Univeristà La Sapienza

Laurea Magistrale Ingegneria Informatica

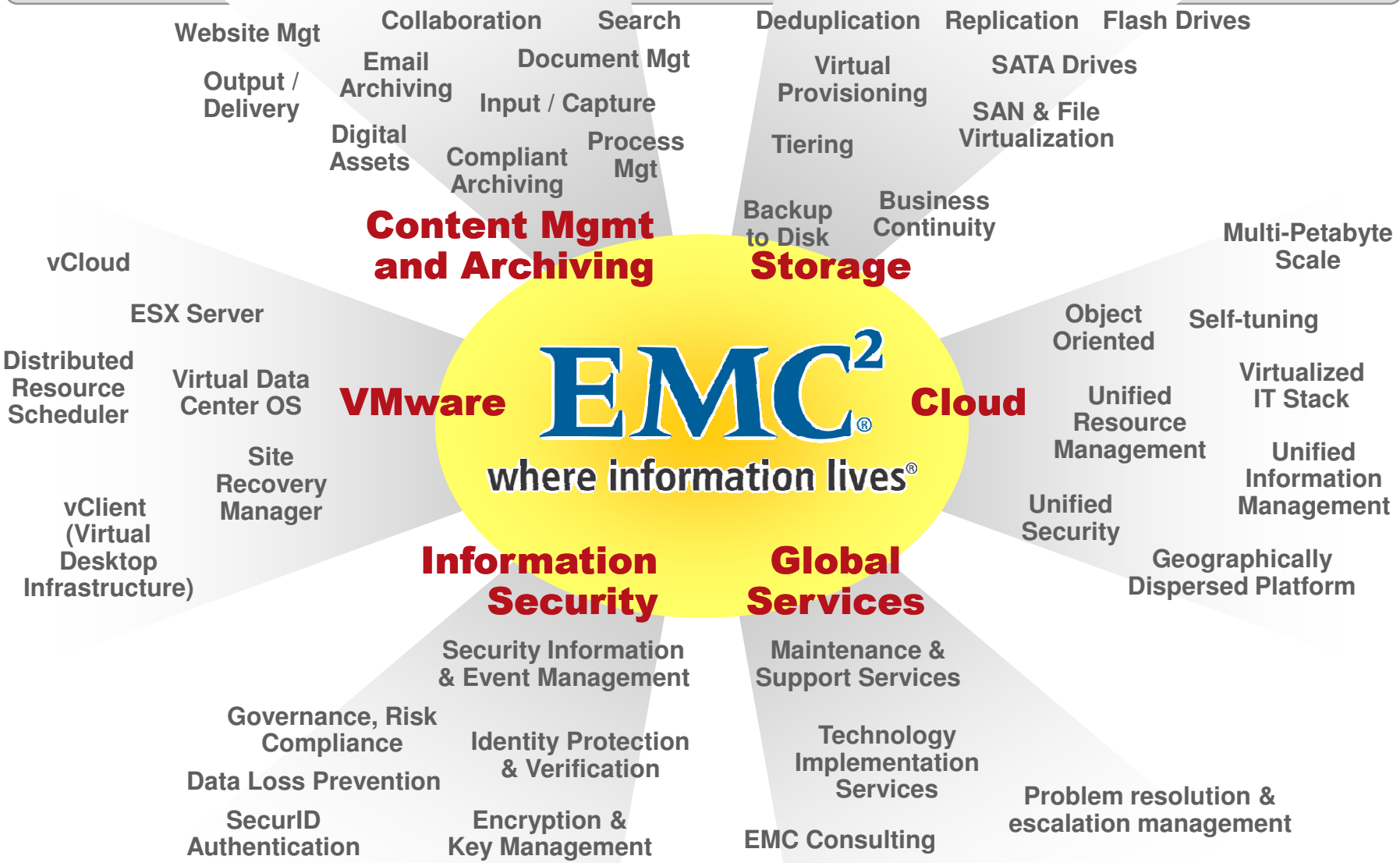
Seminario Beyond Green: EMC and Energy Efficient IT

Franco Martino

EMC Consulting Manager

21 May 2010

EMC's Broad Product and Solutions Portfolio



EMC Infrastructure Consulting

EMC² where information lives®

Reduce Cost

Reduce Risk

Consolidation & Efficiency

Security

Operational Efficiency

Compliance

Virtualization

Data Protection

Environmental Commitment

Environmental Policy

EMC recognizes its environmental responsibilities to shareholders, employees, customers and the public and is committed to continuous improvement of our environmental management systems

Climate Change and Energy Conservation Programs

Regulatory Compliance

Manufacturing and Supply Chain Sustainability Management

Recycling and Waste Reduction Programs

Water Conservation Design for Environment

Climate Change Initiatives

U.S. Environmental Protection Agency (EPA) Climate Leaders Program

- Greenhouse gas (GHG) reduction 8% below 2005 levels by 2012

Cork, Ireland plant: Irish EPA GHG reduction program

- 10% under annual allowance

EPA Carbon Disclosure Project Participant: “Best in Class” recognition

UN Global Alliance for ICT & Development (GAID) member

- Providing financial and technical support to utilize information technology for acceleration of economic development and environmental programs

