Leveraging System z for Lowest Cost of Ownership
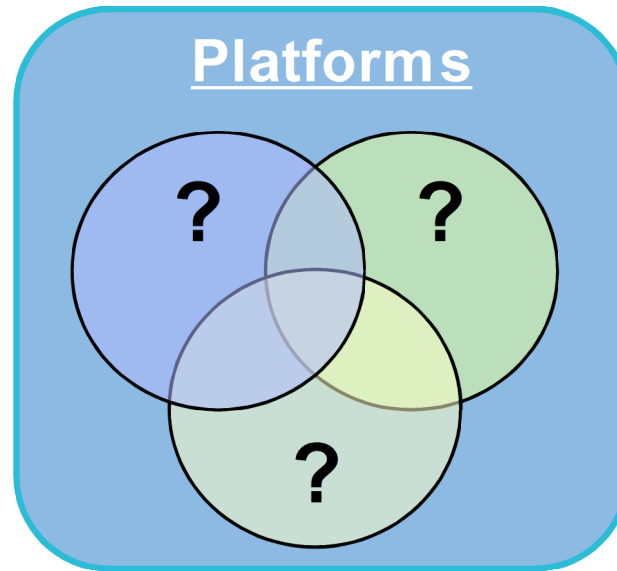
Steve Mills, Senior Vice President and Group Executive, IBM

IBM

Supporting multiple workload approaches……

Transaction/data processing

Scale

Flexible workload management

Fast transaction, I/O speeds

High quality of service

Security

Platforms

? ? ?

Basic web and collaboration

Scale

High throughput

Varying quality of service

Varying levels of security

Business applications (including web)

Scale

High quality of service

High memory requirements
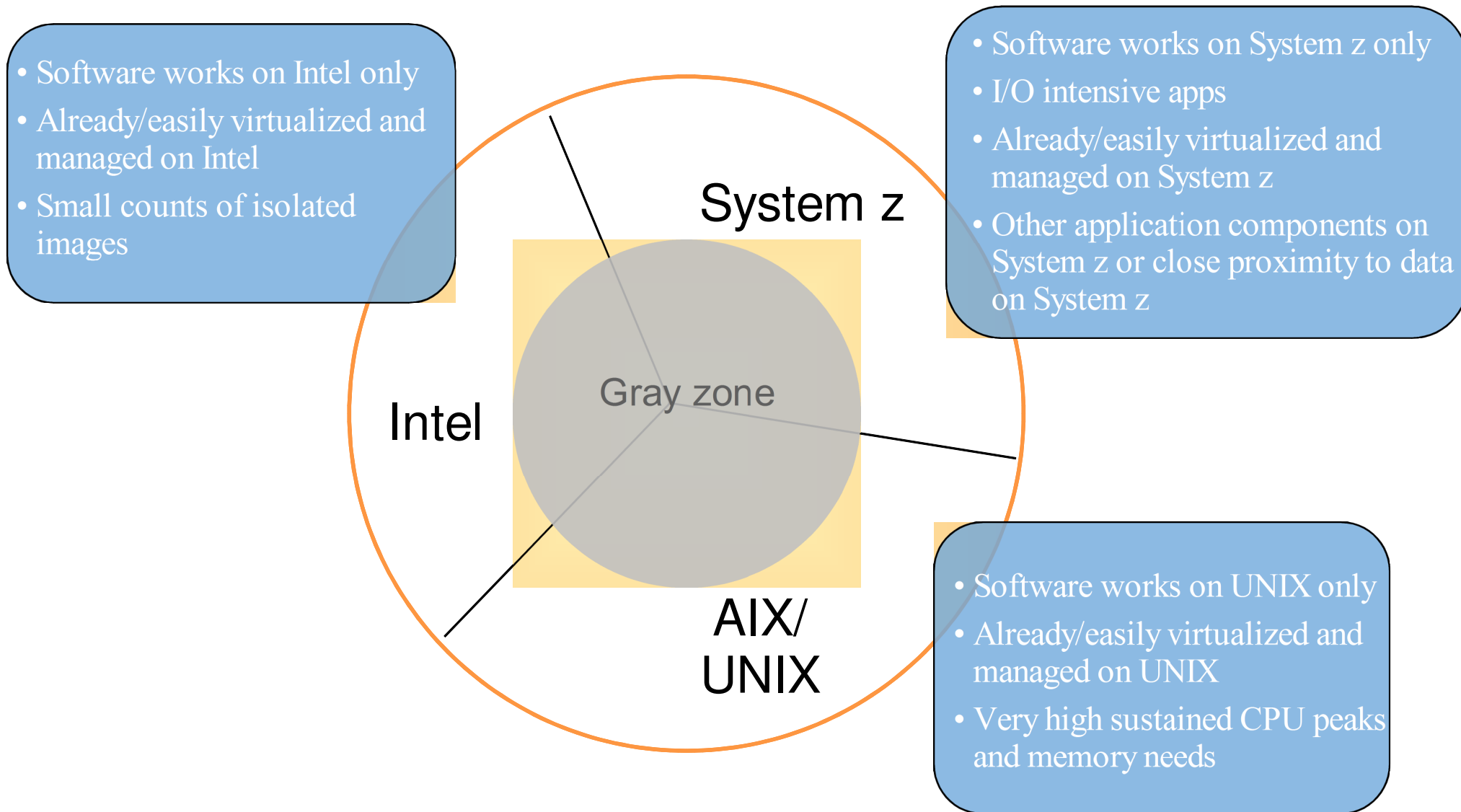
Flexible infrastructure

Security

Business Analytics

Scale

Compute intensive

High I/O bandwidth

High memory requirements

Varying levels of security

Static simulation/modeling

Compute intensive

High memory requirements

Lower QoS

Matching best platform for workload is crucial

Platform: Fit for purpose for today's applications & data

- Software works on Intel only
- Already/easily virtualized and managed on Intel
- Small counts of isolated images

