IBM Technical Forum & Executive Briefing

17 al 21 Octubre 2011

Imagine PODER Imagine CAPACIDAD

The Journey – Storage Solutions for a Smarter Planet

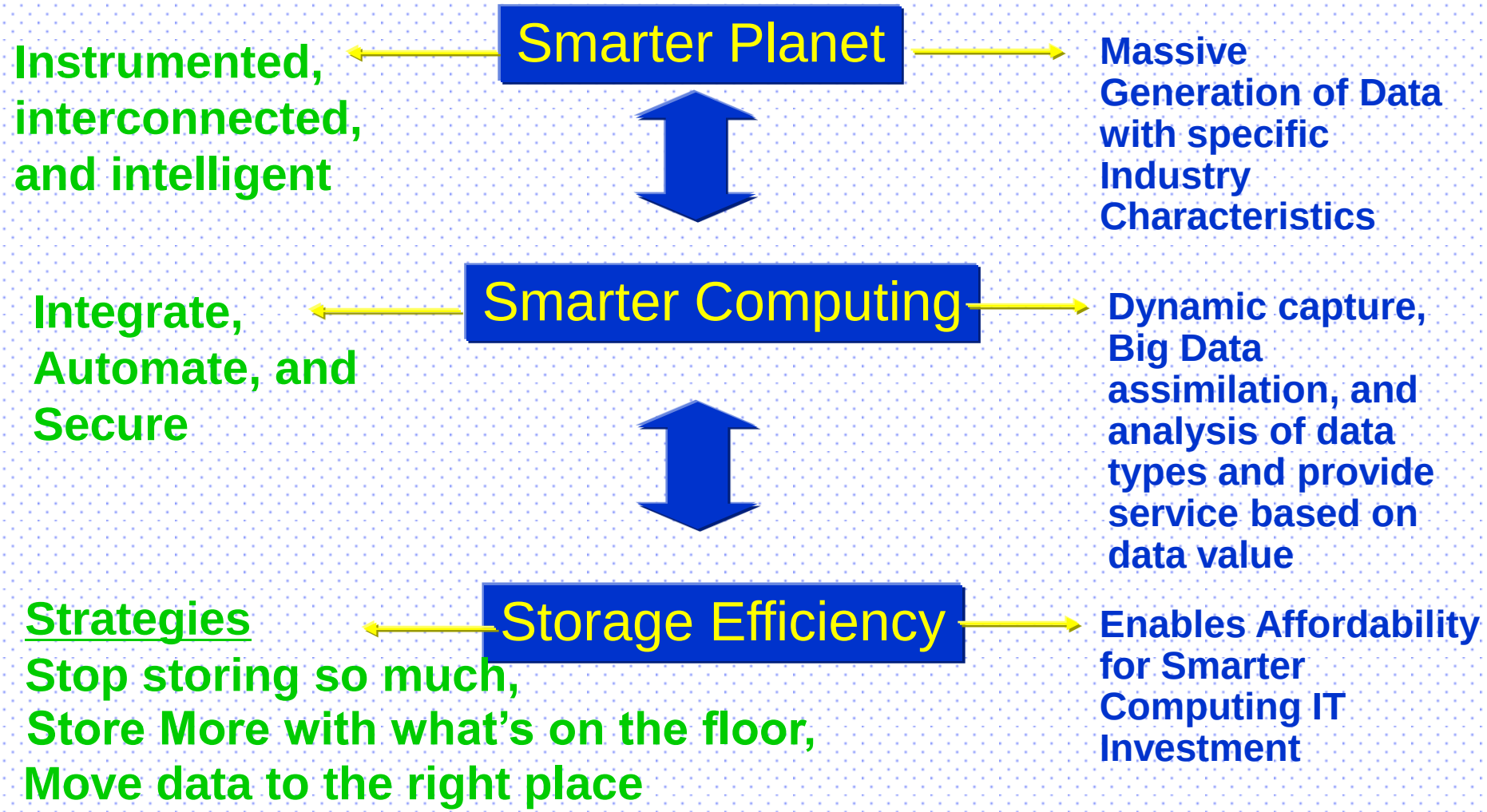
Ace Lopez

Chief Strategy Officer – GMU Storage

October 20, 2011, Riviera Maya, Mexico

Smarter Planet Needs Smarter Computing

Enabled by Storage Efficiency

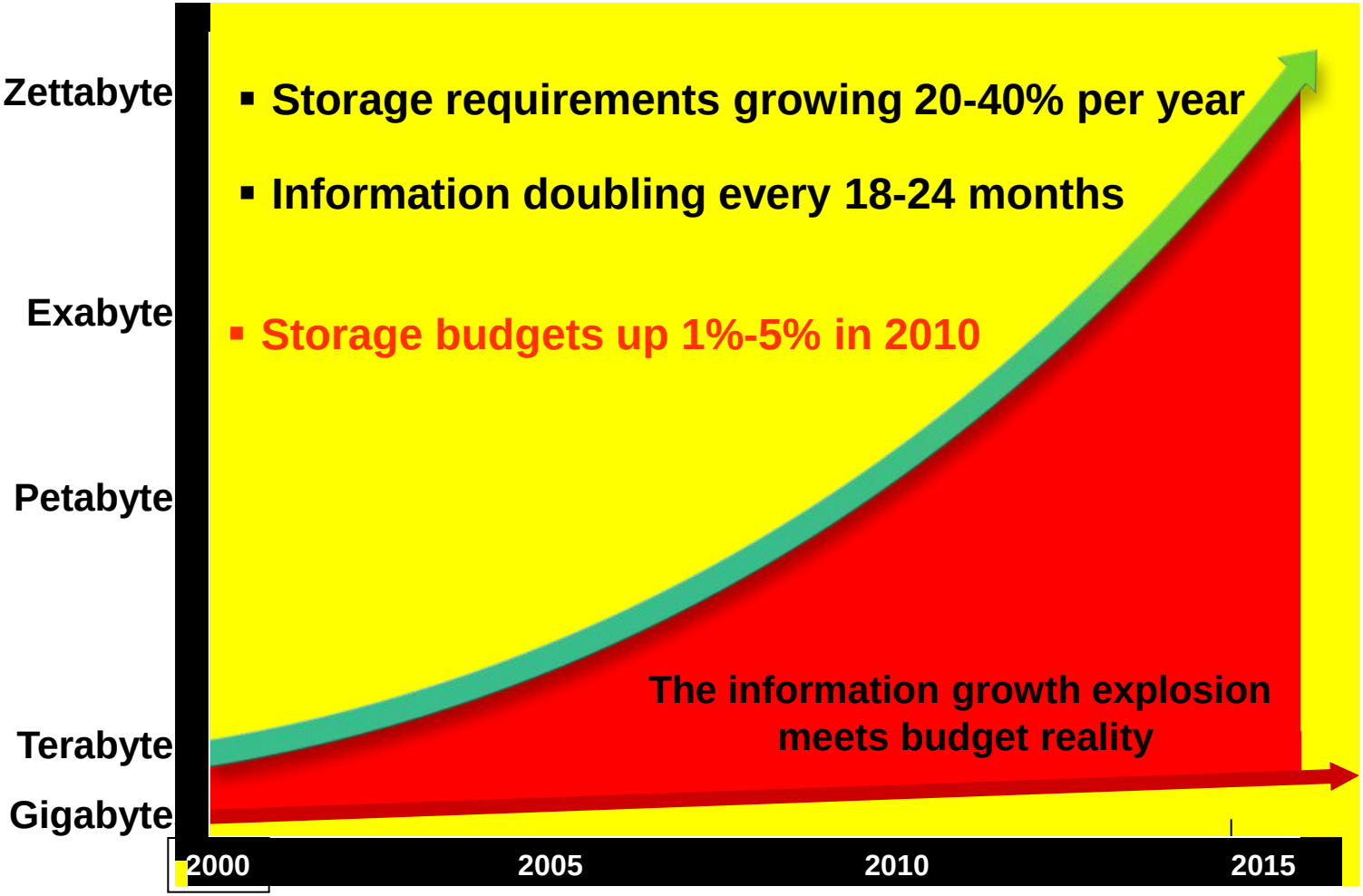


What Our Clients are Telling Us

I have one or more of these challenges:

- I need to reduce costs, improve performance and increase IT flexibility
- I am not realizing the value from IT that I should be
- Need to understand all my IT assets
- How do I improve service and beat expectations/
- I want to maintain access to information only throughout its useful life
- We are experiencing explosive information growth!

Smarter Systems are creating a storage efficiency challenge



What is Big Data?

2500000000000000000 (2.5 quintillion)?

Number of Bytes Generated Everyday

90% 2 Years?

90% of World's Data Created in Last 2 Years

Big data spans three dimensions:

Variety – Structured data, including unstructured data of all varieties: text, audio, video, click streams, log files and more.

Velocity – Often time-sensitive, big data must be used as it is streaming in to the enterprise in order to maximize its value to the business.

Volume – Big data comes in one size: **Big**.

Pop Quiz

- 10 hours/minute
- 1 Petabyte/second
- 200-300 Megabytes
- What do all these have in common?
- How to manage it?