Beyond Green: EMC and Efficient IT

Collaboration

Customers, IT vendors, consultants

Proven practices

IT design, deployment and operation

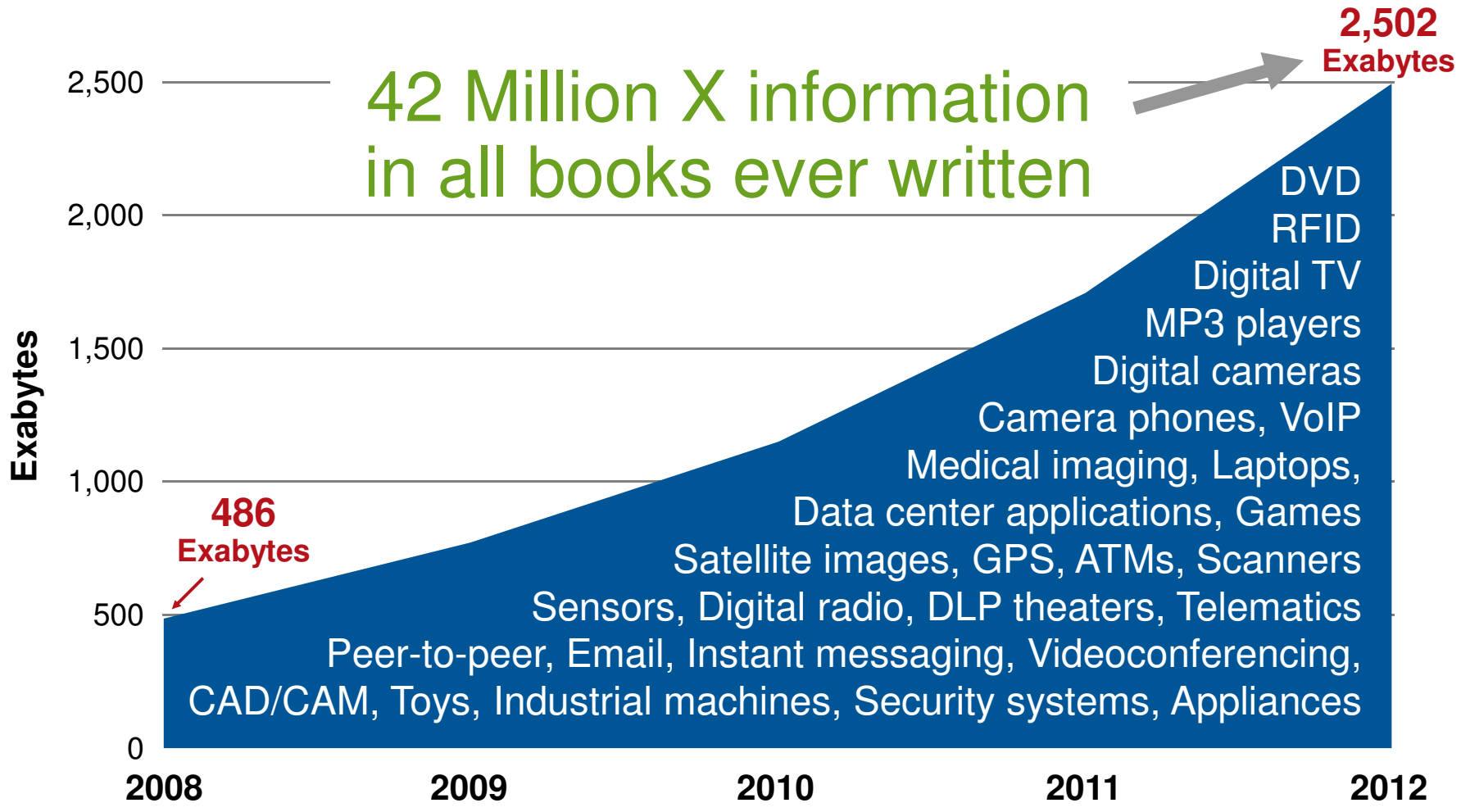
Infrastructure efficiency

Current technology achieving cost savings, business objectives and future flexibility

Environmental impacts

Minimized

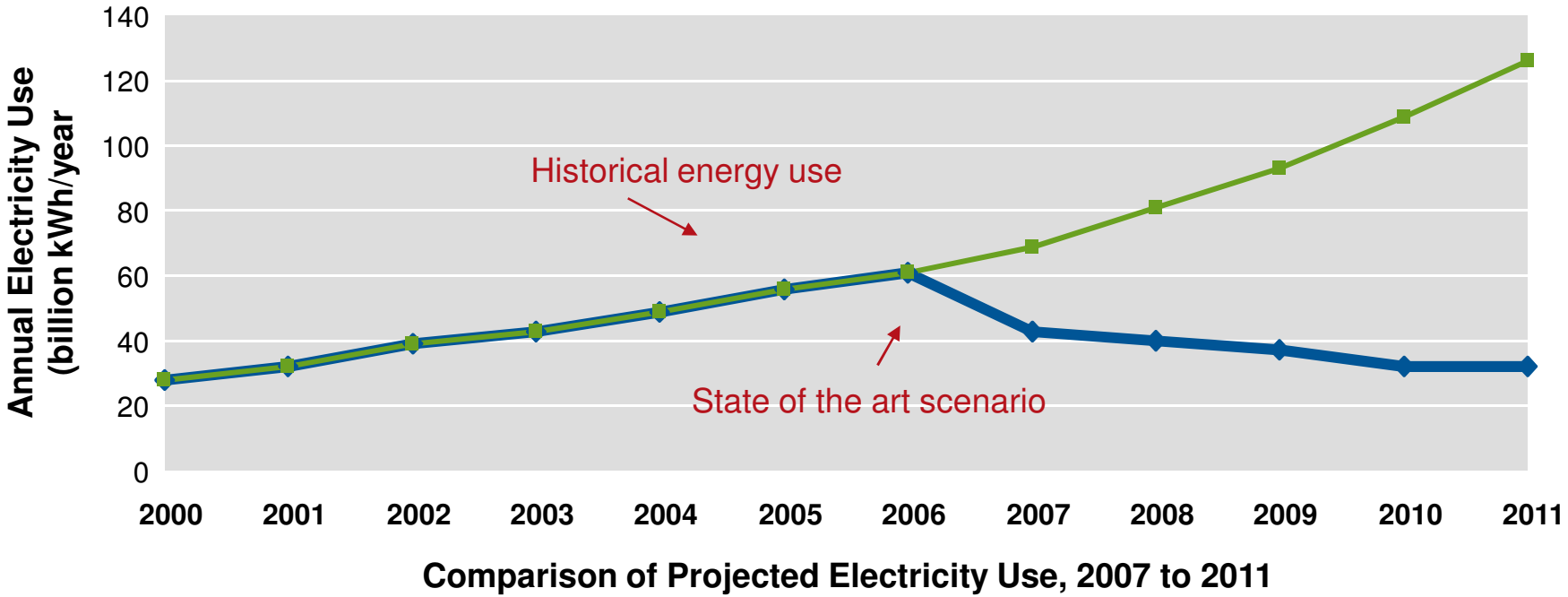
The Digital Universe is Rapidly Expanding



Source: IDC Digital Universe White Paper, Sponsored by EMC, May 2009

Data Center Energy Use is Doubling

IT efficiency and energy savings go hand in hand



Comparison of Projected Electricity Use, 2007 to 2011

IT energy use has doubled since 2000 and will likely double again by 2011

Energy operating costs will soon exceed the cost of purchase for servers

Existing conservation technologies can reduce consumption to 2002 levels

Source: EPA report to Congress, 2007

Data Center Components

EMC² where information lives®

What are the main infrastructural components?

