IBM System z10 EC

Mainframe Value

Maximizing your Data Center ROI

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The Future Runs on System z

IBM Systems

A New Era for Business

24x7

Global

Highly networked

Common Data Center Challenges

Increasing complexity

Rising costs

Floor space, energy and cooling problems

IBM System z10 EC – 4 Steps to Maximizing your IT ROI

Lower the running costs of existing IT

Reduce the operating costs of existing workloads with the improved price performance and technology driven dividends of a new z10 EC mainframe.

Manage growth, complexity and risk

Scalable products and solutions you can trust to more easily and securely manage the complex world of IT.

Go green and save

Cut costs and "go green" with leadership energy-efficient hardware, consolidation and virtualization capabilities on System z10 EC

Realize innovation

Technology that makes innovation real in your business and sets you apart from the competition.

System z10 EC is great technology that is designed to help you lower your running costs

Great Technology

- Low point of entry and expanded granularity: 100
- More flexibility with more engines: 64 engines
- More powerful specialty engines for new and different workloads: 50% or more
- Upgradeable from previous generation IBM System z9™ and IBM zSeries® 990 (z990) servers
- Accredited with EAL5 security classification
- Highest Capacity / Kilowatt rating

Great Value

- Pay for the capacity you need, today and for future growth
- Designed for 'right sized' configurations
- Improved price / performance for Linux®, Java™ and eligible data serving workloads
- Improved investment protection for z9 and z990 customers
- The highest security rating for any publicly available server
- Lowering the cost of electrical power and cooling

The Pricing Advantages of the Latest Technology

- Generation to generation price / performance improvements for software and maintenance from z9 and z990
- Consolidate x86 software licenses at up to a 30 to 1 ratio
- Sub-capacity software pricing to better align IBM software costs with use: Lowest cost per unit of work
- Expanded Virtualization capabilities that enable Total IT Cost savings Gold Standard

System z10 EC delivers continued price / performance and investment flexibility for on demand computing

Generation to generation price / performance improvements:	z10 EC
Reduction in software charging units, MSUs ,[1] versus z9 EC ([1] Millions of Service Units)	10%
Reduction in software charging units, MSUs, versus z990	19%
Reduction in maintenance costs (*) (up to)	15%
Price performance improvement for Linux (IFLs), Java (zAAPs) and Integrated Information Processors (zIIPs) (*)	35%
Typical charge for MES upgrades for IFLs, zAAPs, and zIIPs	0
Technology-driven value	**z10 EC**
Improved Capacity: >50% bigger engines and 30,000 MIPS in a box	100 capacity settings
Specialty engines (IFLs, zAAPs and zIIPs) (**)	same price as z9
IBM Software charges for zAAP capacity and zIIP capacity	0
Unsurpassed Virtualization capability with z/VM® on z10 EC	Beyond x86 virtualization

