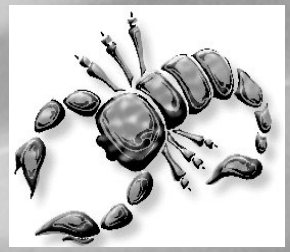
IBM STG Lab Services Consulting 2008

9265 TCO: Comparing System z and Distributed Environments; Building the Business Case



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SHARE

San Jose, CA

August 2008

IBM Systems and Technology Group (STG) Lab Services

Lab Services Mission and Profile

- Accelerate the adoption of new products and offerings.
- Deliver technical training tailored to customer needs
- Team with GTS and IBM Business Partners to optimize deployment of service offerings
- Develop processes to link Clients and Development

Our competitive advantage

- Leverage relationships with the Labs to build deep technical skills and exploit the expertise of our developers
- Provide timely skills transfer to our services teams and business partners
- Tightly integrated Lab Services and Technical Training

Helping our clients win the race!

Enterprise Systems

Business Systems

Mainframe

Power Systems

Modular Based Systems

(System x/Blade/Clustered Solutions)

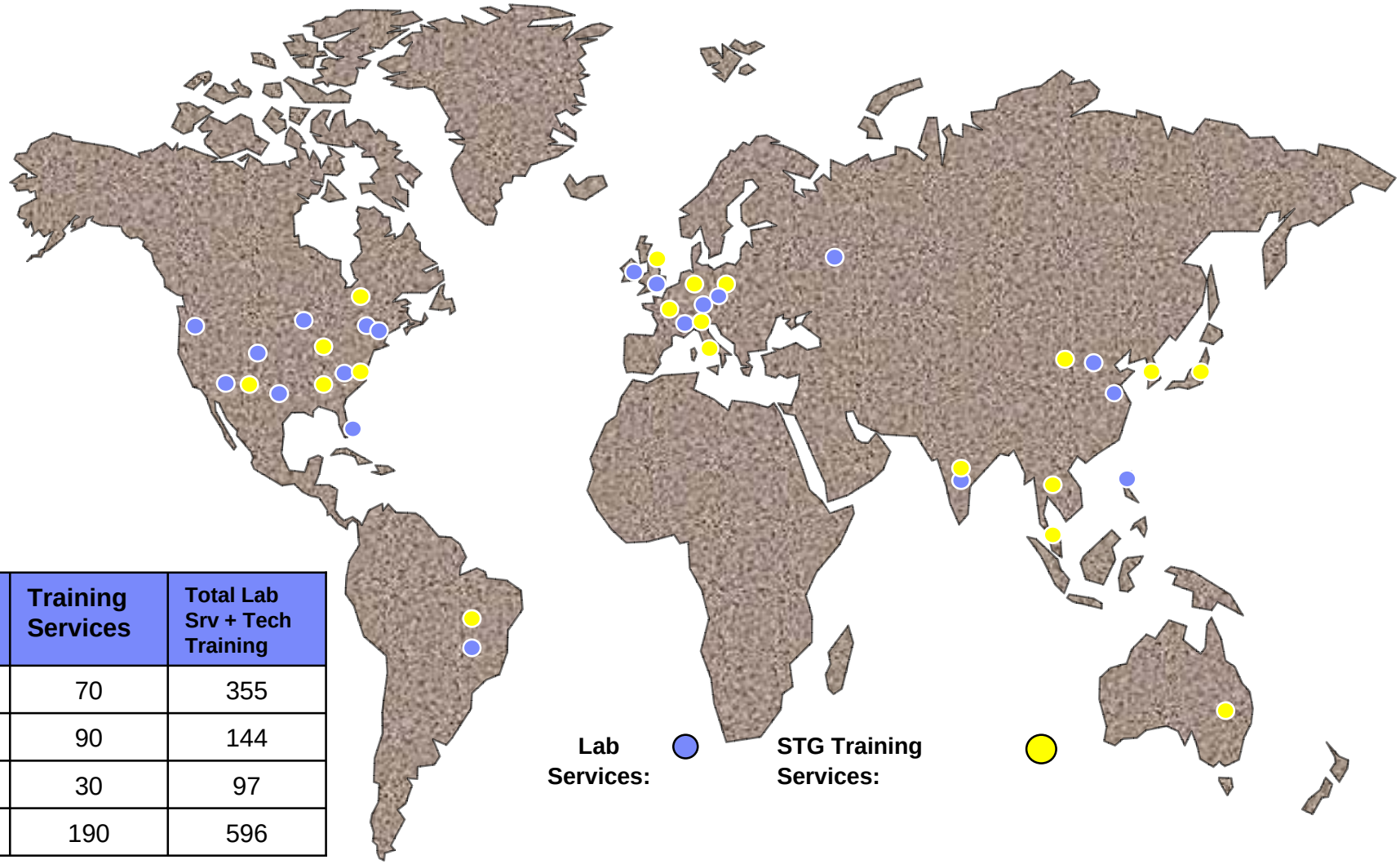
System Storage

IT Consolidation / Virtualization

Data Center Services / Systems Management

Training Services

WW STG Lab Services & Training Delivery Teams



Geo	Lab Services	Training Services	Total Lab Srv + Tech Training
AG	285	70	355
Europe	54	90	144
AP	67	30	97
Total	406	190	596

596 person team across 17 IMTs delivering a full portfolio of services and Technical Training

Recent Videos and article

Videos

Scorpion series part 1: Mainframe Cost Misconceptions
Scorpion series part 2: Server Proliferation and Utilization
Scorpion series part 3: Facility and Infrastructure Considerations
Scorpion series part 4: Saving Money with zIIPS, zAAPs and IFLs
Scorpion series part 5: Building a Business Case
Scorpion series part 6: The Best Fit for System z

http://www-306.ibm.com/software/info/television/index.jsp?lang=en_us&cat=systemz&item=xml/A361366R16875X50.xml

The new TCO and the value of the mainframe

Published on: 11 Jan 2007

The Mainstream -- January 2007 -- Issue 22

http://www-306.ibm.com/software/swnews/swnews.nsf/n/cres6x3lc8

Have you heard these statements?

" My mainframe cost 2x, 5x, 10x compared to my distributed environment“ Mainframe

“Mainframe software costs are expensive and are driving me off the platform” Mainframe

