



Take Cost Out with zEnterprise Eagle TCO Studies

Dr. Holger Smolinski

IBM Competitive Project Office, EMEA Eagle TCO Consultants

IBM Client Center Boeblingen, Germany

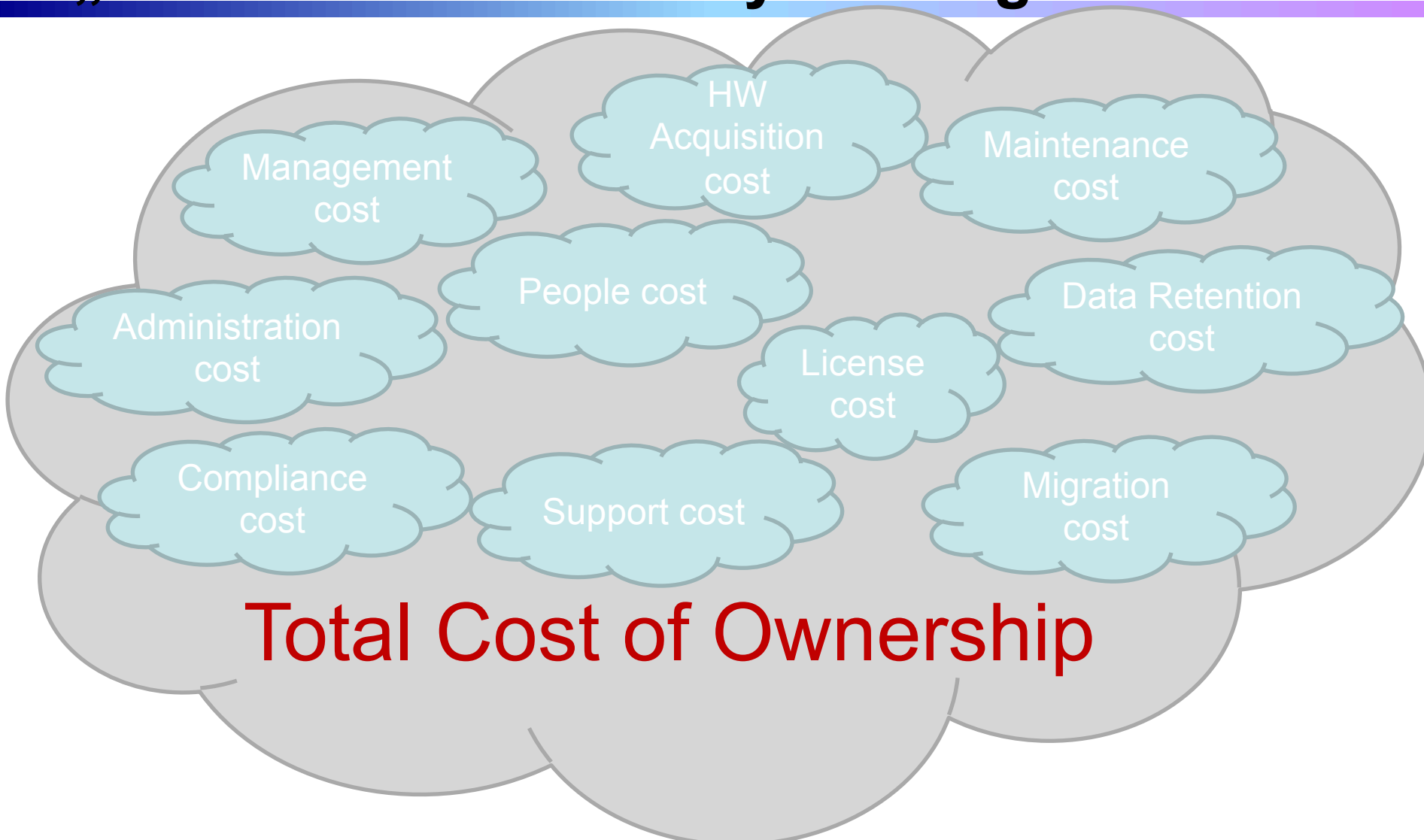
Agenda

- What is TCO?
- The EAGLE Method for TCO studies
 - ▶ Study process and parameters
 - ▶ Cost model – the 4 dimensions of cost
- Example Studies with System z
 - ▶ z/OS Offload
 - ▶ Server Consolidation
 - with Oracle & WAS
 - with Open Source Middleware
 - ▶ New Workload
 - Rehosting of CRM System with System z and pureFlex