- Video loaded on YouTube
- Data Generated by Super Collider (aka Doomsday Machine)
- Amount of data stored in the human brain for lifetime
- A lot of redundant data… or data not particularly useful
- Solution: Prioritise what is needed…keep minimum number of copies of unique…and/or disregard what is not needed

- 1 Gigabyte

- "Maximum capacity that will ever be needed on a single spindle"
- *(RF72 Business Plan 1989 – Digital Equipment Corporation… Ace Lopez Disk Business Manager*

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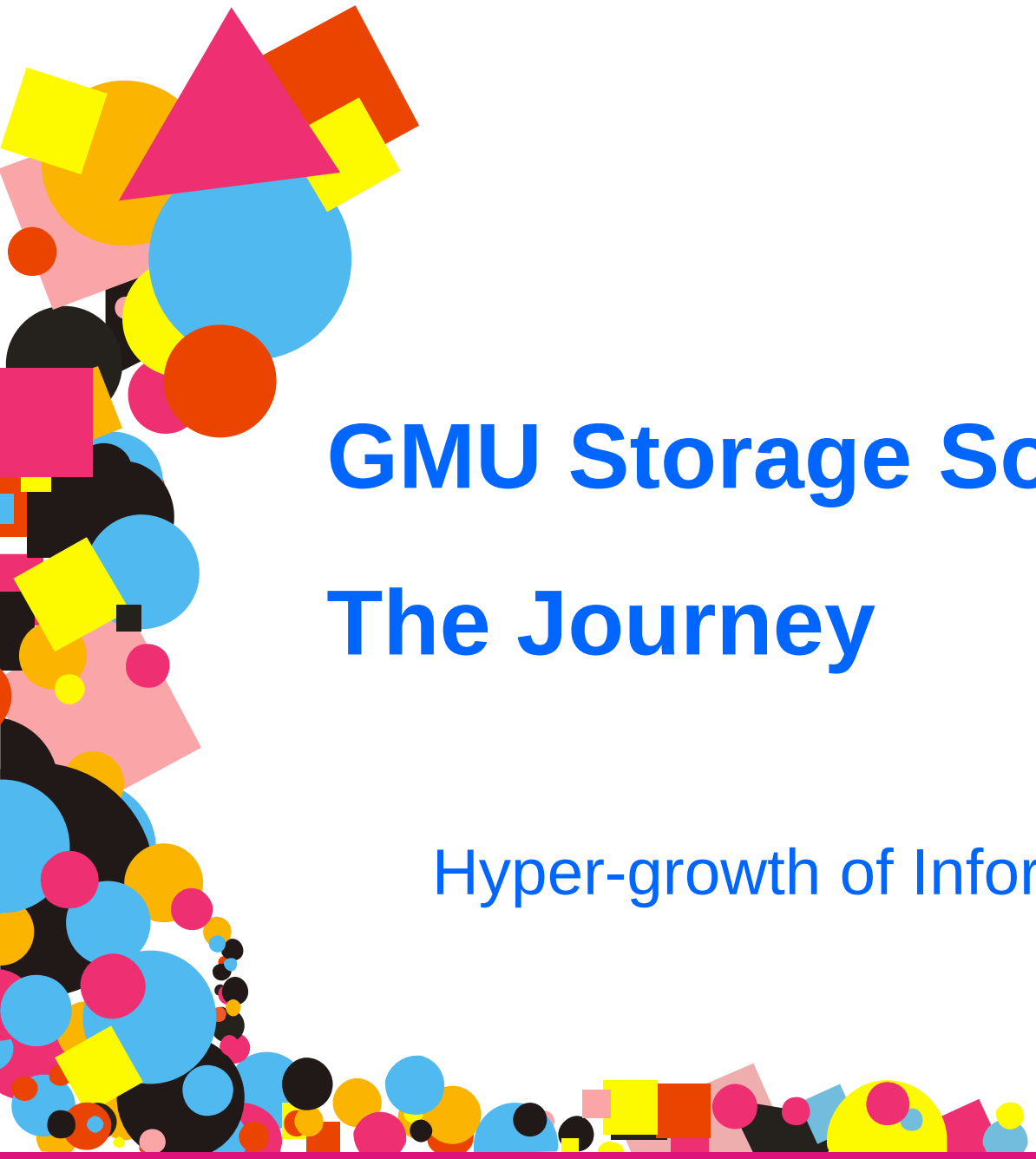
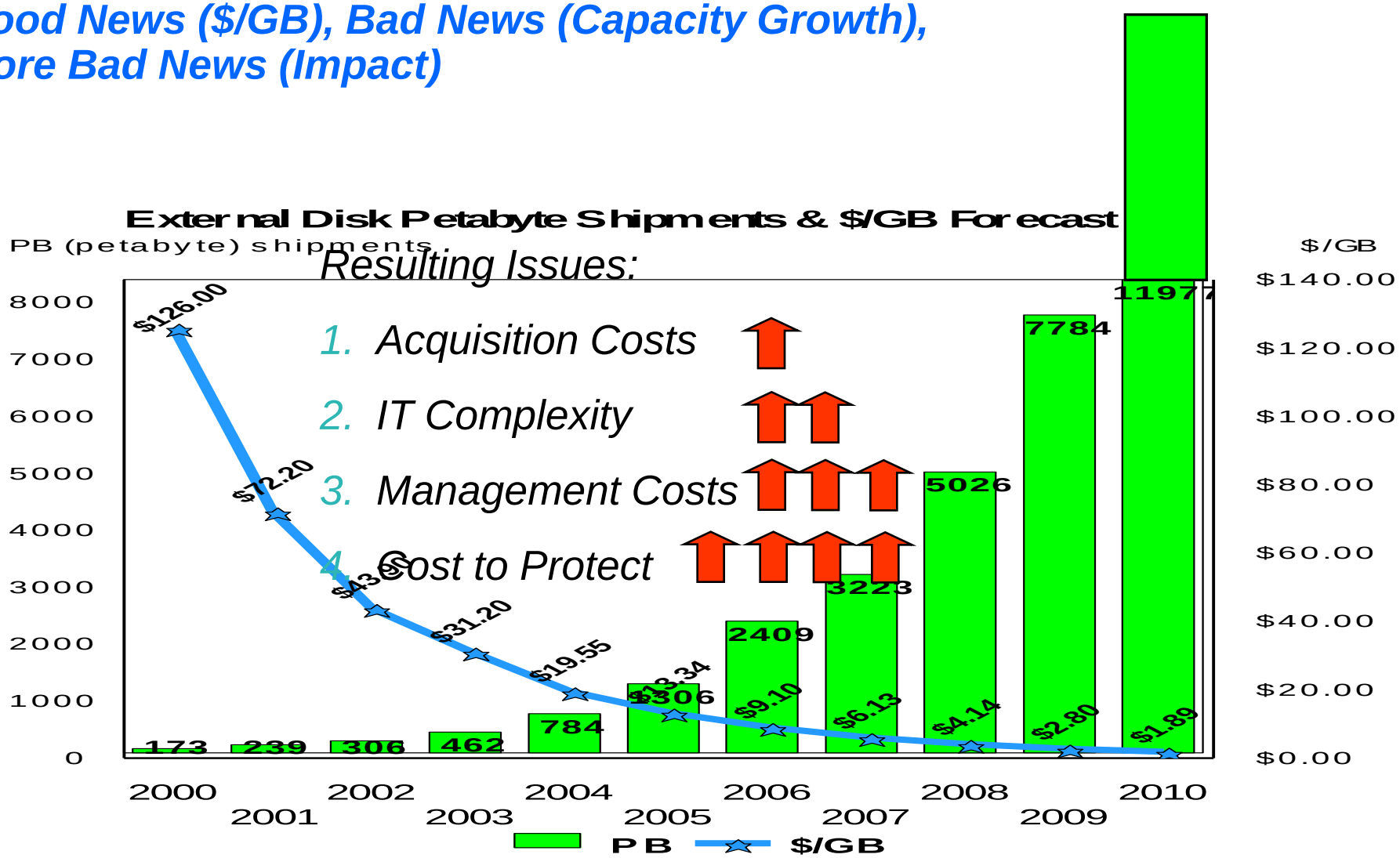
The Journey

Hyper-growth of Information



Industry Information Growth

Good News ($/GB), Bad News (Capacity Growth), More Bad News (Impact)



Petabyte: ~ 1000 Trillion bytes; Exabyte: 1000 Petabytes

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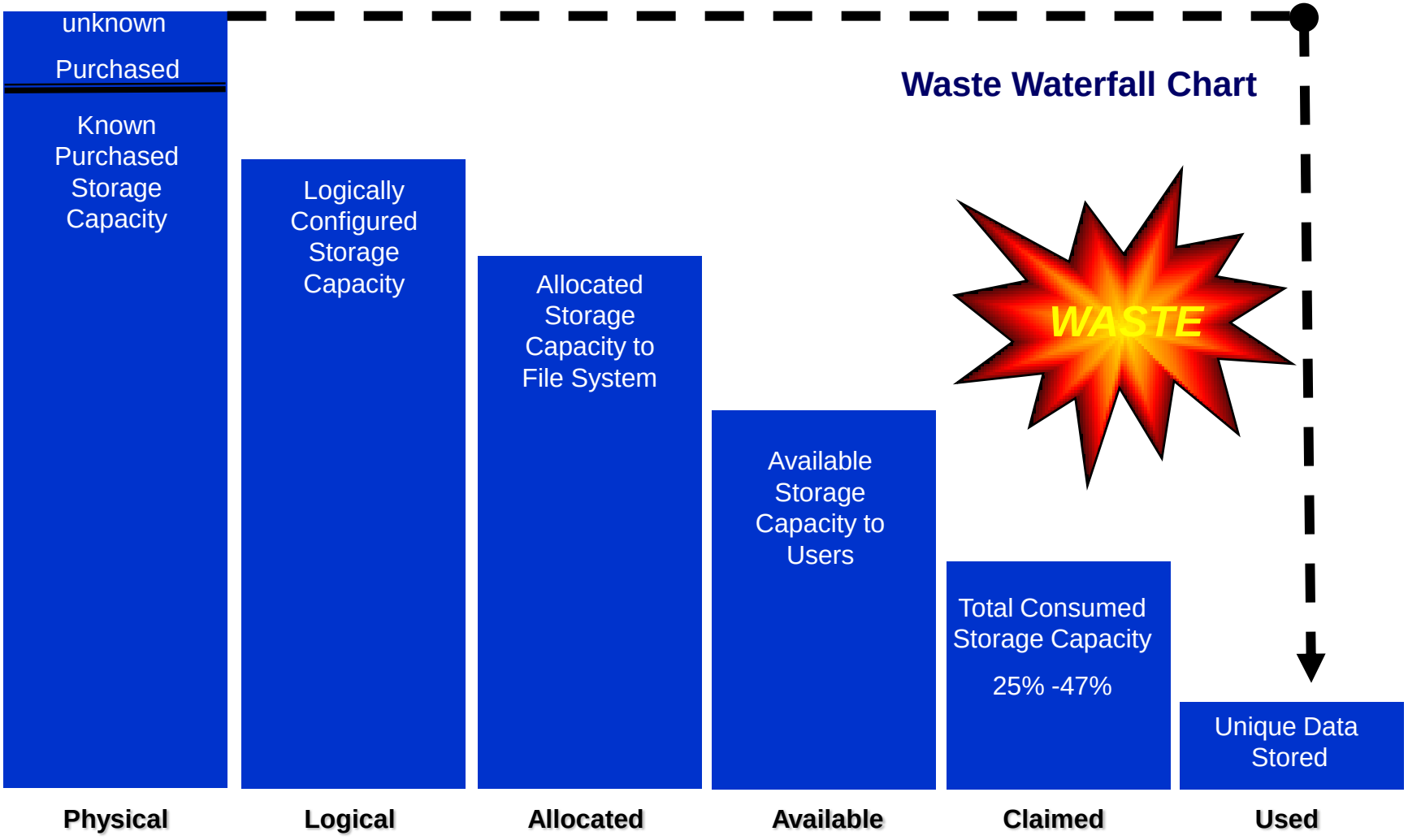
The Journey