"We are on a get off the mainframe strategy“ Mainframe

"We keep adding servers and people“ Distributed

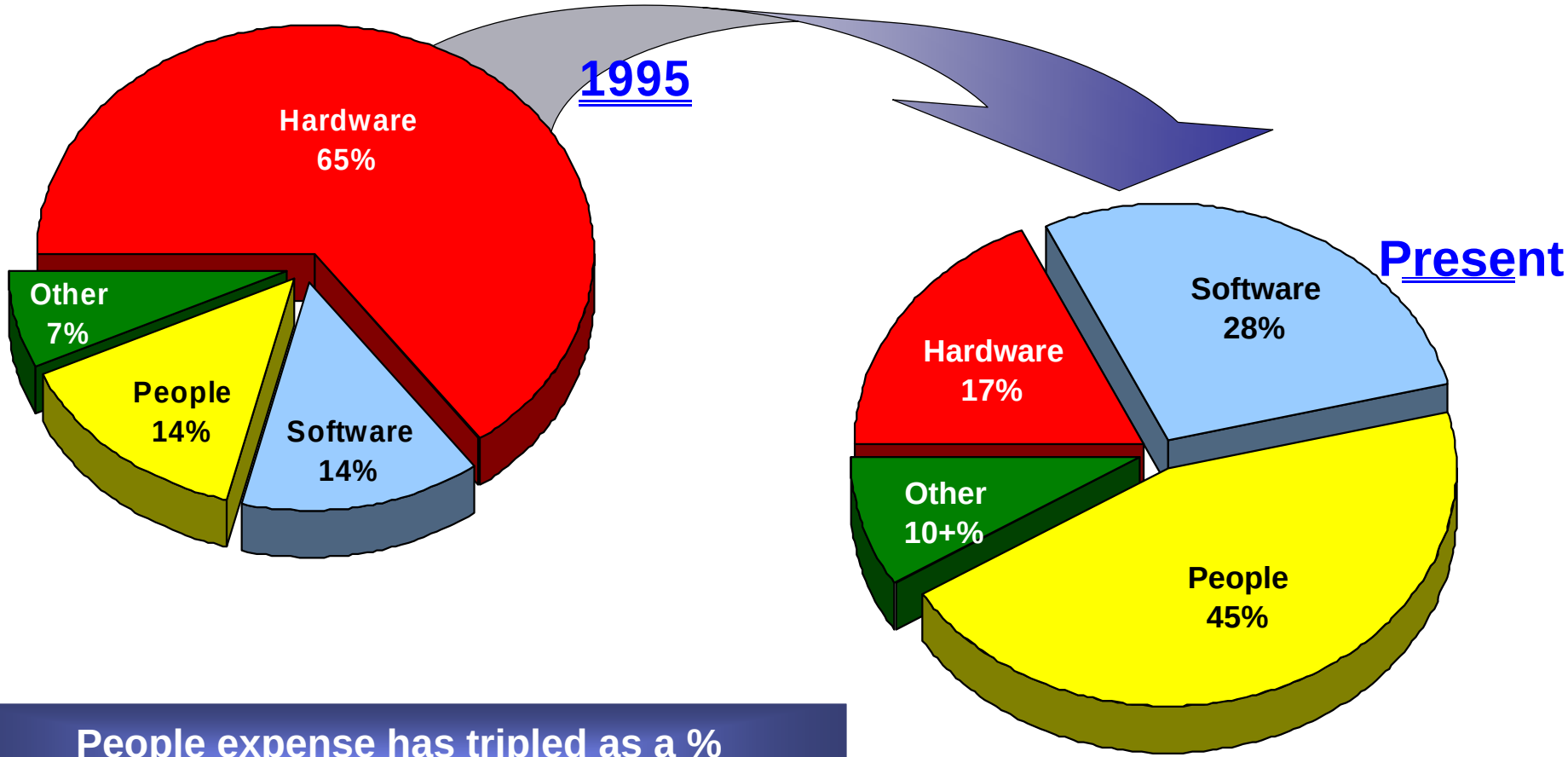
“Our infrastructure can not support our servers” Distributed

Pain Point: *Despite the emergence of virtualization tooling on Unix and Windows architectures, most enterprises continue to buy more processing power than is needed and end up getting .. more to manage, more costs, more complexity*

Full Burden Cost vs. Incremental Cost

- Full burden cost is typically reflected in a chargeback system
  - Mainframe chargeback pools are typically 50% overstated
- Incremental cost is the “real” cost a customer will pay for additional capacity
- Cost Comparisons –Full Burden vs. Incremental
  - Incremental cost is 20 – 25% of the full burden cost
  - Hardware cost is typically 3x greater
    - 3 – 5 yr depreciation and blexed leases
  - Software cost is typically 4 – 5x greater
    - Capacity discounts (PSLC), New Workload pricing
    - ISV contracts have a significant impact
  - People costs
    - How many additional people are really needed
  - Facility costs
  - Allocations
    -
- Chargeback methodology should not be used for comparing the cost of adding or removing a workload

Throughout the past 10+ years the cost dynamics of supporting corporate IT infrastructures has changed significantly as has the landscape.

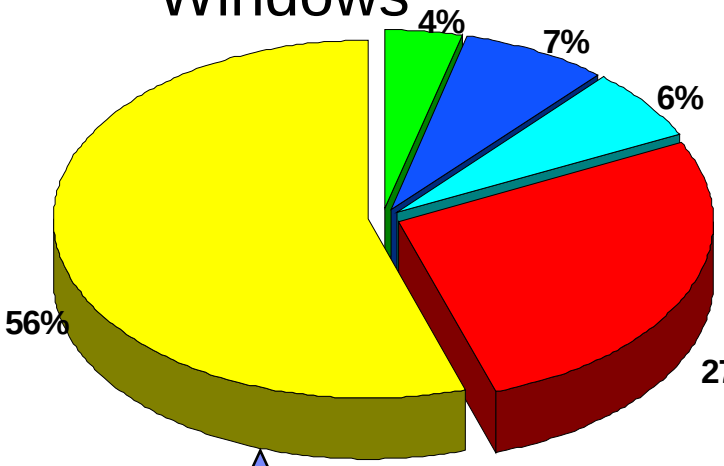


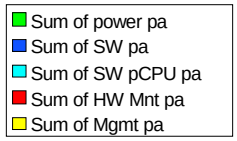
People expense has tripled as a %
Software expense has doubled as a %
Hardware is less than 1/3 of its original %

