



The Gartner Perspective on the IBM Mainframe Marketplace & The Role of the Mainframe in 2008 and Beyond

March 4, 2008

Topics of Discussion

- Today's Business Climate
- Mainframe Market Trends
- What does System z do well
- What are the challenges for System z
- How will the z10 impact you

Critical Issues Facing the Large IT Organizations Today

Financial Pressures

- + Budgets
- + Asset utilization
- + Improve TCO and ROI

Time to Market

- + Move with the business
- + Increase efficiencies

Facilities

- + Power, cooling & space
- + Green IT

Deploy new capabilities

- + Invest in new while integrating with old
- + Address skills issue long term

Simplify Infrastructure Complexity

- + Respond quickly
- + Eliminate islands
- + integrate systems, databases and processes
- + increase management/operational efficiency

Increase revenues

- + Grow share and market
- + Competitive advantage
- + Satisfy customer demands

Security & Operational Resiliency

- + privacy & compliance
- + Business continuity
- + 24x7

What's Keeping CIOs Awake at Night

Nearly 1,500 CIOs Participated

2008 CIO Strategies			
To what extent will each of the following be a top five priority for you in 2008?	2008	2007	2006
Delivering projects that enable business growth	1	1	1
Linking business & IT strategies and plans	2	2	2
Attracting, developing and retaining IT personnel	3	4	5
Improving the quality of IS services	4	7	12
Improving the business and IT relationship	5	*	*
Implementing IT process improvements	6	12	**
Improving IT governance	7	8	9
Building business skills in the IT organization	8	9	3
Use of information/intelligence in ops, products or service	9	6	**
Reducing the cost of IT	10	12	**

* New question for 2008 ** New question for 2007

Source: 2008 Gartner Executives Programs CIO Survey

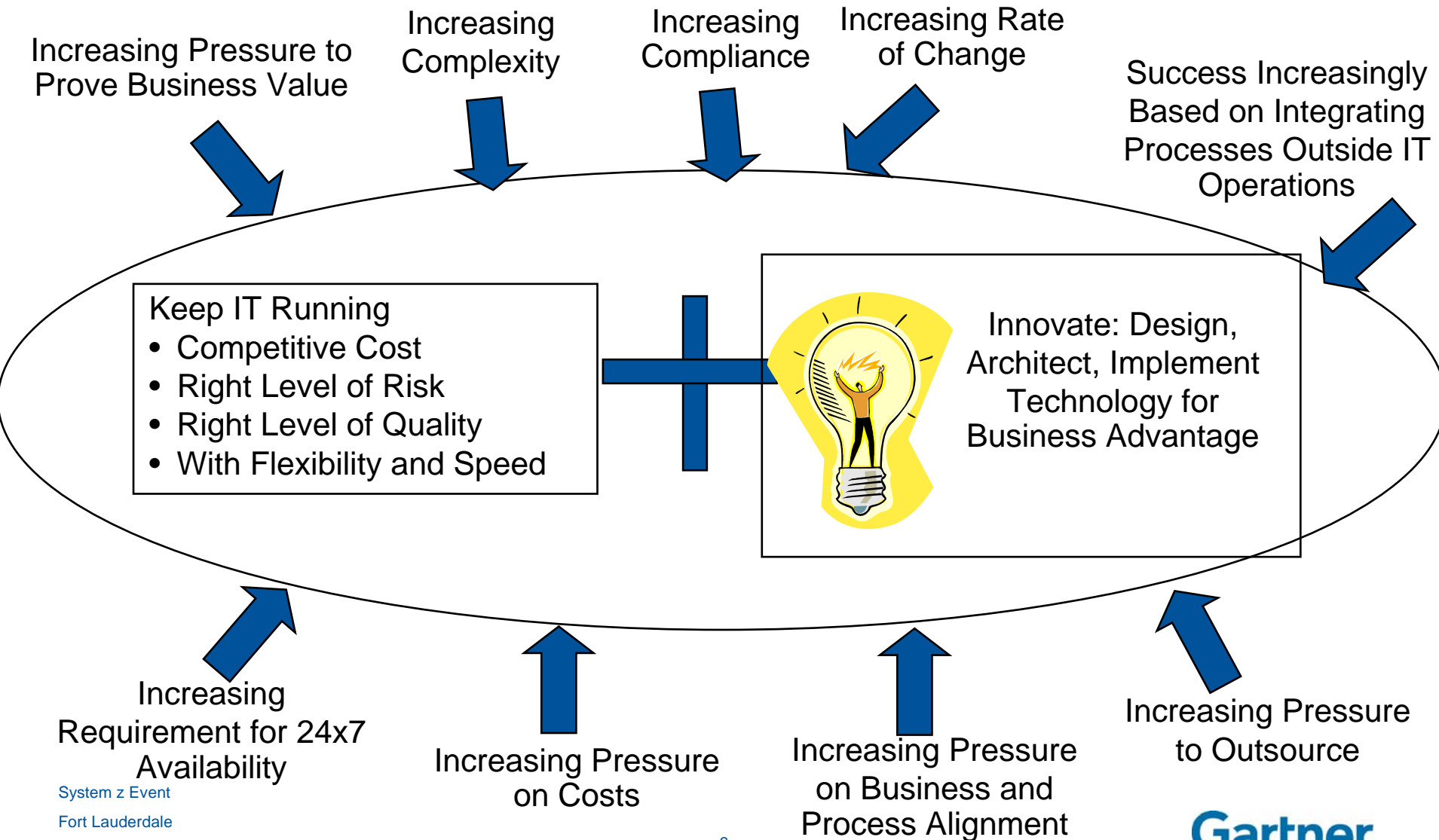
Where are CIOs Focusing in 2008?

