



Your way to profitable technology markets.

Architecting Next Generation Enterprise Network Storage

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IMEX Research

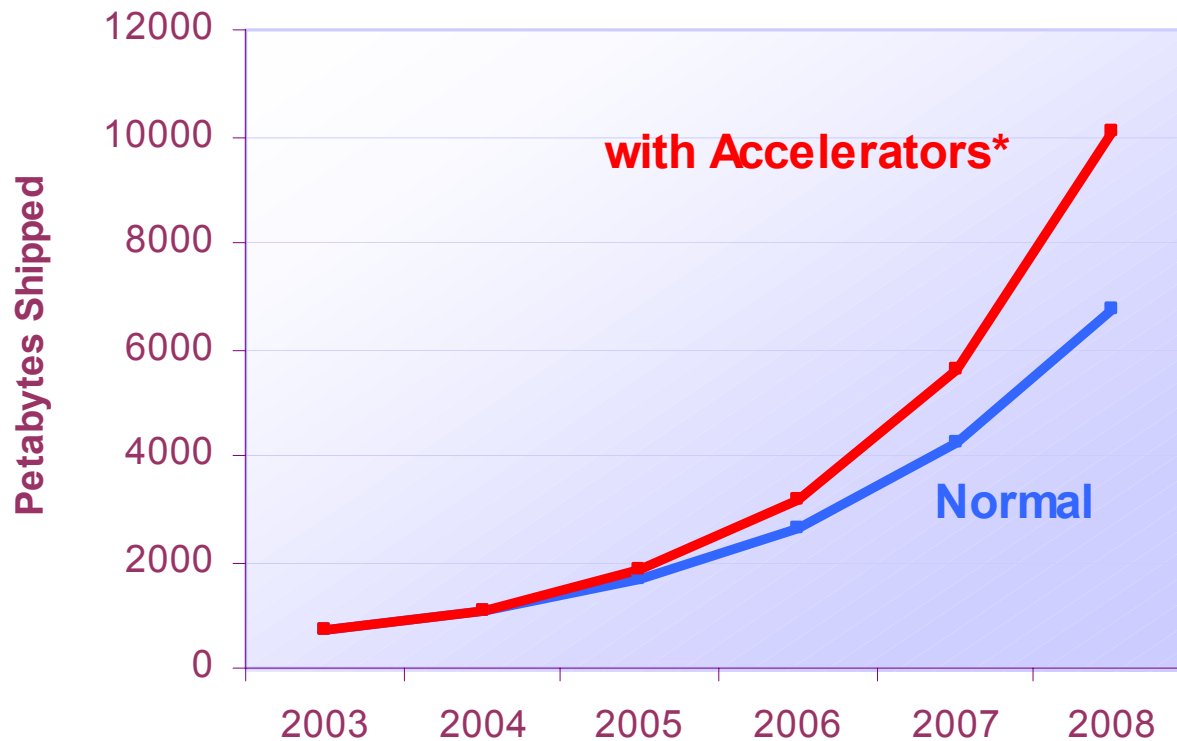
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Market Drivers

- **Data Explosion (Driven by Connectivity...)**
- **Regulatory Compliance (HIPAA/SARBOX...)**
- **Standardization (Volume Servers/SATA/SAS...)**
- **Emergent Applications (Content/eCommerce/HPC...)**
- **Virtualization/Externalization (Pools of Storage...)**