Server Annual Cost Distribution

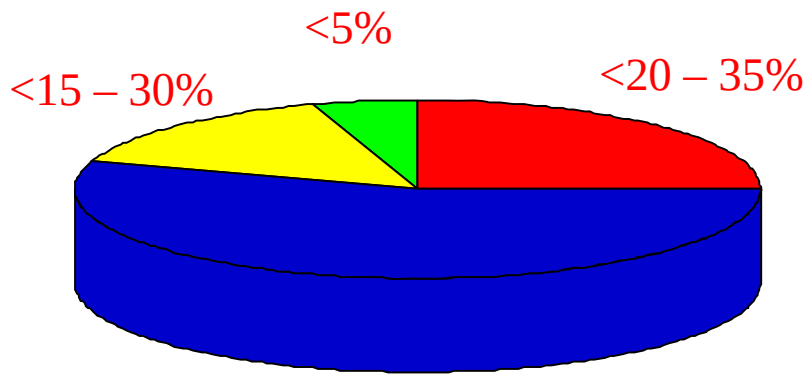
These are typical customer examples

Windows



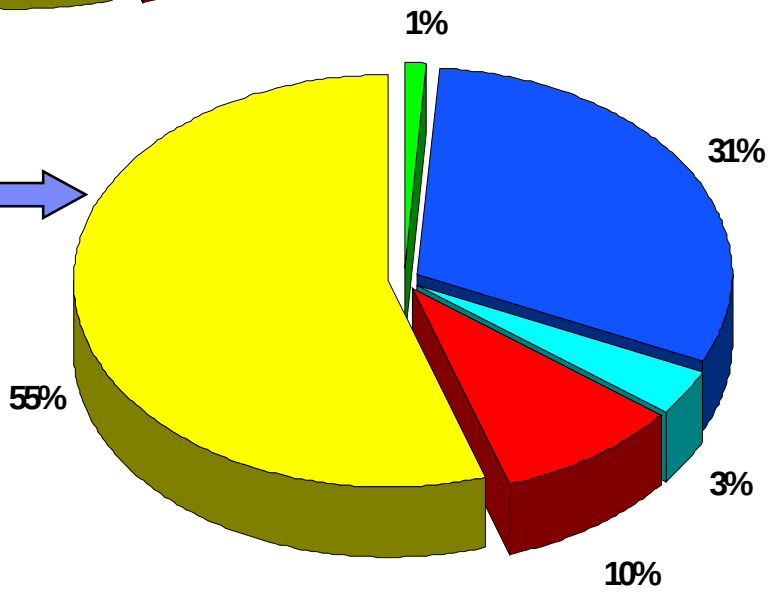


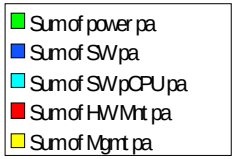
Mainframe



The key is people

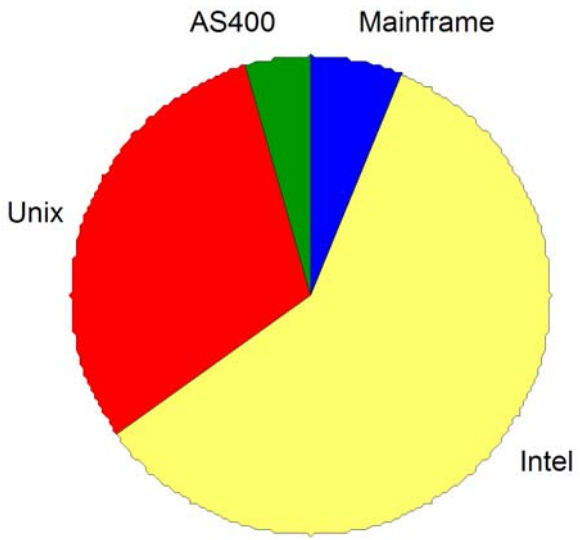
Unix



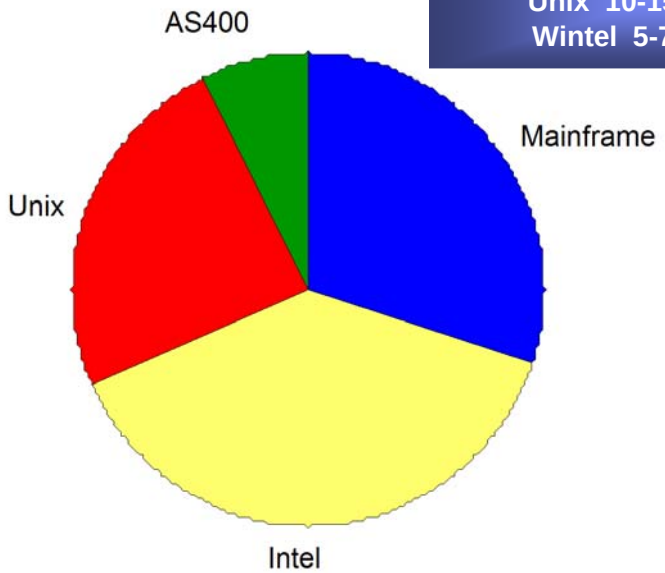


Installed vs. Used capacity

Installed Capacity: 33M tpms*



Used Capacity: 4M tpms*



Typical Utilization
Mainframe 80 – 95%
Unix 10-15% now 15-30%
Wintel 5-7% now 5-12%

* system capacity (tpms) is an approximation of the transaction processing capability of each system. It cannot be compared to other commercial ratings or benchmarks and is invalid outside of the context of this IBM study.

Server utilization varies significantly by platform and that needs to be accounted for in the business case. The mainframe environment is used most efficiently, but is it the most or least expensive .

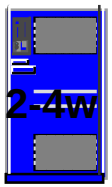
Datacenter Reality

- Mainframe
  - Well managed
  - Rock solid QoS
  - Expensive (perception)
  - Lowest TCO (reality)
- UNIX and Intel
  - Proliferation of servers
  - Lower systems utilization
  - Staffing growth
  - Inexpensive HW (perception)

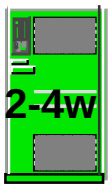
Server Proliferation

- Describe a current application environment
  - Production
    - Database server? How many?
    - Application server? How many?
    - Messaging server? How many?
    - Failover servers? For each?
  - Additional Servers
    - Development servers? Multiple levels?
    - Test servers? Multiple levels?
    - Systems test? Multiple levels?
    - Quality Assurance servers?
    - Education servers?
  - Disaster Recovery
    - Do you have a DR site?
- How many applications/types of workload do you have?

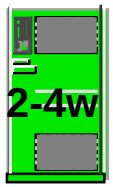
e-business Servers - Complexity and Cost



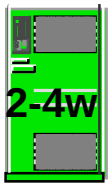
Web/App



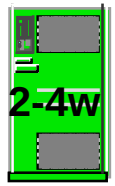
App F/O



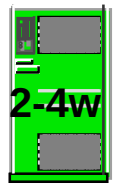
Development



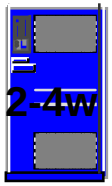
Test



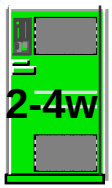
Web/AppD/R & QA



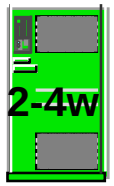
D/R F/O



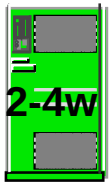
Messaging



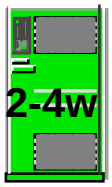
Messaging F/O



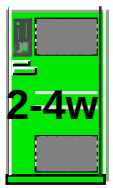
Test/Education



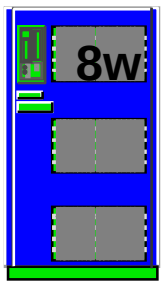
Integration



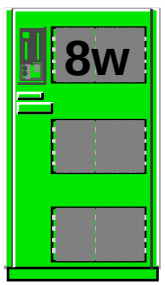
Messaging D/R & QA



D/R F/O



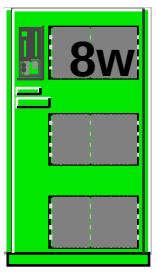
Database



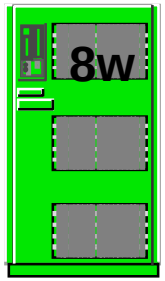
Database F/O

Hardware
- 3 primary production servers
- 16 total servers
  5:1 ratio

Software
- 32+ processors for database software
  ~ $1.8M for 3yrs
- 15+ processors for application software



Database D/R & QA



D/R F/O

Why is utilization low?

- Use of response time as a measure of capacity
  - Buy rather than tune
- Backup, development, test, training and integration servers
- Peaked, spiky workloads on dedicated rather than shared hardware
- I/O Bound workloads, contention
- Utilization controlled to avoid system stress and outages
- Incompatible release levels
- Incompatible maintenance windows

Summary of Server Scorecard Metrics

Example

	Mainframe	UNIX	Intel
People Efficiency	**Very Good**	**Average to Low**	**Very Good** **tend to be cloned infrastructure applications**
Prime Shift Utilization	**Very high (65-85%)**	**Fair/Good (10-20%)**	**Very low (1- 8%)**
Online Availability	**Excellent (99.9-99.95%)** **** DB2® avail. = 99.98%***	**Fair/Good (98.5-99.7%)** **** Oracle avail. = 99.35***	**Not known (97.0-99.0%)**
Total Spend / Year	**.. M$ / year**	**.. M$ / year**	**.. M$ / year**
Usual Incremental Cost Ratio to Mainframe	**1.0**	**0.9 – 1.5 x** ***** IBM System p 0.75 - 1.25x***	**<1.0 - 4.0 x**
Typical Incremental to Current Cost Ratio	**20 - 25 %**	**50 - 60%**	**50 - 60%**

* actual customer measurement

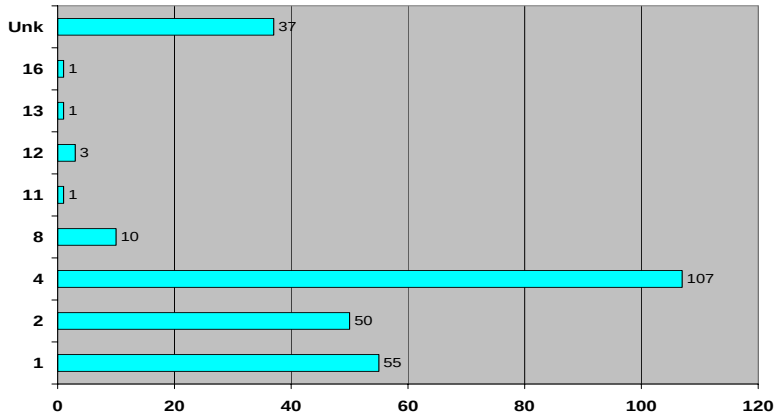
** based on multiple studies

Are Space and Facility Costs and issue in the Data Center?