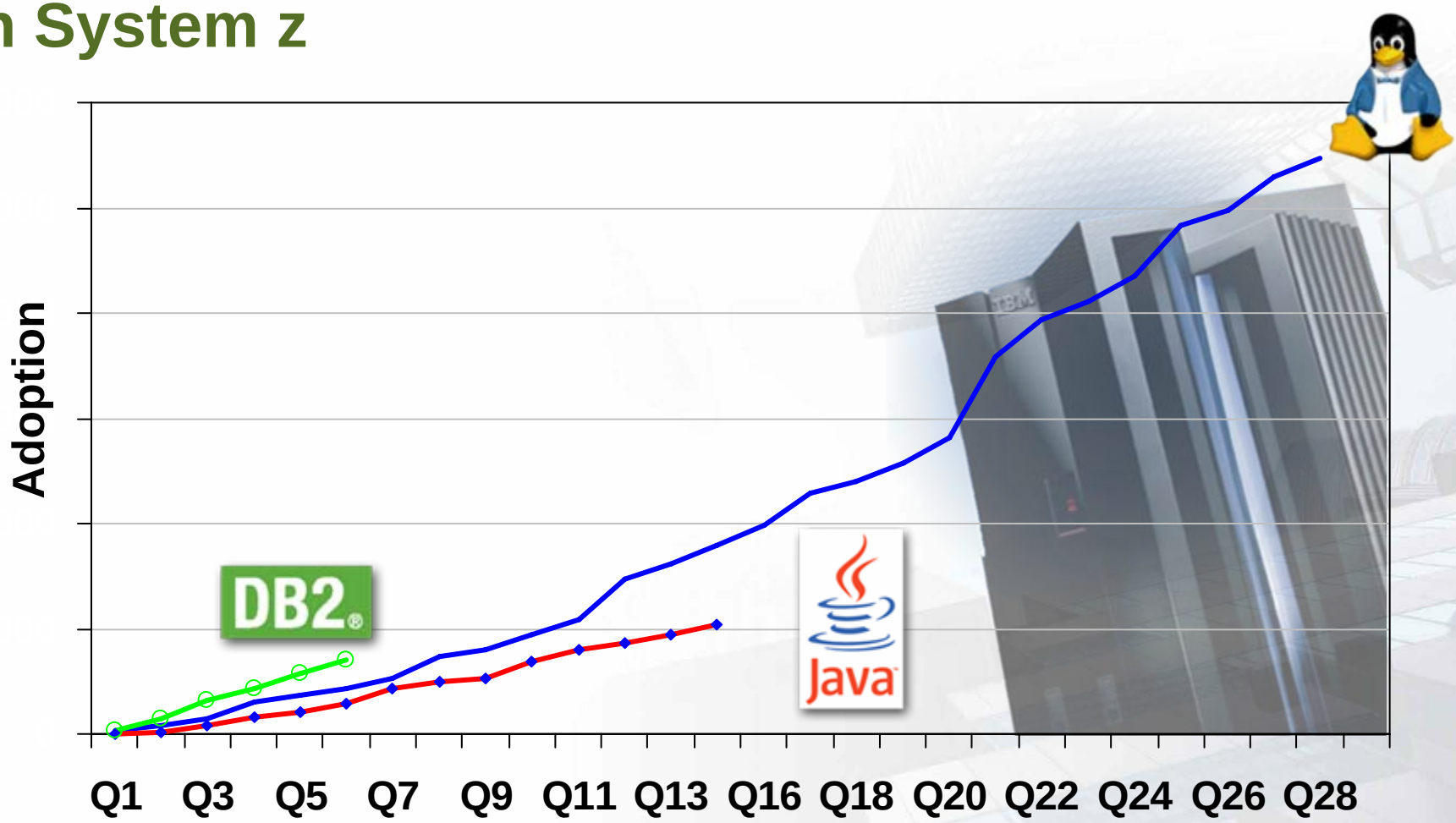
Plus

- **System z New Application License Charge (zNALC) pricing metrics for New Workloads***
- **On/Off Capacity on Demand (On/Off CoD) enhancements to better manage volatile business requirements**

(*) – comparisons shown are z10 EC vs. z9 and z10 EC vs. z990

(**) Prices may vary by country

Dynamic Growth in New Workloads on System z



Source: IBM internal data

Consolidation with Linux gets a “green light”

z10 may help customers become more energy efficient:

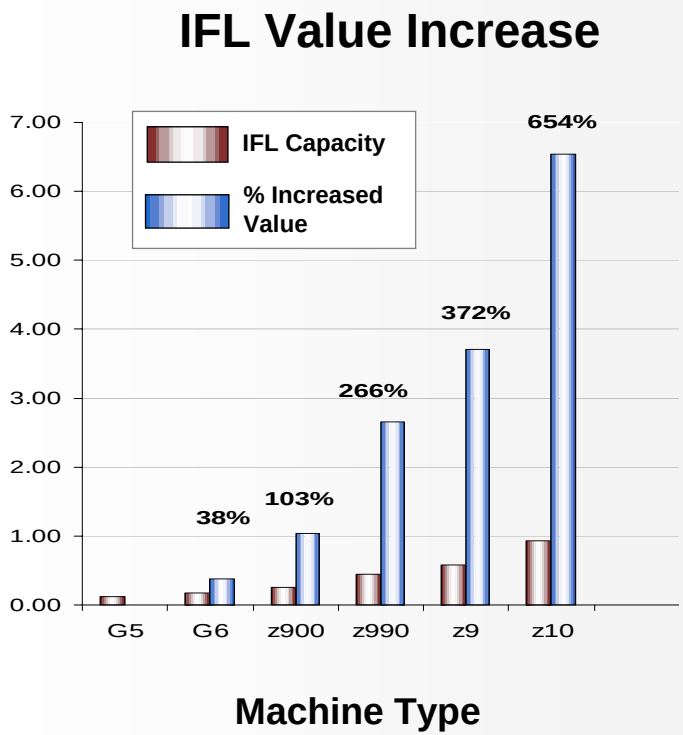
- Deploy energy efficient technologies – reduce energy consumption and save floor space