2008 CIO Technology Priorities				
To what extent will each of the following technologies be a top five priority for you in 2008?	2008	2007	2006	2008 Unweighted Average Budget Change
Business intelligence	1	1	1	11.20%
Enterprise applications (ERP, SCM, CRM, etc)	2	2	**	8.02%
Servers & storage technologies	3	5	9	8.45%
Legacy modernization, upgrade or replacement	4	3	10	5.79%
Security Technologies	5	6	2	8.53%
Technical Infrastructure	6	8	12	4.67%
Networking, Voice and Data	7	4	8	6.83%
Collaboration technologies	8	10	4	7.75%
Document management	9	9	**	7.91%
Service oriented (SOA, SOBA)	10	7	6	6.71%

* New question for 2008 ** New question for 2007

Source: 2008 Gartner Executives Programs CIO Survey

IT Operations and Infrastructure Management Challenges



As if there weren't enough challenges, many organizations have a facilities issue

Survey of 290 North American Organizations found:

- 36% of organizations' *newest* data centers are seven or more years old
- 78% of organizations' *oldest* data centers are seven or more years old
- 48% foresee building a new data center in next three years
- 55% foresee expanding existing data centers in next three years
- 57% view the incorporation of “greener” features in the design to be a high priority

Power and Cooling Effects of the "Energy Crisis"

Energy costs are typically <10% of the overall IT costs — but are part of the facilities budget

Left unchecked, this could rise to 20% to 30% within four years

Securing power to the new requirements is difficult and expensive

Distributing power and cooling across large sites is difficult

IT organizations will become more exposed to global energy prices

Legislation may be introduced that requires more environmentally friendly DCs — U.S. EPA Bill, August 2006

- nothing mandated yet, but it is an election year

Data Center Power and Cooling — Limitations to IT Growth

As of today, 50% of data centers have insufficient power and cooling capacity to meet the demands of high-density equipment