Infrastructure

Electric Generator

Cabling (IT)

WAN (IT)

LAN (IT)

UPS

Cooling Units

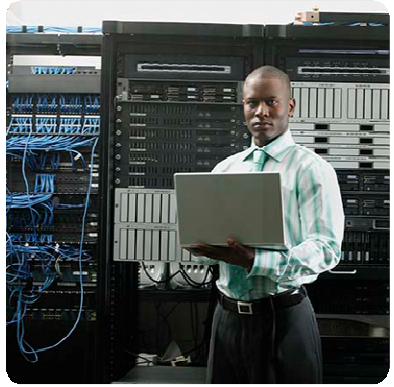
SAN (IT)

Applications

Server (IT)

Storage (IT)

IT Assets are Poorly Used



Typical IT Utilization Rates

Servers: 5–15%

Direct-attach storage: 20–40%

Typical Data Utilization Rates

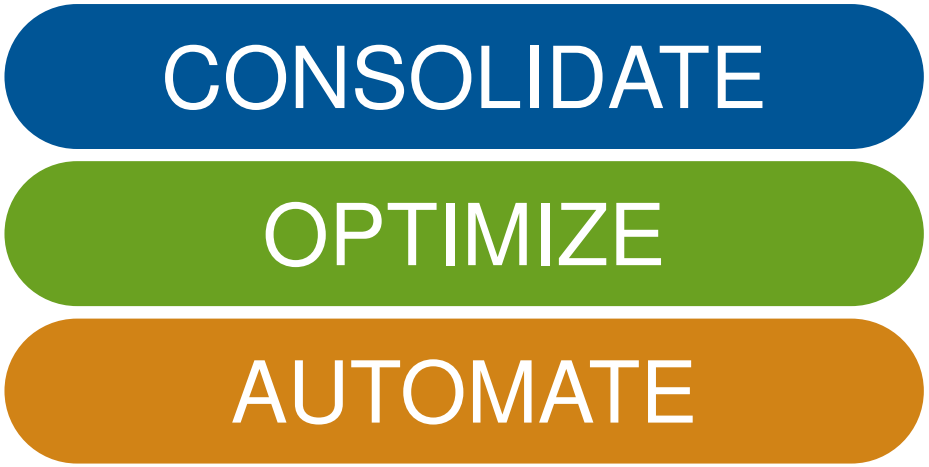
As much as 70% of file data is never accessed

Sources: VMware, Microsoft, EMC

Data Center Efficiency Strategies

EMC² where information lives®

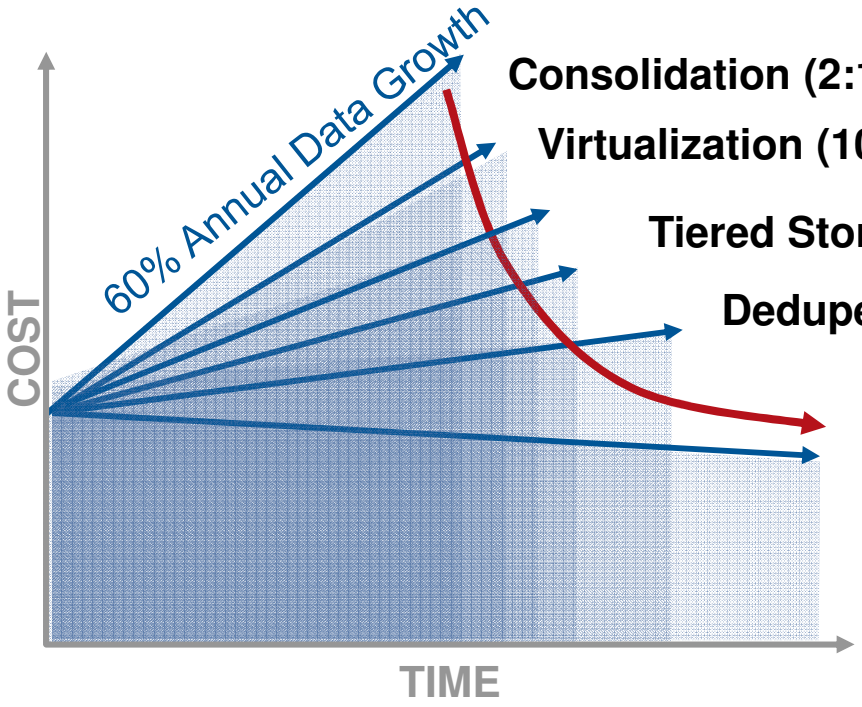
A Systems Approach to IT Efficiency



Practical Approaches to Efficient IT

EMC² where information lives®

Assessment & Strategy + **Experience & Best Practices** + **Technology & Solutions** = **Efficient IT & Maximum ROI**



Consolidation (2:1 savings)

Virtualization (10:1 to 15:1)

Tiered Storage (-25 % TCO)

Dedupe (up to 98% reduction)