Economics of IFLs and z/VM® help to drive down the cost of IT

- IFLs attractively priced, have no impact on z/OS license fees, and z/VM and Linux software priced at real engine capacity
- ‘No charge’ MES upgrades available when upgrading to new technology

Harness the Unique Value of Specialty Engines

- Integrated Facility for Linux (IFL) specialty engine Prices have remained constant
- IFLs typically move with upgrades at no cost
- Over 50% more capacity from z9 EC and at same price as z9 EC
- System z Application Assist Processors (zAAPs) and Integrated Information Processors (zIIPs) follow the same model
- Distributed model over same time:
  - 3 Technology Refreshes (New Hardware)
  - 3 System migrations



Specialty Engines: IFL, zAAP and zIIP

The investments that keep paying dividends generation to generation

Business requirements for IT have driven complexity

- **Demand for IT capacity continues to grow**
  - **New IT Solutions**
  - **New workloads**
  - **New applications…and more instances**
- **IT growth has been powered by large scale deployment of x86 servers**
  - **Seen as powerful, low cost and high density of technology packaging**
- **Distributed server proliferation is at an all-time high and growing**

Worldwide Server Market – x86 Unit Shipments

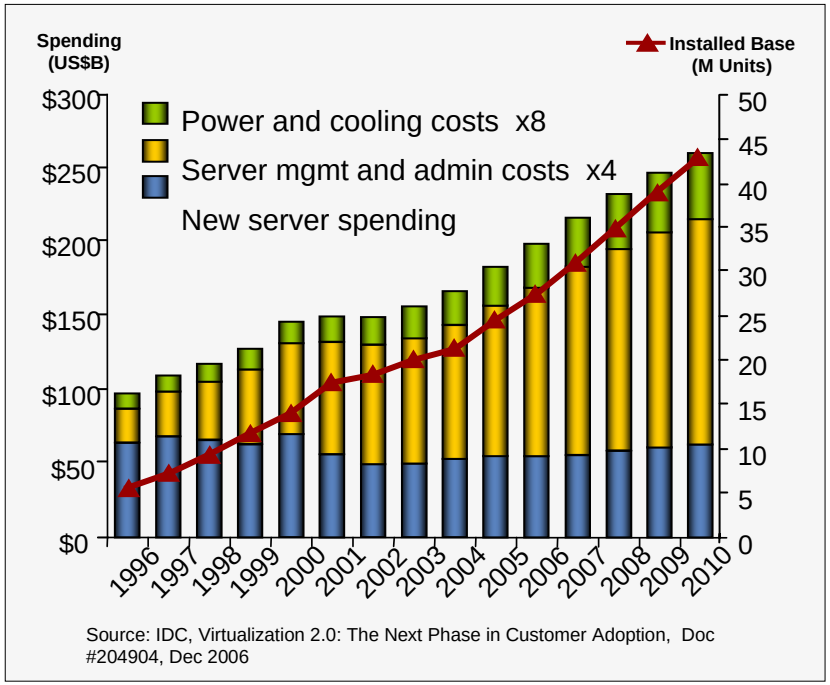
	2003	2004	2005	2006	CGR% '03-'06
Total x86 Servers	4,732,564	5,688,198	6,473,502	6,960,226	13.7%
% Total Server	89.7%	90.2%	91.8%	93.1%	

IDC Worldwide Quarterly Server Tracker, August 2007

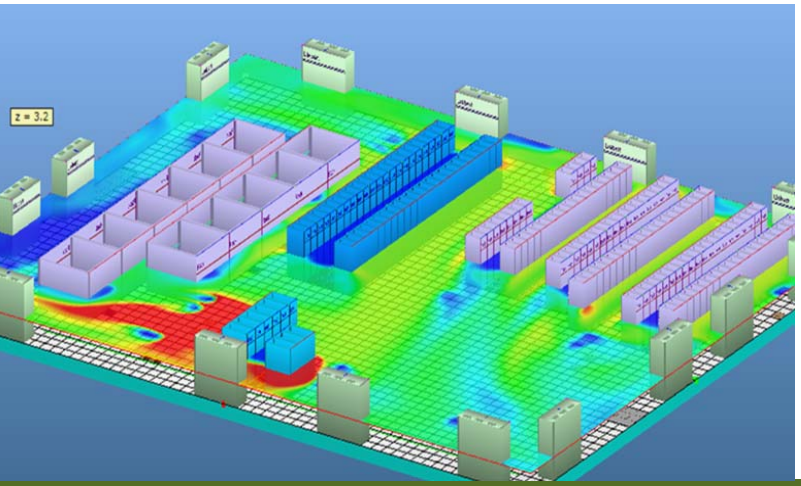
IT Complexity has driven many hidden costs