TCO means:

- Total cost of Ownership
 - ▶ „cost“ related: What does a solution cost?
 - Determines rentability of a solution!
 - ▶ „total“: comprehensive
 - Should cover all aspects of „cost“
- Why is that important?
 - ▶ Did you recently „get“ a „free“ cellphone?
 - ▶ Did you recently „win“ a „free“ stay in a resort?
- Hidden cost can impact rentability severely
 - ▶ Cost might be hidden by accident or on purpose

„Cost“ means a variety of things:



Eagle TCO Engagements



- **Free of Charge** total cost of ownership study that helps customers evaluate the lowest cost option among alternative approaches. The study usually requires one day for an on-site visit and is **specifically tailored to a customer's enterprise**.
- The study can be focused on at least one of the areas below :

Fit For Purpose
Platform
Selection

Private Cloud
Implementation

Enterprise
Server
Economics

- We conduct Eagle studies for System z, POWER, PureSystems, and Storage accounts
- Studies are conducted for both IBM customer and Business Partner customer accounts
- Over 300 customer studies since the formation of the TCO Eagle team in 2007
- **Engage our Eagle-Eyed TCO Experts!**
 - ▶ Start by requesting sending an email to eagletco@us.ibm.com

EAGLE TCO Consultants: Take Cost Out



US Team led by Christopher v. Koschembahr

Global Lead:
Craig S Bender
Somers, USA



EMEA Team led by Alfredo Micarelli Rome



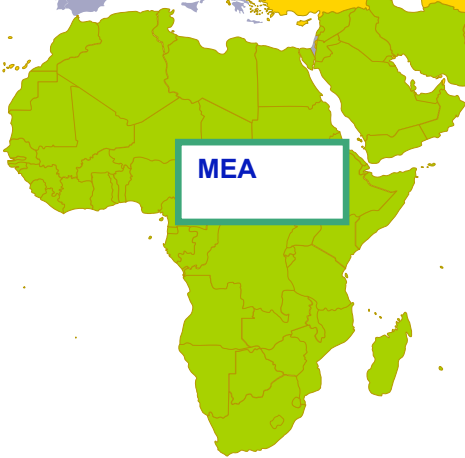
AP Team led by JC Yao



Europe

CEE

United Kingdom:



MEA



Germany:
Client Center
Boeblingen

Italy: Bari



The EAGLE Method:

- Listen to our customers
 - ▶ Business background and requirements
 - ▶ IT Strategy and Project Goals
 - ▶ Non-functional requirements
- Define scope of study and scenarios to compare
 - ▶ Fit-4-Purpose can be used to identify best technical options
 - Frequently best technical fit is also cheapest, because built-in capabilities do not need to be established at extra cost.
 - ▶ Establish equivalence or assign value to differences
- Calculate detailed total cost for each scenario
- Identify solution which fulfills requirements at lowest cost

A study consists of 7 steps

1. Identify client sponsor for support
2. Conduct Kick-off workshop
 1. Interview with sponsor/business stakeholders
 2. Interview with technical stakeholders
 3. Define Study Parameters, Scope and Scenarios
3. Establish equivalence of compared solutions
4. Agree with customer on High-Level Architectures
5. Perform financial modeling for scenarios
 1. Apply model: 4 dimensions of cost
6. Re-fine architecture and financial model in up to three iterations with EAGLE peers, client team and customer
7. Present study result and recommendations to customer



EAGLE studies are kicked off by the IBM client team and are free of charge. Fast-Path studies are available at lower detail level starting from 2 days.

