchy and Multitude of Secondary Storage devices
  - Ability to backup different sub class of data on different media
  - Policy based and/or default movement of data from one type of media to another including to new technology
- 'Process oriented' as against 'People oriented' systems
 - Lay the foundation for ITIL standards

Design Considerations lead to Critical factors

- **Multiple backup options**
  - Scheduled, Flashcopy, CDP
- **Multiple data movement options**
  - Backup, Archive, HSM, DR
- **Multiple data types**
  - Application aware, DB aware, Bare machine, Files

Tivoli Storage Manager 6 - Overview

Tivoli Storage Manager 6 keeps IBM on the leading edge of enterprise-class data protection and recovery management, staying ahead of the ever-increasing growth in digital information, no matter where it resides.
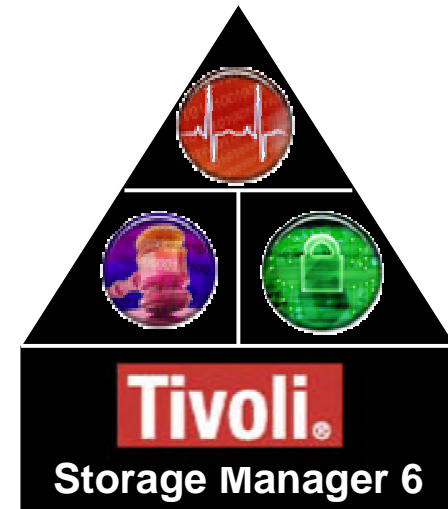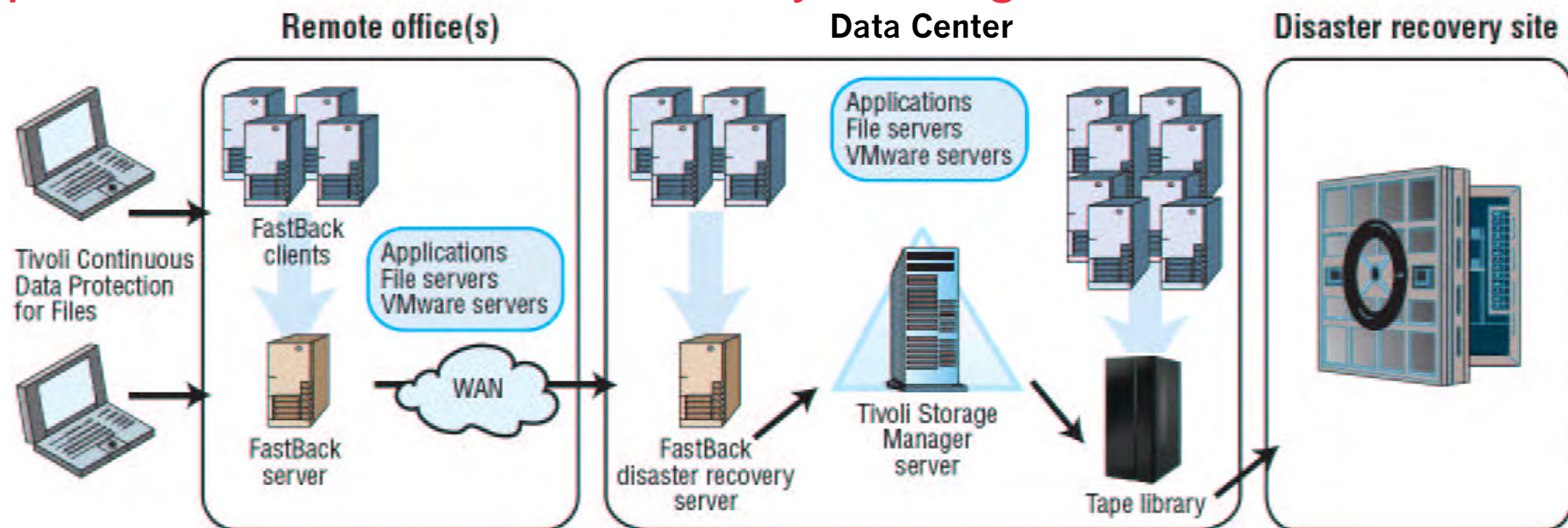
- Data Protection: Backup & Recovery
- Data Retention: Archive
- Data Reduction and Data Management
  - Progressive Incremental Backup
  - Data Deduplication
  - Tape Reclamation
  - Collocation