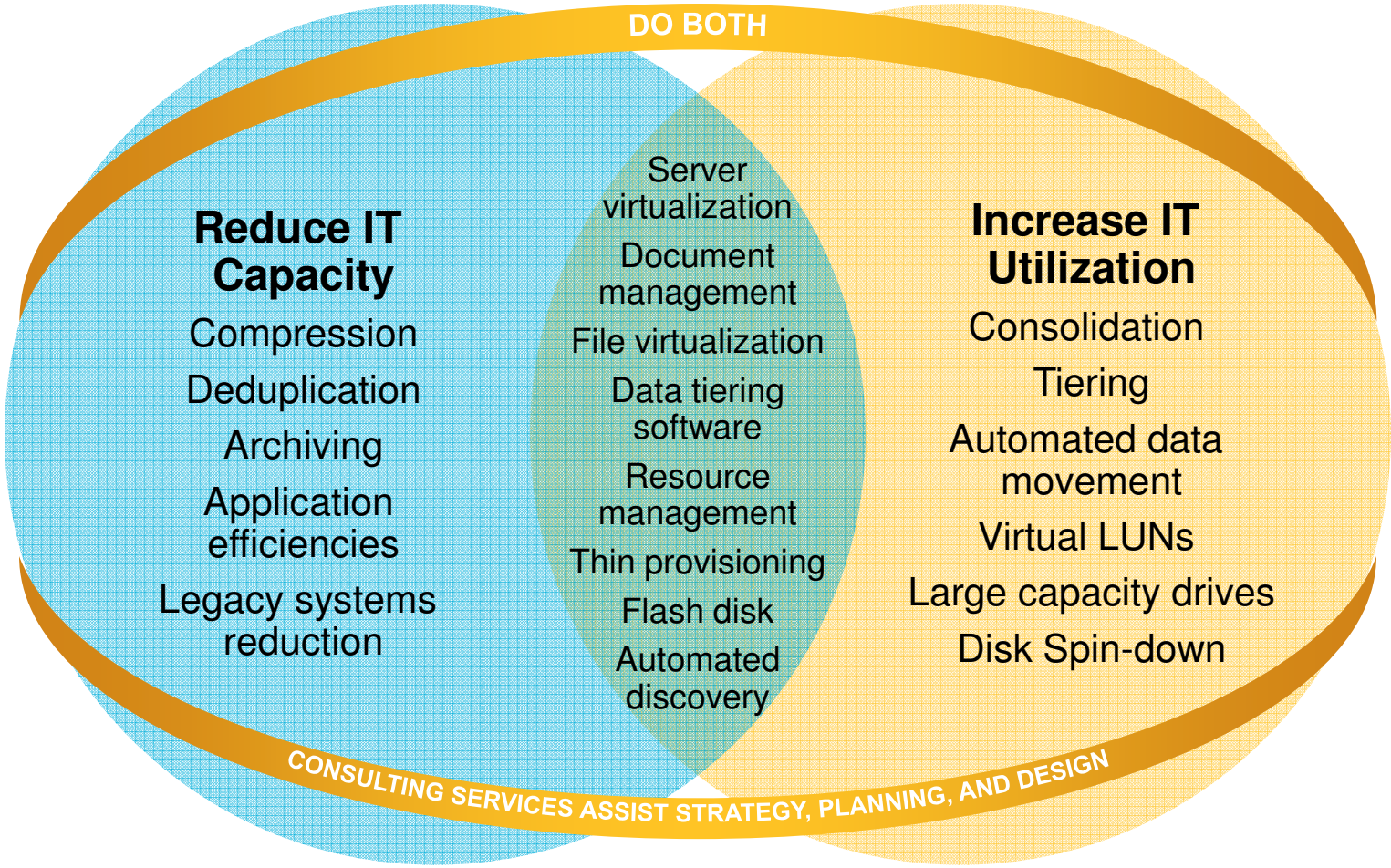
Software and Process Automation (-30% TCO)

Power, Cooling and Space Reductions Exceeding 50%

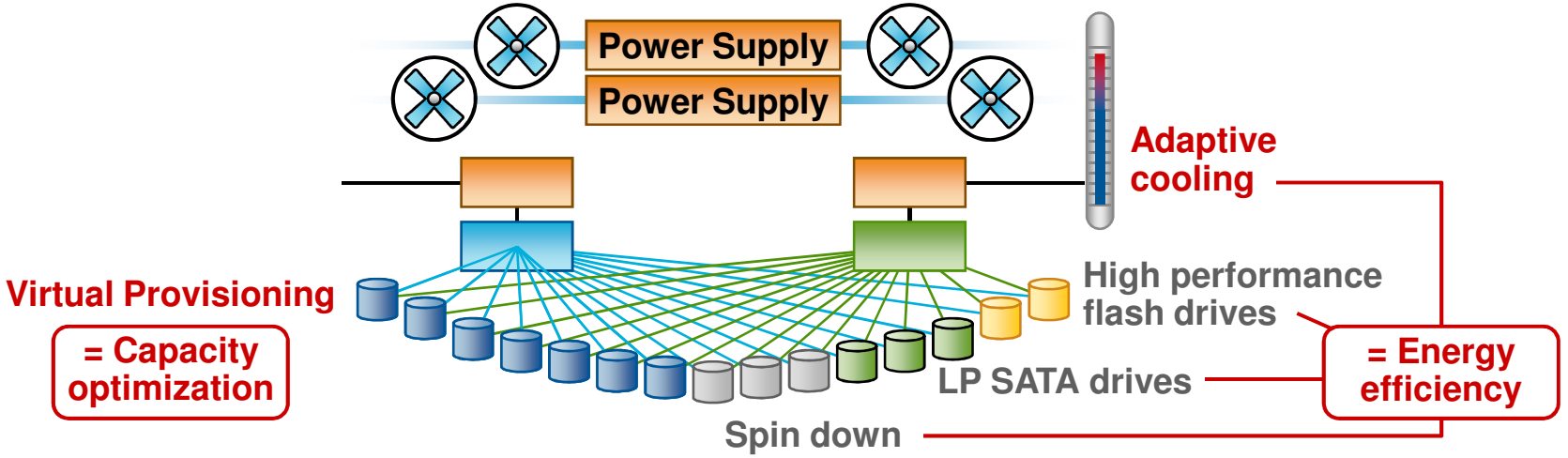
Opportunities for efficiency improvements AND lower total cost of ownership

Efficient IT: A Systems Approach to Functionality and Process

Improve efficiency and reduce energy consumption



EMC: Leading New Standards of Efficiency

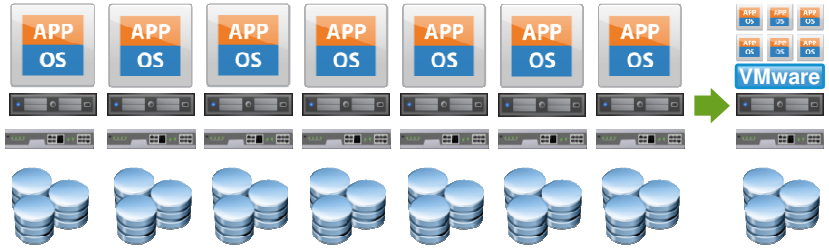


And new business practices . . .