Hidden Waste

Hidden Waste



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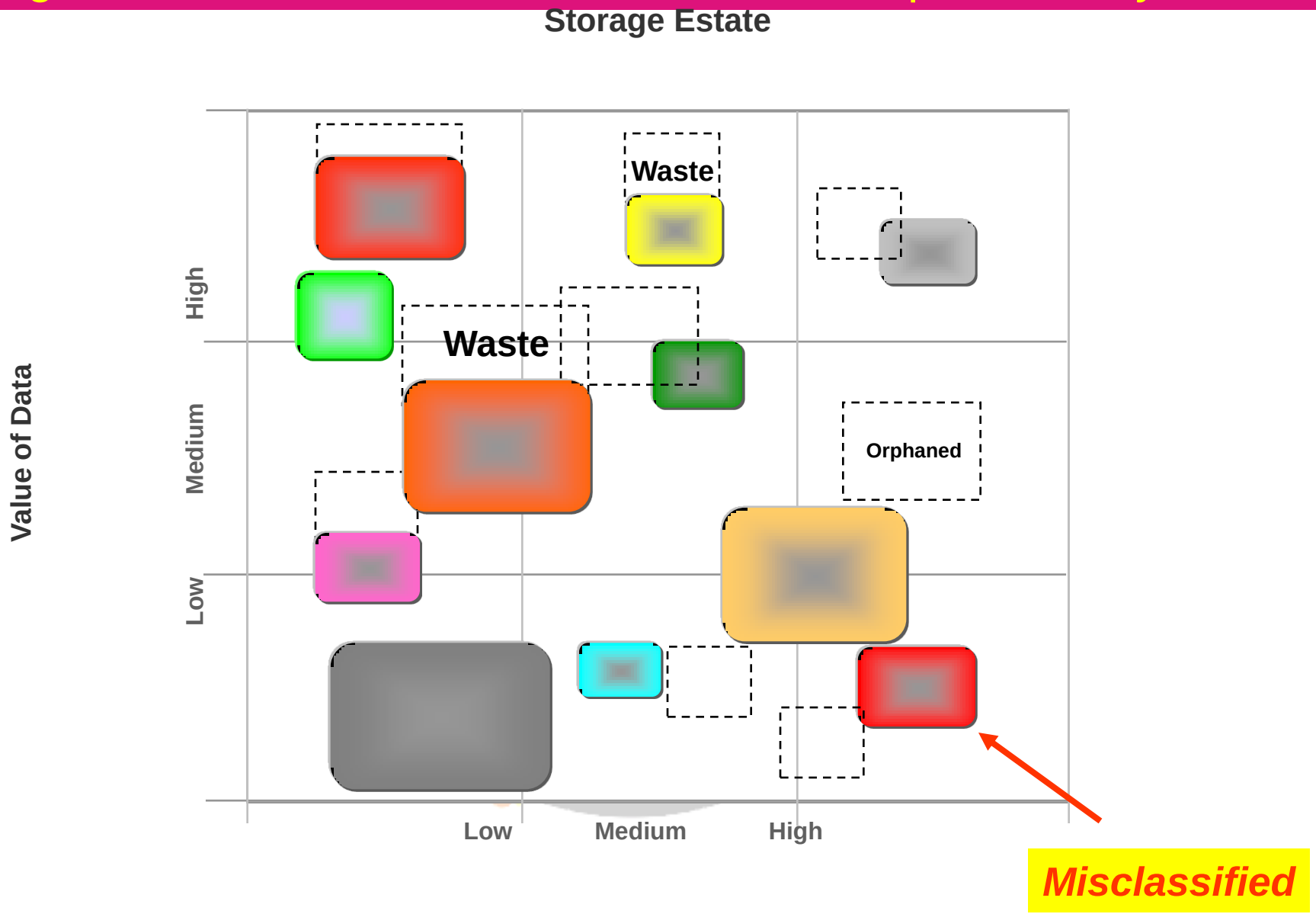
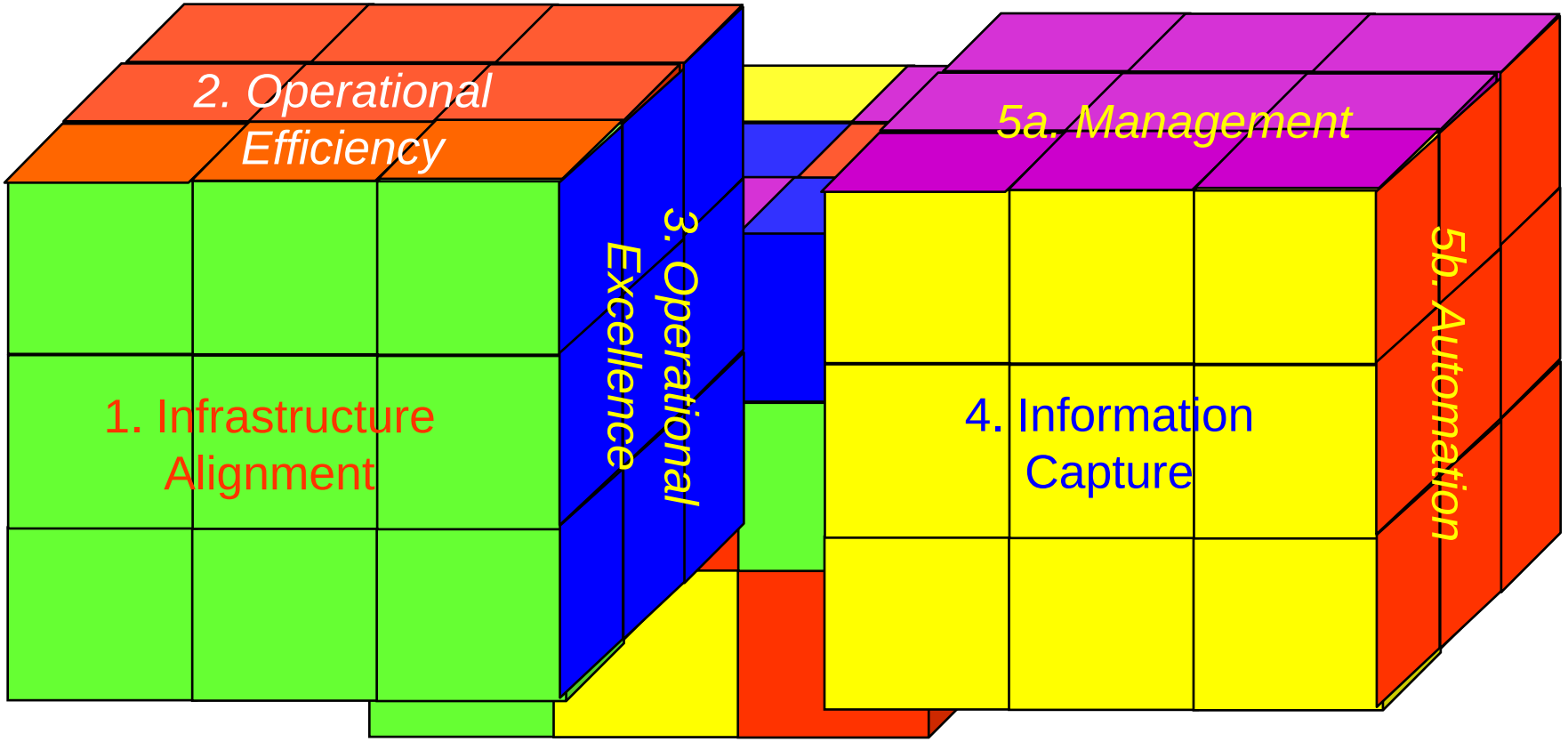
The Journey