- Architecture
  - Relational Database
  - Policy Management
  - Storage Hierarchy
  - Reporting and Monitoring

Tivoli Storage Manager 6
The core component of an integrated, end-to-end data protection and unified recovery management solution

- *Tivoli CDP for Files:* Continuous data protection for desktops & mobile users

- *TSM FastBack:* Block Level CDP protection for critical Windows servers

    - Robust remote office data protection & replication

    - Near-instant recovery of any data, anywhere

Storage Infrastructure Management

<u>Each element</u> has to be managed!
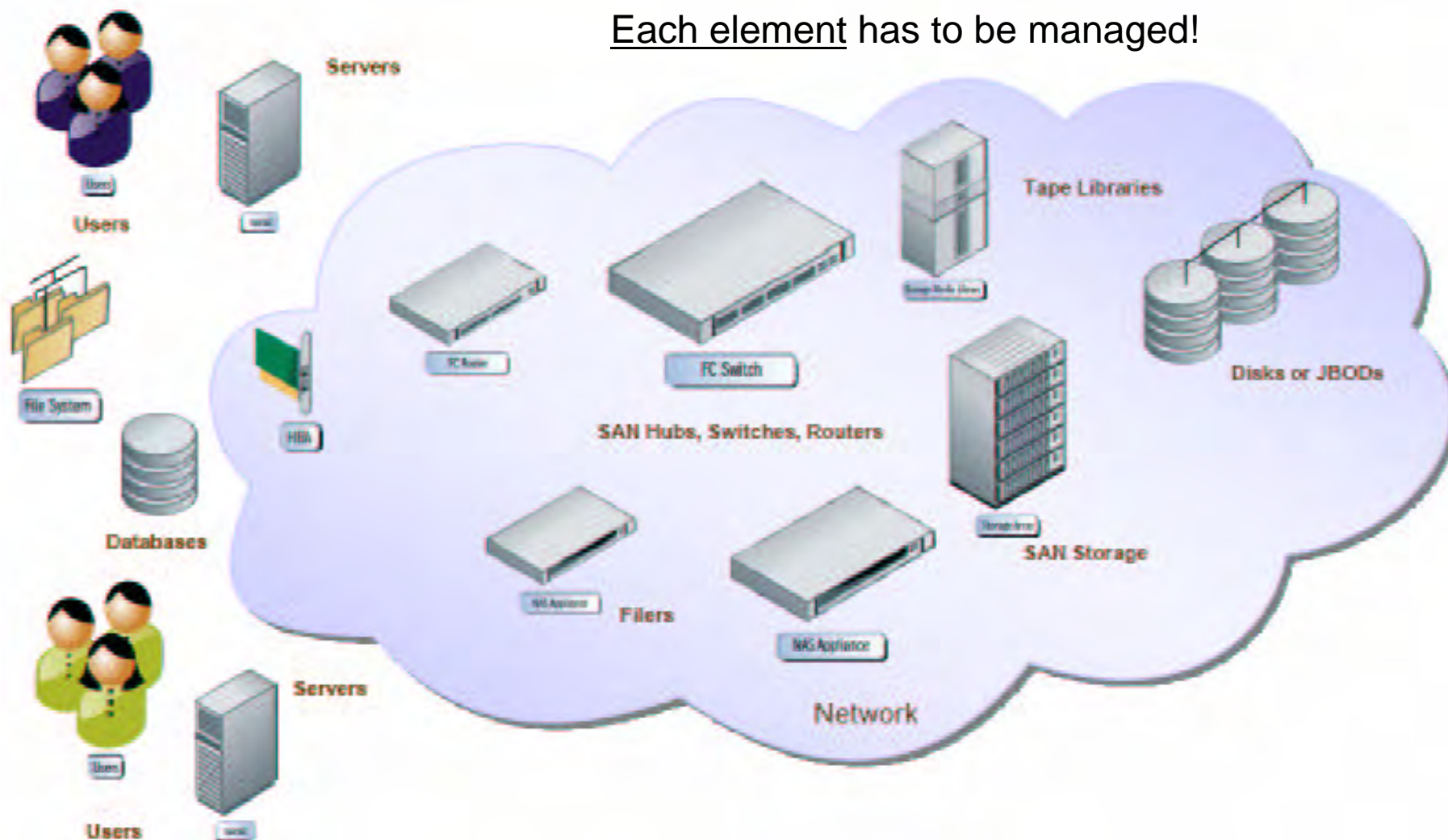
Storage Management Challenges