Site consolidation will be constrained

Refurbishing legacy DCs is often not possible

Building new DCs can be too expensive

Using hosted space has its own set of problems

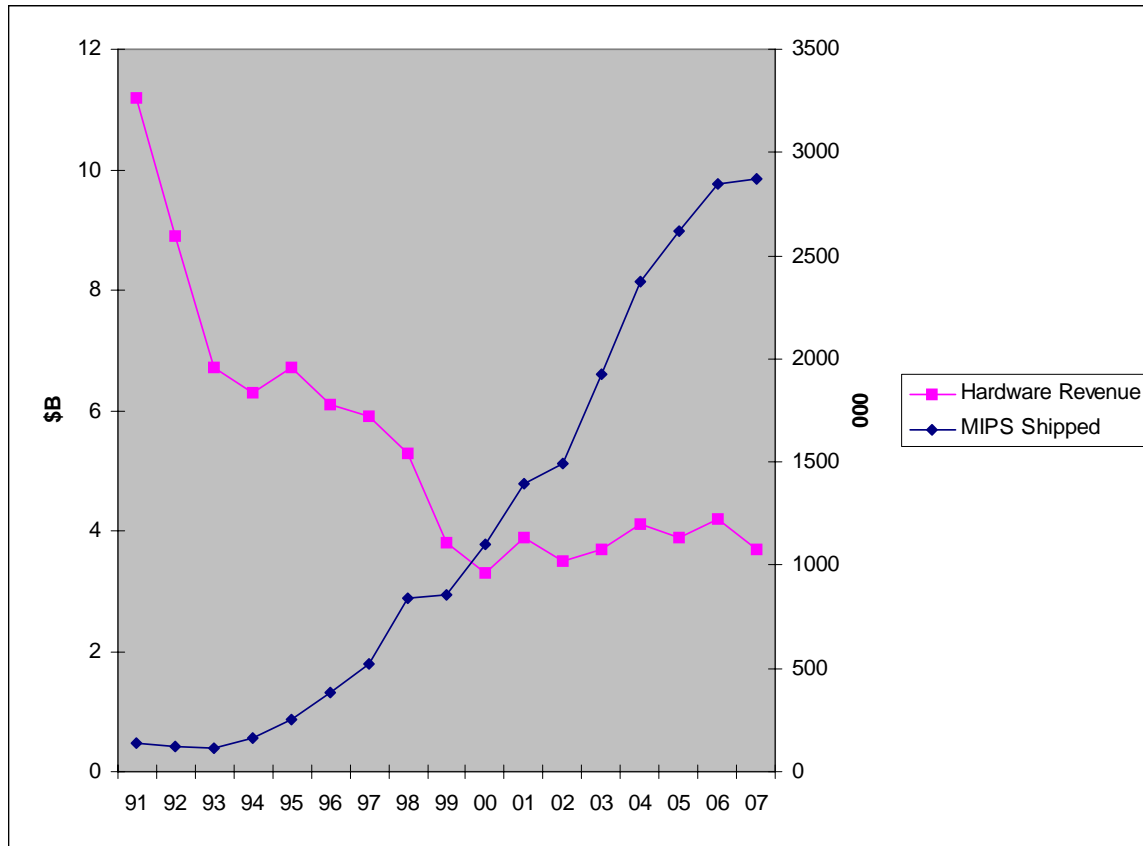
Speed of change of technology vs. DCs

New technologies will create serious challenges for traditional capacity-based software pricing models on other platforms