Issues:
Fragmented Storage Estates
Misclassification of Data

Fragmented, Misclassified Information, Complex, Costly



GMU Storage Strategy - The Journey Stations



ITBefore ITAfter

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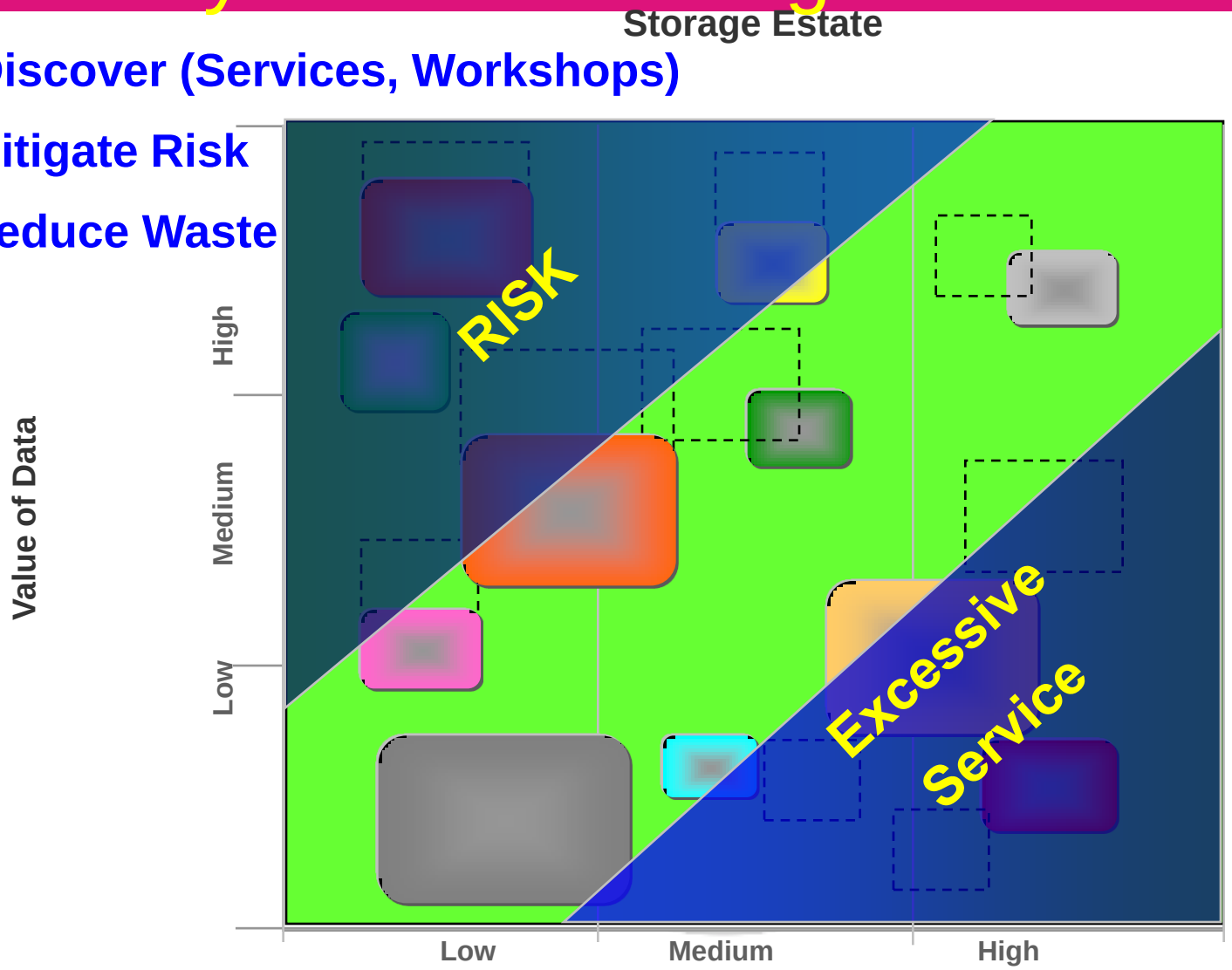
The Journey

The Journey: Station 1 Alignment

Journey Station 1 – Alignment

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



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The Journey

Station 1 - Alignment:

Discovery Solution:

Storage Infrastructure Optimization (SIO)

Storage Infrastructure Optimization initiatives focus on six key practices

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 Recory 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

Reduce Cost

Improve Service

Manage Risk

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What you can 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

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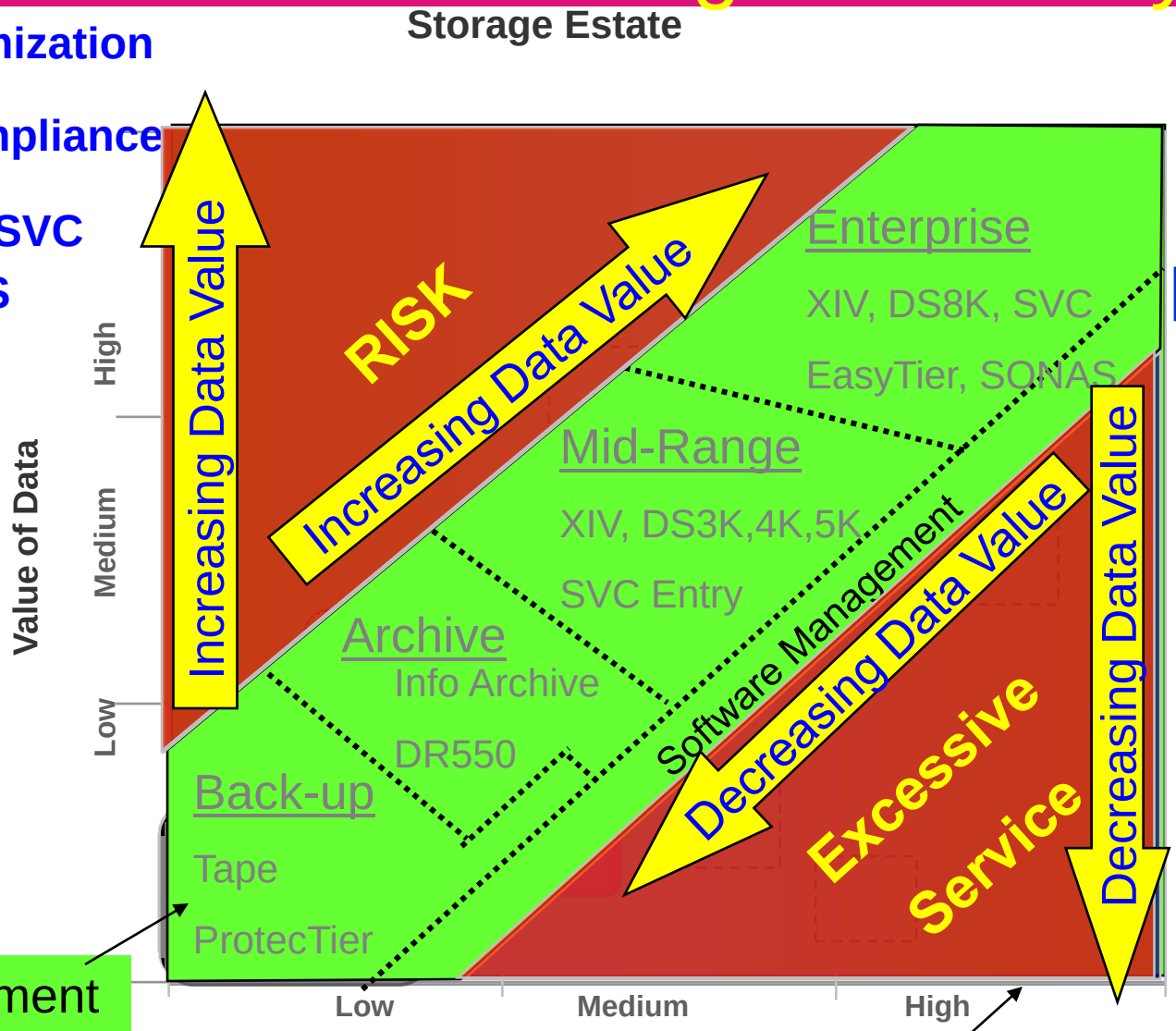
The Journey

The Journey: Station 2
Storage Efficiency

Journey Station 2 – Storage Efficiency

1. Back-up Optimization
2. LTO Ultrium
3. Archive + Compliance
4. TCO - XIV
5. Virtualization SVC
6. Scale-Out NAS
7. LTFS
8. Encryption
9. EasyTier
10. TSM, TPC
11. GTS Services
12. Lab Services



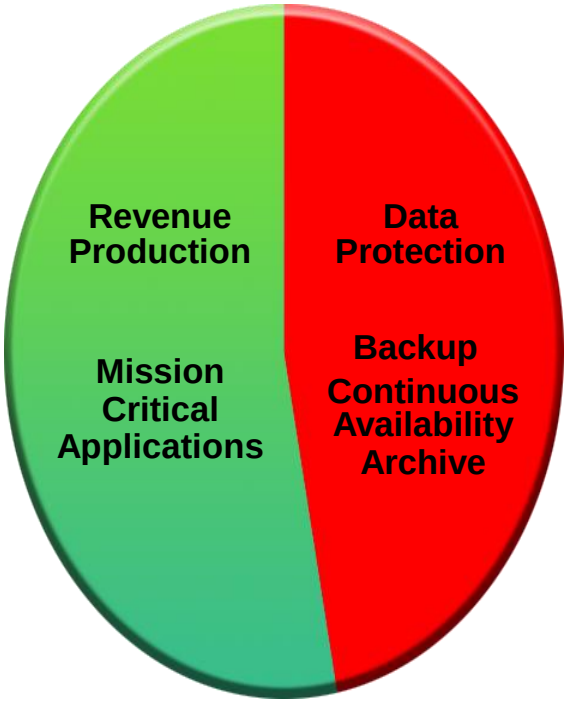
Data in Motion

Alignment "Green" Channel

Avoidance Zones

Companies are forced to spend in ways they'd rather not

Business Analytics has increased the value of information and launched the "Big Data" challenge



The Cost of losing data or searching for it has skyrocketed

Users Expect 100% Availability

"For every dollar spent on buying primary storage for supporting mission critical applications, 4-6 dollars are spent protecting that data, in the form of snapshots, mirrors, replication for DR, backups and archives. Financially, this doesn't make sense but that is what the best practices today dictate. For the first time new technologies are becoming available that will fundamentally improve this ratio."