Customers' desire for a solution to complexity-driven business pain and cost has never been higher

- **IT Complexity is driving business pain and cost to our clients**
  - People Costs have doubled as a % of Total IT Cost
    - From 33% in 1996
    - To over 66% in 2007
  - Software costs continue to grow linearly
    - As distributed servers grow



Source: IDC, Virtualization 2.0: The Next Phase in Customer Adoption, Doc #204904, Dec 2006



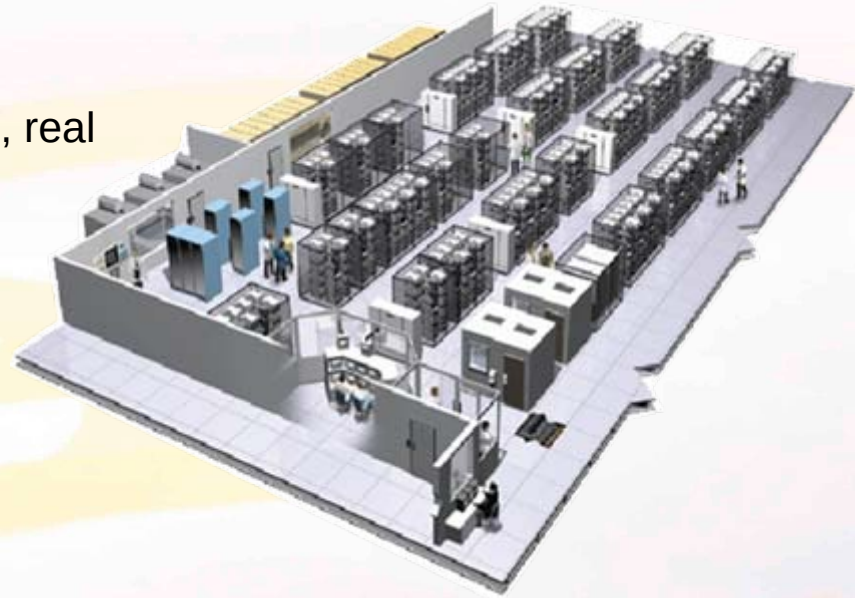
- Energy costs are rising
  - A high priority concern for customers
- Excessive heat and Insufficient electricity
  - Key problems for Data Centers
- Global climate and environmental concerns
- Increased technology density will continue to raise energy requirements

The growth of distributed servers in Data Centers

A source of complexity and cost, and a Savings Opportunity

Distributed-systems can proliferate IT costs:

- Cost and complexity (e.g., more physical servers, real network gear)
- Excessive energy usage and heating problems
- Inadequate power and cooling infrastructure
- Data silos and data synchronization
- Linear staffing costs
- Linear per processor software costs
- Frequent outages



IBM System z10 EC suggests an alternate approach

- Use fewer, more powerful z10 EC servers to unlock the savings in your Data Centers

LESS IS MORE – Focus on highly efficient use of FEWER servers

Leverage the strengths of the Ultimate Virtualization Platform

Use z10 EC to rein in Linear Costs driven by Server Growth and Complexity

- ***Virtualize*** **everything with up to 100% utilization rates**
- ***Consolidate*** **your workload on a single IBM System z™ mainframe**
- ***Secure*** **everything with industry leading security capabilities**
- ***Non-disruptively add*** **anything with proper planning**
- ***Optimize and integrate*** **it all with the IBM software portfolio**

MAXIMIZE ROI

REDUCE COST

AVOID COST

DELAY COST

REMOVE COST

Virtualize distributed servers with z/VM and dramatically reduce costs

z/VM Value point #1: the Power to Simplify

Scenario: Host 760 Linux Servers

...should I use z/VM Virtualization or x86 Virtualization?

z/VM Virtualization

Grow here (inside the box)

One IBM System z10 EC with 26 cores (IFLs) and z/VM
– with room to add 38 more cores –

X86 Virtualization

Grow here (add more boxes!)

x86 blade servers with 304 cores using an x86 virtualization product
Example: x86 SUN X2100 1U dual-core Opteron
8 racks of 19 dual-core servers per rack running many copies of x86 virtualization product

Simplify your architecture, and simplify management and control.

