System z – A Smart System For A Smarter Planet

What's Wrong With Offloading?

A Common Situation

I just attended a conference where they talked about saving money by moving workload off the mainframe

Let me do an analysis, and I'll get back to you with a recommendation

Service Oriented Finance CEO

Service Oriented Finance CIO

Perceptions And Misperceptions

- Workloads cost more on a mainframe

- Offloading mainframe workloads can save money

- Offloading migrations are easy and risk free

- Qualities of service of the resulting solution are just as good

NOT!

Reality

- Heavy processing workloads and heavy I/O workloads are fit for purpose on the mainframe
  - Offloading these workloads will not save money
  - They are already on the lowest cost platform
- Costs of moving to a distributed deployment show up in several ways
  - Explosion of processor cores required
  - Cost for software priced per core goes up
  - I/O bandwidth can be a problem
  - Migration costs are significant
  - Acquisition and periodic refresh of distributed hardware boosts costs over time

Let me demonstrate it with an Eagle TCO Study!
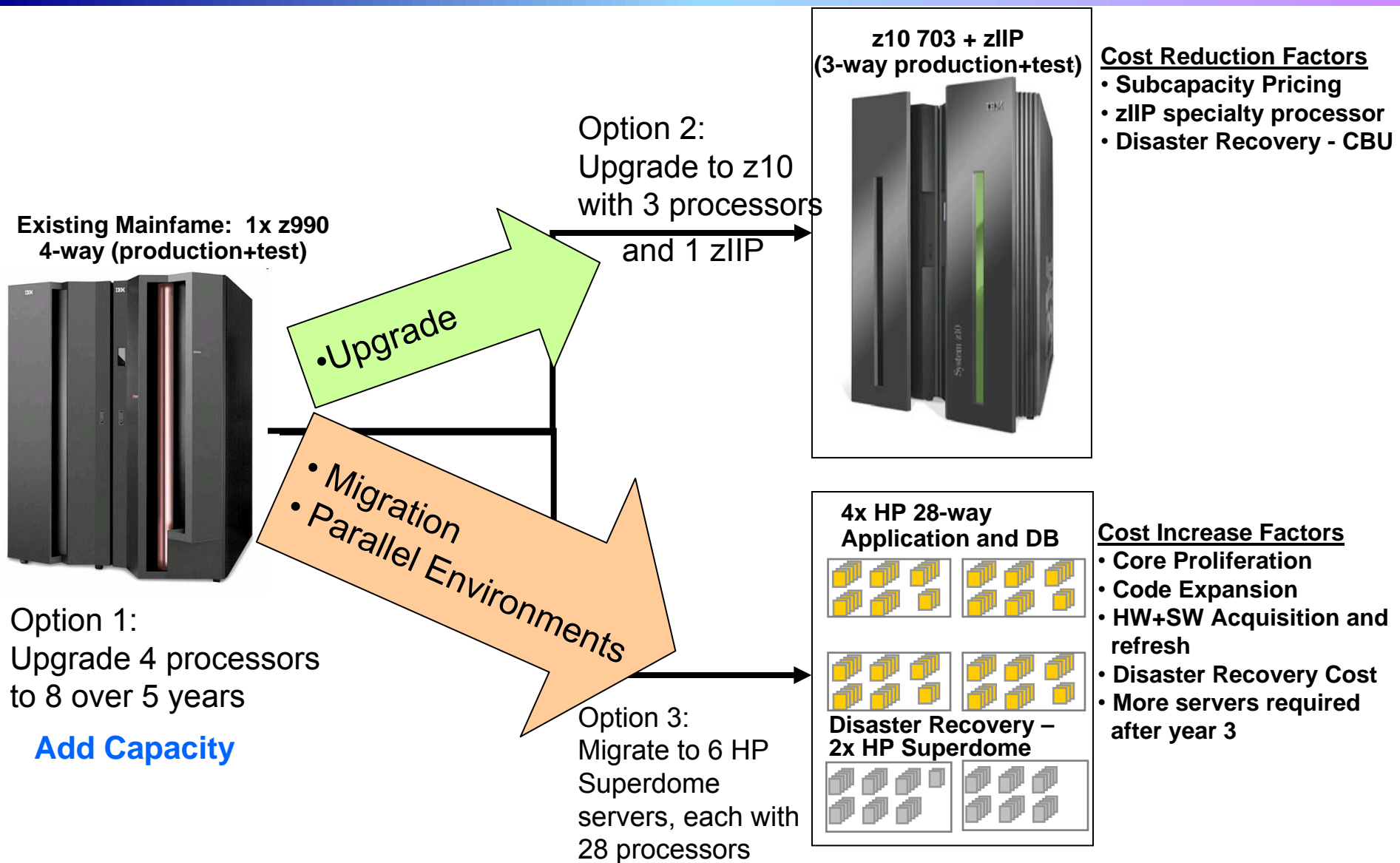
Please do!