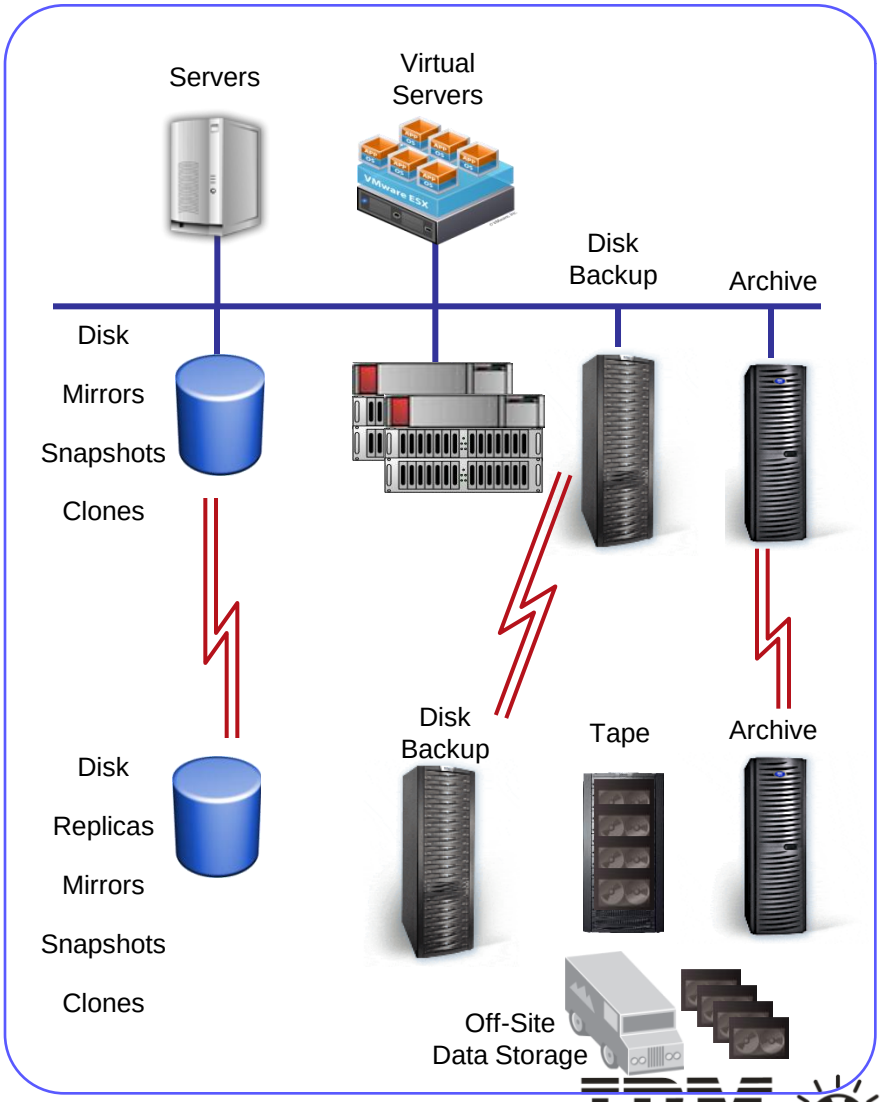
Arun Teneja - Founder and Consulting Analyst - Taneja Group

Cost of Data Protection: Multiplier Effect of Copies

What if…?	Then, I'll Use….
• Data Gets Lost?	• **Back-up!**
• My storage subsystems crash?	• **Mirroring**
• A fire destroys my data center?	• **Mirroring a little farther**
• A hurricane, tornado, earthquake, or tsunami strikes?	• **Disaster Recovery Site**
• I need to test new applications?	• **Snapshots!**
• I need to conduct analytics?	• **Clones!**
• My Recovery Point Objective is not right?	• **More Snapshots**
• My Recovery Time Objective is too long?	•
• Someone sues us?	• **Create a copy from Archive**
• We get audited?	• **Pull Persistent copy from Archive**
• I am not compliant?	• **Create Persistent Copy in Archive**
• My archive gets destroyed	• **Backup my Archive!**
• We need to be 24X7 Worldwide?	• **Cloud Storage**

How Did It Get This Way?

- Data continues to grow 35% to 65%* for most companies
  - Growth is a factor of:
    - Mirrors
    - Snapshots
    - Clones
    - Replicas
- All of this data is being backed up
  - Of the backup data, a good deal of it is being replicated for DR purposes
- Archives of primary data are also created for compliance purposes
  - Archive data is also replicated for DR
- In the remote facilities backup tapes are cut from the disk copies for long term preservation
  - This data is hauled off on tapes and the tape 'farm' continues to grow

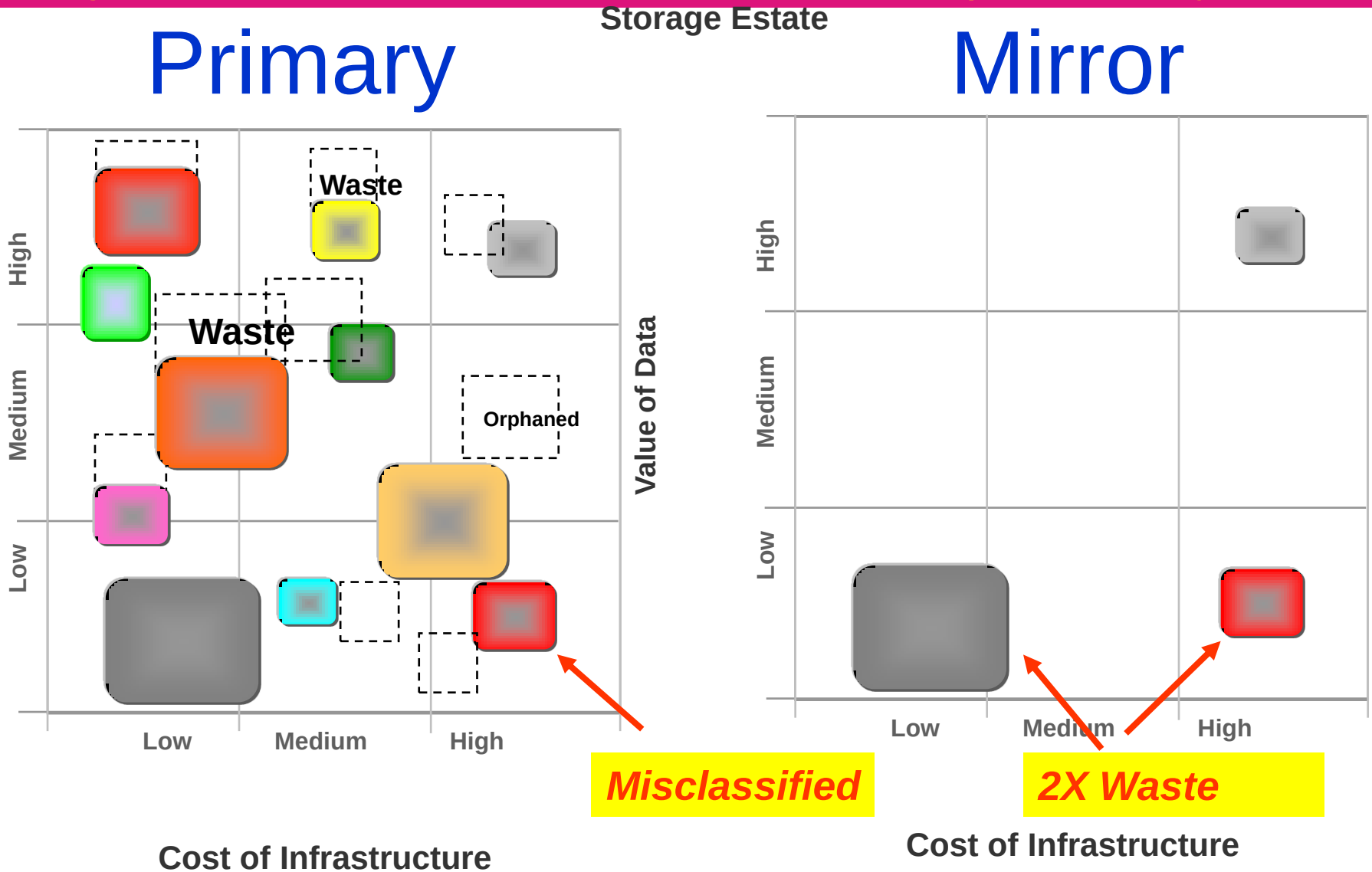


* Source: Wikibon

Storage Efficiency Extented to Data Protection

- If you Mirror Low Value Data sitting on a High Cost Infrastructure you are multiplying waste
- If you back up all data on production systems without archiving infrequently accessed data your back will be inefficient
- Archive old dated information and clean up production system
- Mirror production data based on distance, RPO, and RTO
- Backup the more efficient production data