- Software works on System z only
- I/O intensive apps
- Already/easily virtualized and managed on System z
- Other application components on System z or close proximity to data on System z

System z

Intel

Gray zone

AIX/ UNIX

- Software works on UNIX only
- Already/easily virtualized and managed on UNIX
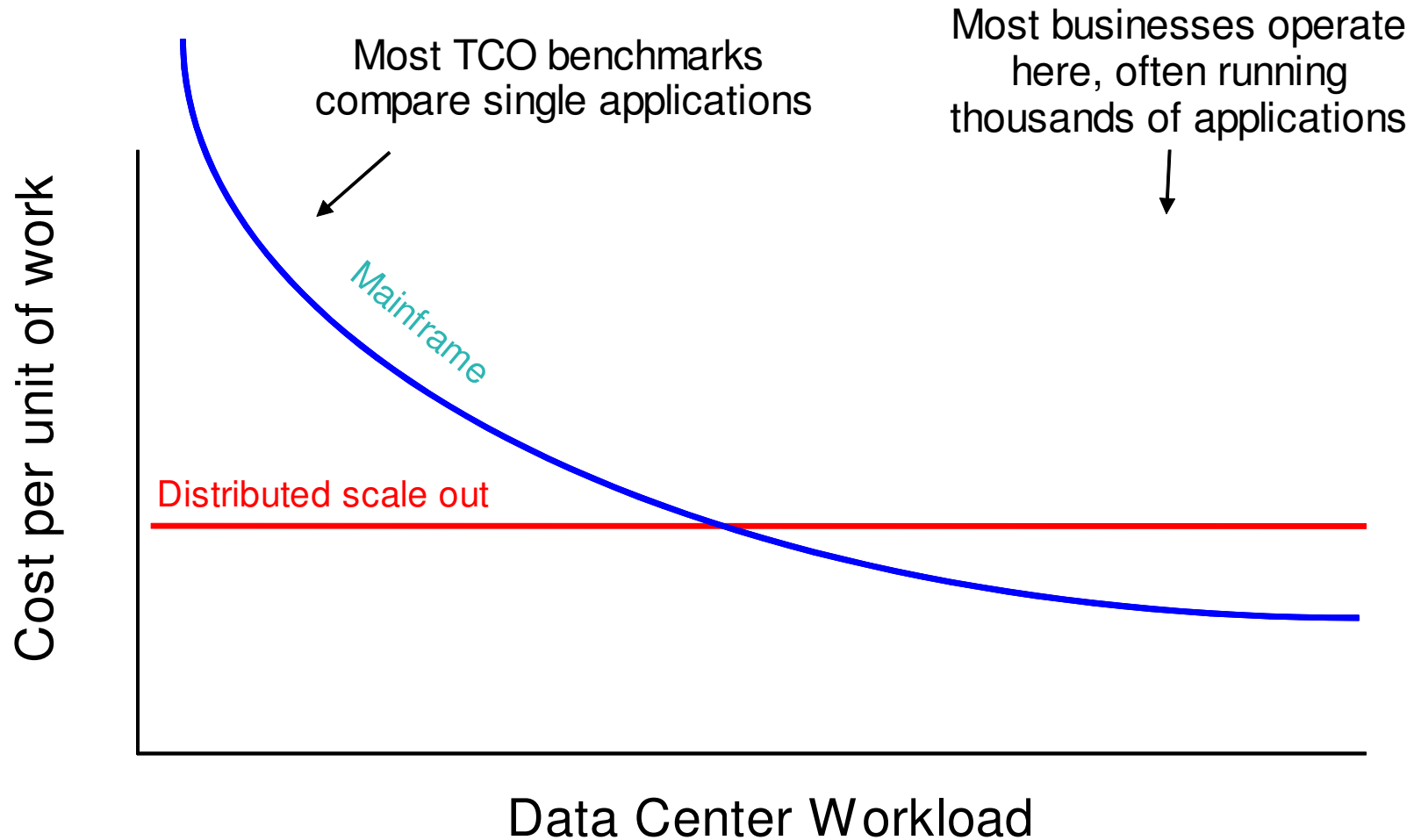- Very high sustained CPU peaks and memory needs