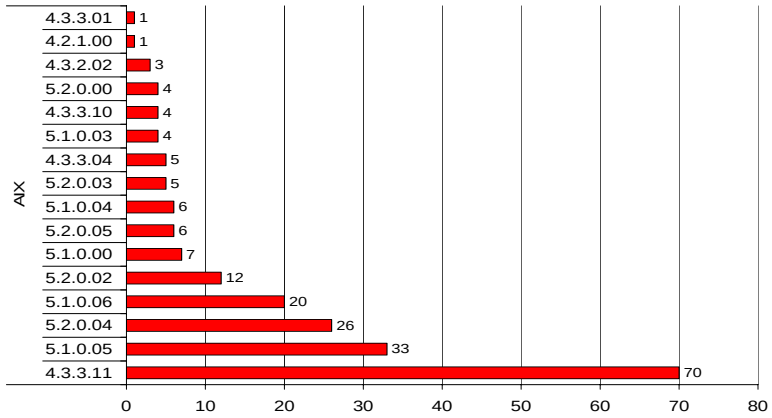
A Typical Distributed Environment

Are facilities an issue?

Lots of 1w, 2w, 4w boxes

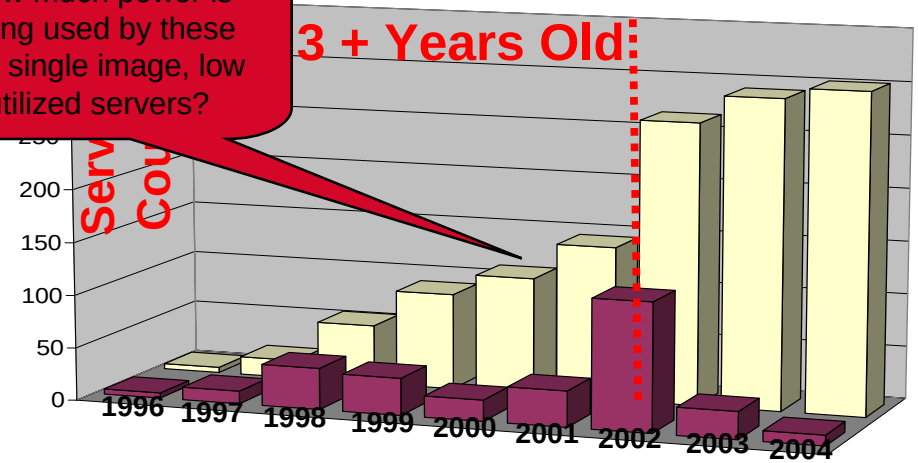


Multiple operating system releases

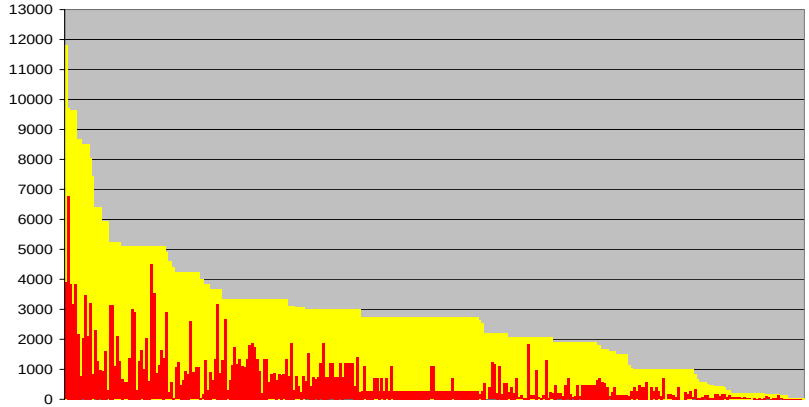


Many servers are old

How much power is being used by these old, single image, low utilized servers?



Servers are under utilized

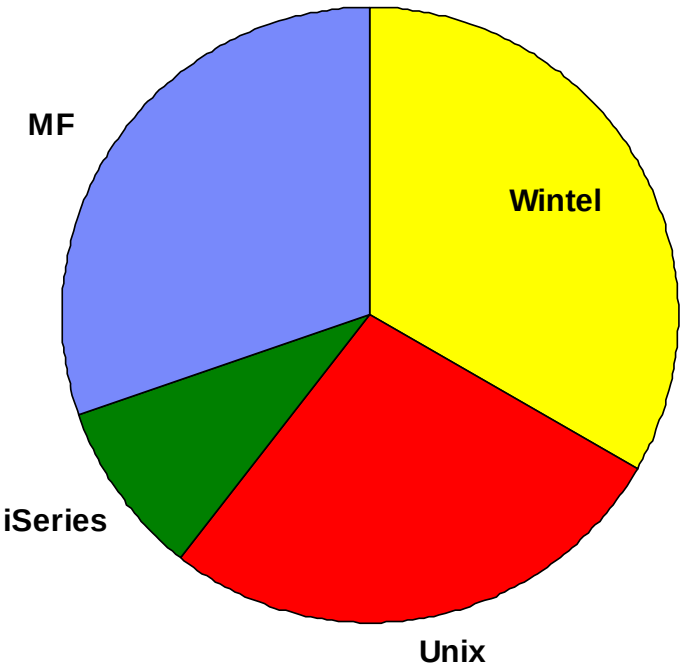


Source: Scorpion Study 1999 - 2007

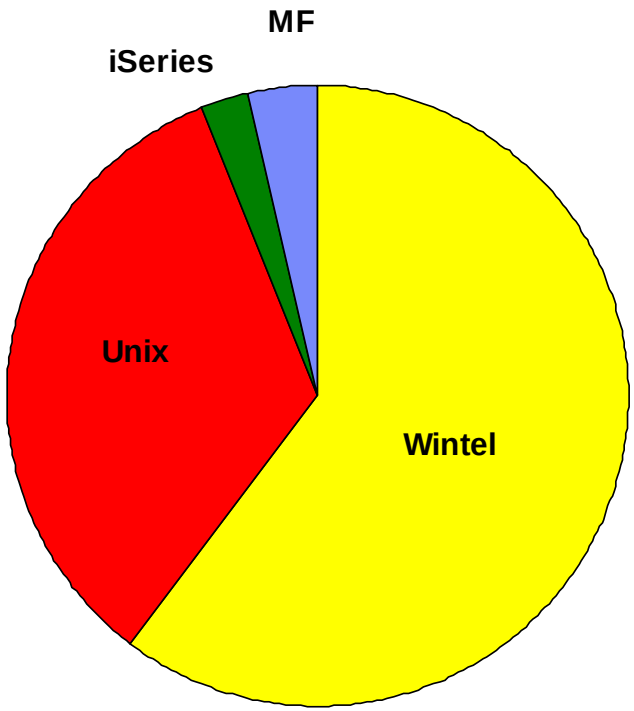
Current State - Environmental costs are LOW on System z

Power and cooling resources are dominated by Wintel machines. Although these resources are not yet constrained at ABC, costs are rising steadily and will continue to do so. Environmental costs will be included in the business cases.

Used Capacity



Power Draw



Ratio

Watts / Used RIP	
Wintel	16.7
Unix	11.4
iSeries	2.6
MF	1.1

Relative Internal Performance is a cross-architecture capacity metric used here. It is to be used only within the context of this study and cannot be compared to external benchmarks or other IBM performance ratings. Load or Used RIPS is the product of estimated utilization and RIP per instance for all 2000 server instances.