Worked example
Your experience will vary

z/VM Value point #2: Lower People & SW Cost

z/VM or x86 Virtualization?
IT Cost Implications of Scenario #1

z10 EC – 26 IFLs

People : 5
Annual Cost $500K

26 new Oracle SW + S&S = $1,269K

26 Annual Oracle S&S only = $229K

z/VM Net Savings
10 People

$1,000K Mgt cost

91% Less SW cost
$1,406K S&S Yr 1

$2,537K S&S Yr 2

8 Racks of x86 Blades (304 CPUs)

People : 15
Annual Cost : $1,500K

304 new Oracle SW + S&S = $14,835K

304 Annual Oracle S&S only = $2,675K

The potential to save labour and software costs is clear.

Worked example
Your experience will vary

z/VM Value point #3: Improved Competitive Speed

- A z10 EC mainframe with z/VM can create a new virtual image in 10 seconds to run a new application on hardware that you already own.
- Forward binary capability for new generations. Multiple image maintenance is much faster.

- x86 Virtualization products can virtualize quickly, to a point.
- Extending capabilities: When will you run out of images or need a new server? How quickly/easily can you deploy new logical and physical servers?
- Ordering and installing a new x86 server can take days or weeks. Lots of effort going to a new generation of server and operating system.

System z with z/VM speeds server provisioning and gives on demand flexibility

z/VM Value point # 4: Improved Security and Availability

z/VM, LPAR

- **Security built into OS and hardware**
- **EAL5 certification for z900, z990 and z9,**
  - **Certification in-process for z10 EC**
- **EAL4+ certification for z/OS 1.7 with RACF**
- **EAL4+ certification for Linux for System z**
- **Cryptographic support**

Security for virtualizing sensitive and mission critical workloads.
Reliability, Availability and Serviceability for world class Quality of Service.

z/VM Value point #5: lower Environmental Cost

z/VM or x86 Virtualization?
IT Cost Implications of Scenario #1

z10 EC – 26 IFLs

30 Square Feet

Hourly Energy Usage: 16.3 KWatts

Annual Energy Usage: 0.2 M KWatts*

Cost: $24.6 K/year

Worked example
Your experience will vary

z/VM Net Savings per year 900,000 KWatts

$108.4K

81% Less electricity

8 Racks of x86 Blades (304 CPUs)

43 Square Feet

Hourly Energy Usage: 87.8 KWatts*

Annual Energy Usage: 1.1M KWatts*

Cost: $133.0 K/year

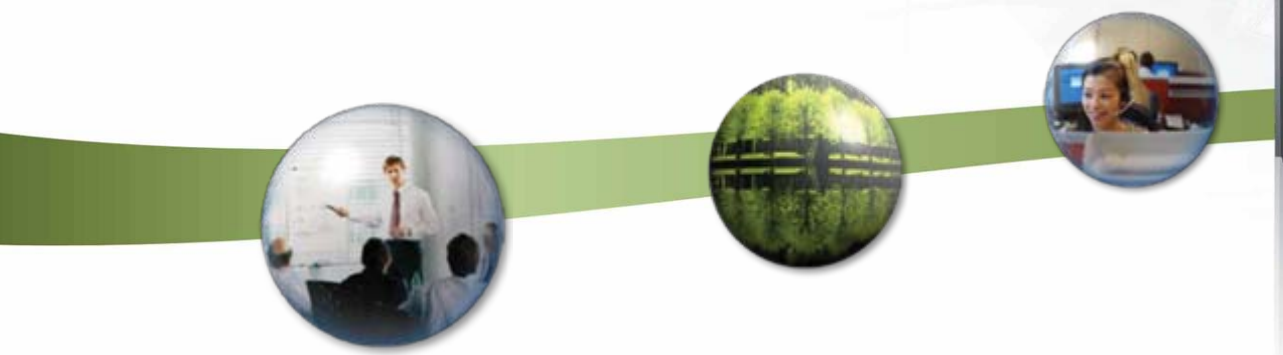
*** Source of power consumption data for the Sun SunFire X2100 (1U) Opteron 2.8 GHz 1 MB server: *Competitive Profiles***