Let's Break Down the Elements of Cost

Total Cost of Ownership =

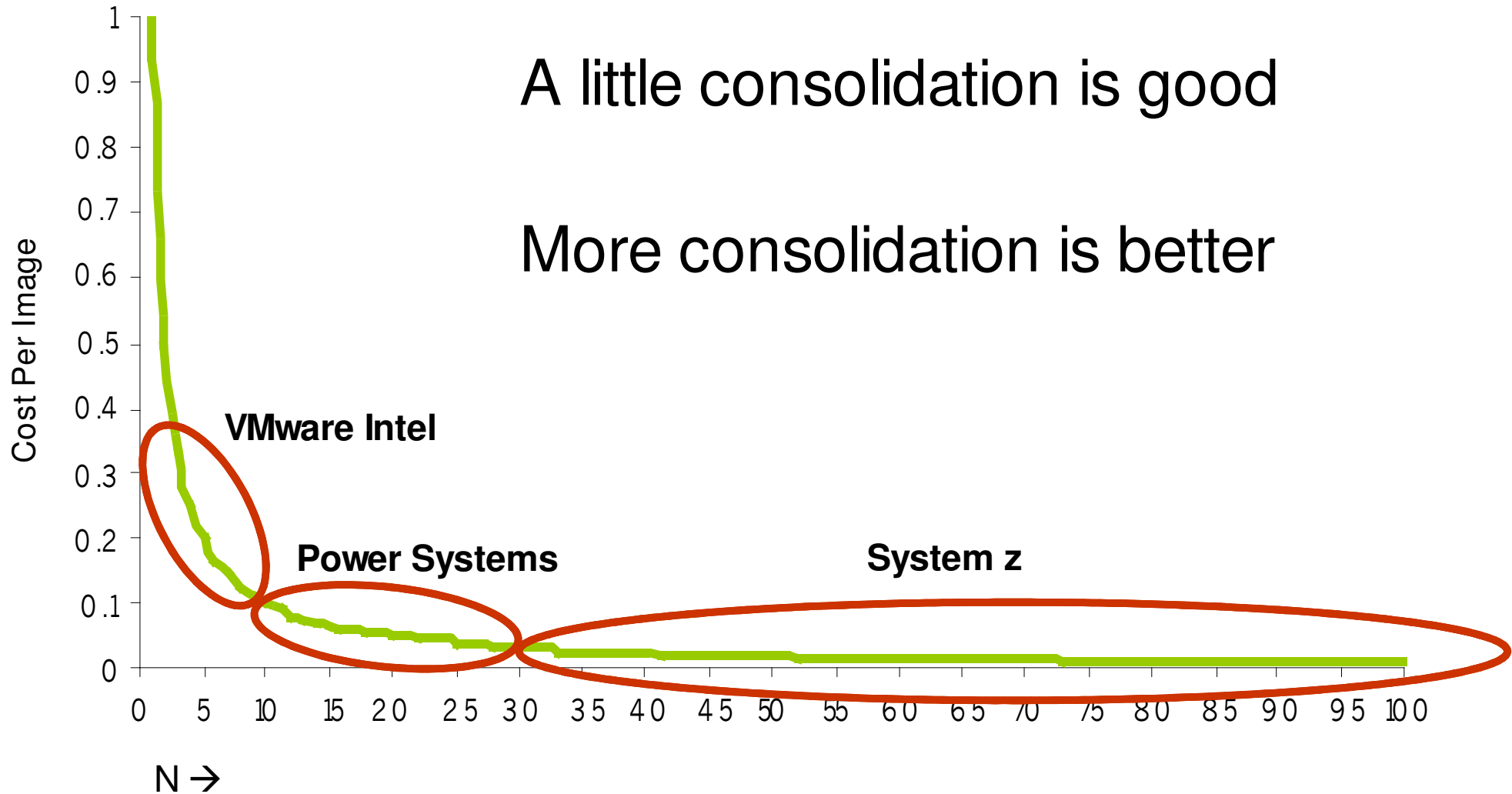**Hardware/Maintenance**

+ IBM Software

+ Environmentals

+ Labor

+ required Quality-of-Service

(Availability, Security, Disaster/Recovery…)

+ other Elements

(Chargeback)

The total cost requires a total picture of your I/T assets and expenses

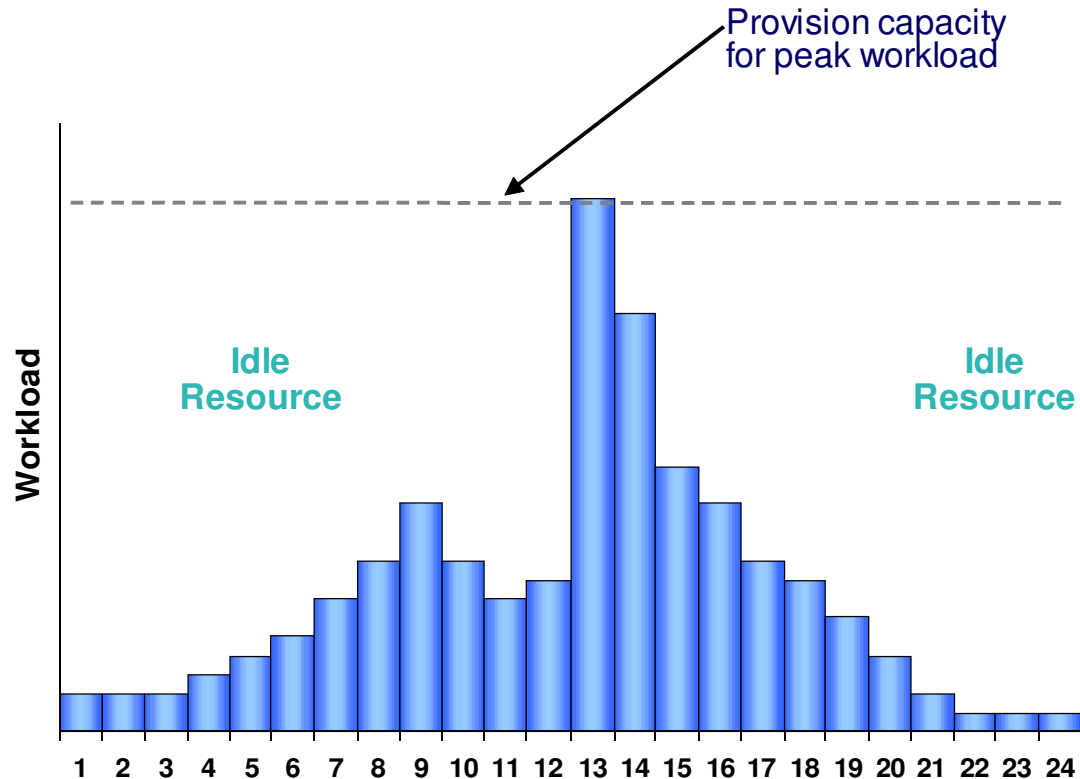# Mainframe Cost/Unit of Work Decreases as Workload Increases

Most TCO benchmarks compare single applications

Most businesses operate here, often running thousands of applications

Cost per unit of work

Mainframe

Distributed scale out

Data Center Workload

Observed Consolidation Ratios

A little consolidation is good

More consolidation is better

Utilization of Distributed Servers & Storage

Typical utilization of:	
Windows Servers	5-10%
UNIX Servers	10-20%
System z Servers	85-100%

Server dedicated to one application

The cost of storage is typically three times more in distributed environments

Provision capacity for peak workload

Workload

Idle Resource

Idle Resource

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

▪ **Storage Allocation**

– Application-specific resulting in over-allocations

– Fine grained storage allocation mechanisms characteristic of mainframe storage are uncommon in distributed environments.