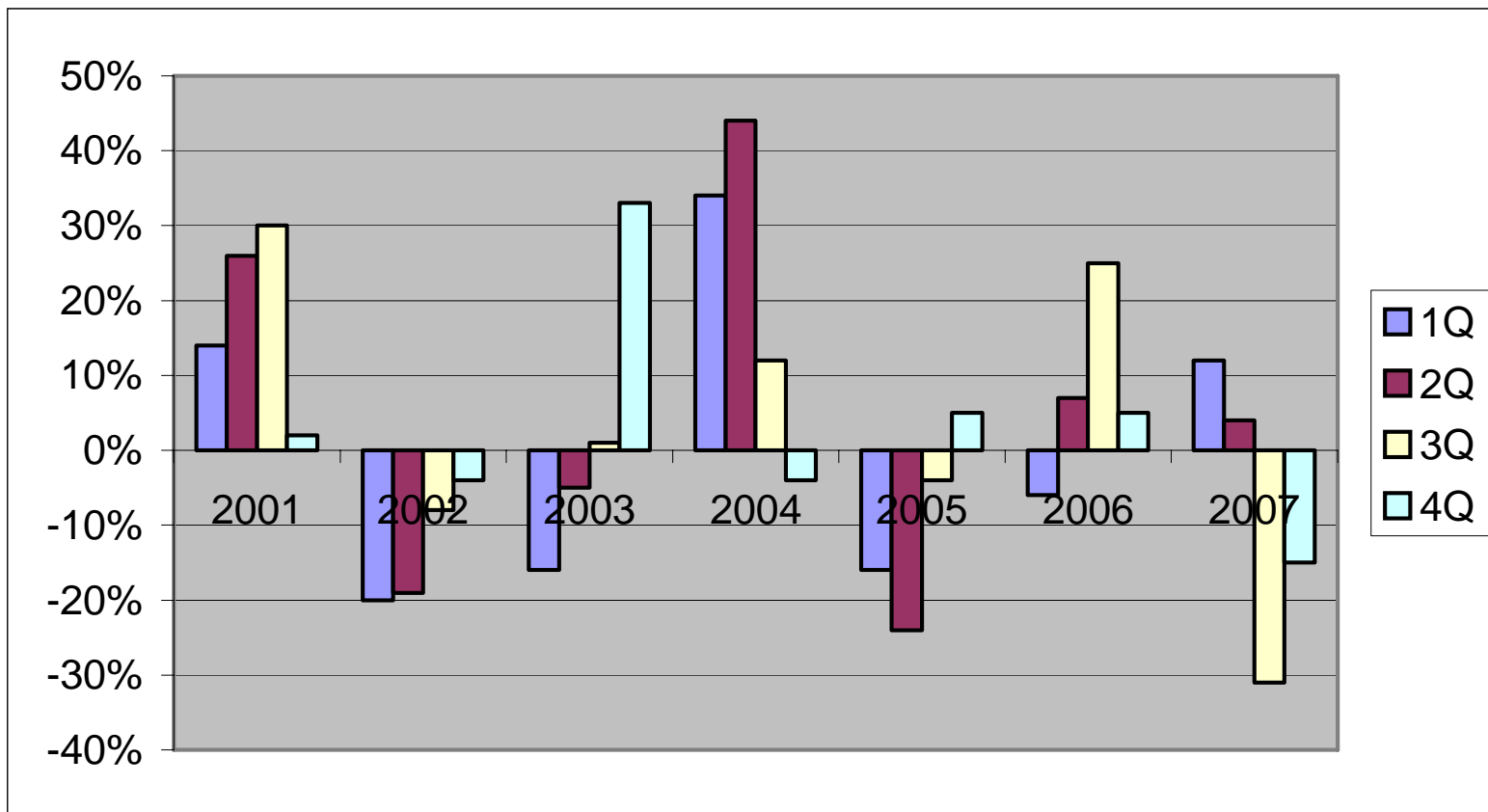
- Multicore Processors
- Consolidation
- Distributed workload management
- Capacity on Demand
- Virtual Machine and Partitions
- Rapid Provisioning and Migration Software

IBM Has Revitalized the Mainframe, but Product Cyclicality Still Raises the Long-Term Viability Question