The method and four dimensions of cost model are:

- Flexible to (manually) connect to different sources
 - ▶ Server inventory and configuration tools
 - ▶ Sizing tools for establishing equivalence
 - RACEv, Gartner/IDEAS International competitive profiles,...
 - ▶ Other specialized TCO tools:
 - TCOnow! for storage, alinean for pureFlex,...
- A most comprehensive model of total cost
 - ▶ Extensible to special customer requirements
 - ▶ Reducable to most important criteria (fast path)

The 4 dimensions of cost in a nutshell

2. Environments	PROD	Dev/TST	HA	Q/A	D/R	4. NFRs
1. Cost Items						Reliability
HW acquisition						Availability
SW licenses						Security
Maintenance & Support						Scalability
Network cost						Compliance
Power and Cooling						Standards
Facilities						Legal
Storage						Data Retention
...						...
3. Time	Growth	Migration	Events	Lifecycle	...	

Example studies: Offload

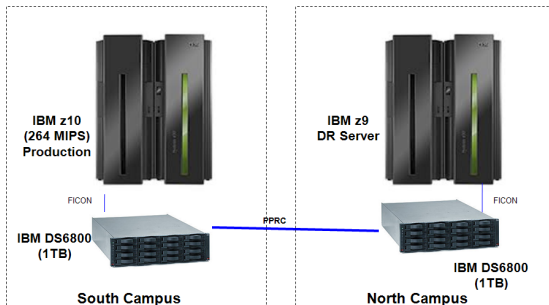
Offload: Retailer

- Today runs order processing system on System z
 - ▶ ~1.2M LOC legacy TX code COBOL etc.
 - ▶ Outages immediately impact business: D/R RTO < 1hr
 - ▶ < 10GB of data in IMS and DB/2 – mirrored w/ PPRC to D/R site
- Plans to reengineer/modernize application
 - ▶ COCOMO porting estimate: USD ~12M/4yrs @ >40 FTE peak
 - ▶ Migrate data into Oracle database
- Platform candidates: Power Systems, Intel
 - ▶ HA, Dev&Test separate from PROD for isolation purposes
 - ▶ Virtualization widely used to reduce number of physical servers

Offload: Environments

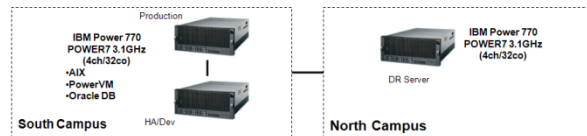
Case 1 – System Z

- z10 BC @ 264 MIPS
- DR Server on old z9
- DS6800 (1TB) with PPRC
- IMS and DB2 Databases



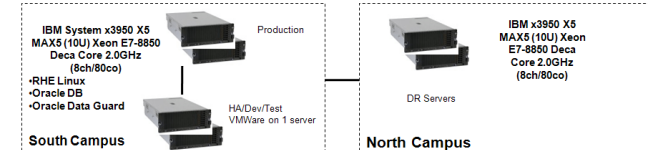
Case 2- System P

- 3x IBM - Power 770 32co@3.1GHz AIX, PowerVM(Pr./Dev./DR)
- Cold Fusion & Oracle DB