▪ **Storage Utilization**

– Single digit utilization for distributed environments is not uncommon

– Storage utilization of 80% + is typical for mainframe

▪ **Storage Management**

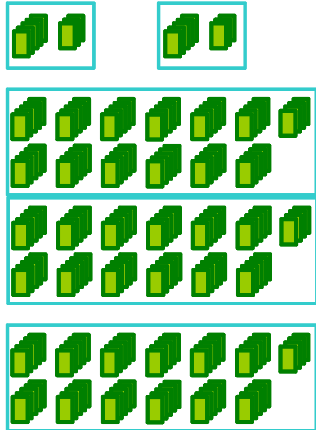– Data disaster recovery, synchronization, and transfer requirements add complexity and cost

Application specific storage allocations tend to occur in large units

resulting typically in single digit utilization
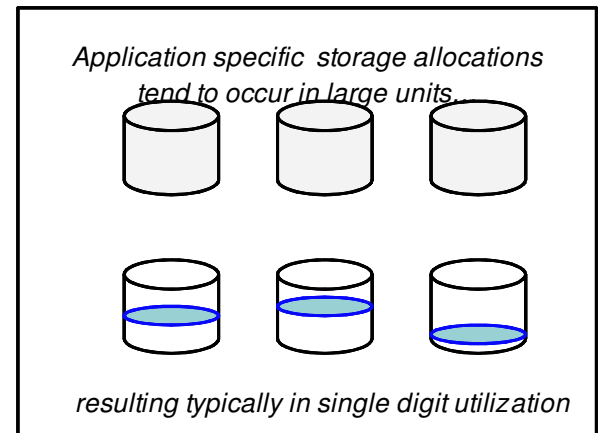
Compare The Processors Needed To Achieve 2,200 Transactions Per Second

Online Injector: 1 x HP RX7620

TCS BaNCS and DB2
1x z10 2097-705

Processor

Processor

Processor

Processor

Processor

5 processors

(3,906 MIPS)

Temenos T24 Servers:
   2 x HP RX7620
   3 x HP 9000 Superdome

280 processors

(457,762 Performance Units)

$18.9M
TCA (3yr)

$26.0M
TCA (3yr)

Oracle 10g: 1 x HP 9000 Superdome

117 Performance Units per MIP

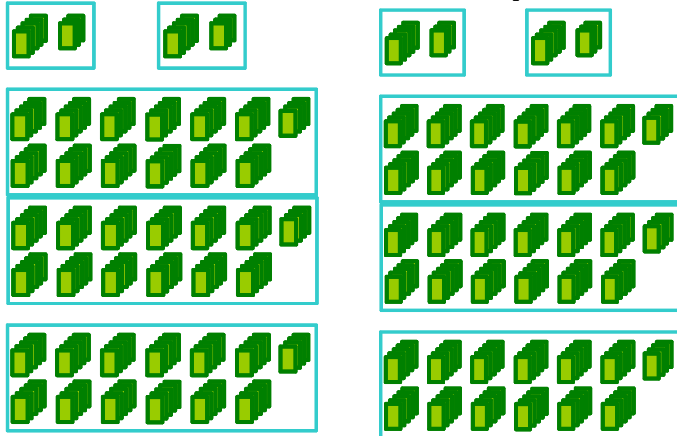HP Integrity rx7620 - (10U) 1.5GHz 6MB (8ch/8co)

HP 9000 Superdomes - 32W 1GHz 32MB (32ch/64co)

Compare The Processors Needed To Achieve 2,200 Transactions Per Second (with Dev/QA)

Online Injector: 2 x HP RX7620

TCS BaNCS and DB2
1x z10 2097-707

Processor

Processor

Processor

Processor

Processor

Processor

Processor

7 processors

(4,906 MIPS)

Temenos T24 Servers:
     4 x HP RX7620
     6 x HP 9000 Superdome

560 processors

(915,524 Performance Units)

$22.7M
TCA (3yr)

$59.2M
TCA (3yr)

187 Performance Units per MIP

Oracle 10g: 2 x HP 9000 Superdome

NOTE: Double Distributed Servers, add 1000 MIPS to System z for Dev/QA

HP Integrity rx7620 - (10U) 1.5GHz 6MB (8ch/8co)

HP 9000 Superdomes - 32W 1GHz 32MB (32ch/64co)