IBM
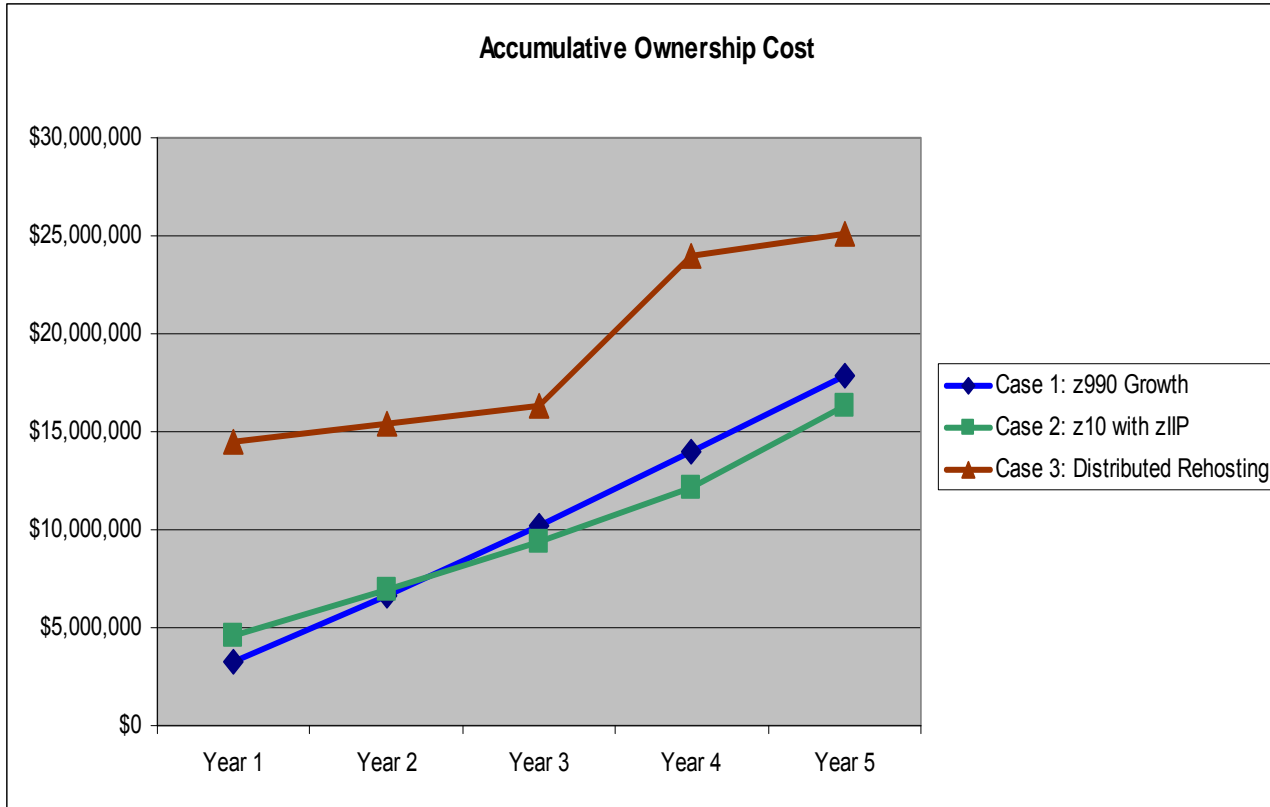
Service Oriented Finance CIO

Service Oriented Finance Eagle TCO Study

- Current solution
  - ▶ Workload is combination of transaction processing and batch
  - ▶ Workload growth 14% per year
  - ▶ z990 with 4 general purpose processors
    - − CICS, DB2 z/OS
  - ▶ Production, test and disaster recovery
- Three options considered
  - ▶ Grow current z990 system to 8 processors in 5 years
  - ▶ Upgrade z990 to z10 with zIIP processors
  - ▶ Migrate to distributed platform
    - − HP Superdome
    - − TmaxSoft open frame
    - − Oracle RAC
    - − HP-UX