Comprehensive Transformation Savings

Corporate Express

	Before	After
Servers	200	16
Storage	50 TB DAS	20 TB SAN
Network	600 ports	64 ports
Backups	2 TB	200 GB
Facilities	20 server racks 100 KVA power	2 server racks 10 KVA power



Technology and strategies

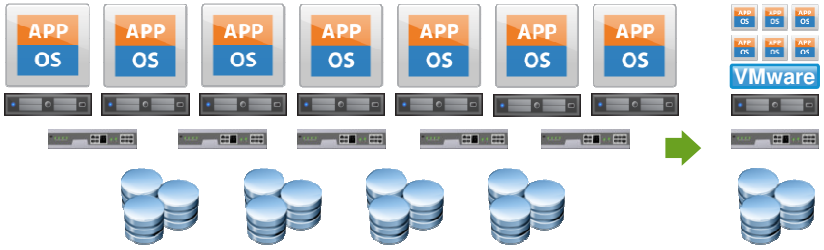
- Consulting—analysis, planning and implementation of IT strategy
- Server virtualization
- Storage area network, tiering, and management
- Disk Library and data deduplication
- Data replication and simplified disaster recovery

Impacts

- 70-80% reduction on data center space, power, cooling
- 40% reduction of server TCO
- 70% improved server utilization
- 52% reduction in required storage capacity
- Tape eliminated

EMC Internal IT Transformation Snapshot

	Before	After
Servers	1,252	250*
Server racks	60	24*
Storage utilization	50%	69% (+38%)
SAN fabrics	63	12
Storage systems	205	104



**Phase one virtualization*

Technology and Strategies

- Executive support of IT strategy
- Server virtualization
- SAN consolidation and tiering
- Cooling and airflow improvements
- Tiered data centers

Impacts

- $10M reduction in data center space, power, cooling (five years)
- $80M infrastructure cost avoided
- Reduced 59,821,624 lbs CO_2
- $30M data center upgrade delayed four years
- Tape reduced $1M/year to $25k/year
- Half the number of storage systems and triple the capacity

EMC Tiered Storage Options

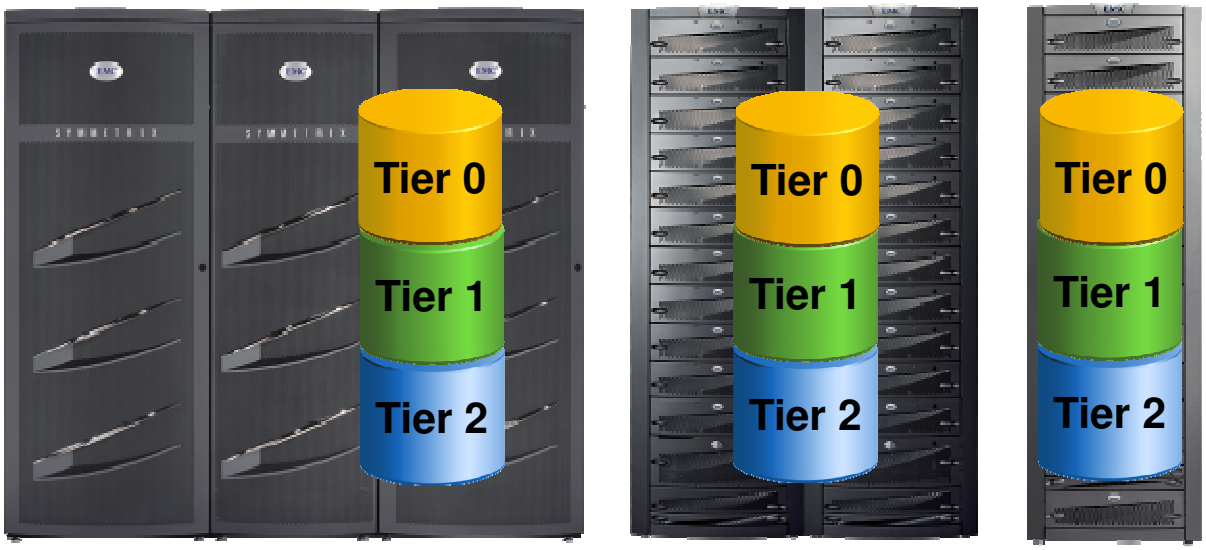
EMC² where information lives®

SOFTWARE-BASED TIERING CAPABILITIES

Cache Partitioning | ControlCenter Symmetrix Optimizer | Quality of Service Management | Virtual LUN Technology | Virtual Provisioning