Incremental Cost Of New Workload Can Be Isolated Using Sub-Capacity Pricing…

Incremental Cost

Existing Cost

New Application

z/OS

Application | Application | Application

z/OS

Application | Application | Application

z/OS

DB2 | DB2 | DB2

z/OS

Linux Image

Linux Image

Linux Image

z/VM

Pay for the peak usage of the software in this partition

Additional MIPS do not increase the cost of IBM software in other partitions

All Data

10
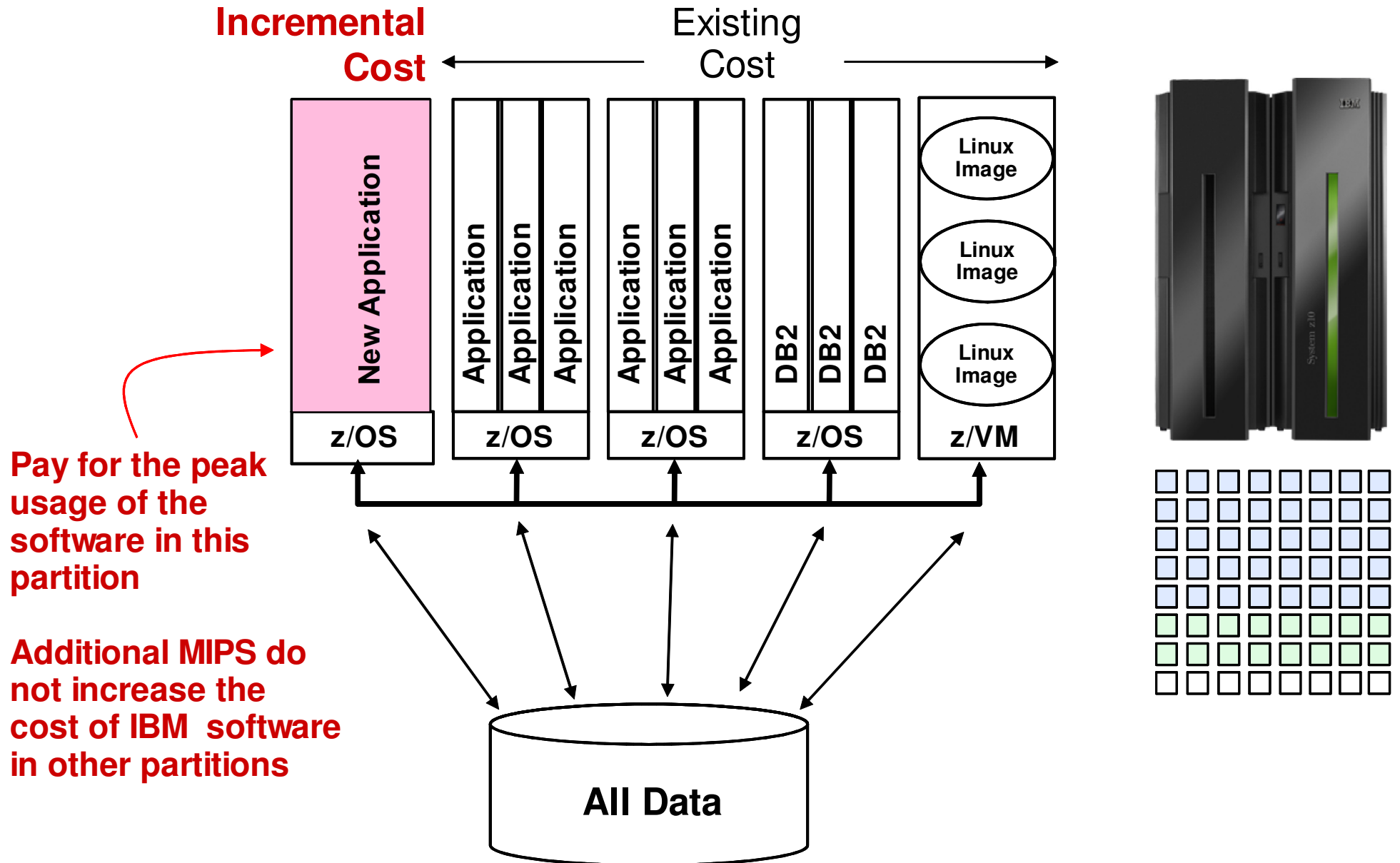
…Or on zLinux With IFL Pricing

Existing Cost

Application / Application / Application — z/OS

Application / Application / Application — z/OS

Application / Application / Application — z/OS

DB2 / DB2 / DB2 — z/OS

Linux Image / Linux Image / Linux Image — z/VM

All Data
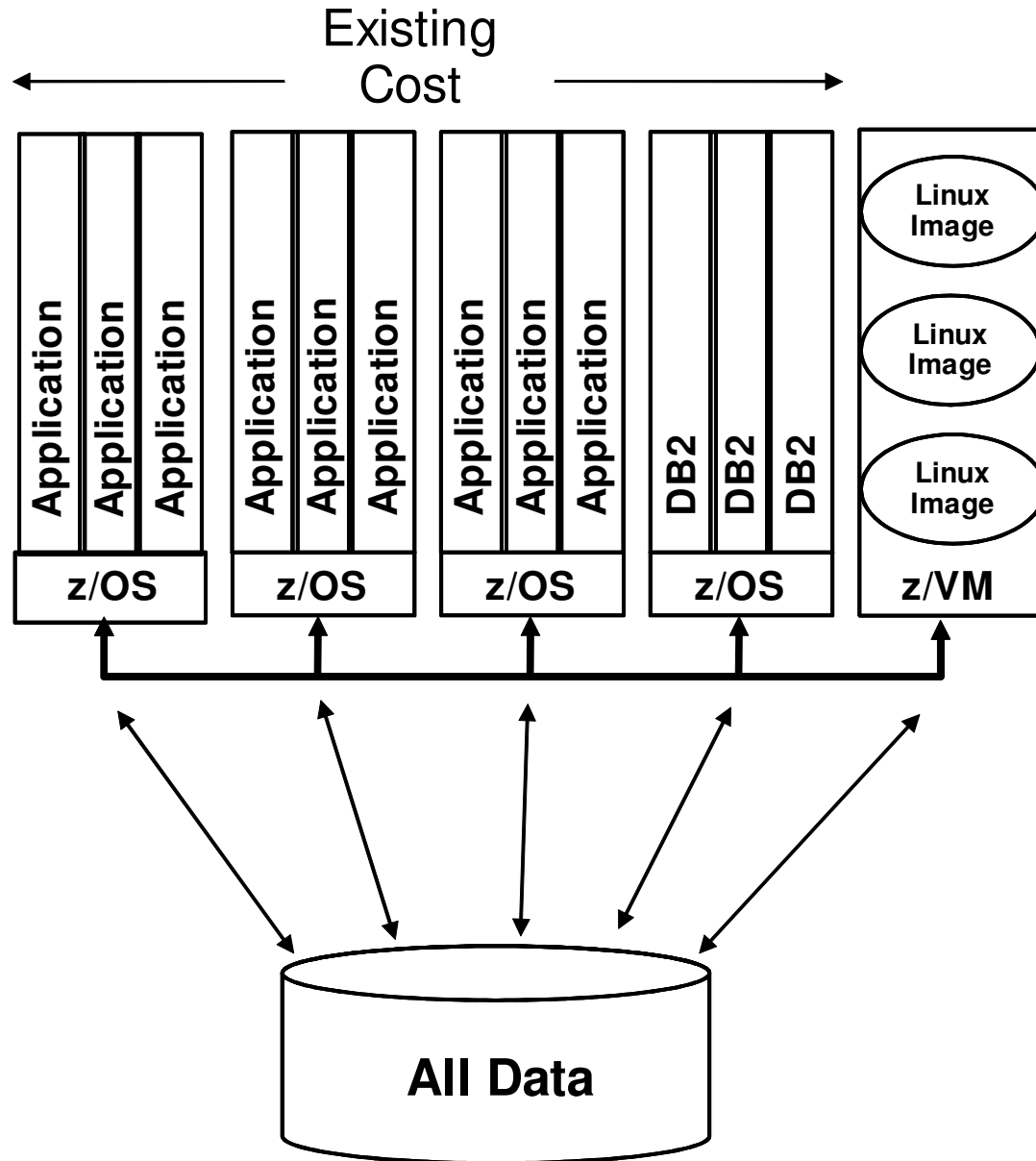
Incremental OTC payment per IFL core