Three Options For Eagle TCO Study

**Existing Mainfame: 1x z990
4-way (production+test)**

Option 1:
Upgrade 4 processors
to 8 over 5 years

Add Capacity

•**Upgrade**

•**Migration**
•**Parallel Environments**

Option 2:
Upgrade to z10
with 3 processors
and 1 zIIP

**z10 703 + zIIP
(3-way production+test)**

Cost Reduction Factors
• **Subcapacity Pricing**
• **zIIP specialty processor**
• **Disaster Recovery - CBU**

Option 3:
Migrate to 6 HP
Superdome
servers, each with
28 processors

**4x HP 28-way
Application and DB**

**Disaster Recovery –
2x HP Superdome**

Cost Increase Factors
• **Core Proliferation**
• **Code Expansion**
• **HW+SW Acquisition and refresh**
• **Disaster Recovery Cost**
• **More servers required after year 3**

Result: Compare 5 Year TCA Costs

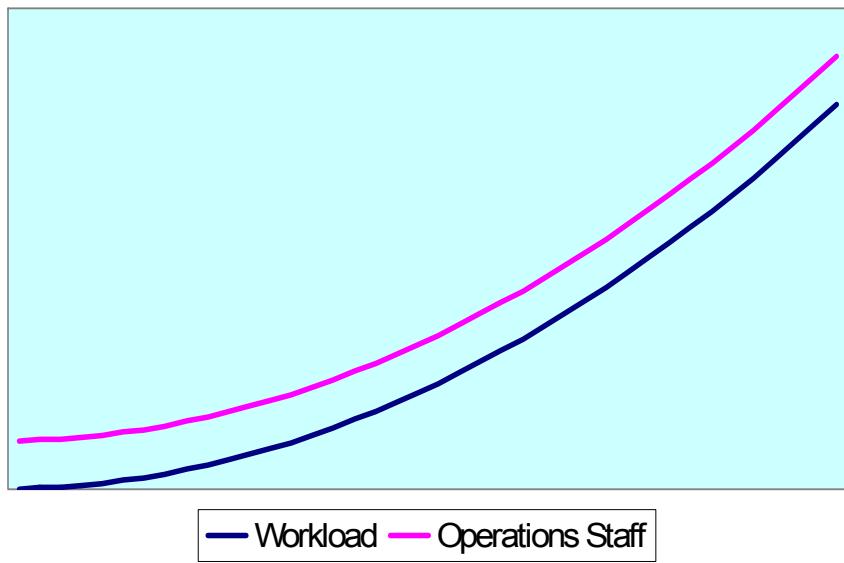**Accumulative Ownership Cost**

Lower cost reconfirms
fit for purpose

Other Things To Consider

- Labor Cost
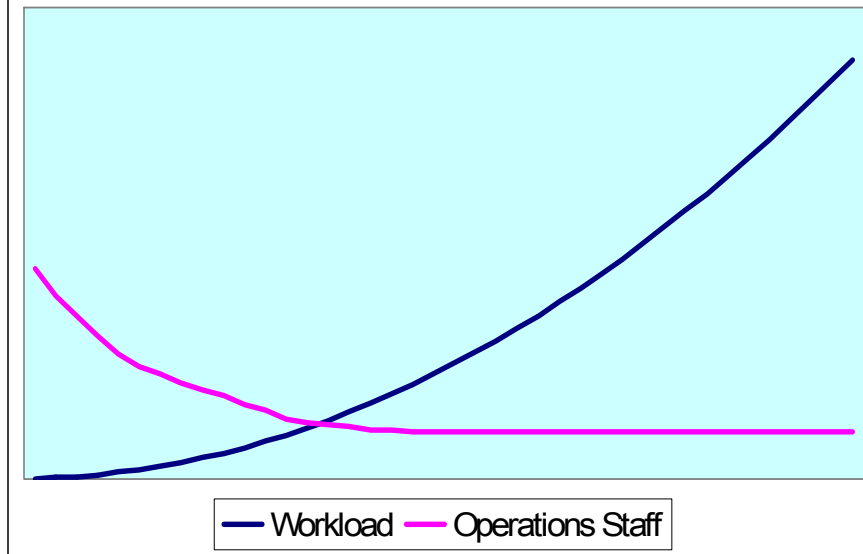
- Quality Of Service

- Unexpected Pricing Consequences

Labor Cost Trends

Distributed Labor Trends

— Workload — Operations Staff

Mainframe Labor Trends

— Workload — Operations Staff

- Labor costs go up in proportion to the number of servers

  ▶ Labor cost per unit of work is constant

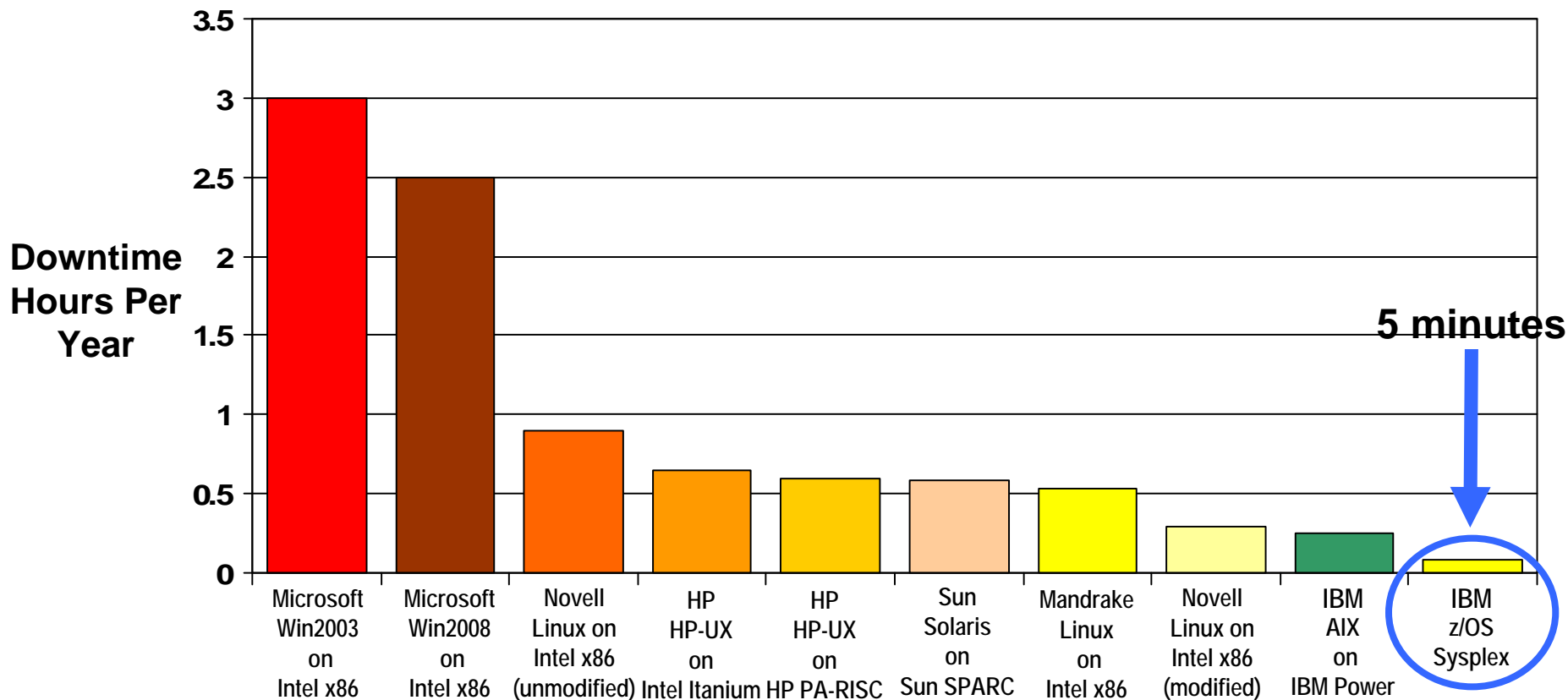 ▶ 31 servers/FTE (Intel)