► *Data Explosion*

Data Explosion



***Realtime Data, VoIP, HPC, Grids, WebServices/XML**

▶ *Market Segmentation by Data*

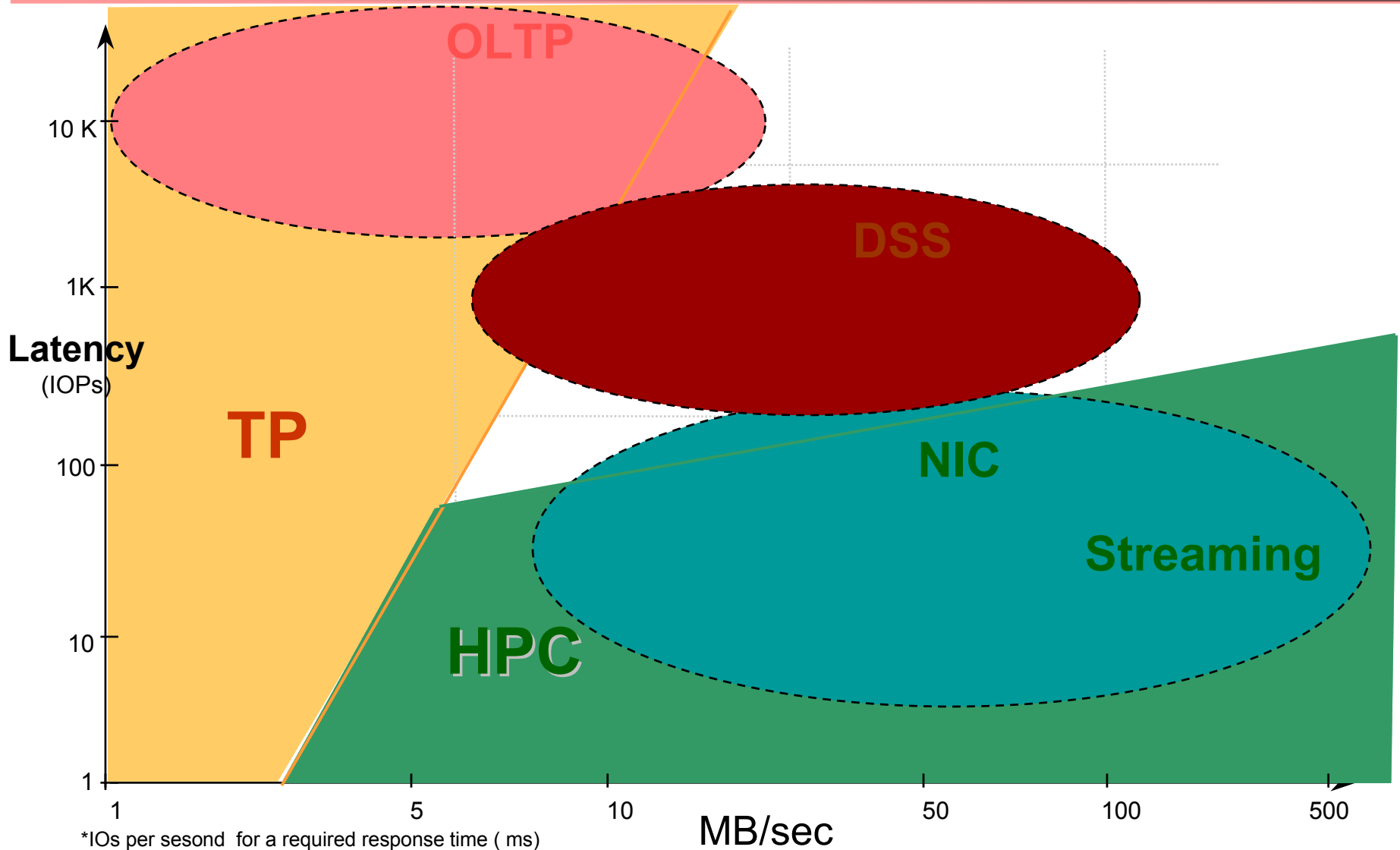
▶ **By Application Requirements**

▶ **By Data Types**

- **Dynamic Data (Online Data – Addressable Fast)**
- **Reference Data (Content Addressable Streaming)**
- **Backup (Nearline Buffered Data)**
- **Archive (Offline Vaulted Recoverable)**

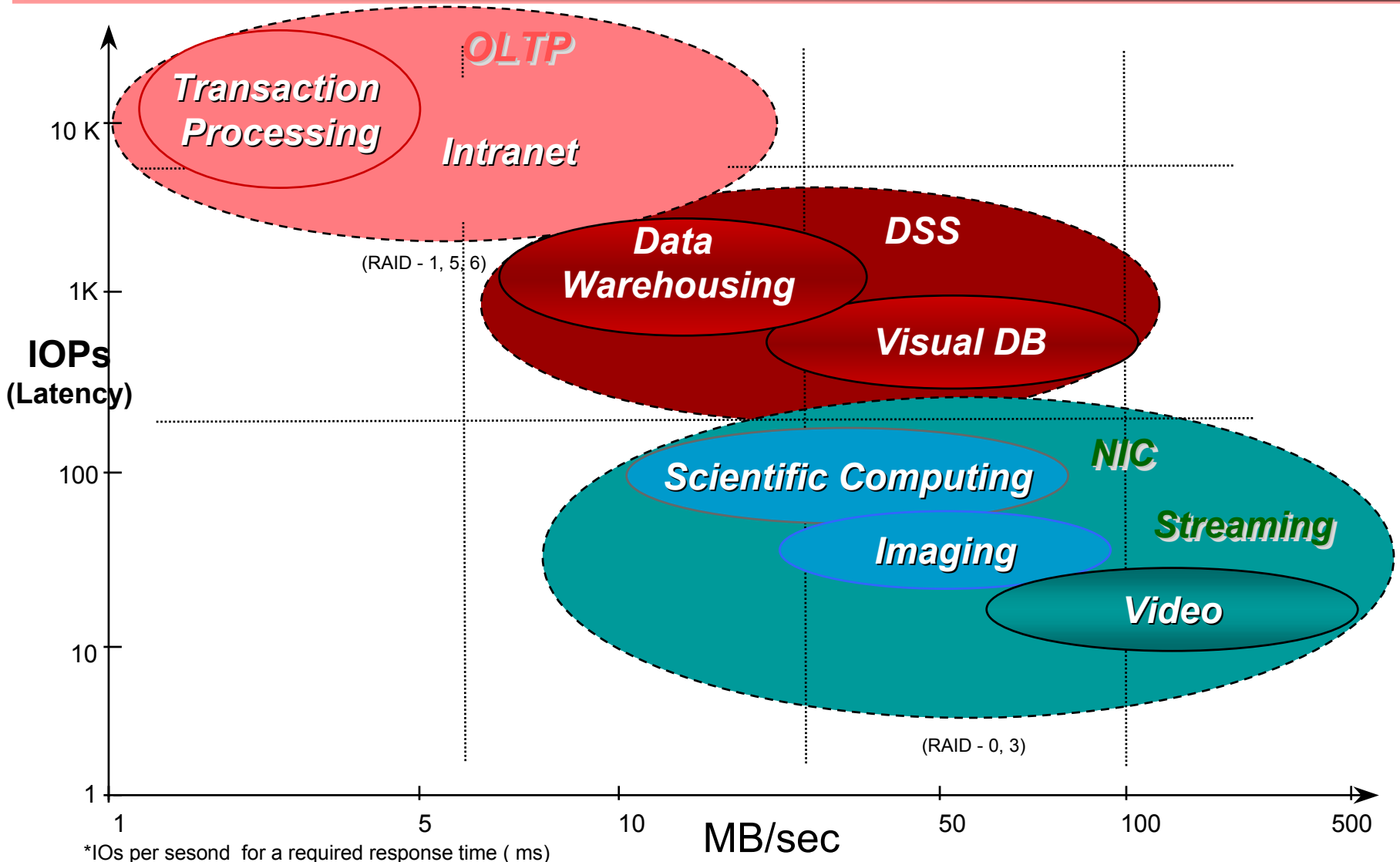
▶ **By Record Size, Amount of Data & Frequency of Access**

► Data Segmentation by Application



*IOPs per second for a required response time (ms)