Does not increase the cost of IBM software in other partitions

Specialty Engines Reduce Cost For New Workloads

- **Special assist processors for System z**
  - For Java workloads (zAAP)
  - For selected DB2 workloads (zIIP)
  - For Linux workloads (IFL)

- **Attractive pricing**
  - $125K for a 920 MIP processor (**90% discount**)
  - No charge for IBM software running on zAAP/zIIP
  - IBM software running on IFL costs 120 PVU's
  - Free upgrade to next generation!

- **Requirements**
  - Max number of zAAP =< number of general purpose processors
  - Max number of zIIP =< number of general purpose processors
  - No limit on the number of IFL's

How Does Consolidation Reduce Costs?

- Costs shared by all "N" consolidated images
  - ▶ Hardware
  - ▶ Software
  - ▶ Power
  - ▶ Floor Space
  - ▶ Local Network Connectivity
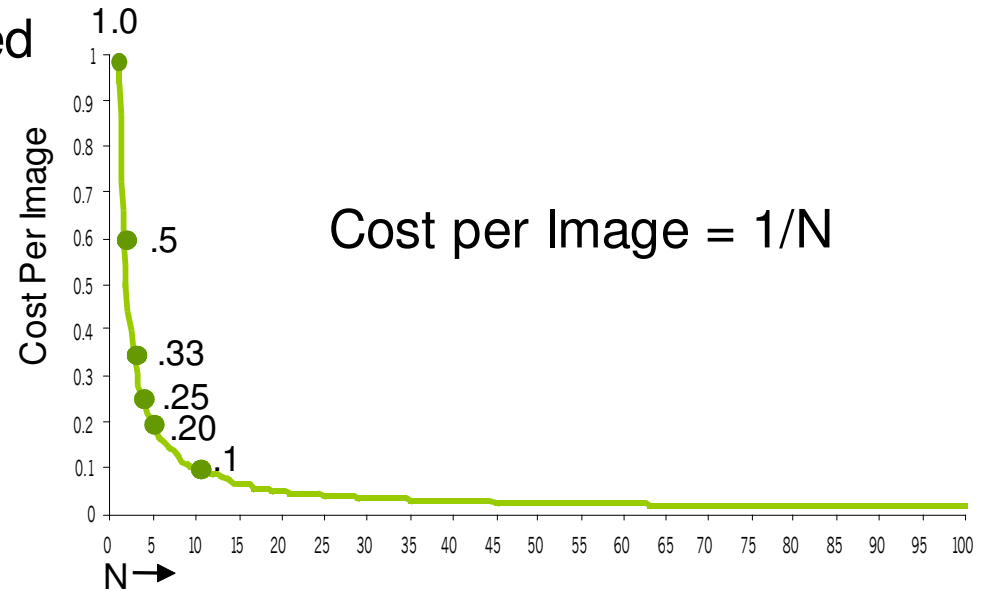
Cost per Image = 1/N

- Costs not shared by consolidated images
  - ▶ Migration cost per image
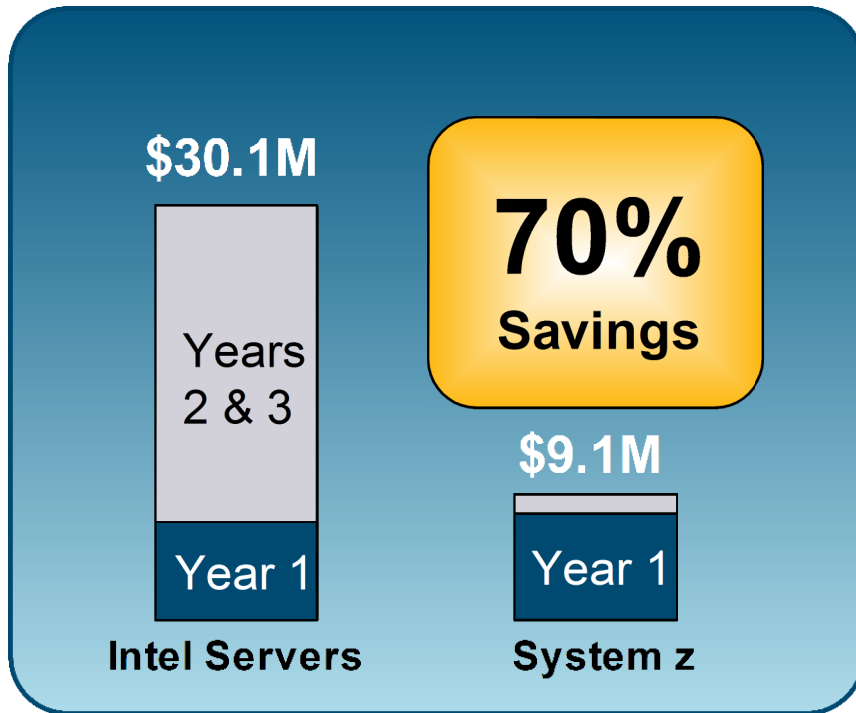 - ▶ Off premise network cost