IBM Mainframe Trends



IBM Mainframe Hardware Revenue Quarterly Growth Rates

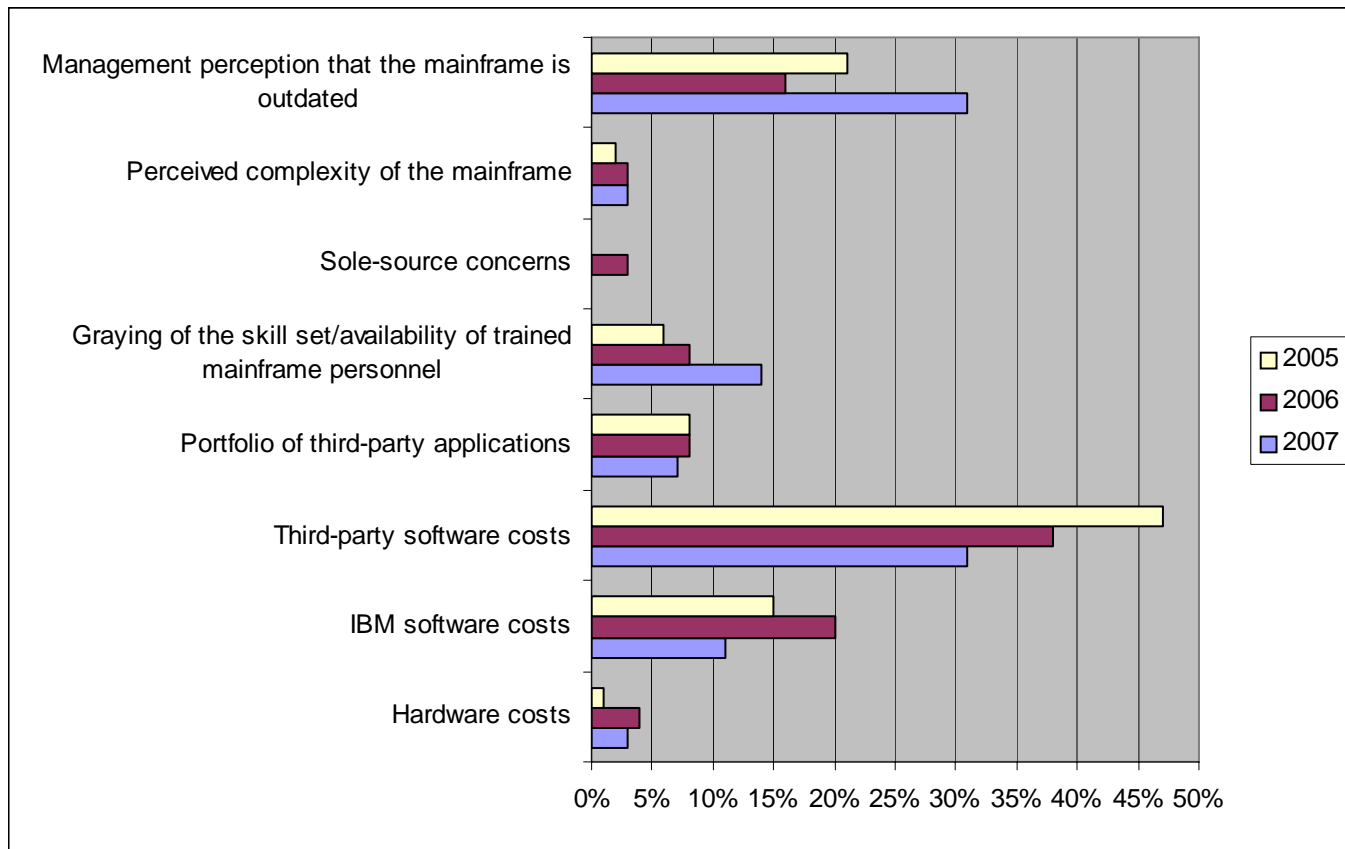


Mainframe Market Status Report

- Eight consecutive quarters of year-over-year capacity growth and five consecutive quarters of year-over-year revenue growth ... until 3Q07
- 12 million MIPS installed... and growing 15 percent per year
- Linux on z — more than 20% of MIPS being shipped
- Specialty engines (MIPS) now 15% of installed base
- More than 400 ISVs and 1,100+ applications for Linux on z
- Over 1,300 ISVs on System z today
- Leader in platform security, business resiliency, virtualization & utilization
- Facilities are now a mainframe competitive strength
- Academic initiatives — approximately 400 universities
- \$1 billion, multi-year investment in each generation of System z