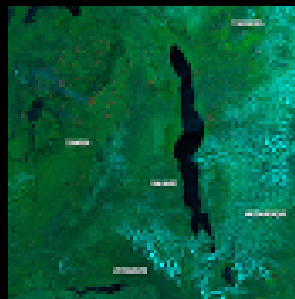
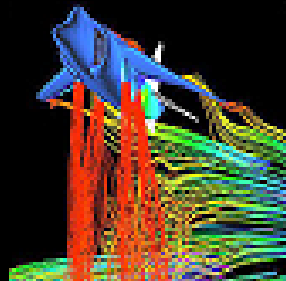
Market Segments by Applications



*IOPs per second for a required response time (ms)

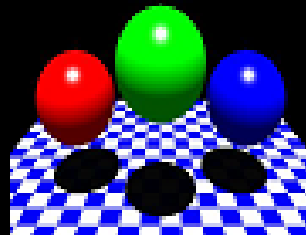
► Rich Data Applications

High Performance Computing



- ▶ 100+ Teraflops
- ▶ Throughput = 100 GB/s

Commercial Visualization

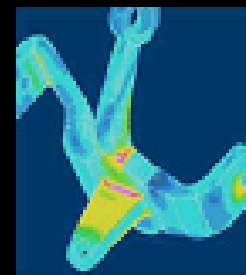
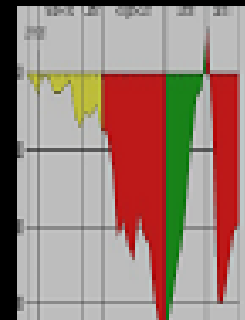


- ▶ Rendering (Texture & Polygons)
- ▶ Throughput = 1.2 GB/s

Bioinformatics

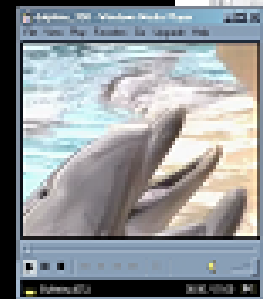
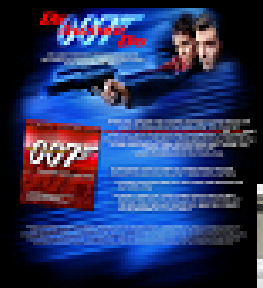