  Fixed cost per image

  - ▶ Labor cost per image

  Fixed cost per image, but typically less than unconsolidated labor cost

The more workloads you can consolidate, the lower the cost per image

Consolidate applications and data
Drive down costs of hardware, software and management

$30.1M

Years 2 & 3

70%
Savings

$9.1M

Year 1

Year 1

Intel Servers

System z

A regional North American government organization

Top three reasons for savings

✓ Consolidated 292 Oracle servers to one System z

✓ System administration costs 90% less on System z

✓ Subscription and support licenses were over 95% less on System z

Additional benefits

Increased administrator productivity

Faster provisioning speed

Simpler Infrastructure

Optimize deployment of applications and data

Deploying a portal application

Top three reasons for savings

71%
Savings

Years 1-5
Distributed Servers

Years 1-5
System z

A large technology organization

✔ 93% reduction in software licenses: 26,700 down to 1,800

✔ Greatly reduced labor costs due to less administration

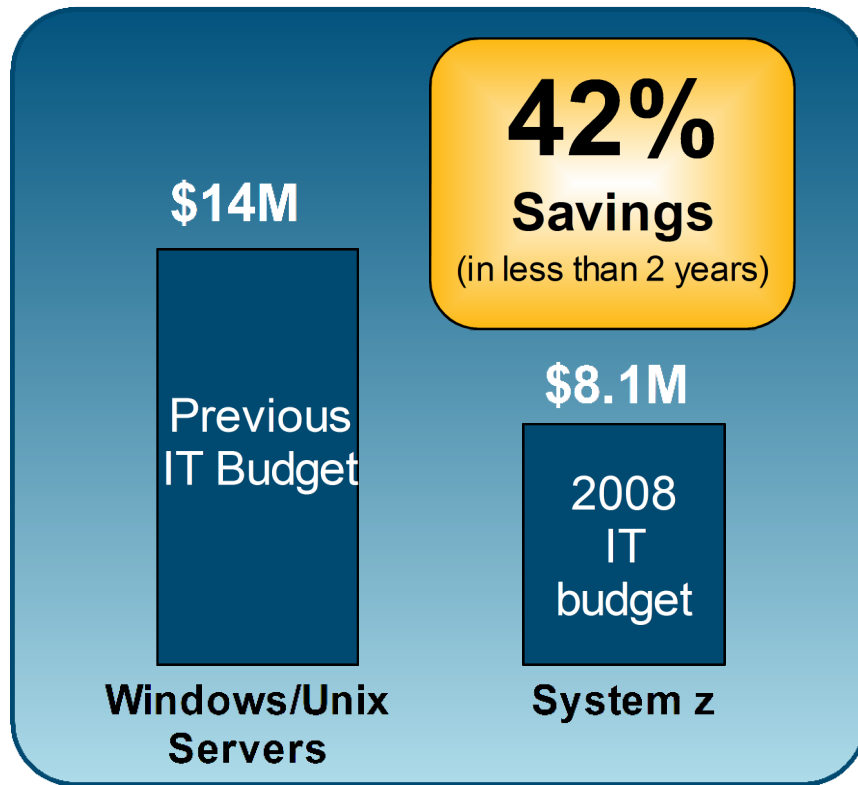✔ Hardware costs are dramatically less

Additional benefits

Far fewer ports

Dramatically less cabling

A fraction of prior physical network connections

Optimize deployment of applications and data
Deploying SAP database and application servers

42%
Savings
(in less than 2 years)

$14M

Previous
IT Budget

**Windows/Unix
Servers**

$8.1M

2008
IT
budget

System z

Top three reasons for savings

Software and hardware licensing costs dramatically reduced

Software and hardware maintenance costs are significantly down

Networking costs plunged, while infrastructure was drastically simplified

BALDOR

$1.8 billion Electric motors manufacturer

Additional benefits

**Space savings with
System z: 85%**

**IT budget proportion to
revenue less than half of
industry average, 2.5%**

**Power consumption
down over 60%**

Reuse applications and data

Replacing existing legacy application with web-based customer facing application

Development Cost

$38M

94% Savings

$2M

.net app on Intel

Reuse applications on System z
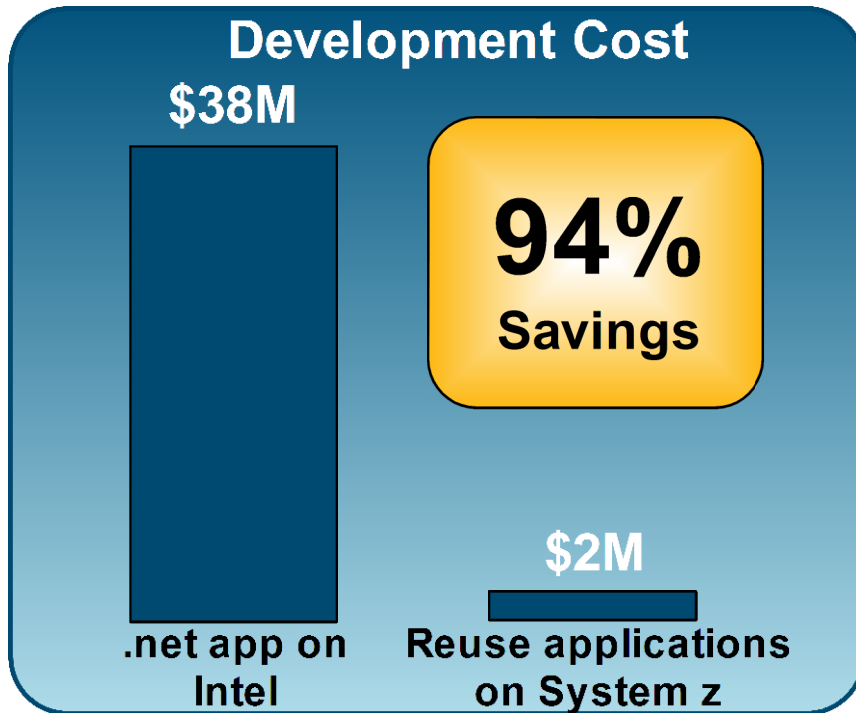
A medium-sized financial services vendor