Market Perception Regarding Mainframe Futures

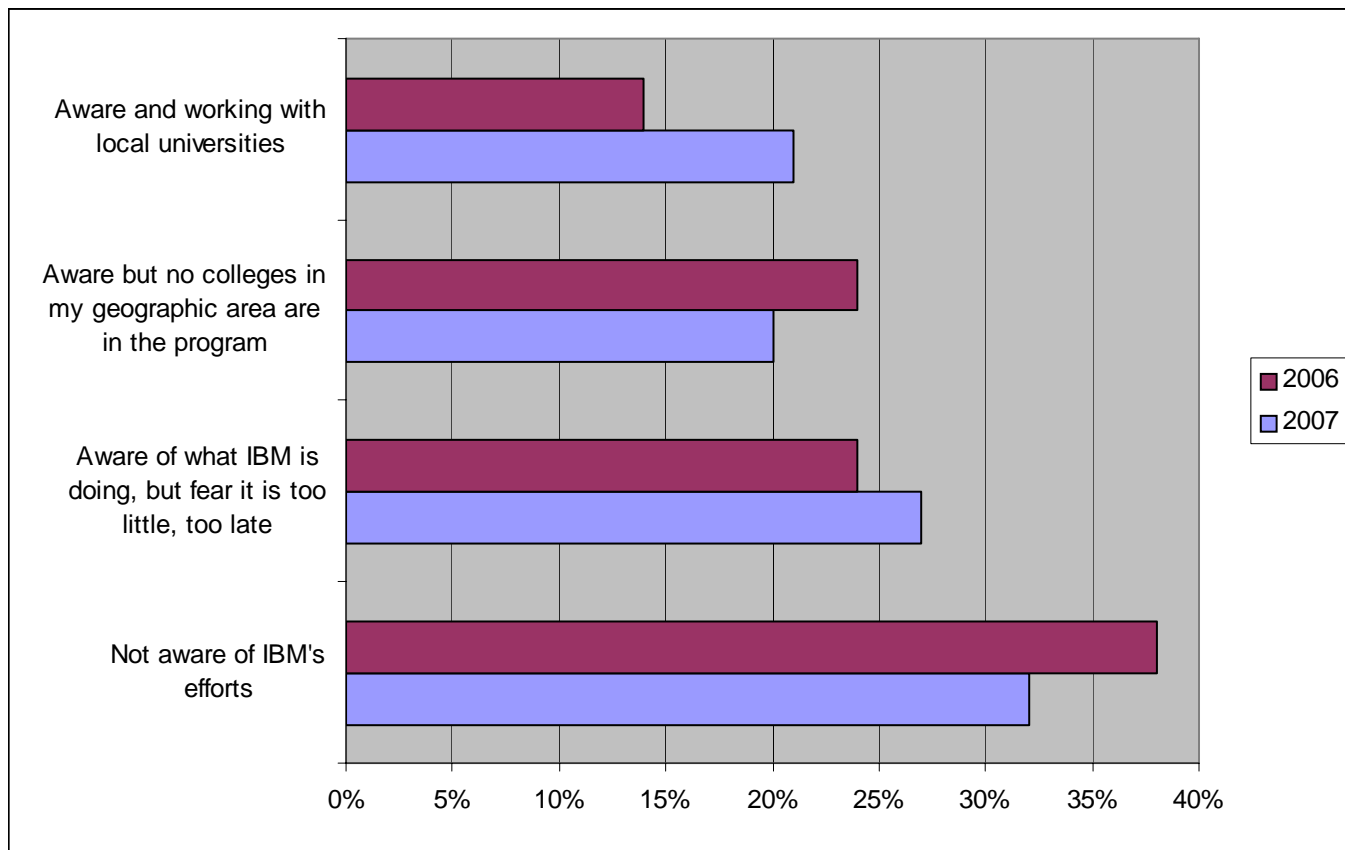
What is the largest inhibitor to the growth in usage of the mainframe in your organization?



Source: November 2007 Data Center Conference Survey

Market Perception Regarding Mainframe Futures

Are you aware of IBM's Academic Initiative, and its efforts to address the skills shortage issue?



Source: November 2007 Data Center Conference Survey

What Has Made the Mainframe Unique?