- Leverage Information
  - Capitalize on data sharing for collaboration
  - Align storage investments, informational value

- Optimize IT
  - Automate and Simplify IT operations
  - Optimize Performance, Functionality, Availability

- Mitigate Risk
  - Comply with regulatory, security requirements
  - Keep your business running continuously

- Enable Business Flexibility
  - Flexible, On Demand IT infrastructure
  - Protect your IT investment

Storage Management Challenges

- Leverage Information

- Optimize IT

- Mitigate Risk

- Enable Business Flexibility

How much storage do I have available for my applications?

Which applications, users and databases are the primary consumers of my storage?

When do I need to buy more storage?

How reliable is my SAN?

How is my storage being used?

Storage Management Challenges

- Leverage Information

- Optimize IT

- Mitigate Risk

- Enable Business Flexibility

How do I simplify and centralize the management of my storage infrastructure?

How do I know the storage is not the bottleneck for user response time issues?

Is the storage infrastructure available and performing as needed?

Storage Management Challenges

- Leverage Information

- Optimize IT

- **Mitigate Risk**

- Enable Business Flexibility

How do I monitor and centrally manage my replication services?

How do I maintain storage service levels?

Which files must be backed up, archived and retained for compliance?

Storage Management Challenges

- Leverage Information

- Optimize IT

- Mitigate Risk

- Enable Business Flexibility

How can I automate the provisioning of my storage systems, databases, file systems and SAN?

How can I quickly determine the relationships between my applications, servers, and storage resources?

How can I more quickly configure and deploy storage resources?

How does Storage Infrastructure Management Help?

- Reports on storage infrastructure
  - Assets/Capacity
  - Applications and Database awareness

- Chargeback for storage usage
  - Control storage costs

- Data Classification
  - Managing storage and data based on level of criticality of information
  - Manage compliance
  - Manage storage tiers and tier based service levels

How does Storage Infrastructure Management Help?

- Centralization
  - End to end visibility
  - Storage provisioning
  - Event management
  - Performance Management
  - Configuration Management

- Analytics and Trending
  - Historical configuration changes
  - Workload based provisioning
  - Performance analysis
  - Configuration analysis

- Service Management
  - Align your storage and data management policies with your business goals
  - Automation/workflow based management

What is SMI-S?

- Storage Management Initiative Specification
  - The specification was designed with the purpose of standardizing and streamlining storage management functions and features into a common set of tools that address the day-to-day tasks of the IT environment.

www.snia.org/forums/smi/tech_programs/smis_home

SMI-S addresses Storage Management related to -

- Hardware Devices: SMI-S Providers
  - FC Switches
  - Arrays (FC and iSCSI)
  - NAS Devices
  - Tape Libraries
  - Host Profiles (including HBAs)

- SMI-S Clients (Software)
  - Configuration Discovery
  - Provisioning and Trending
  - Security
  - Asset Management
  - Compliance and Cost Management
 - Event Management
  - Data Protection

IBM TivoliStorage Productivity Center

- **Enable end-to-end storage management with a single tool**
    - Extends storage configuration management across the SAN
    - Centralizes management of storage

- **Improve storage utilization, performance and service levels**
    - SAN Topology end to end views and management

- **Reduce storage complexity to make your team more productive**
    - Storage Reporting across host file systems, data bases and storage
    - Correlation to host usage