  ▶ 15 servers/FTE (Unix/Linux)

- Labor costs stay flat while workloads go up

- Consolidation and structured practices increase in labor productivity

  ▶ Typical best practice (circa 2010) 500 – 1000 MIPS per FTE

Example: A Large Financial Services Company

- Labor cost should be closely analyzed
  - ▶ Scenario
    - Large US Financial Corp
    - Highly invested in process methodology
    - Consolidated 1000 applications on 6000 cores to 90 IFLs
  - ▶ Processes studied
    - Access management
    - Server provisioning
    - Application on-boarding
    - Software installation and maintenance
    - Asset management
    - Capacity management
    - Change management
    - Server decommissioning
    - Chargeback
  - ▶ Result
    - Process iteration count reduction
    - Process work time reduction
    - *Estimated labor savings ALONE was $1.6M PER MONTH*

Qualities Of Service – Availability

(400 participants in 20 countries)

5 minutes

Downtime Hours Per Year (vertical axis, scale 0 to 3.5)

Category	Downtime Hours Per Year
Microsoft Win2003 on Intel x86	3.0
Microsoft Win2008 on Intel x86	2.5
Novell Linux on Intel x86 (unmodified)	0.9
HP HP-UX on Intel Itanium	0.65
HP HP-UX on HP PA-RISC	0.6
Sun Solaris on Sun SPARC	0.58
Mandrake Linux on Intel x86	0.52
Novell Linux on Intel x86 (modified)	0.3
IBM AIX on IBM Power	0.25
IBM z/OS Sysplex	0.08

Source: ITIC: ITIC 2009 Global Server Hardware & Server OS Reliability Survey; July 2009; http://itic-corp.com/blog/2009/07/itic-2009-global-server-hardware-server-os-reliability-survey-results/; Results are measured in minutes per year.
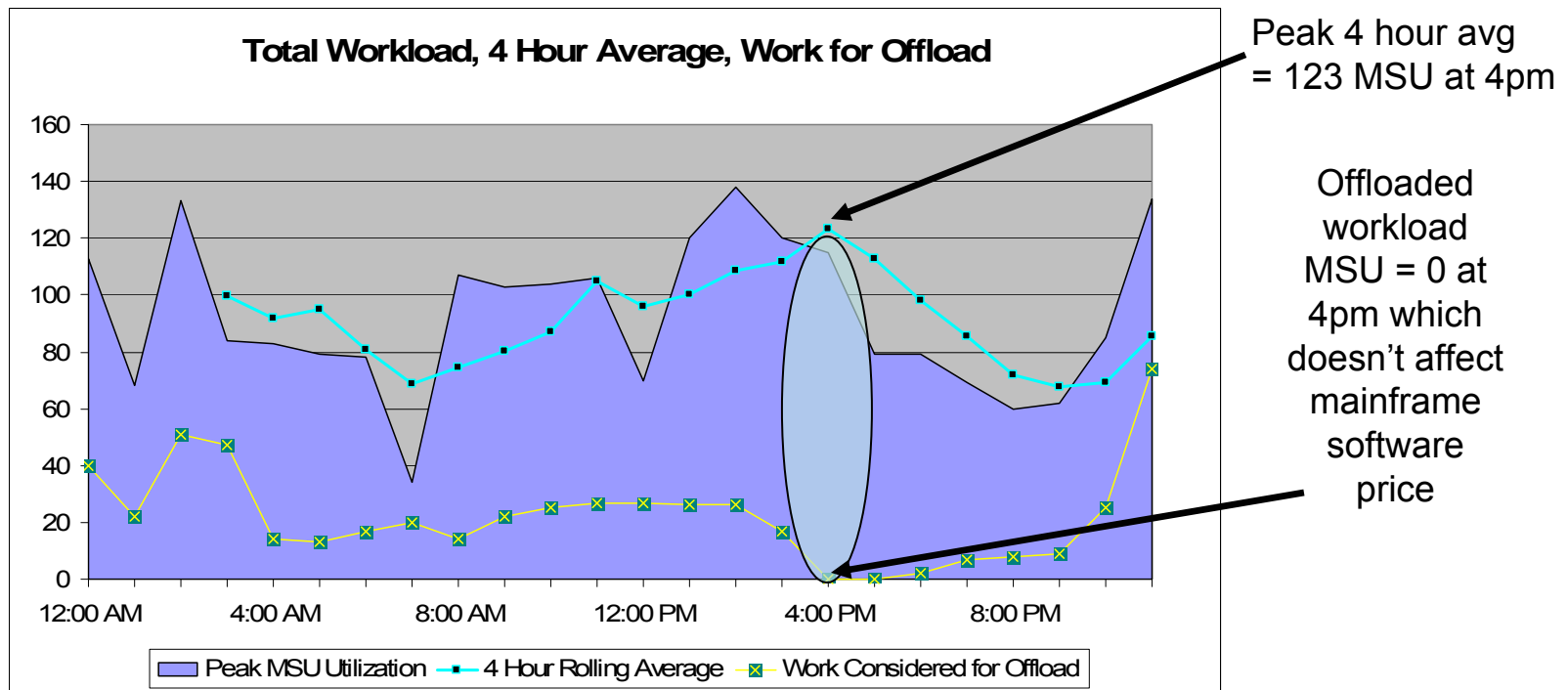*Note: All operating systems included in the survey are not included in this chart. Fifteen operating systems on various processor architectures were included in the survey. The chart will be updated when the full report is available.