Become Greener with z/VM Virtualization on z10 EC : 5X better than x86 Virtualization

Economics

Leverage the ability of Linux on System z on z10 EC to run many distributed workloads and to consolidate x86 core processors at up to a 30:1 ratio to deliver significant IT Cost savings

- **People Cost**
- **Software Cost**
- **Maintenance**
- **Energy Cost**
- **Facilities Cost**



IBM consolidates distributed servers for large savings

IBM Expected Results

- **Reduce operational complexity with significantly less hardware**
  - **3,900 distributed servers going to approximately 30 System z9**
  - **Significant increases in average utilization**
- **Reduce labor cost through virtualization**
- **Dramatic reduction in software expense**
- **85% reduction in IT Data Center square footage for consolidated servers**
  - **Enables growth**
  - **Better consumption of facilities**
- **80% reduction in energy utilization associated with consolidated servers**
- **Increase in new applications deployed to System z**

If using all new System z10 ECs, the number of machines could be cut nearly in half … for even greater savings in IT operational cost

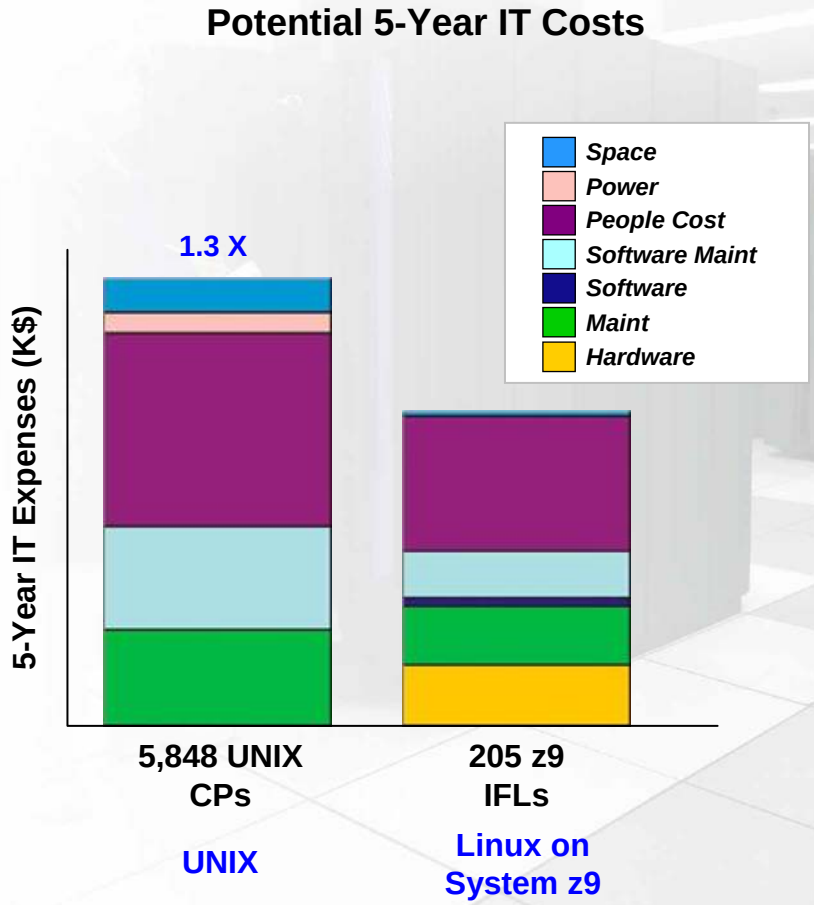
Potential IT Cost impact of mainframe consolidations

Your IT Cost may vary:

- **Potential for dramatic reductions in software expense for processor based licenses**
- **Reductions in power and cooling**
  - **95% Savings in KWatts and Energy Costs in this scenario**
- **Facilities Cost Avoidance**
  - **Building a new data center**
- **People savings**
- **Increased processor utilization**

Imagine the additional savings with z10 EC.