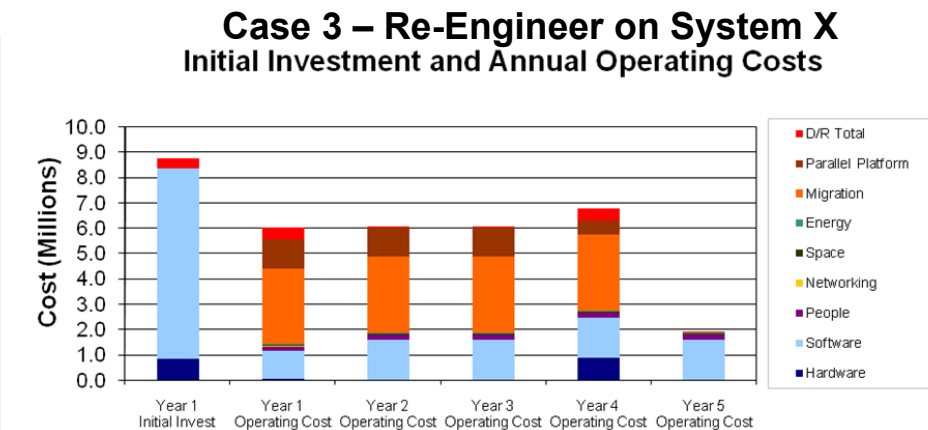
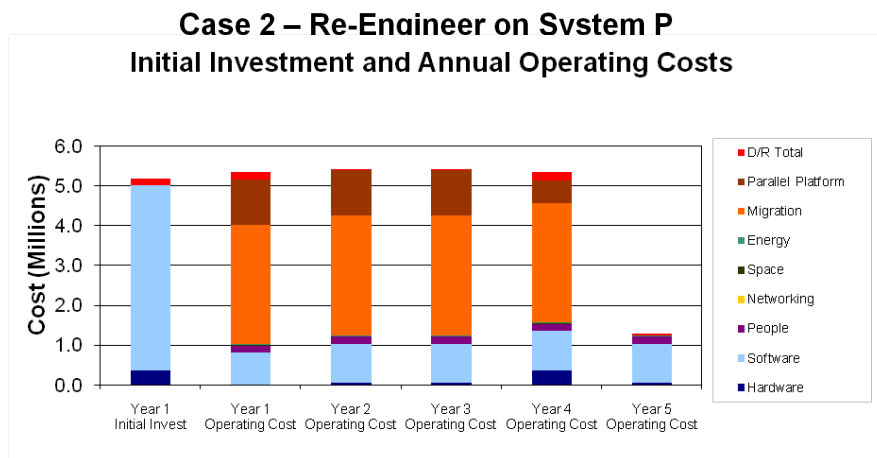
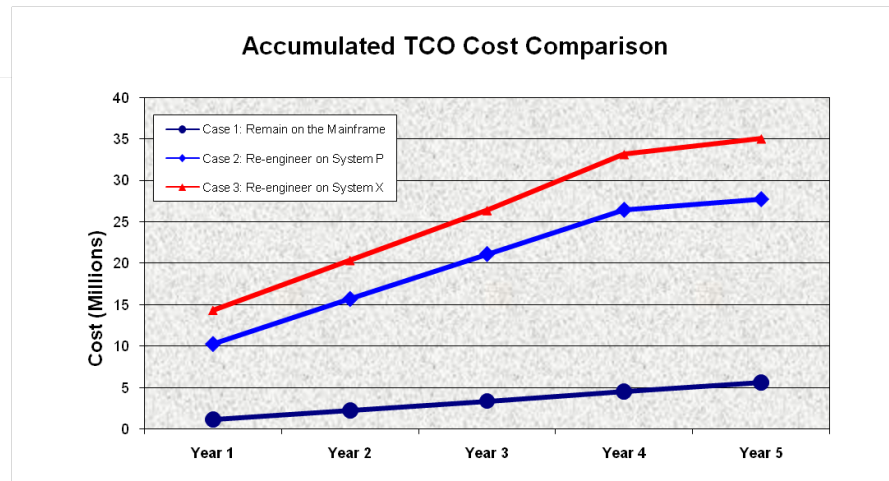
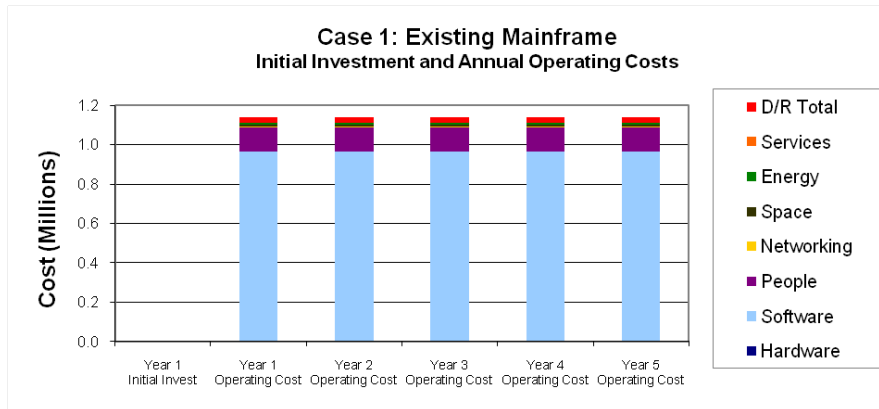