Top three reasons for savings

✓ Complexity of recoding from scratch all the business processes into .net framework

✓ Speed of implementing System z solution was less than 29 days

✓ Additional employees to test and maintain .net application versus none for System z

Additional benefits

Improved application functionality

Faster time to market

Quick implementation and reduced risk

Properly account for your costs

"False Economics":
Over-allocation of Costs to System z

Getting to "True Economics"

	Intel/UNIX Servers	Mainframes
Direct Costs Hardware, Software, Admin	$ Correct allocation	$ Correct allocation
Shared Costs Power, Facilities, Network, Mgmt overhead, etc.	🚫 Incorrect, zero allocated	$ Correct allocation
	All of Intel/UNIX incurred costs are moved to mainframe	+$

Core problem

- Difficult to assign shared costs to platforms
- Shared costs lumped in with mainframe costs
- Thus, mainframe costs tend to be overstated
- Platform decisions are made that waste cash

Pragmatic quick-return remedy

- Meter basic usage
- Identify largest cost distortions
- Incorporate information in decision making

System z – Thriving environment for today's and traditional applications

System z Linux: fastest growing server platform

- 77% increase in System z Linux MIPS in 2008

- Approximately 1,300 System z customers are now using Linux on z

- Linux is ~15% of the customer System z install base (MIPS)

- Linux engines sold per year

> 1800

| 2002 | 2004 | 2006 | 2008 |
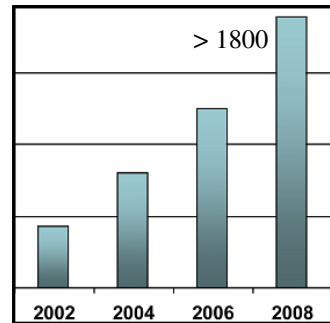
Thousands of ISVs investing in System z

- Over 1,000 new applications and more than 150 new ISVs in 2008

- Over 2,800 LINUX applications are supported on System z; 18% growth in 2008

- Over 1,500 ISVs building applications for System z

- Recent ISV investment includes:

Chordiant. Optimizing the Customer Experience   **TEMENOS** The Banking Software Company   **SAP**

90% growth in mainframe education

Students educated:
- 50,000 worldwide, 5,000 more students in China by 2010

University adoption:
- 600 schools enrolled globally as of May 2009
- 90% growth in 2 years; 2,000% since 2003; continued flow of schools adding curricula
- 50%+ outside of US

Over 15 New York schools involved:

COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK   **MARIST**

SYRACUSE UNIVERSITY

System z – Thriving environment for today's and traditional applications

| IBM key announcements: increasing benefits to today's and traditional applications	
Improves query response times by a factor of 5 – 10, with a significant decrease in operating cost:	**Smart Analytics Optimizer (tech preview)**
A vastly scalable, highly resilient, low-cost way to optimize DB2 for z/OS data:	**InfoSphere Warehouse for System z**
Simplifies the integration of mainframe applications and data into modern applications:	**CICS v4.1**
Simplifies cross-platform development and deployment:	**Multiple product releases from Rational**
Further reduce short term costs for new workloads:	**System z Solution Edition Series**
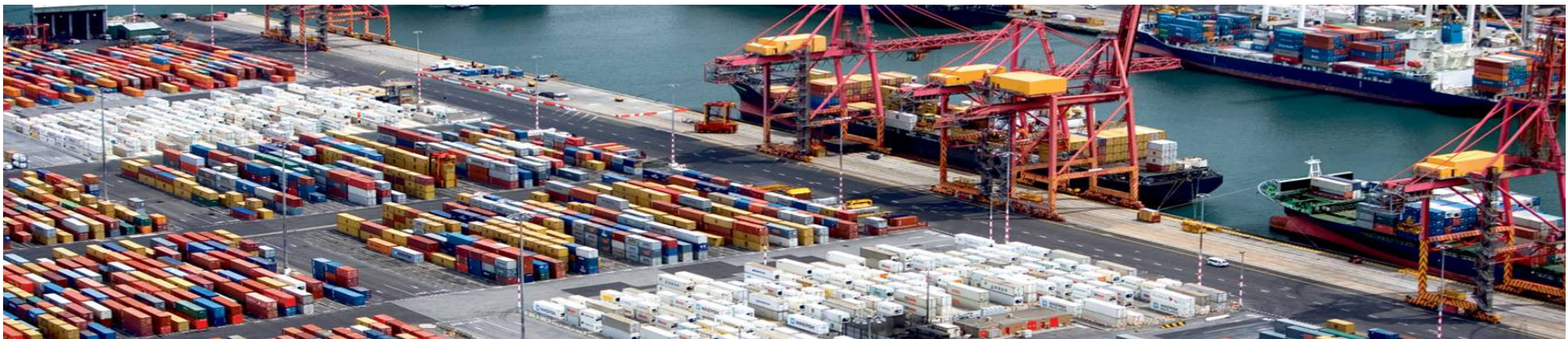
System z: Free Offers to help you to reduce costs

Cost and risk analysis: use of mainframe vs. alternatives
- Off-site preparation and on-site information gathering
- Analysis developed over two weeks, concluding with a findings summary

Application change and configuration improvement
- Two day on-site review of change and configuration environments
- Analysis over one week with summary of potential cost savings

True economics cost allocation assessment
- Analysis of IT infrastructure costs and current cost associations
- Recommended steps for improvement provided within 10 business days