Decision Support Syst



- ▶ Data rate & capacity
- ▶ Throughput : DSL/Cable

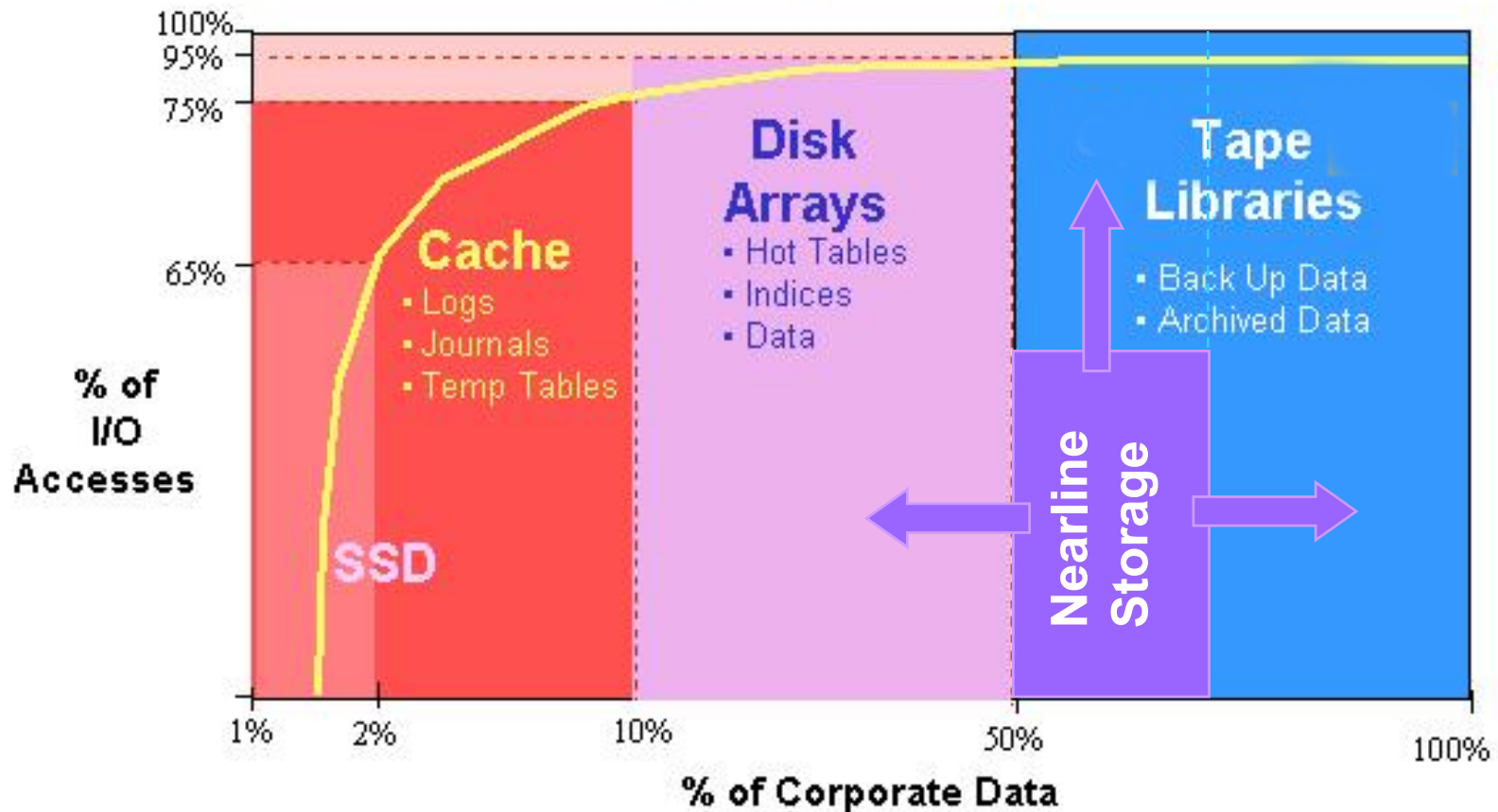
Entertainment Audio/Video On Demand



Data: IMEX Research & Parasol

► Corporate Data Usage

Corporate Data Usage I/O Access Frequency vs. Percent of Data



► Storage Data -Types & Characteristics

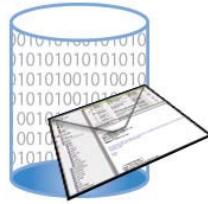
Online



Dynamic Data

Current Business
Critical Active data
Hi-transaction data

Midline



Reference Data

Aged, Reference data
- Images, records, BU emails
Unalterable - regulatory

Nearline



Buffered Data

Centralized backup
- Disk-to-Disk-to-Tape
Staging to tape

Offline/Vaulted



Recoverable Data

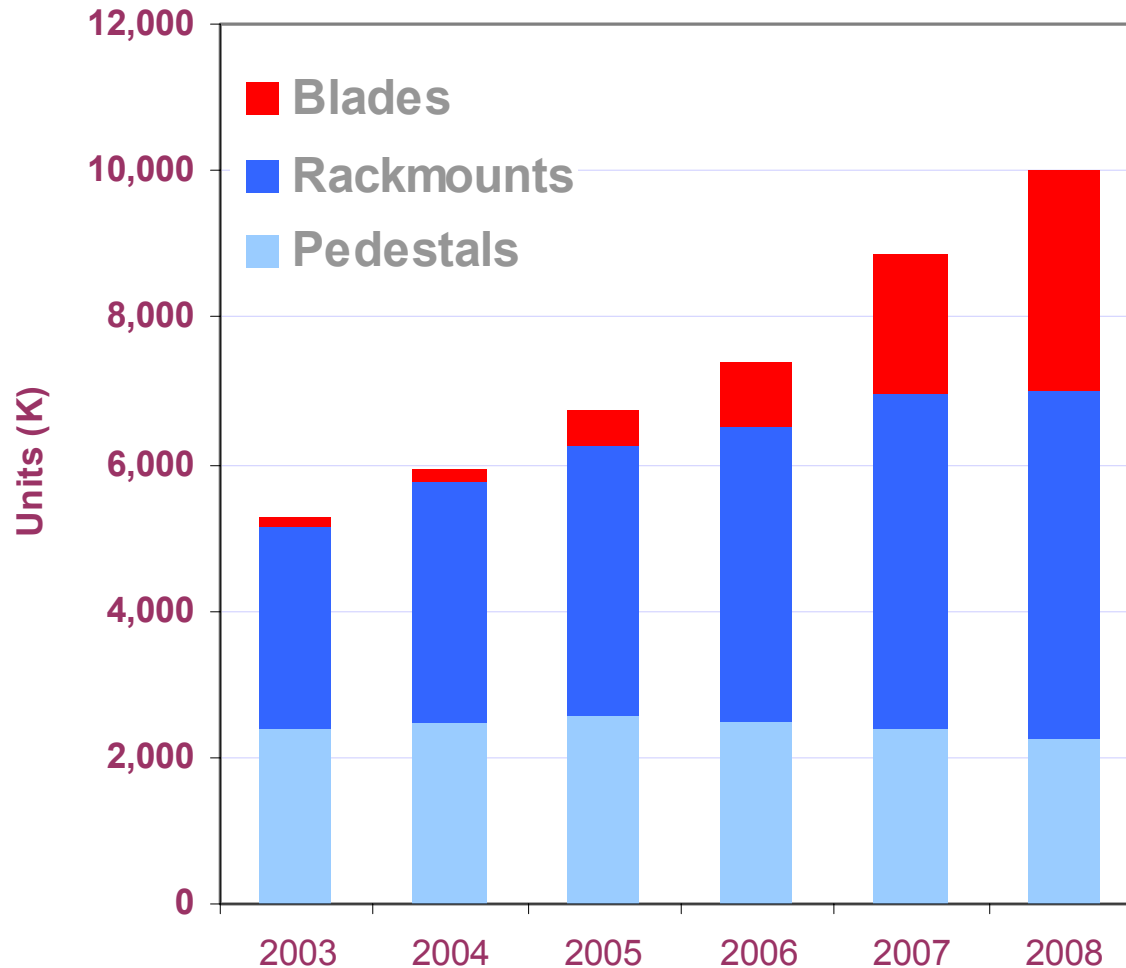
Archived for BC/DR
- Local, - Remote

Price	• High \$/GB	• Moderate \$/GB	• Moderate to Low \$/GB	• Low \$/GB
Response Time	• Milliseconds	• 10 ^{ths} of sec to seconds	• Minutes to hours	• Hours to days
% On Disk	• 50%	• 35%	• 15%	• Tape

Source:Maxtor



Industry Standard Servers Market (x86 based)



► Storage System Segments

► Product Topologies

■ DAS

(Bus Based - ATA, SATA)

NAS

(NetBased File Level Access – NFS,CIFS)

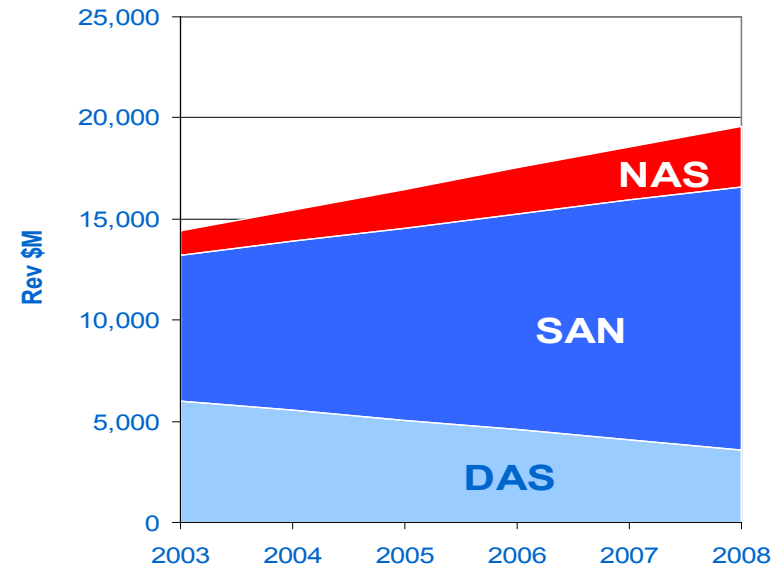
SAN

(NetBased Block Level Access – SCSI, FC...)