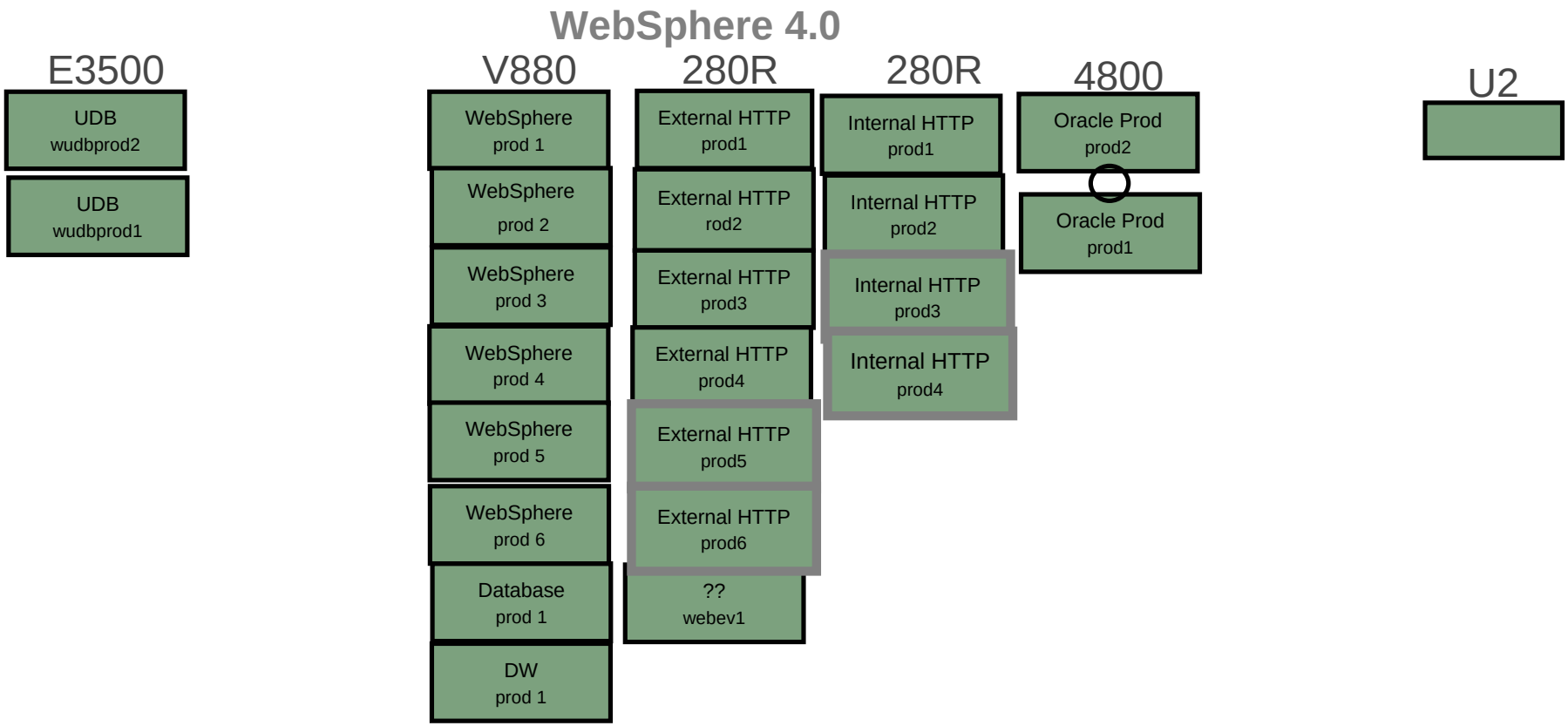
Customer Studies

- WebSphere® customer
- Hardware
  - 5000+ MIPS
  - 1000+ servers (25% UNIX)
- Software
  - WebSphere currently on Solaris
  - Oracle and DB2®

Customer perception:

Solaris environment is 1/5 the cost of the mainframe

Production SUN Server Architecture

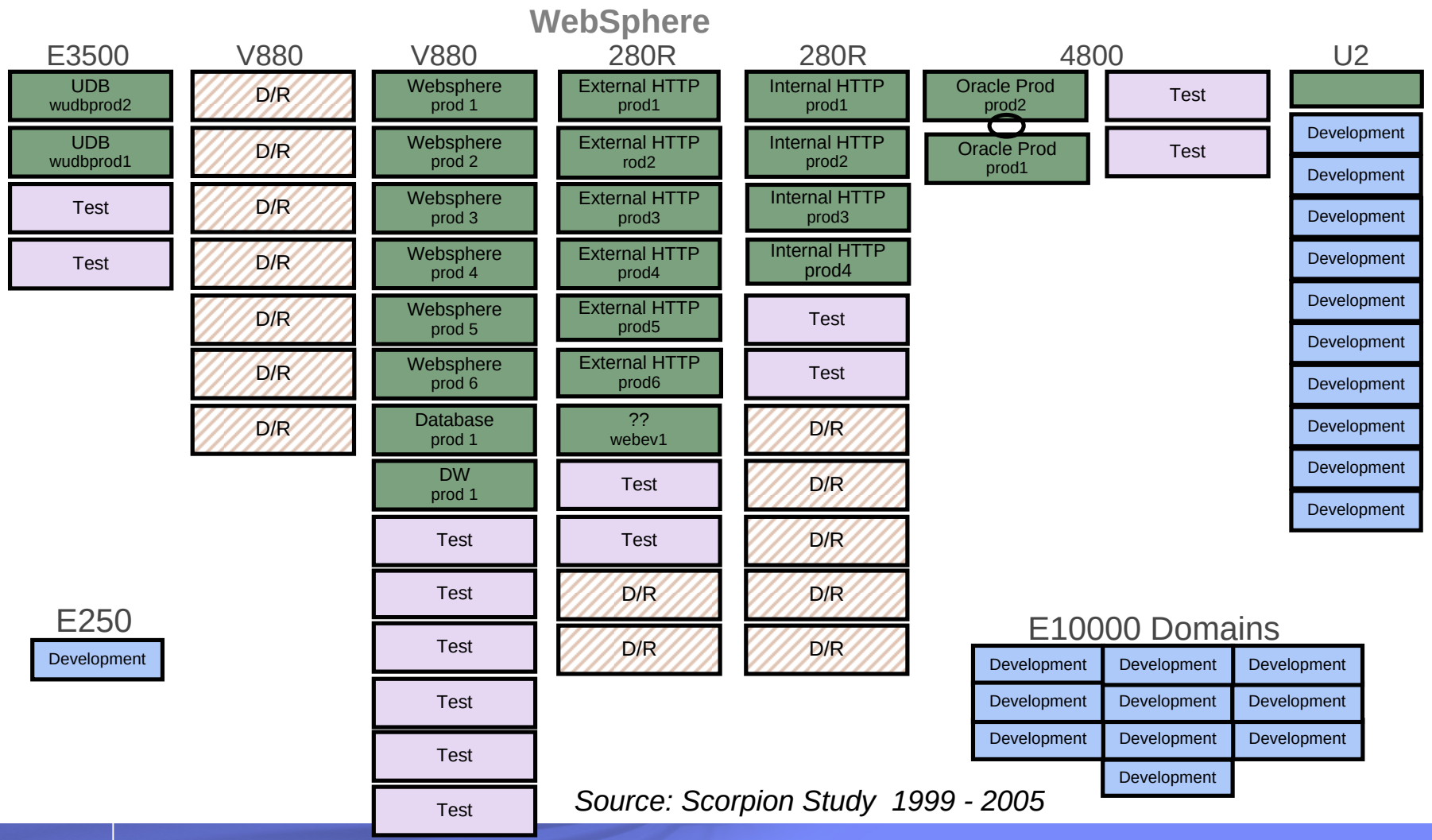


Source: Scorpion Study 1999 - 2007

Customer Example:
Distributed SUN Server Solution – perception…

isn't always reality!