Example: Large Brazilian Telco

- 30% annual growth forcing disruptions

- Application is pre-paid SIM
  - ▶ System down = Customers using cell network without paying
  - ▶ Downtime cost: in the millions – <u>monthly</u>!

- Mainframe adds capacity non disruptively
  - ▶ CPU Memory and I/O can be added on fly
  - ▶ Database and application changes tested in LPAR and quickly promoted to production

- ***Downtime elimination savings hundreds of millions R$***

Large German Financial Institution

- Offloaded about 1000 MIPS workload from mainframe that was not "peak" workload
  - Mainframe software charges did not change
    - Sub-capacity pricing charges are calculated on peak of 4 hour rolling average
    - Offloaded workload did not contribute to the peak
  - Hardware and software licenses for distributed servers cost an additional 1M Euro
  - Offloaded workload was running "for free"

Total Workload, 4 Hour Average, Work for Offload

Peak 4 hour avg = 123 MSU at 4pm

Offloaded workload MSU = 0 at 4pm which doesn't affect mainframe software price

Legend: Peak MSU Utilization | 4 Hour Rolling Average | Work Considered for Offload

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TCO Checklist

For New Workload

- ☑ Have you considered only the incremental cost if using an existing mainframe?
- ☑ Have you used LPARs and sub-capacity pricing to limit incremental cost?
- ☑ Have you used zIIPs and zAAPs and Solution Editions for new workload?
- ☑ Are you co-locating your database and transaction monitor?
- ☑ Have you upgraded to the latest hardware to get improved price/performance of specialty engines?
- ☑ Have you extended your existing applications to get decreased costs/transaction?
- ☑ Do you have an ELA or OIO contract with IBM?
- ☑ Is your IBM seller aware of the latest pricing plays?
- ☑ Are you aware of the various Capacity on Demand capabilities and are you using them?
- ☑ Does the new workload require disaster recovery

For Consolidation Scenarios

- ☑ Have you used IFLs to run Linux software
- ☑ Do you understand the savings in software licensing?
- ☑ Have you examined the savings in
  - network complexity, power and cooling, labor productivity?
- ☑ Have you considered how to avoid server hardware refresh?
- ☑ Are you using sub-capacity pricing where appropriate?
- ☑ Have you considered costs benefits of disaster recovery on System z?
- ☑ Have you considered potential savings in system management on System z?
- ☑ Have you consolidated as much workload as possible on your System z?

- ☑ **Have you engaged with the IBM Eagle TCO Studies team?**

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धन्यवाद

Hindi

多謝

Traditional Chinese

ขอบคุณ

Thai

Спасибо

Russian

Gracias

Spanish

شكراً

Arabic

Thank You

Obrigado

Portuguese

Grazie

Italian

Danke

German

Merci

French

நன்றி

Tamil

多谢

Simplified Chinese

감사합니다

Korean

ありがとうございました

Japanese