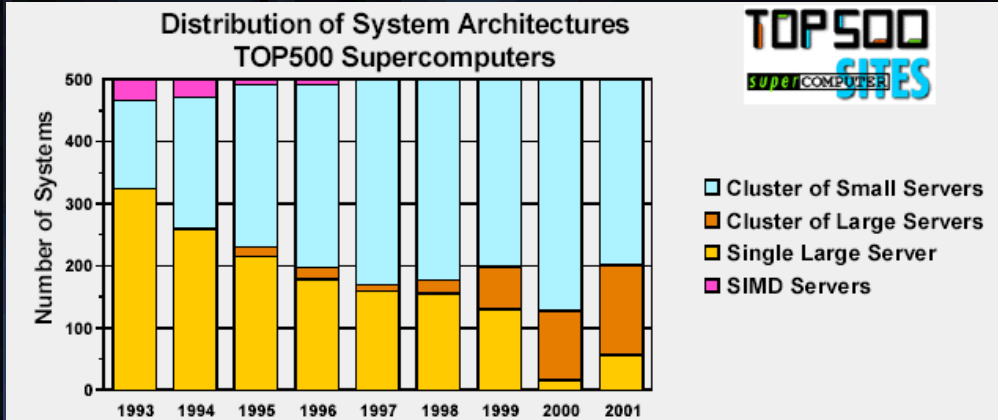
■ Internal

(ATA,SATA) vs.