High Capacity

- + Processor
- + I/O bandwidth
- + Scalability

Personnel

- + scalable capacity/staff ratios

Mixed Workloads

Power, Cooling & Space Efficiency

Security

- + Hardware
- + Software
- + Integrity

Reliability, Availability and Serviceability

- + Hardware
- + Software

Operational Disciplines

- + 24x7
- + Disaster/recovery
- + Security
- + Backup/recovery

Systems Management

Perceived Shortcomings

- High hardware costs
- High software costs
- Proprietary operating system
- Not user-friendly
- Not “modern”

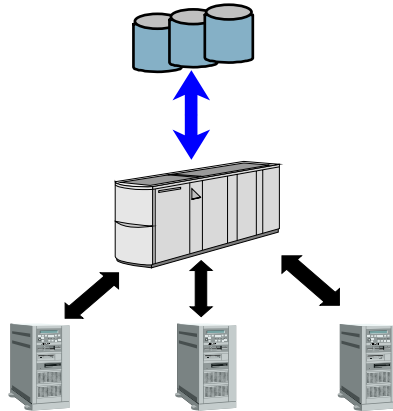
How are Companies Using The Mainframe?



Mainframes: **“Perfect for legacy applications”**



Mainframes: **“The ultimate consolidation platform”**



Mainframes: **“The ultimate data server”**



Mainframes: **“Perfect for new emerging applications”**

Mainframes: **“The mission-critical server”**



If the Mainframe Is the 'Best' Technology, Why Doesn't Everyone Use It?

- Application portfolio or ISV enthusiasm
- Total cost of ownership (TCO)
- Worries about graying of the mainframe staff
- Perceived complexity of system
- Desire for use of open standards
- Public perception that the mainframe is obsolete
- Other platforms becoming “good enough” for some workloads

What is System z Doing Well?

- Linux on System z has been taken to the next level
 - No longer “kicking the tires”
 - Continue to build portfolio of applications
- Building support in Academia
- Ability to bring new workloads to the platform
- Specialty engine investments move with family upgrades
- Ability to insulate legacy workloads from price increases
- Ability to bifurcate market
- Articulate power consumption metrics and impact on cost of ownership
- MA (Mainframer’s anonymous) chapters are down 😊

IBM's Specialty Engines: The Catalyst for Growth

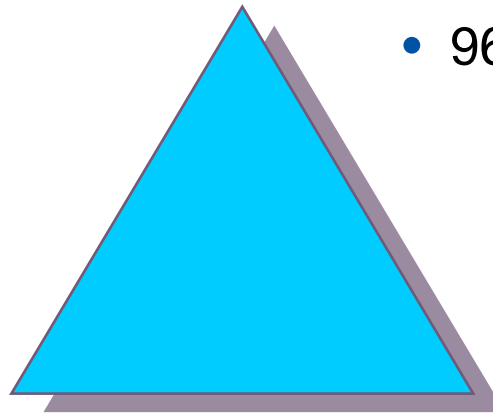
- Lower hardware prices
- Investment protection on upgrades
- Lower software costs — IBM and third party
- Create room for legacy applications to grow
- No additional staffing

IFL

- Introduced in 2000
- 9672 through System z10

zIIP

- Introduced in 2006
- Certain database workloads
- IPSec encryption
- New Feb. 26 function
- System z9 & z10



zAAP

- Introduced in 2004
- Java workloads
- z/OS XML Sys Services
- z890, z990 z9 and z10

Mainframe Customers Building on their Investment

Linux on the Mainframe

Nationwide Insurance

- 450+ Linux virtual systems
- 2 Linux-only z9's with 21 IFL's
- 5 month project to set up
- Reasons for System z
 - Mature/low overhead virtualization
 - High availability
 - Small footprint/power/cooling
 - Simpler disaster recovery solution
 - Attractive middleware pricing
 - Sophisticated capacity on demand
 - Certified application isolation
- Linux on System z with z/VM chosen as top priority
- Decided to standardize on virtualization and J2EE
- Results
 - 50% reduction in Web hosting monthly costs
 - 80% reduction in floor space and power consumption
 - 50% reduction in hardware and OS support costs
 - Estimated savings of over \$15 million over three years