Advanced functionality to optimize storage tiering

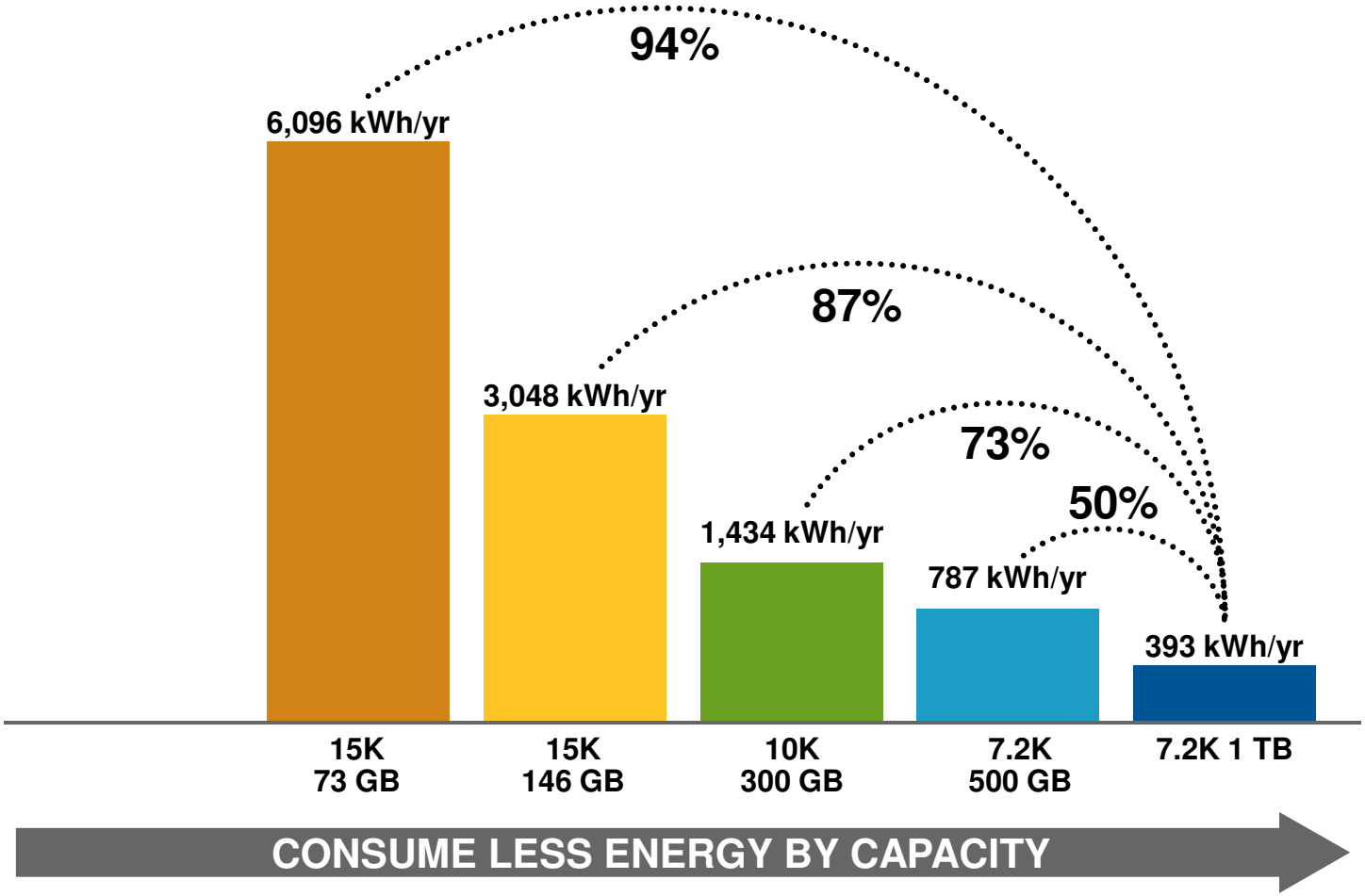
PLATFORM-BASED TIERING CAPABILITIES



Best of-breed storage systems and technology

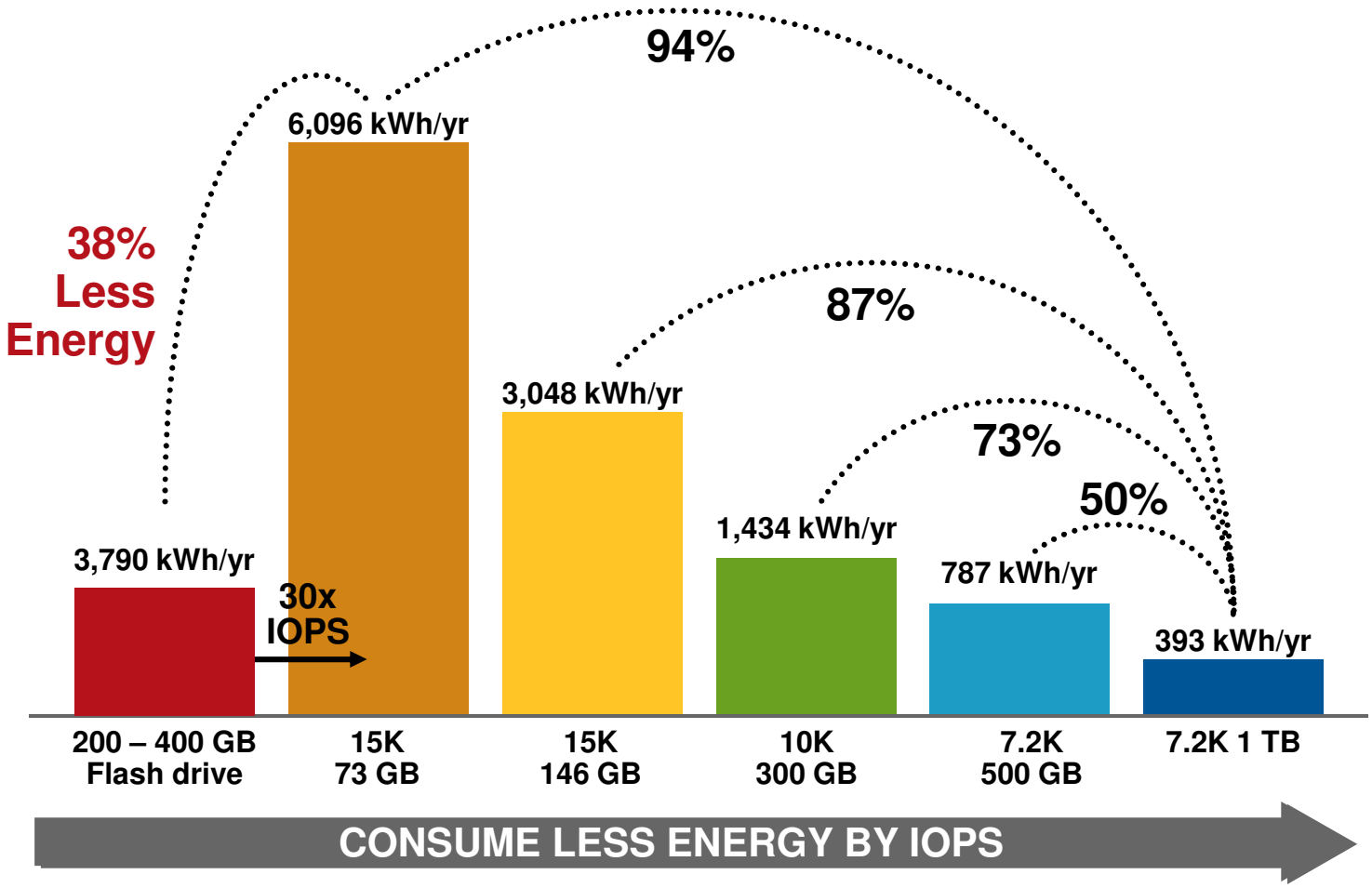
Today: Energy-Efficient Storage Design

1 TB data on different capacity/performance drives

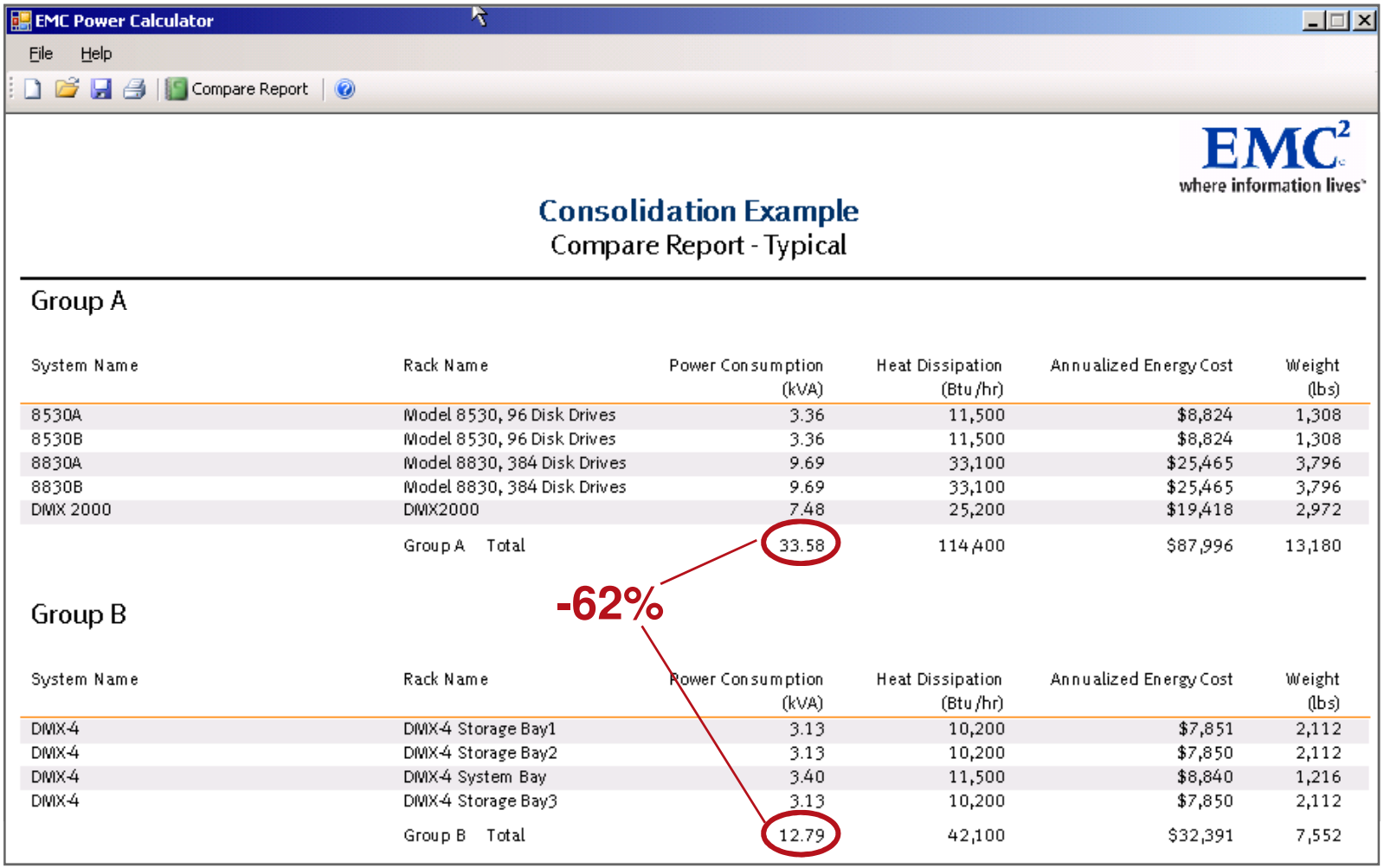


Today: Energy-Efficient Storage Design

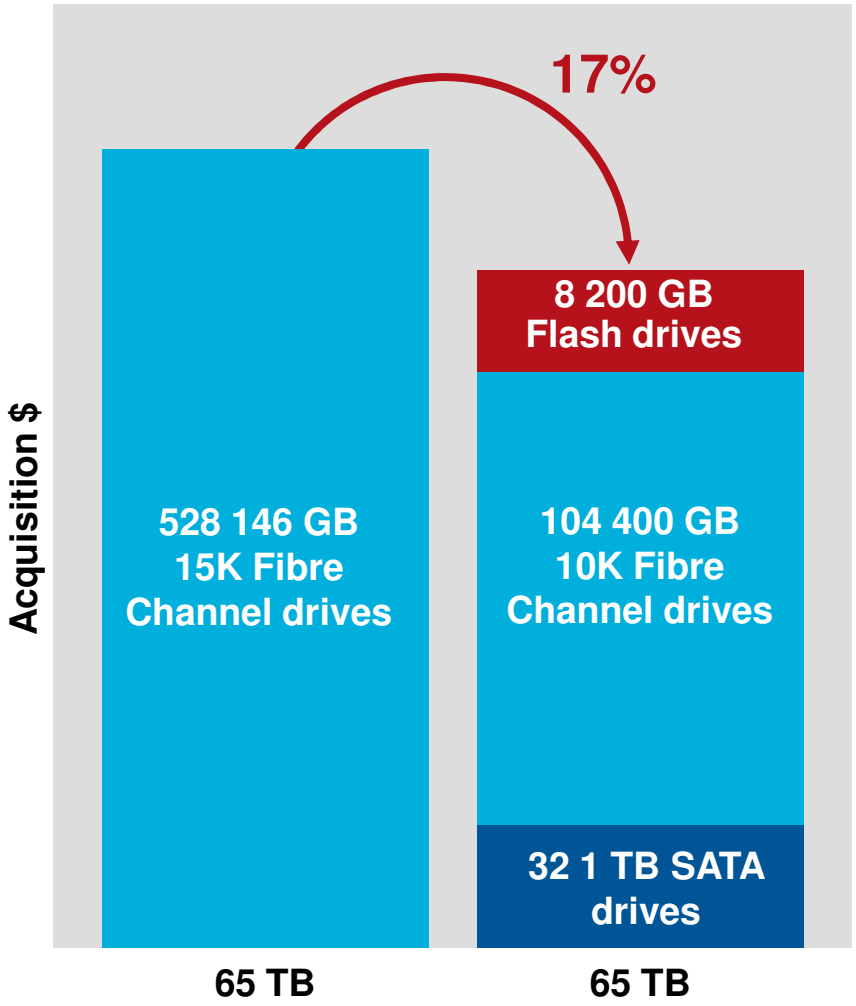
1 TB data on different capacity/performance drives



EMC Power Calculator



Lower Costs and Optimize Service Levels



17 percent lower storage costs

And reduced maintenance and software costs

38 percent more drive IOPS

And more aligned with workloads

32 percent less power and cooling

And more efficient use of space

384 fewer drives

144 Flash drives plus Fibre Channel drives plus SATA drives versus 528 Fibre Channel drives

EMC Energy Efficiency Service

CONSOLIDATE
OPTIMIZE
AUTOMATE

Review current data center strategy

Baseline your current and future needs

- Servers, storage, floor space
- Power and cooling
- Facility systems

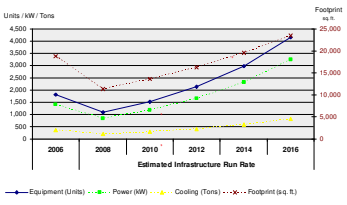
Analyze and consider your alternatives

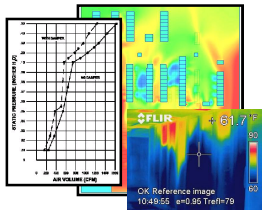
- Power, thermal, and cooling efficiency
- Server virtualization and storage optimization to reduce power
- Three year “business as usual” (BAU) costs compared to the three-year “optimized” costs