External

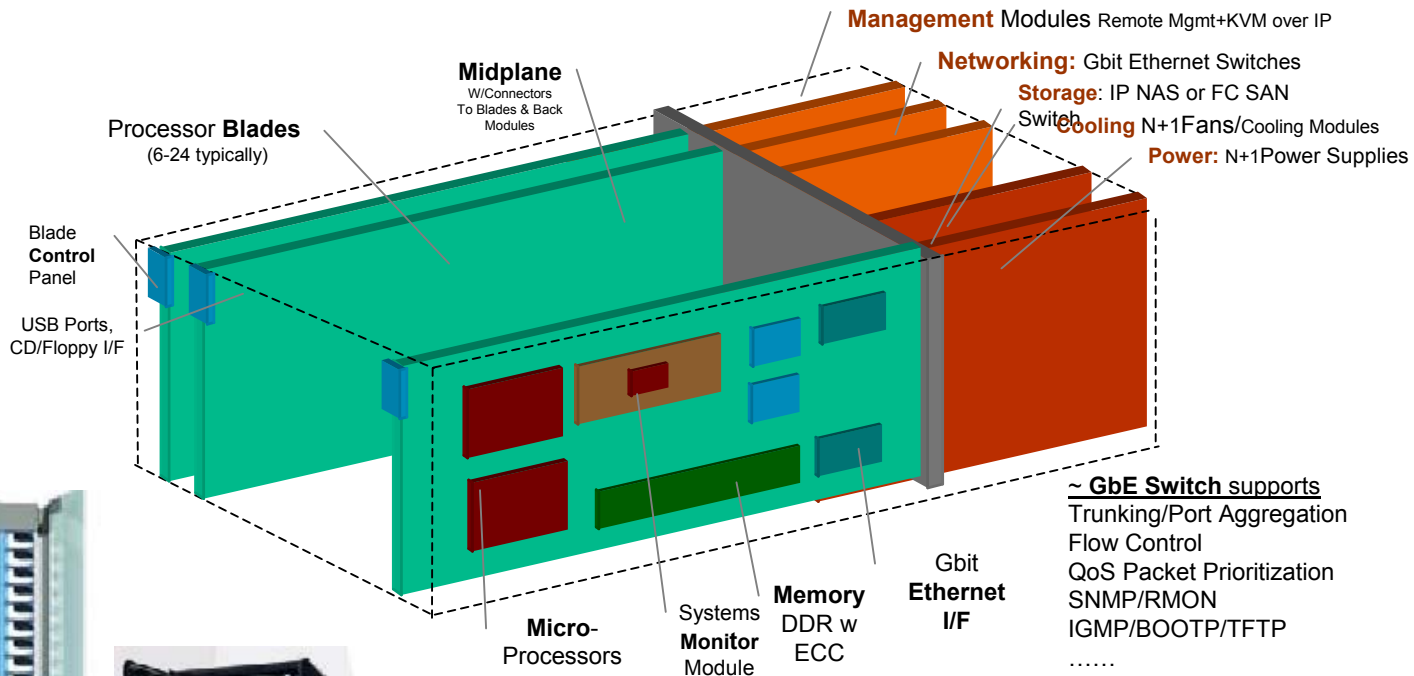


High Performance Computing



TOP500
superCOMPUTERS
SITES

Blades Servers - Infrastructure



© 2003 Source: IMEX Research

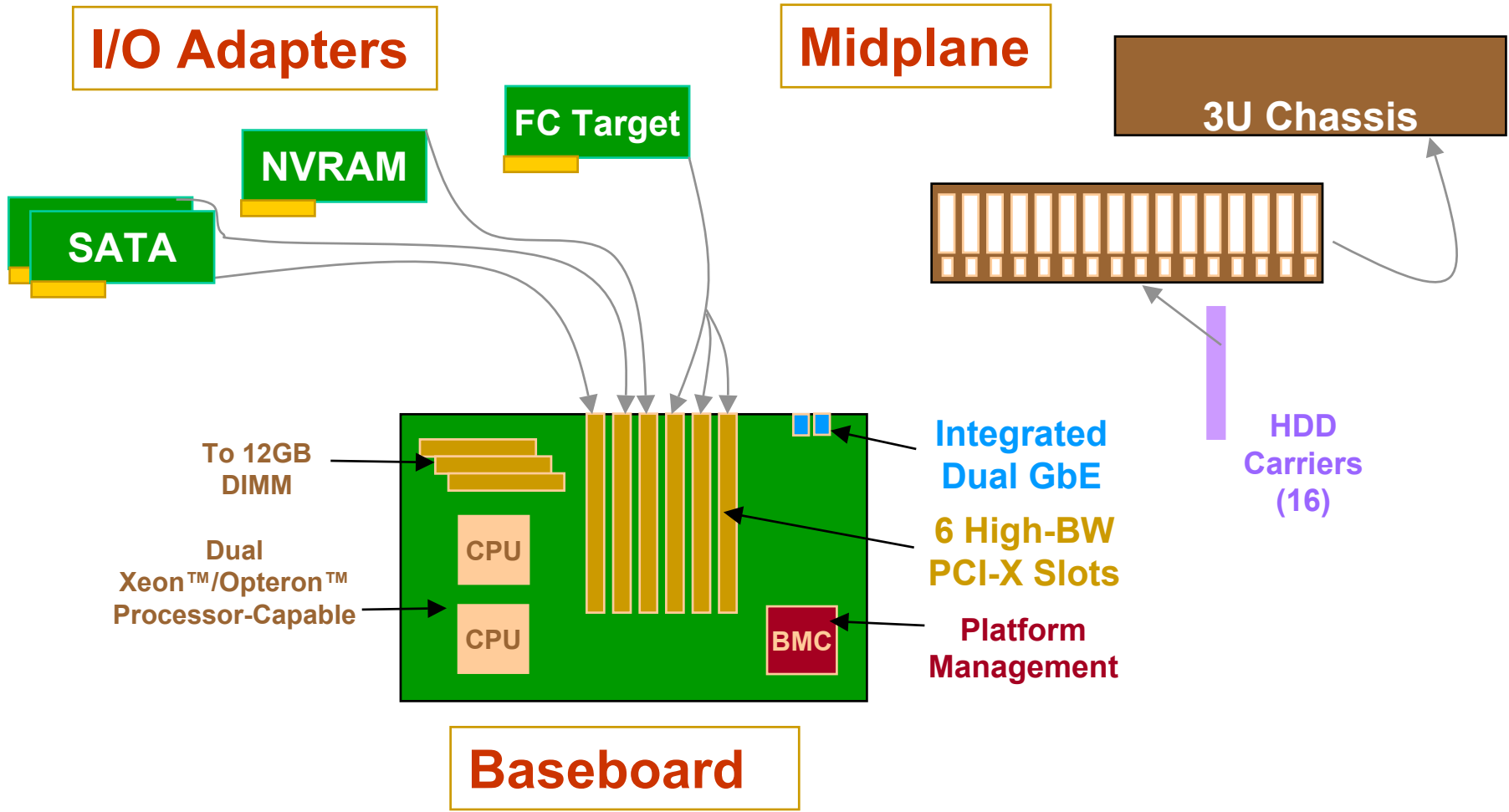


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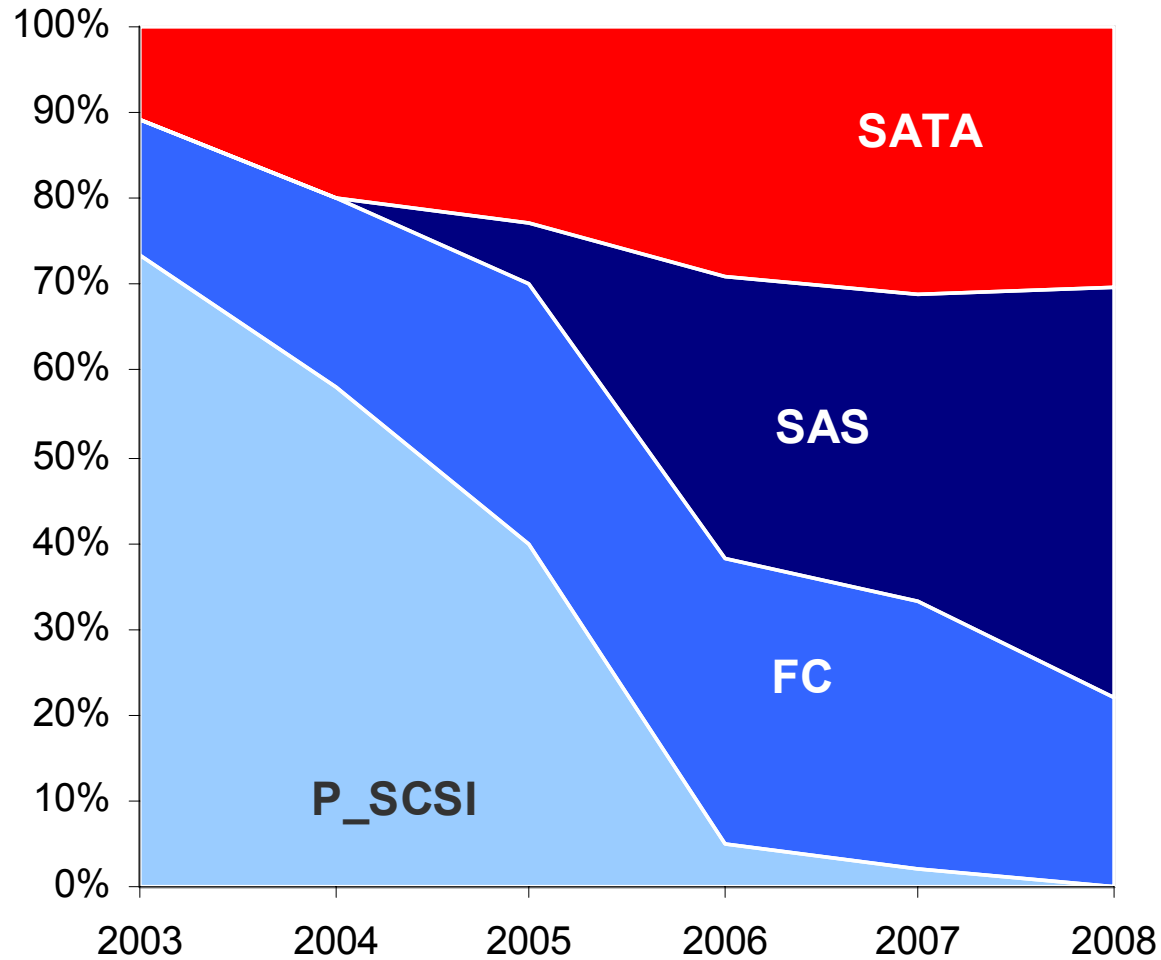
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ited,