- **Ties to Tivoli Storage Manager for complete information life cycle**

IBM TotalStorage Productivity Center
Screenshot
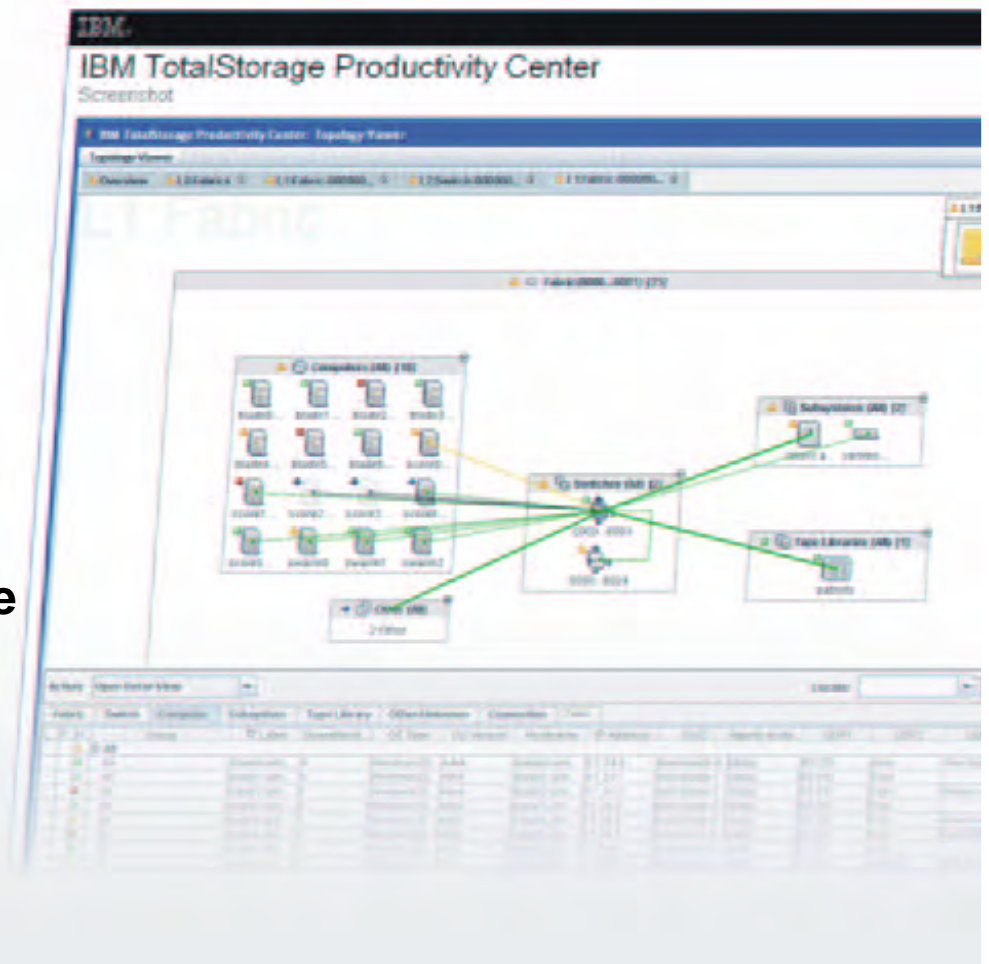
A Look Inside Productivity Center 4.1
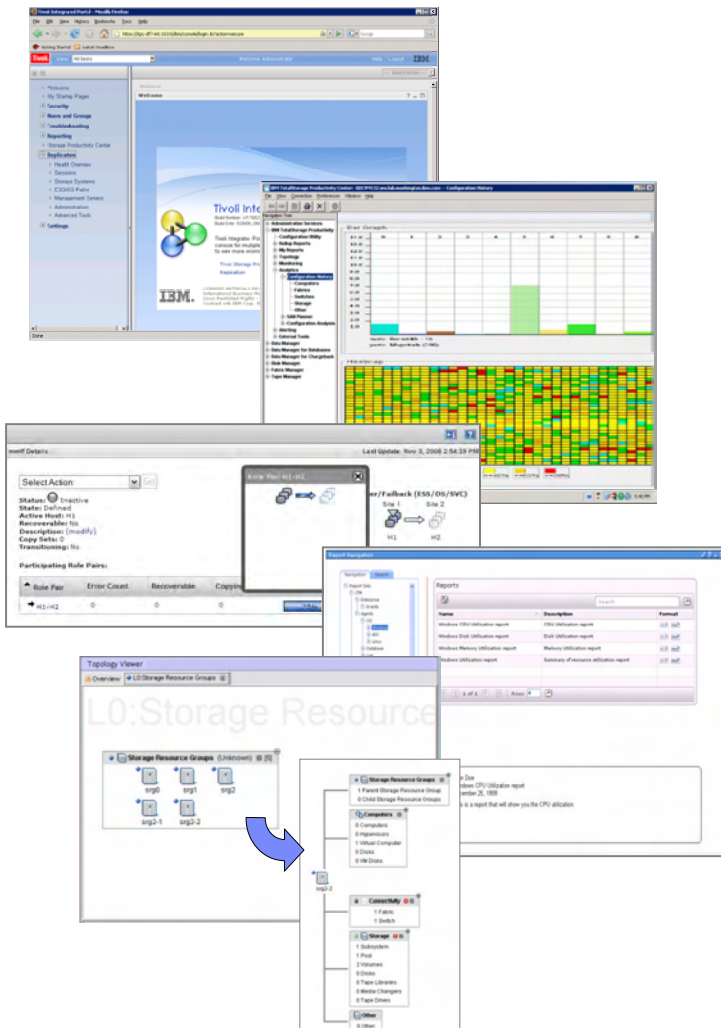
- *Tivoli Integrated Portal*