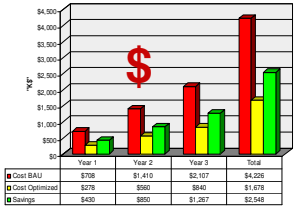
Update your enterprise data center strategy

Create your efficiency roadmap

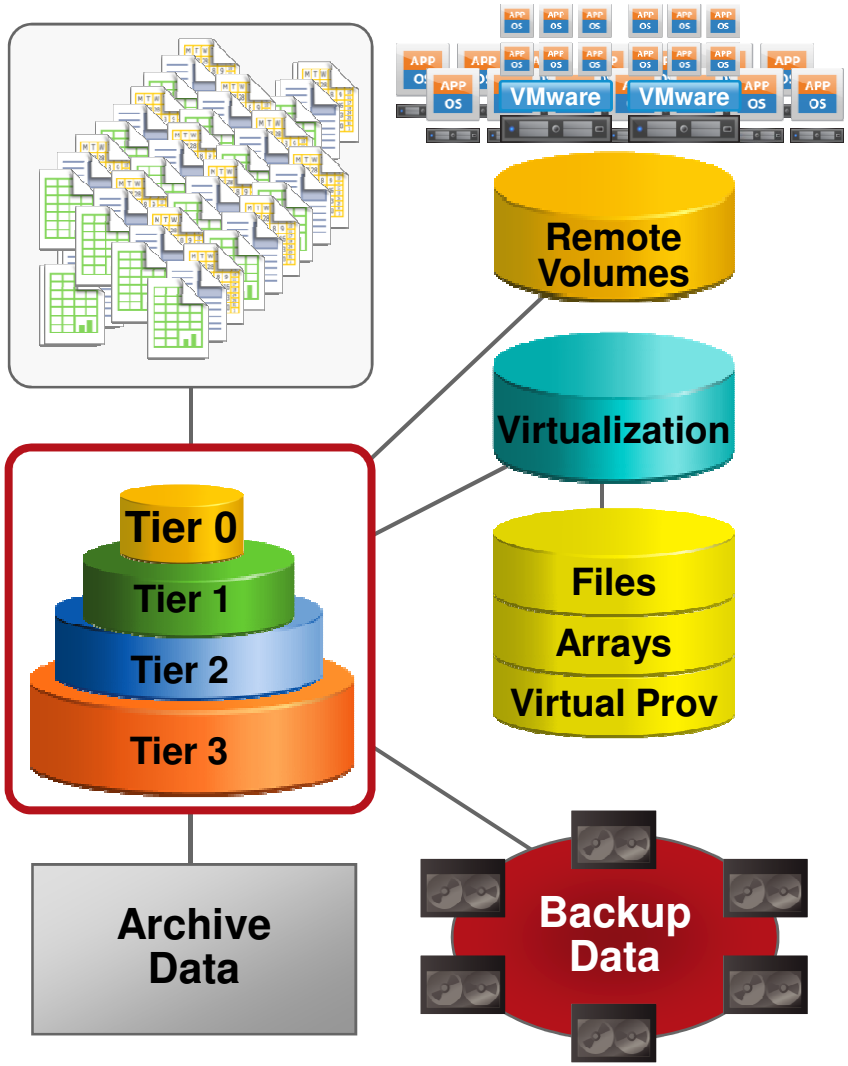
- Improvements and phasing to avoid cost and gain energy benefits







Storage Consolidation and Tiering Yield Efficiency

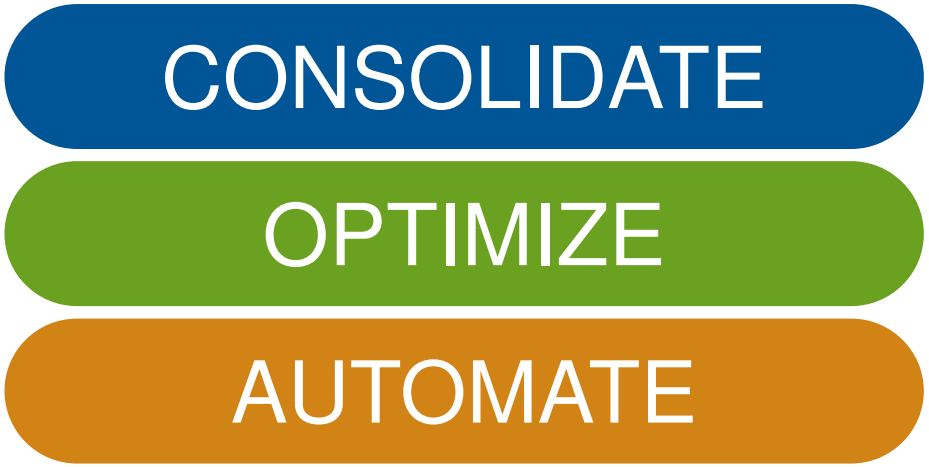


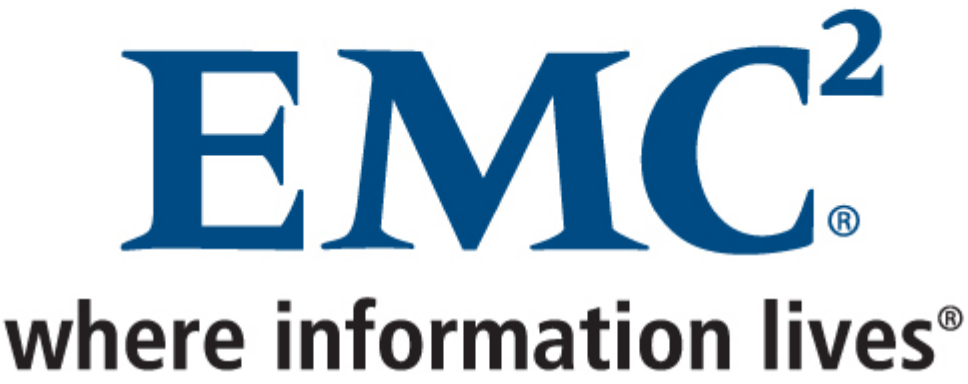
- Virtualize servers
- Classify and tier
- Archive inactive data
- Eliminate redundant data
- Streamline backups
- Virtualize storage

Data Center Efficiency Strategies

EMC² where information lives®

A Systems Approach to IT Efficiency




EMC²
where information lives®