Industry Std. Blocks for Open System Platform



► Enterprise Market – I/F Transitions



Tiered Storage by Price/Performance

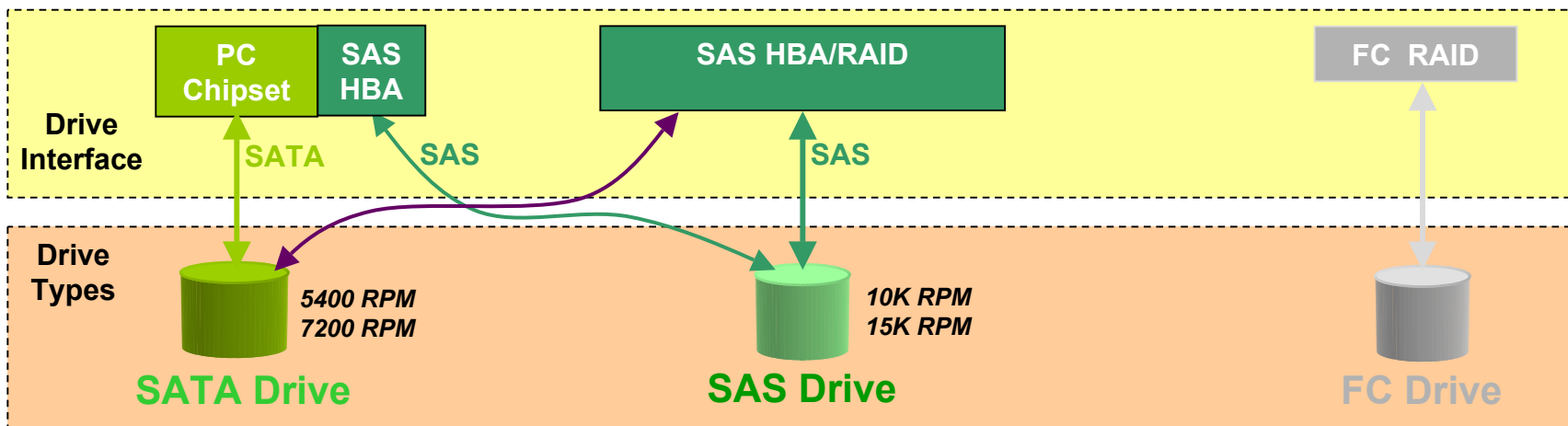
Desktop PC
Entry NAS
Workstations



Servers
Midline Storage
Mainstream NAS/SAN

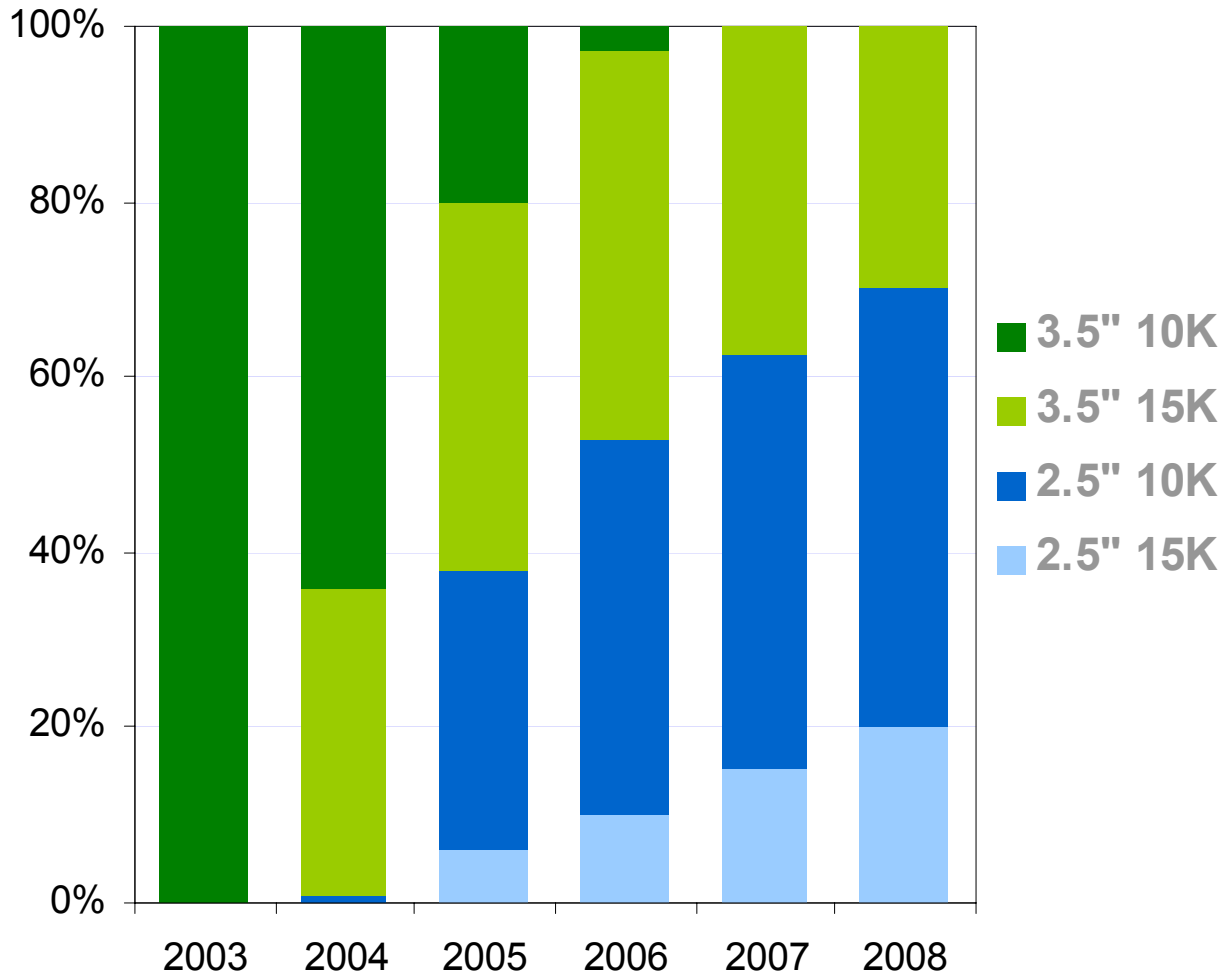


Large Enterprise
SAN & NAS



Source:Maxtor

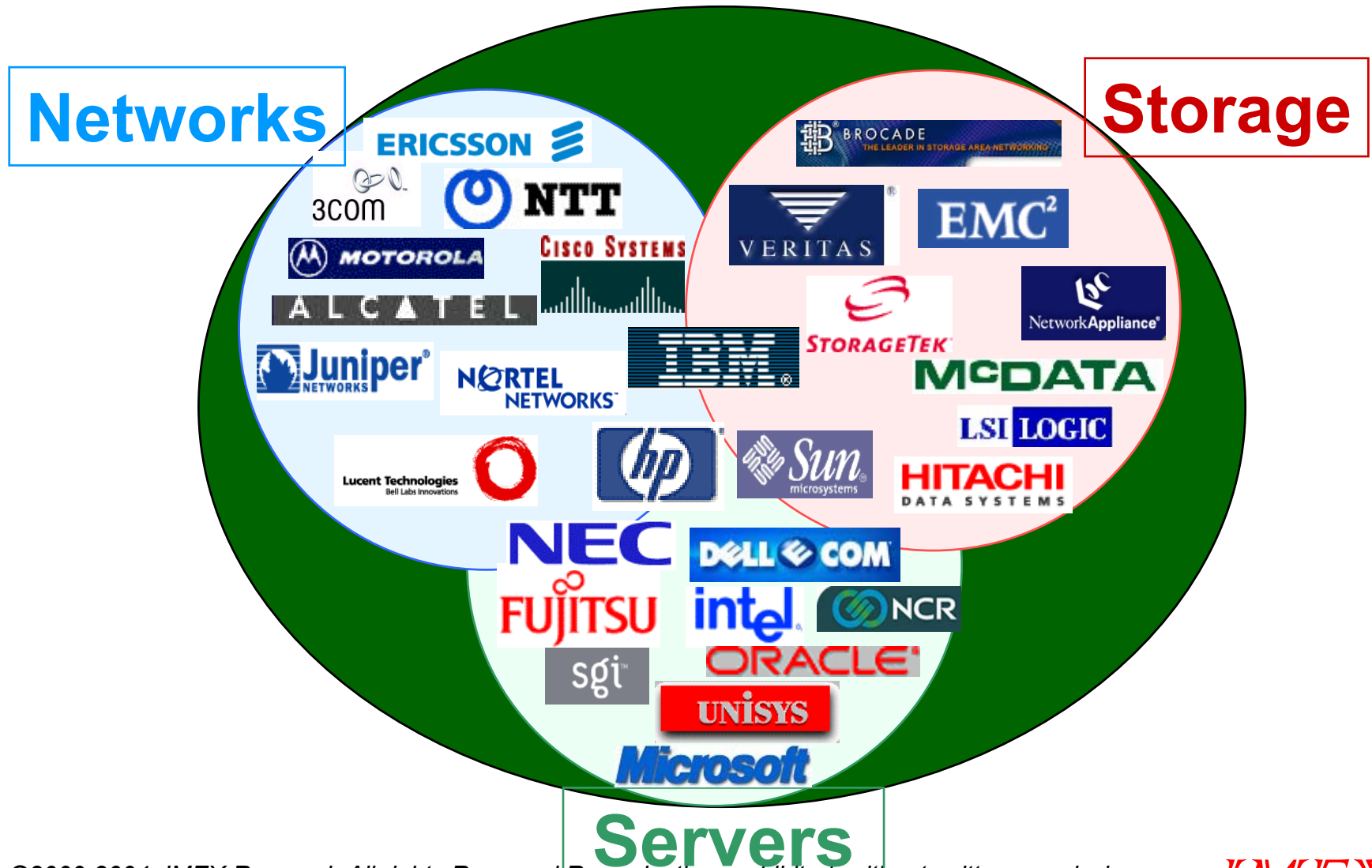
► Enterprise Market – HDD FF Transitions



► *Emerging Opportunities/Key Requirements*

- ▶ **Compliance Data Protection** (Nearline Storage)
 - Low Cost Vaulting
- ▶ **Reference Data Search Engines** (Nearline Storage)
 - Corporate & Service Providers (Google, MS Longhorn +)
- ▶ **Storage Externalization/Ease of Use**
 - User Driven Scalability (Cost)
 - Backward Compatibility (Investment Protection)
- ▶ **Lower TCO**
 - Standardization/Interchangeability (Mix & Match, Virtualize)
 - Autonomics (Lights Out Management)
(Self Discover/Self Configure/Self Scale/Self Migrate/Self Healing^{© IMEX..})

Major Players in Infrastructure Convergence





Your way to profitable technology markets.

For latest, full set of slides - go to

**[www.imexresearch.com/
NexGenNetStorage.pdf](http://www.imexresearch.com/NexGenNetStorage.pdf)**

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