Mainframe Customers Defying Conventional Wisdom

Oracle on the Mainframe

Quebec Government

- 150+ Linux virtual systems supporting 200 Oracle instances
- 1 Linux-only z9 EC with 5 IFL's and 8 LPARs
- 18 month project from vision
- 18 months in production
- Reasons for System z
 - Stable and mature virtualization
 - Guaranteed isolation
 - Software savings
- 100:1 Linux VM admins
- Use in-house developed cloning engine
- Results
 - Break-even point planned 36 months but actual 24 months
 - Oracle license reduction from 49 to 4 – saved 27 OTC + yearly maint
 - WAS license reduction from 88 to 8 – saved 33 OTC + yearly maint
 - Won the SHARE 2007 Award for Excellence

System z Event

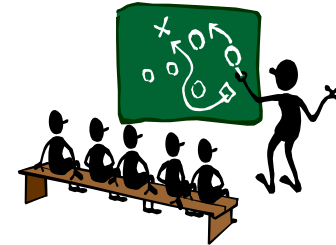
Fort Lauderdale

March 6, 2008

Source: Quebec Government

IBM's Academic Initiative: Can You Afford to Wait?

- IBM's program now four years old
- Number of higher education schools growing
- Be wary of student numbers
- Mastery exam the key metric
- Regional Roundtables
- In the meantime:
 - Get HR involved!
 - Pursue college relationships
 - Online course credits
 - Encourage mentoring assignments
 - Cross-train to enable flexible staff utilization
 - Talk to your ISVs
 - Do your own in-house training



	Schools in program	Students
YE03	24	
YE04	70	
YE05	213	10,000
YE06	294	27,000
3Q07	359	47,000

Is Now the Time to Re-Platform?

- Have we optimized the status quo?
- Are the vendor case studies relevant to my environment?
- What are my application provider's priorities?
- How much time and effort will it *really* take to migrate?
- What's the lost-opportunity cost?
- What are the implications on quality of service, security and availability?
- Have I considered the impact on my DR plans and energy costs?
- How can I gracefully unwind from my software contracts?
- Will I realize staff savings?
- Are you modernizing the application or just moving COBOL code from one platform to another?
- Can we get a performance guarantee in writing?

What Makes the Mainframe a Credible Option for Today's Emerging Workloads

- Virtualization
- Mixed workloads with very different characteristics
 - Capable of high utilization
- Sophisticated management capabilities
- High availability
- Security
 - Inherent in platform within system
 - High-performance Encryption capabilities
- BC/DR
- \$ per transaction costs for high volume workloads
- Good environmental footprint
- Openness
 - Special purpose engines

What Makes the Mainframe Attractive for New Workloads?

Incremental cost of ownership

- Software costs for incremental general purpose MIPS can be trivial
- Specialty engines (IFL, zAAP, zIIP) fence off additional costs
- Hardware pricing – no incremental cost for technology refresh of specialty engines
- Often no additional staffing required

So What Makes the System z10 a “Good Fit”

- Significant reduction in cost per unit of work for new workloads
- Energy and space efficiency per unit of work for all workloads
- Raises the bar even further on the “ities” gold standards
- Improved Capacity-on-Demand technical capabilities
- Additional Performance for CPU-intensive workloads
 - More than just a faster chip (new hw instructions)
- More memory and better management of it
- A third iteration of the “Technology Dividend”
- Cell coming
- An even better consolidation play!

The Benefits of IBM's Technology Dividend

	z/OS Monthly License Charge (\$000)			
MIPS	z900	z990	z9	z10
1000	70	63	58	53
10000	238	227	218	208
35000	407	380	358	339

Where is there room for improvement?

- **Academic Initiative awareness outside the data center**
- **Virtualization = VMWare!**
- **Specialty engine Granularity**
- **Taking on the “Google” architecture – the massive commodity infrastructure approach**
- **Deteriorating economic climate – how can the existing mainframe be used to cut IT costs**
- **Case study migrations from “well run” distributed platforms**
- **Legacy modernization**
- **Applications, applications, applications!**
 - Moving apps from Windows
 - Creating/deploying an economically-feasible application developers sandbox
- **“LSPR-like” data for new workloads**
- **Senior management education**