Telecom Company IT Costs
Varied UNIX Workloads
5-Year Total IT Cost



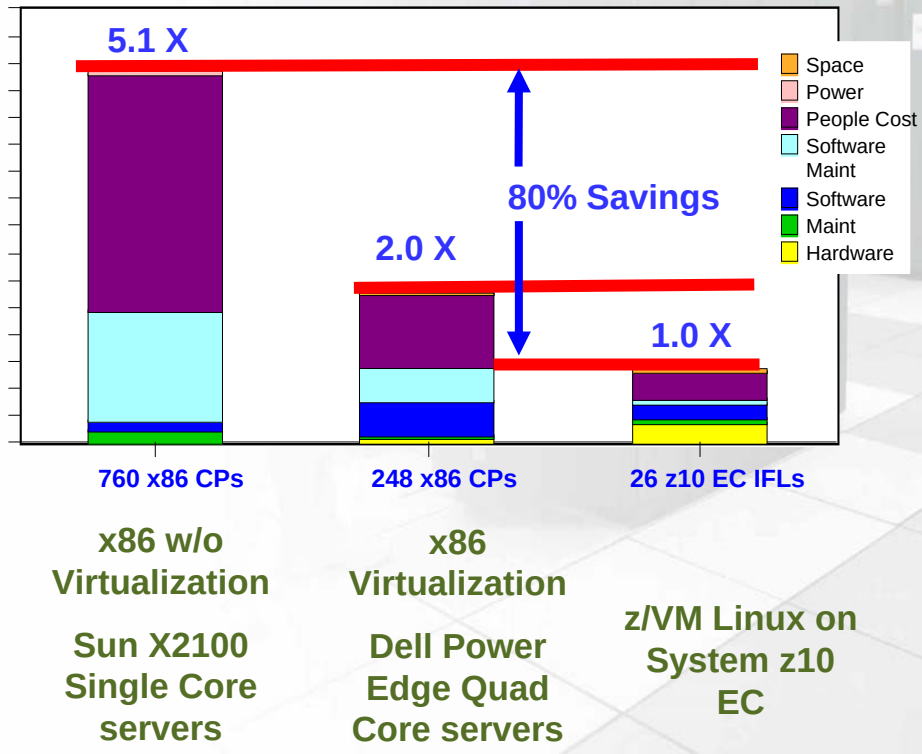
* All performance information was determined in a controlled environment. Actual results may vary.

IT Cost Savings powered by z/VM Virtualization on z10 EC

Your IT Cost may vary:

- **Up to 80% Saving in IT Cost**
- **Potential for dramatic reductions in software expense for processor based licenses**
  - **760 x86 Processor Cores vs 26 IFLs**
- **Potential reductions in power and cooling**
  - **Up to 90% Savings in KWatts and Energy Costs in this scenario**
- **Up to 45% Less Space**
- **Up to 80% People savings**
- **Increased processor utilization**
- **Industry leading Security**

Consolidating 760 Linux servers
z/VM Virtualization versus x86
Oracle DB Workload
3-Year Total IT Cost



Energize your IT savings with z10 EC.

*** All performance information was determined in a controlled environment. Actual results may vary.**

Nationwide

Key Benefits (Value Proposition)

- Expects to save $16M over 3 years
- Initial phase consolidated 250+ Production, Development & Test servers to 6 IFLs
- Savings will be in cooling, maintenance, software and equipment costs
- Lower middleware and application software costs
- 50% reduction in monthly charges for Web infrastructure
- Dramatically improved server provisioning speed

"Nationwide's Linux on System z project is currently estimated to save $16 million dollars over three years, not including floor space. We also were able to provide a reduction in server cost of more than 50 percent to our customers. The Linux on System z system saved significant data center floor space and power consumption."

Steve Womer, Senior IT Architect

Nationwide® On Your Side℠

IFLs reduced the space and power consumption by 80% vs. the alternative distributed server solution.

Maximize your Data Center Return on Investment with z10 EC

LESS IS MORE –

Focus on highly efficient use of FEWER servers

- Run 100s of workloads, and 1000s of images on a single server
- Deploy advanced management and automation capabilities
- Deploy highly secure and resilient technologies
- Benefit from the z9 to z10 EC price performance and processor performance improvements
- Profit from the unique value of specialty engines
- Use z10 EC hardware and software to harvest the Green $ Savings of your Data Centers

Leverage System z10 EC technology to reduce Total IT Costs and to maximize your Data Center Productivity and Savings