Fragmented, Misclassified Information, Complex, Costly



Journey Station – Storage Efficiency

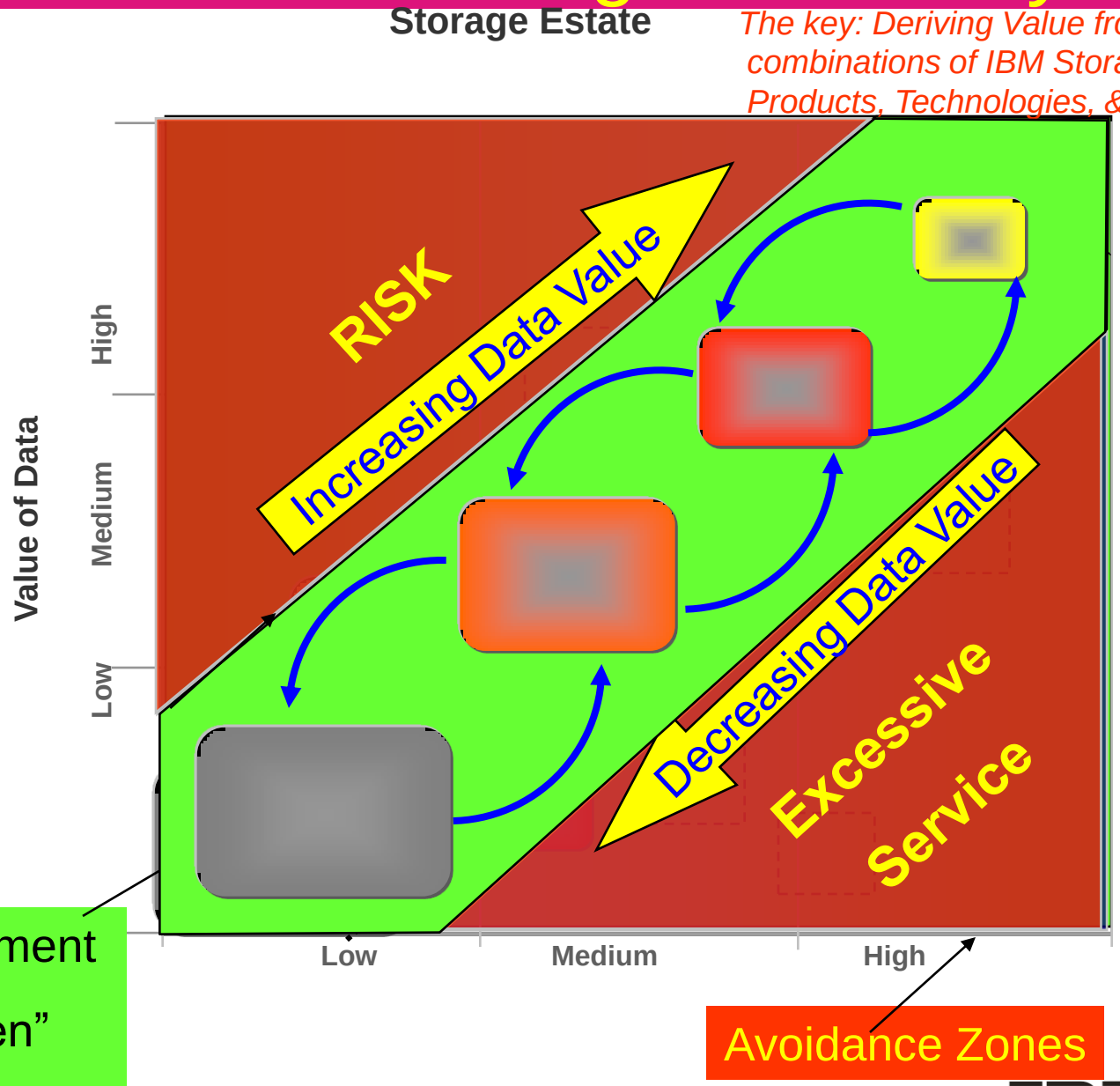
The key: Deriving Value from combinations of IBM Storage Stack Products, Technologies, & Services

Achieving &

Maintaining

Optimization

Bueno!
Bonito!
y
Barato!



Alignment
"Green"
Channel

Avoidance Zones

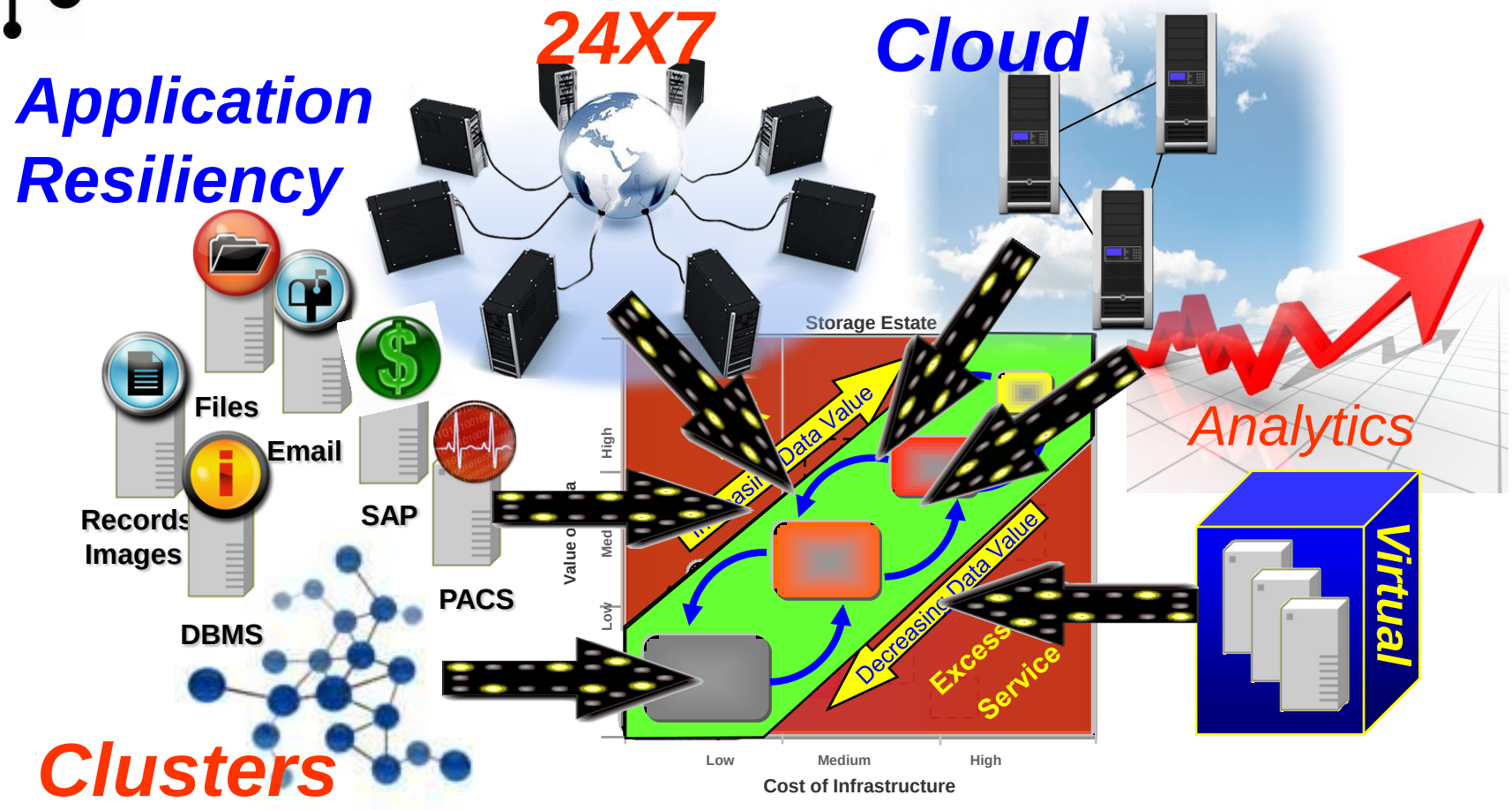
GMU Storage Solutions

The Journey

The Journey: Station 3
Operational Excellence

Journey Station 3 – Operational Excellence

Interconnected



Journey Station – Operational Excellence

Interconnected

24X7

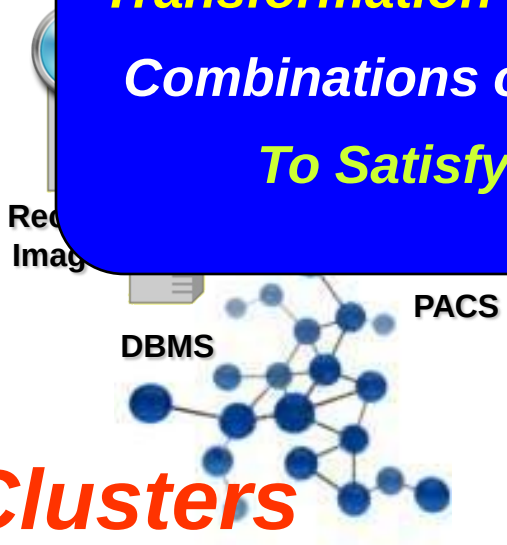
Cloud

Application Resiliency

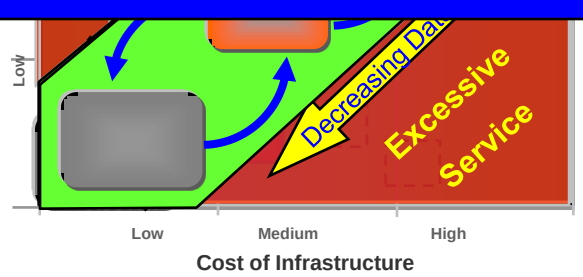
Transformation of: ***People*** ***Process*** ***Technology***

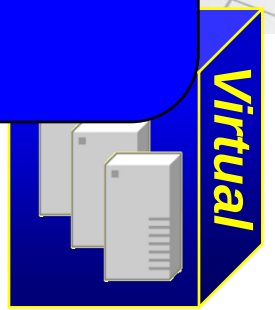
Combinations of: ***Hardware*** ***Software*** ***Services***