- **Customer perception was that the mainframe was 5x the cost of the existing Sun implementation**

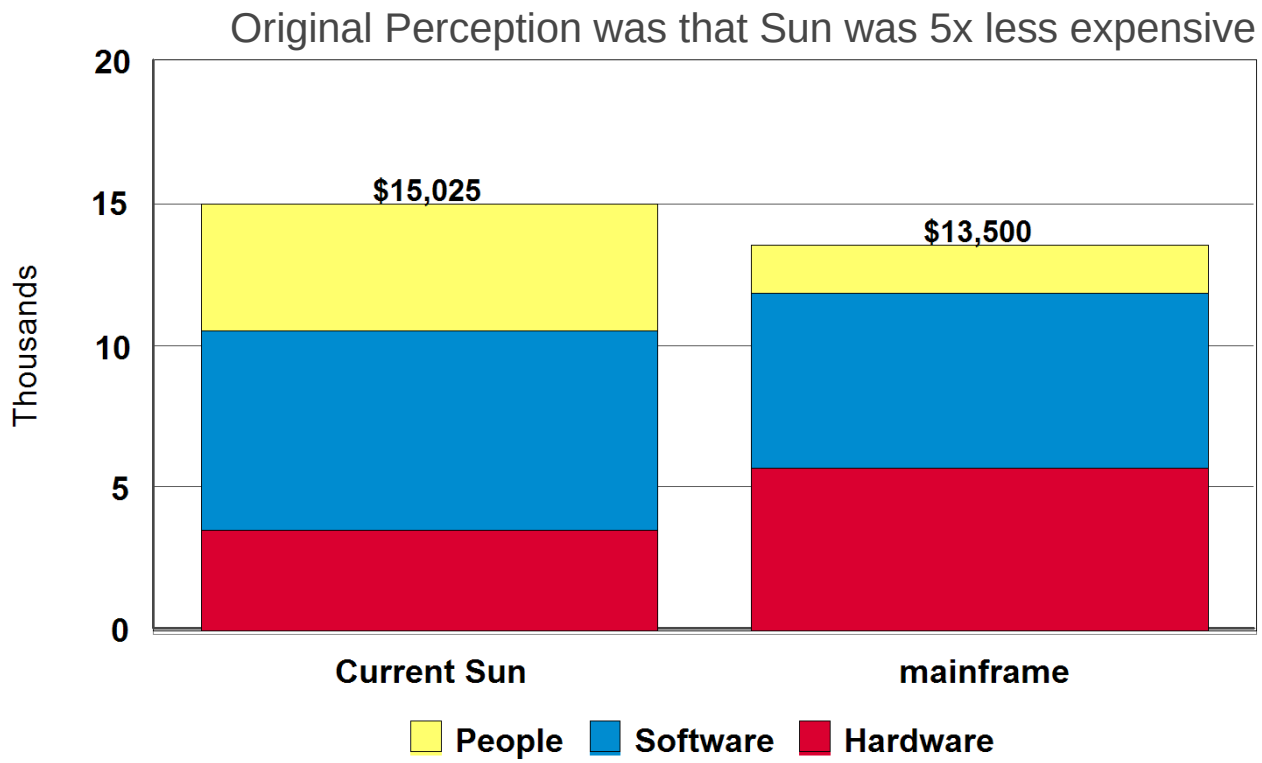


Source: Scorpion Study 1999 - 2005

EEE Corp: WebSphere Business Case

Hardware at street prices
- some Sun equipment was "used"
Software based on customers' actual environment
QoS & back-end connectivity not addressed

Software licenses
Proc. based - Oracle, WebSphere, DB2 Dev servers
Annual maintenance 20%
Average rate for servers $11.5K/yr (non proc. Based)



IBM eServer™ zSeries® savings 10% / 3 year TCO

Source: Scorpion Study 1999 - 2007

IBM STG Lab Services Consulting 2008

Specialty engines on System z9 and eServer zSeries

IFL capacity increases "just happen"

when you do a mainframe hardware upgrade

"zAAP's & zIIP's too"

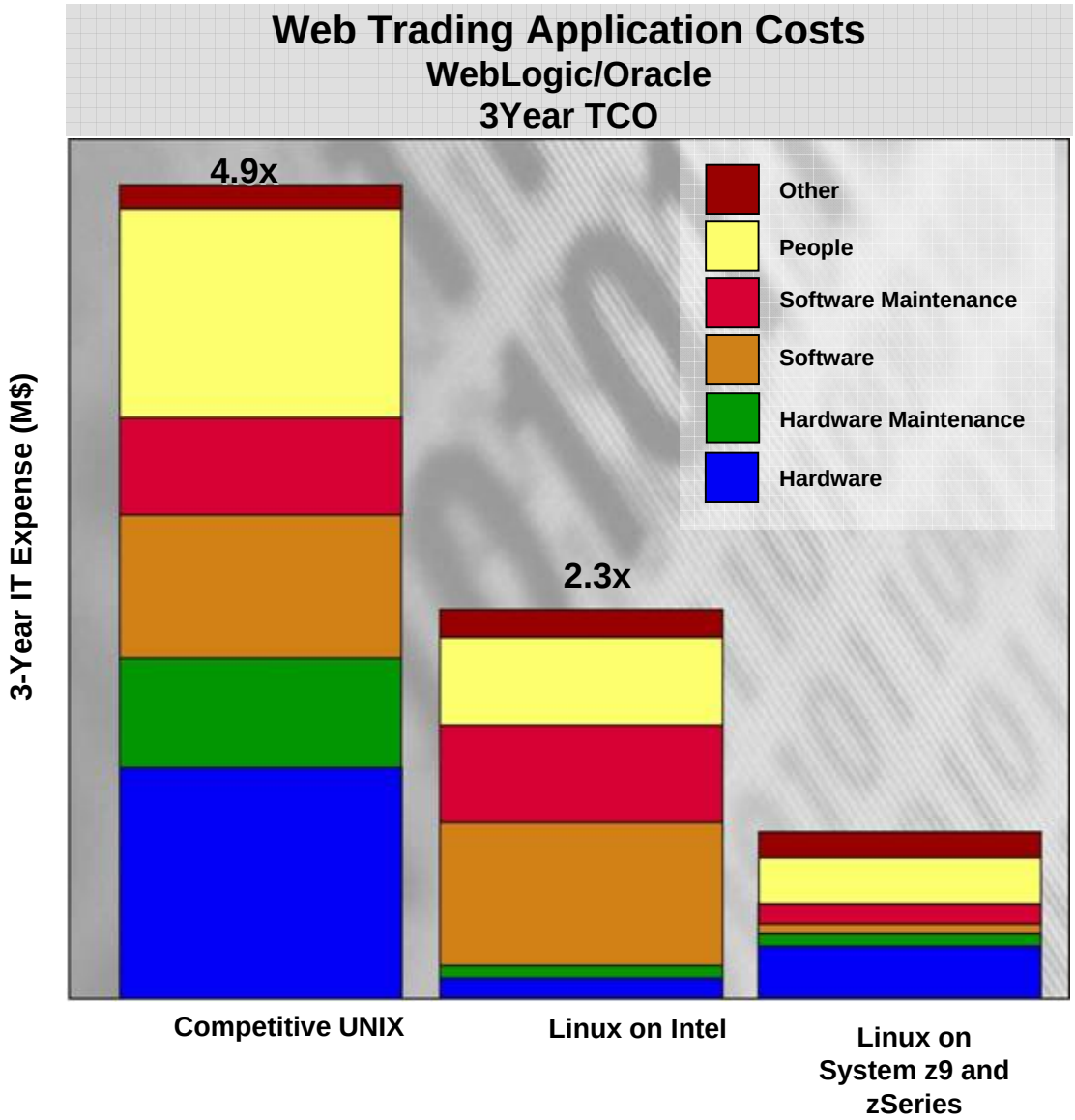
TCO Impact of Mainframe Consolidations

Your TCO may vary:

- Potential for dramatic reductions in software expense for processor based licenses
- Significant reductions in power and cooling costs are typical
- People savings from virtualization
- Increased processor utilization