- *LDAP, Single-Sign-On & Launch in Context*

- *Custom Reporting*

- *Storage Resource Agents*

- *Disk Performance Optimization*

- *Storage Resource Groups*

- *Replication Progress Indicators*

- *MGM with Practice Volumes*

- *MGM with Hyperswap*

- *GM both directions with practice volumes*

- *Global copy*

- *WebSphere on zOS*

Replication Progress Indicators

1. Estimated time to complete synchronization
2. What volumes are currently being synchronized
3. Session progress to Prepared state
4. How many more tracks need to be copied

Storage Infrastructure Management
Wrap-up

- With open interfaces like SMI-S, we can empower administrators with automated tools to improve the effectiveness of the storage environment.

File and database data

- Optimization

  File system and database capacity utilization reporting and trending

- Provisioning

  Event-based file system extension

  Integrated with Disk provisioning operations

- Availability

  SAN File System monitoring

  ...ng

  ...ncy groups

  State monitoring

  Suspend / resume / resync

SAN

Tivoli Integrated Portal

TPC Integrated into TIP Navigation Tree

Start Button to Launch TPC GUI

- **Integration with TIP portal** enabling single management dashboard for many Tivoli products

- **Launch TPC GUI** via Java Web Start

  - **Common security** enables role-based authorization across products

  - **Common reporting** Shared infrastructure for viewing/running/administering/distributing reports -shared across the **Tivoli Portfolio**

But, the Business ROI is still the deciding factor
The Business Value Analyst Tool

- The tool was developed by **ALINEAN** a well established vendor who has been doing ROI modeling for nearly a decade. Two former Gartner ROI/TCO experts founded Alinean.

- The Business Value Analyst Tool is **customized** for IBM products and customized to YOUR environment

- The business case **reduces the time to build effective cost justifications** down from weeks to days

- The **process is fast and NO CHARGE**

- The tool identifies **measurable ROI metrics**

- The tool generates easy-to-read and **customize reports** in both Word and PowerPoint formats

- The IBM Business Value Analyst Tool **helps YOU make a more informed business decision**

Thank You

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TotalStorage SAN Volume Controller
Storage Virtualisation

VMWare
Windows / Linux /
NetWare guests

Microsoft Windows
MSCS

IBM AIX
HACMP

Sun Solaris

HP/UX

Linux (Intel)

IBM BladeCenter
Windows/Linux
VMWare

SAN

SAN

Point-in-time Copy
Full volume
Copy on write

Continuous Copy
Metro Mirror
FCP

SAN Volume Controller

SAN Volume Controller

IBM DS8000 Series

IBM DS6000 Series

IBM DS4000 Series

IBM ESS 800

Hitachi Lightning 99xxV

Hitachi Thunder 9200

HP EVA 3000

HP EMA 12000

HP MA 8000

EMC Symmetrix 8xxx

EMC DMX 800

EMC CLARiiON FC4700

15 Years of Leading the Way in Data Protection

July 1993: IBM ADSTAR Distributed Storage Manager (ADSM); 1st disk-based backup solution

TSM V4.1: backup for mobile systems and tape library sharing

TSM FastBack: Continuous Data Protection for Windows servers

IBM acquires Tivoli, an Austin, Texas-based startup that provides server monitoring software

TSM 5.3: New GUI, improved performance and enhanced application support; a new administrative center significantly reduces management time

TSM 5.4: improved application availability, encryption key management and data shredding capabilities

1993 | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008**

ADSM V3.1: enhanced user interfaces, improved performance, and integration w/ systems management applications

Tivoli Storage Manager (TSM) V3.7, succeeds ADSM ; added enterprise management

TSM V5.1.5: adds support for Linux and is the only known data protection application able to scale across the entire enterprise from laptops to mainframes