To Satisfy: ***Business Needs***



Clusters





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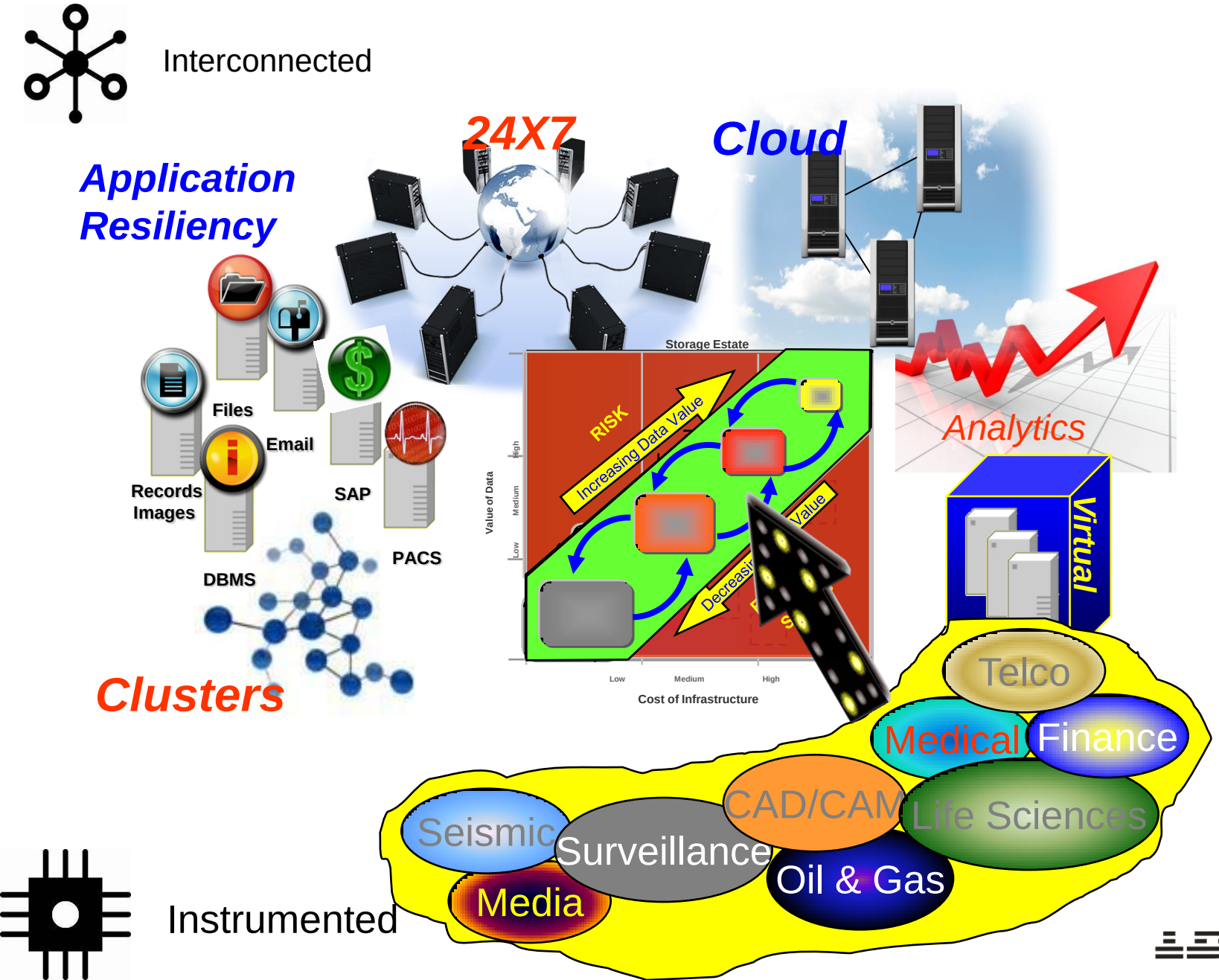
The Journey

The Journey: Station 4
Information Capture (Relevance)

Journey Station 4 – Information Capture (Relevance)

Interconnected



Instrumented

Watson: Just a Pretty Game Show Winner?

Watson: Medical Consultant

Genomics

Specialized Drugs

Off-Label Uses

Treatment Guidelines

Testing

Disease Classification

Give me Options & 2nd Opinion

Watosn: New Value in Healthcare

The Smart Room – Information Integration

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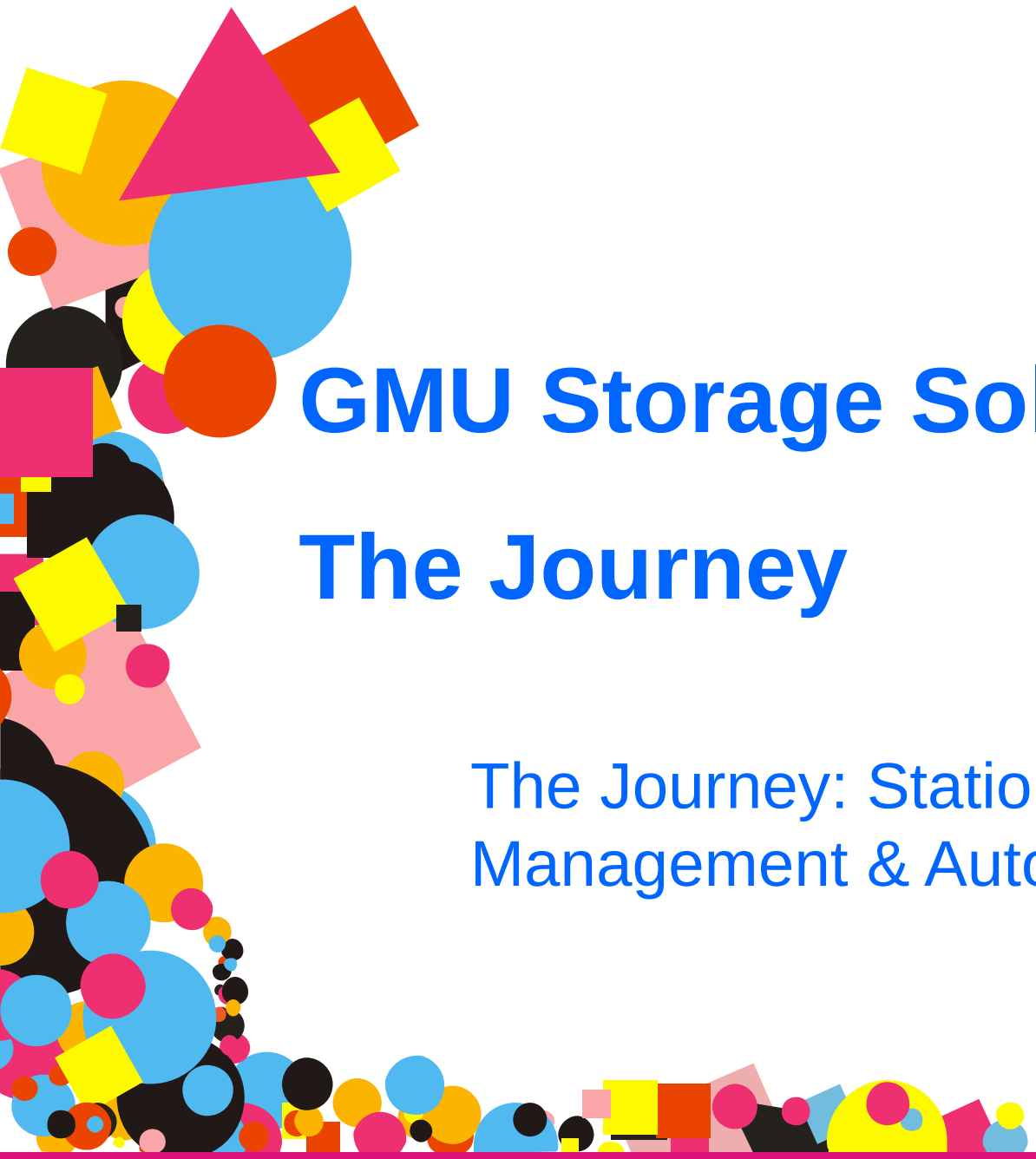
GMU Storage Solutions

The Journey

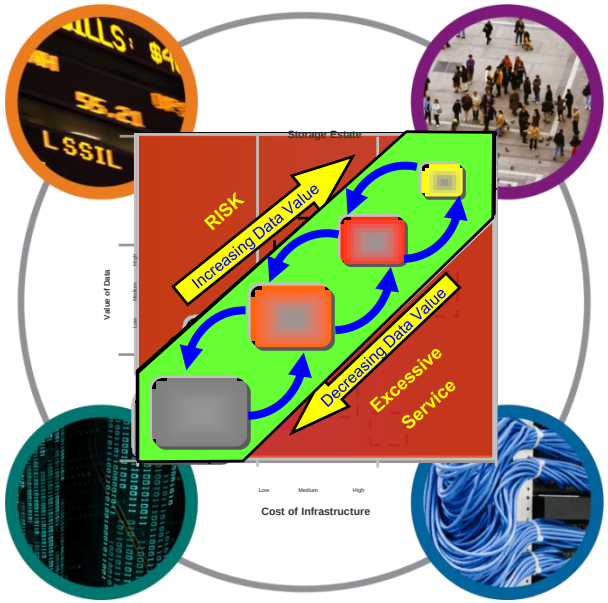
The Journey: Station 5
Management & Automation



IBM

Journey Station 5 – Management & Automation

TRANSACTION PROCESSING AND DATABASE
- Integrity
- Performance
- Flexibility



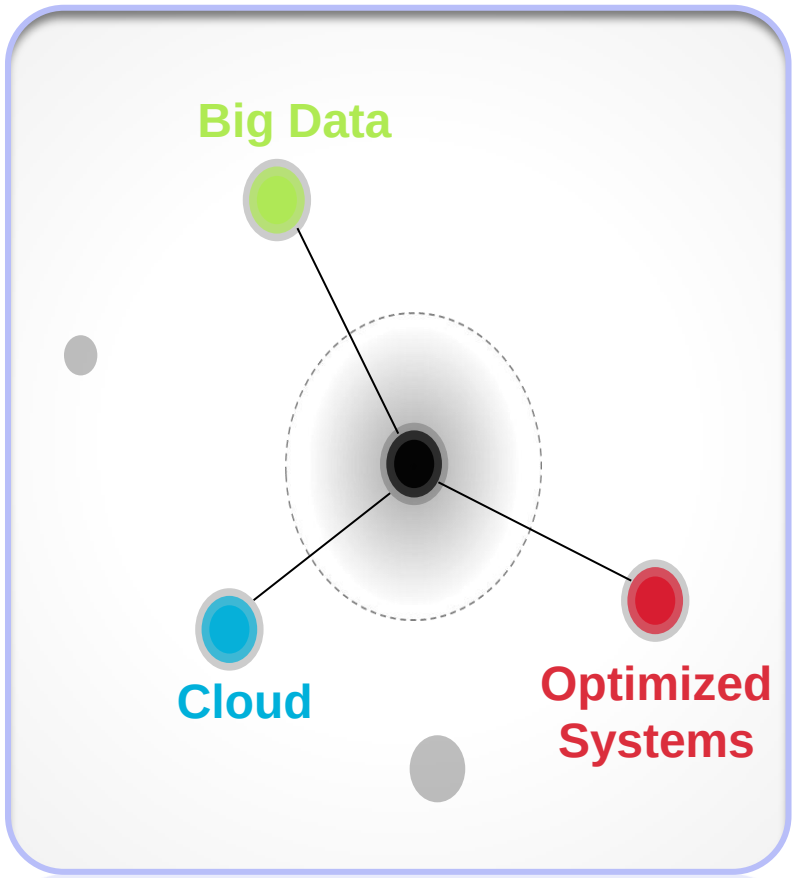
BUSINESS INTELLIGENCE AND ANALYTICS
- Discovering Insights
- Predicting Outcomes
- Enabling Faster Action