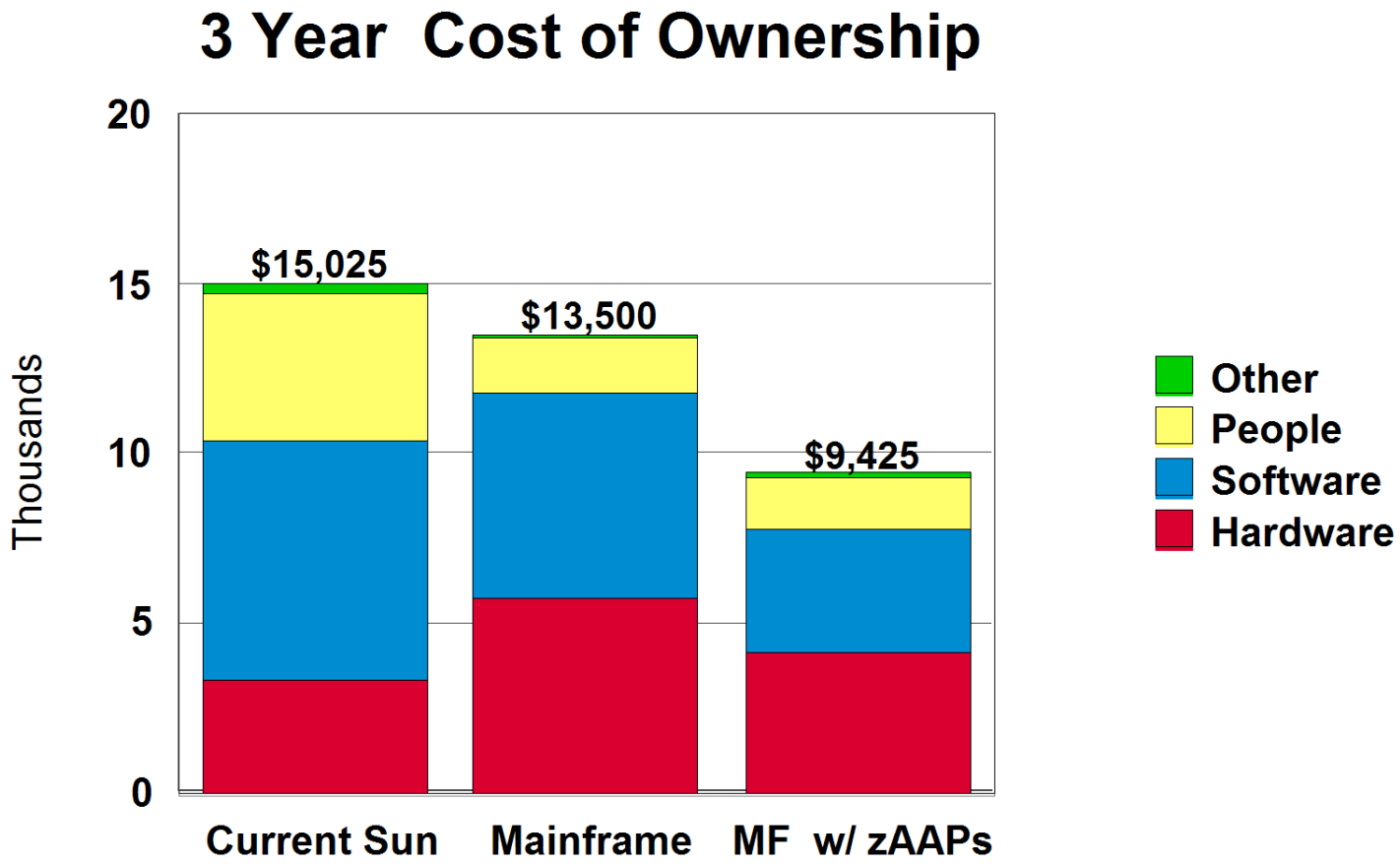
Source: Capricorn whitepaper

Workload consolidation using Linux on a mainframe can result in significant TCO savings



Source: Scorpion Study 1999 - 2007

What about zSeries Application Assist Processors (zAAPs)?



With zAAP processors, zSeries savings would have been 37%

Source: Scorpion Study 1999 - 2007

Recent customer studies

Windows Application Servers

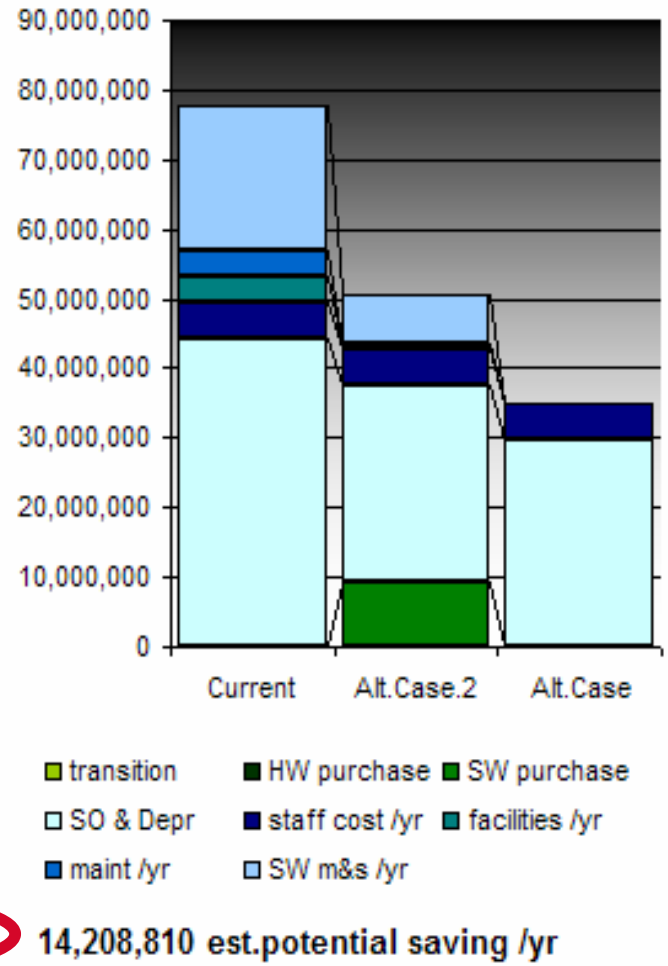
These two alternatives (VMware and Mainframe) differ in level of risk and estimated transition cost, but both are favorable from a business perspective and address the majority of workloads at XYZ.

101: win-app — Actual

Sizing	Current	Alt.Case.2	Alt.Case
server type		x3950(8)7150NDC	z9-EC IFL
total #CPU	3,106.92	640	64
used #CPU		640	64
#Log.Servers	1550.00	1550	1550
#Phys.Servers	1486.84	40	64
avg.Log.srv RIP	596.9	217.9	32.9
total capacity RIP	887,486.6	337,800.0	51,072.0
total workload RIP	40,240.7	40,240.7	40,240.7
average utilization	4.53%	11.91%	78.79%

AOC: Annual Operating Costs			
Staff cost code	Win		
SW cost code	win	WinStack-02	none
SW cost /CPU /yr	1,669	1,399	0
SW cost /Lsrv /yr	911	880	0
SW cost /Psrv /yr	207	207	0
SW m&s /yr	6,905,008	2,267,484	0
maint /yr	1,212,901	216,000	0
facilities /yr	1,229,994	89,698	24,769
staff cost /yr	1,733,426	1,733,426	1,733,426
SO services / yr	8,167,487	8,167,487	9,906,121
depreciation /yr	6,624,310	1,241,760	0
total AOC	25,873,126	13,715,855	11,664,316