Tivoli CDP for Files: protection for desktops & laptops

TSM 5.5: enhancements to data security, deeper Windows application coverage, protection of VMware environments, enhanced scalability, performance and ease-of-use

TSM V4.2: journal-based backup, LAN-free backup for the Backup-Archive, client and SANergy support

Pulling the SAN together with TPC (SVC specific integration)

TPC Console

TotalStorage Productivity Center

Host **Host** **Host**

V Disk   V Disk   V Disk

SAN   **SAN Volume Controller**

M Disk   M Disk   M Disk

Physical Storage
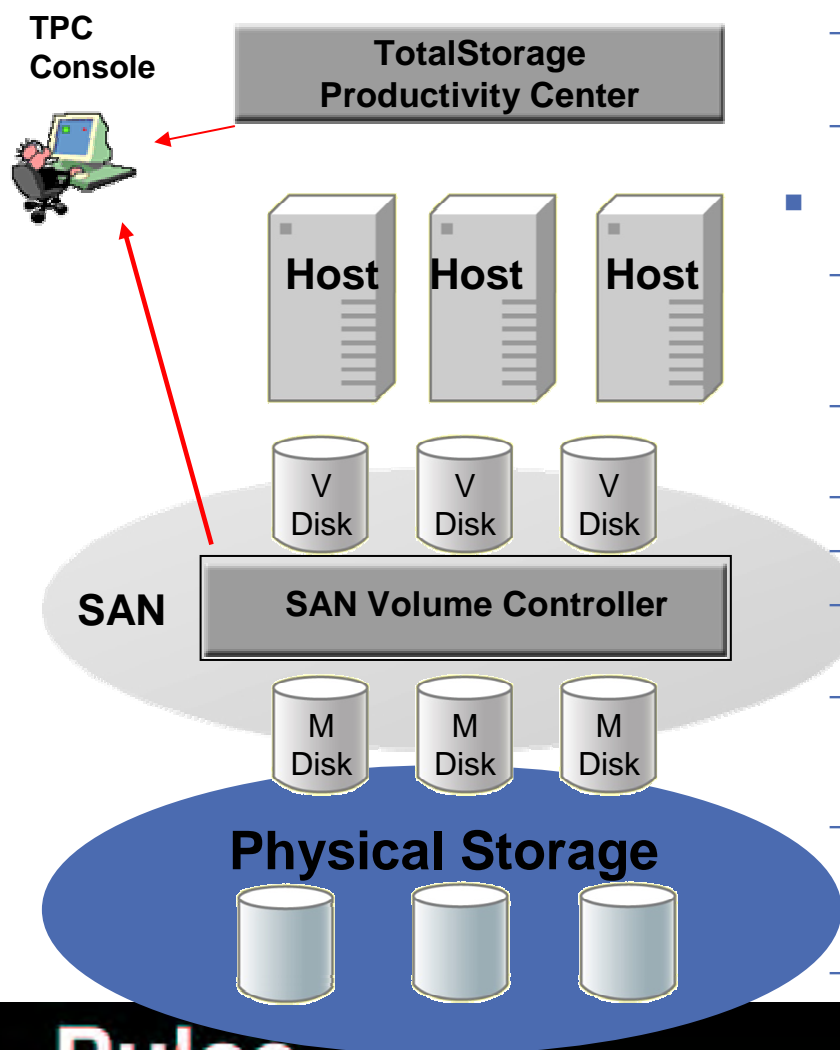
- **Asset and Capacity Reporting**
  - Physical characteristics such as the manufacturer, model, serial number, capacity, etc
  - Show the allocated and free capacity of every SVC on the network

- **Configuration Reporting and Performance**
  - Reports on SVC's storage allocated to logical host volumes (which appear to hosts as disk drives) and the managed disks being used on the backside
  - Display the physical managed disks behind what the host sees as a disk drive
  - List all SVC volumes which have been allocated but aren't in use
  - Show which hosts have access to a given SVC volume
  - Show which hosts have access to a given disk drive (within the SVC)
  - Show which SVC volume (and managed disks) a host has access to Discovery, Show the Storage Controllers (ex. ESS/DS4000) that provide volumes to SVC
  - Historical Reporting Historical SVC Subsystem occupancy data will be maintained (e.g. assigned/unassigned space within the SVC).
  - Measure and monitor SVC performance
  - Define, connect and perform any needed zoning for VDisks through TPC GUI