BUSINESS PROCESS MANAGEMENT
- High Performance
- Process Integrity & Compliance
- Scalability and High Availability

CONSOLIDATION AND VIRTUALIZATION
- Reducing Cost
- Improving Service
- Managing Risk

Intelligent

We Are Entering the Next Era of Computing



Smarter Computing

The Era of Insight for Discovery

- Created by the integration of Big data in Optimized systems, managed as a Cloud
- Applied to deliver new insights and drive innovation
- Twice the capacity for service on a flat budget

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Analytics and visualization are game changing technologies

Extract added value from your data

Find hidden relationships and patterns in data

- **Integrated analytics**

Significantly improve productivity

- **Advanced visualization can simplify investigations**

- ***Enhanced*** IBM Information Archive for Email, Files and eDiscovery
  - Includes advanced visualization and analytics
  - Implement a complete solution quickly, and start finding your data!

The Journey Stations

5. Management & Automation

4. Information Capture (Relevance)

3. Operational Effectiveness (Context)

2. Operational Efficiency

1. Alignment

GMU Storage Solutions

The Journey

The Journey:
Next Steps

Next Steps

- What are the Biggest Challenges in Your Information Infrastructure?
- Storage Management Costs?
- Back-Up Windows?
- Business Continuance?
- Budgets to Keep up with Storage Growth?
- Application Resiliency?
- Compliance?
- Security?
- Other?
- IBM has been helping clients to optimize their Information Infrastructure by providing an assessment from which to make sound business decisions…. If I could arrange an assessment to provide you with additional insight into your storage estate would you be interested?

The Journey – Storage Solutions for a Smarter Planet

.....From IBM

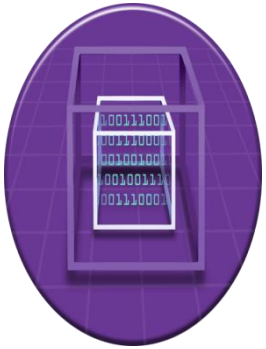
Thank You

GMU Storage Solutions

The Journey

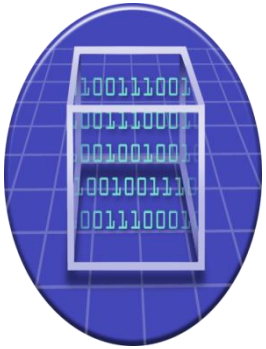
Storage Efficiency Solutions
(Optimization Solutions for Midrange)

Storage efficiency strategies and best practices



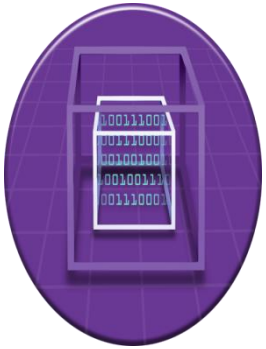
Stop storing so much

Move data to the right place



Store more with what's on the floor

A set of essential technologies enables storage efficiency

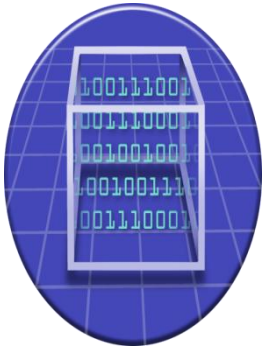


Stop storing so much

- Data Compression
- Data Deduplication

Move data to the right place

- Automated Tiering
- Automated Data Migration



Store more with what's on the floor

- Storage Virtualization
- Thin Provisioning

Journey Station: Operational Efficiency

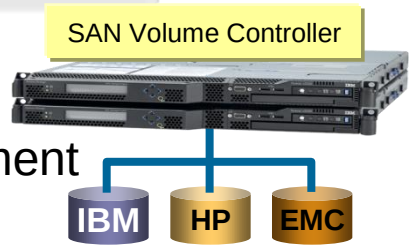
Stop Storing So Much

- Data Compression
- Data Deduplication

- Shrinks active data up to 80% without degrading performance
- Shrink backup data on disk up to 25 to 1

Store More with What's On the Floor

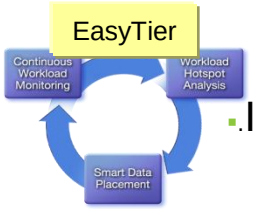
- Storage Virtualization
- Thin Provisioning
- Consolidated Storage Management



- Improve utilization up to 30% by pooling storage

Move Data to the Right Place

- Automated Tiering
- Automated Data Migration
- Policy-based Management



- Improve performance up to 3x

Tivoli

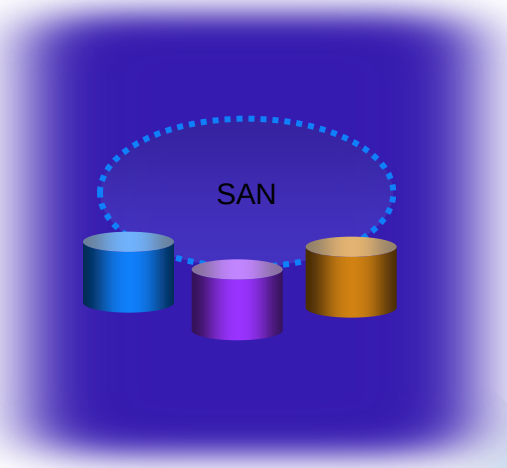
IBM

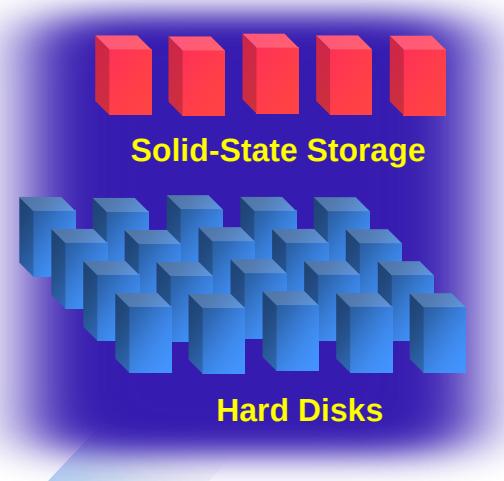
And Now…

IBM Introduces

Storwize V7000

Available for the first time in a midrange offering





IBM Storwize V7000

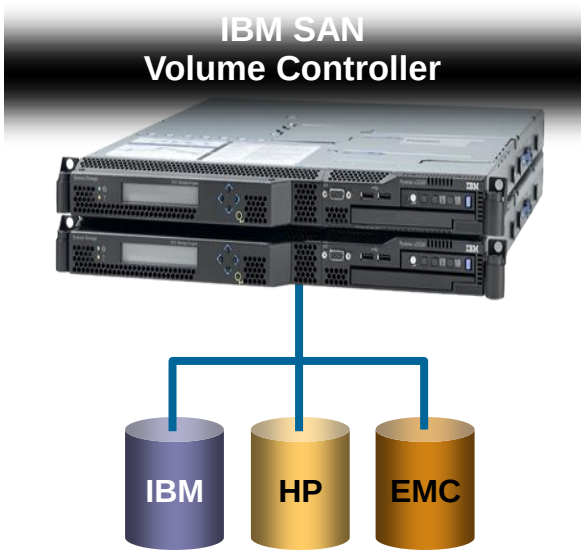
Storage Virtualization

Incredible Ease of Use

Easy Tier

IBM builds virtualization into the storage infrastructure

- Improve utilization up to 30% by pooling storage
- **Extend advanced functionality to your existing storage**
- Online data migration virtually eliminates downtime
- Enhanced! IBM System Storage™ SAN Volume Controller has an updated Graphical User Interface and support for up to 256 storage systems.



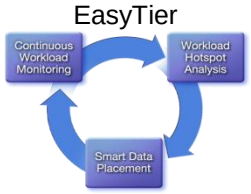
"As a managed service provider, we can take advantage of the IBM System Storage SAN Volume Controller's ability to cater to each customer's requirements individually, according to SLAs"

Markus Peltz, Configuration Manager, IDS Scheer

IBM Storage Integrated Storage Solutions reduce TCO by more than 40%

Example: IBM Storwize V7000 + IBM Tivoli Software + Integrated Enterprise Technologies (SVC, EasyTier, XIV GUI)

3) Move your data to the right place



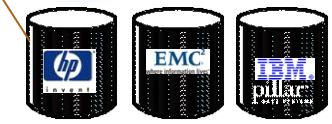
Tivoli

Solid-state storage

Storwize V7000

SVC, EasyTier, XIV GUI

Real-time Compression



1) Stop storing so much

2) Use more with what you have on the floor

- Storage Virtualization (SVC)
- Thin Provisioning

ProtecTIER Deduplication