3 Year Projection

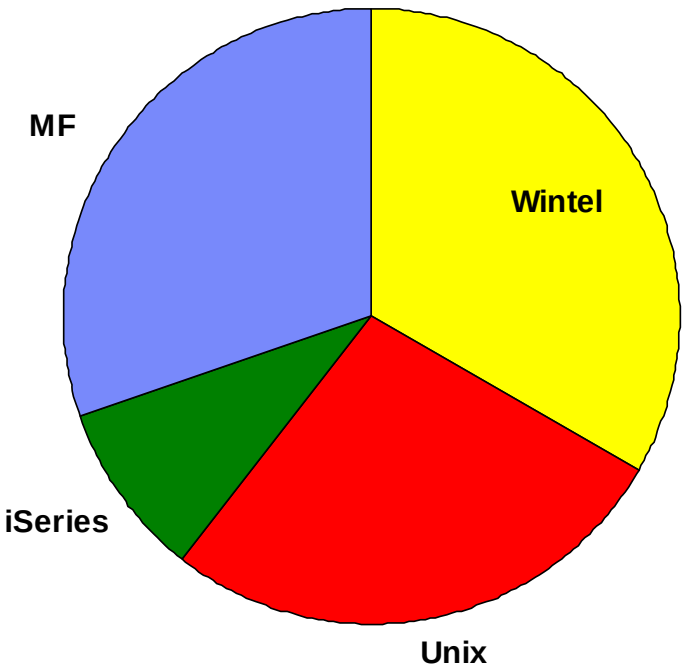


14,208,810 est.potential saving /yr

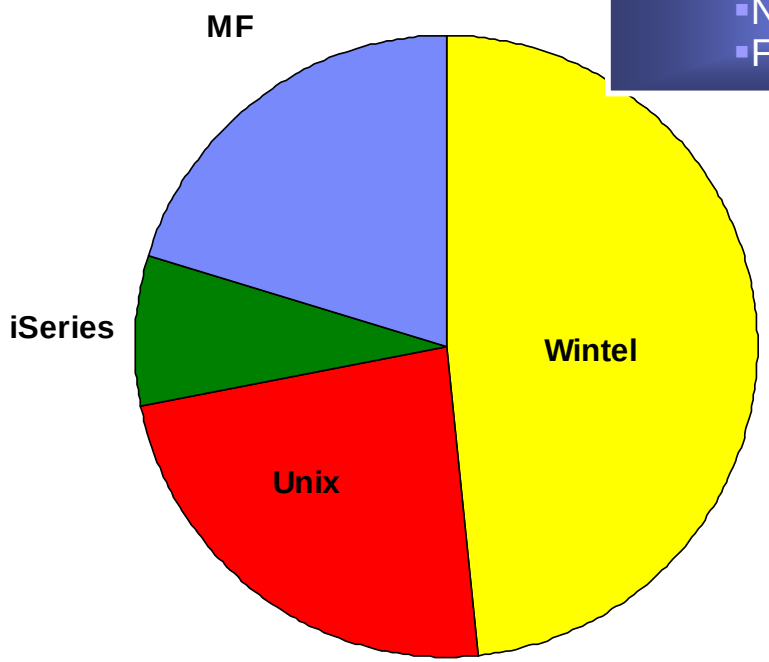
Current State - Staff Efficiency is HIGH on System z

Staffing Resources are dominated by Unix and Wintel machines and reflect the shared responsibilities between Infrastructure support and Application Development at ABC. Enhancing productivity to enable growth without additional staff will be highlighted in the business cases.

Used Capacity



Dedicated Infrastructure Staff



- Customer Profile
  - 1800 servers, 1 location
  - New CIO, “get off the MF”
  - Focused on reducing cost

Ratio

Used RIPs / FTE	
Wintel	552
Unix	578
iSeries	2198
MF	1937

Relative Internal Performance is a cross-architecture capacity metric used here. It is to be used only within the context of this study and cannot be compared to external benchmarks or other IBM performance ratings. Load or Used RIPS is the product of estimated utilization and RIP per instance for all 1800+ server instances.

Windows Application servers – Virtualize on zVM/Linux where appropriate, with majority of work to virtualize on VMware.

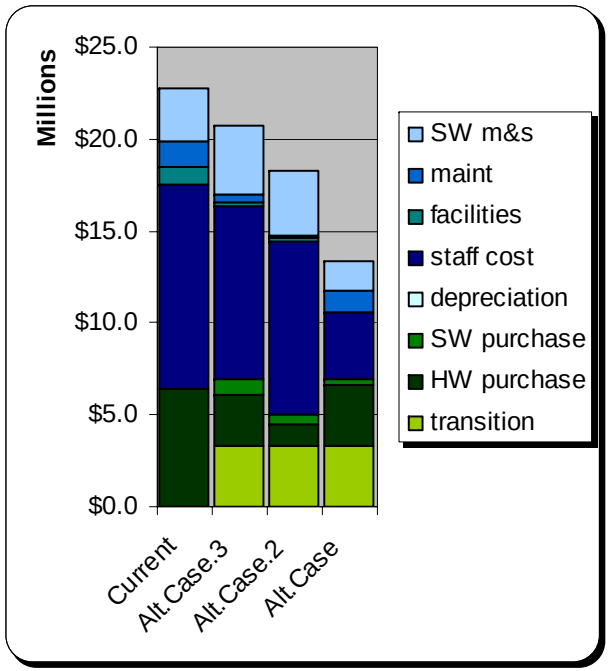
101: win-app Windows App' Servers Actual

Sizing	Current	Alt.Case.3	Alt.Case.2	Alt.Case
server type		x3950(4)7140ND	x3950(8)7140ND	z990 IFL
total #CPU	1,278.00	400	272	21
used #CPU		400	272	21
#Log.Servers	676.00	676.00	676.00	676
#Phys.Servers	669.50	50	17	21
avg.Log.srv RIP	509.8	368.7	216.5	55.5
total capacity RIP	341,308.5	249,250.0	146,370.0	37,548.0
total workload RIP	24,457.2	24,457.2	24,457.2	24,457.2
average utilization	7.17%	9.81%	16.71%	65.14%

AOC: Annual Operating Costs				
Staff cost code	Win	Win	Win	Unix
SW cost code	win	VMwareEE	VMwareEE	zVM.zLinux
SW cost /CPU /yr	0.00	452.81	452.81	15,000.00
SW cost /Lsrv /yr	843.22	843.22	843.22	0.00
SW cost /Psrv /yr	9.70	9.70	9.70	0.00
SW m&s	$576,512	$751,628	$693,348	$315,000
maint	$276,618	$180,000	$91,800	$294,000
facilities	$206,055	$49,225	$33,473	$8,289
staff cost	$2,225,180	$1,881,286	$1,881,286	$715,183
	$0	$0	$0	$0
total AOC	$3,284,365	$2,862,139	$2,699,907	$1,332,472

OTC: One Time Costs				
SW purchase		$862,500	$586,500	$315,000
HW purchase	$6,357,500	$2,725,086	$1,099,254	$3,297,000
transition		$3,347,500	$3,347,500	$3,347,500
total OTC	$6,357,500	$6,935,086	$5,033,254	$6,959,500
write off		$0	$0	$0

5 Year Projection				
OTC + 5x AOC	$22,779,325	$20,705,781	$18,257,388	$13,327,859



$1,951,893 est.potential saving /yr

100.0 :100 SCON ratio Log
3,188.1 :100 SCON ratio Phy

$602,000 Net Cash Investment

59% %age AOC Reduction

$9,451,466 5yr saving

What Makes the Best Fit for z

- **Leverage classic strengths of the zSeries**
  - High availability
  - High i/o bandwidth capabilities
  - Flexibility to run disparate workloads concurrently
  - Requirement for excellent disaster recovery capabilities
  - Security
  - Facilities - 15 yrs ago did you think facilities would be a mainframe strength
- **Shortening end to end path length for applications**
  - Collocation of applications
  - Consolidation of applications from distributed servers
  - Reduction in network traffic
  - Simplification of support model

- WebSphere MQ Series
- DB2 Connect
- CICS Transaction Gateway
- IMS Connect for Java
- Web Logic/WebSphere and JAVA applications development
- Applications requiring top end disaster recovery model
- LDAP security services
- IBI Web Focus

Recent Videos and article

Videos

Scorpion series part 1: Mainframe Cost Misconceptions
Scorpion series part 2: Server Proliferation and Utilization
Scorpion series part 3: Facility and Infrastructure Considerations
Scorpion series part 4: Saving Money with zIIPS, zAAPs and IFLs
Scorpion series part 5: Building a Business Case
Scorpion series part 6: The Best Fit for System z

http://www-306.ibm.com/software/info/television/index.jsp?lang=en_us&cat=systemz&item=xml/A361366R16875X50.xml

The new TCO and the value of the mainframe

Published on: 11 Jan 2007

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http://www-306.ibm.com/software/swnews/swnews.nsf/n/cres6x3lc8

Have a Great Afternoon!