Case 3 – System X

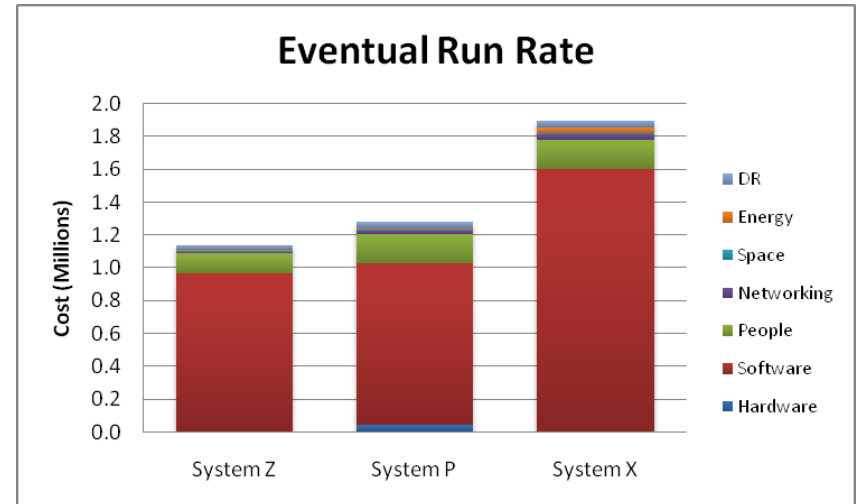
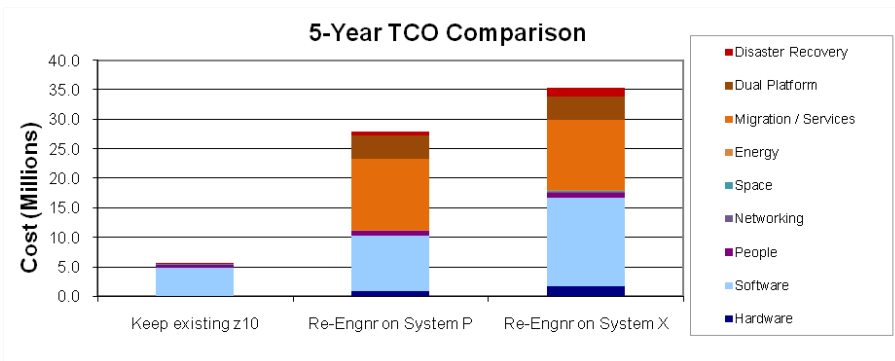
- 6x IBM System x3950 – 80xE7-8850 @2.0GHz (2x Pr./Dev./DR)
- VMWare
- Cold Fusion & Oracle DB w/Data Guard



Offload: Cost structure



Offload: Cost Analysis



■ Cost Factors

- ▶ Migration effort
 - Parallel environments
- ▶ Software priced per core
 - More cores -> more cost
 - License & maintenance

• Other considerations

- Risks
 - Functional equivalence
 - Performance
 - scalability
- Changed HA/DR capabilities

Offload: Summary

- Existing mainframe solution is cheapest:
 - ▶ In regard to Total Cost of Ownership in any year on a 5 year horizon
 - ▶ In regard to Annual Operation Cost after migration
- Migration cost never pays off
 - ▶ Not generally true, but frequently
- Functional and non-functional risks not valued

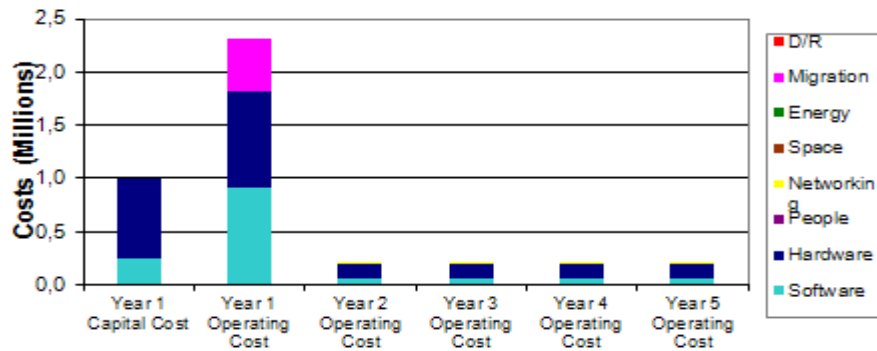
Example studies: Consolidation

Consolidation I: Bank

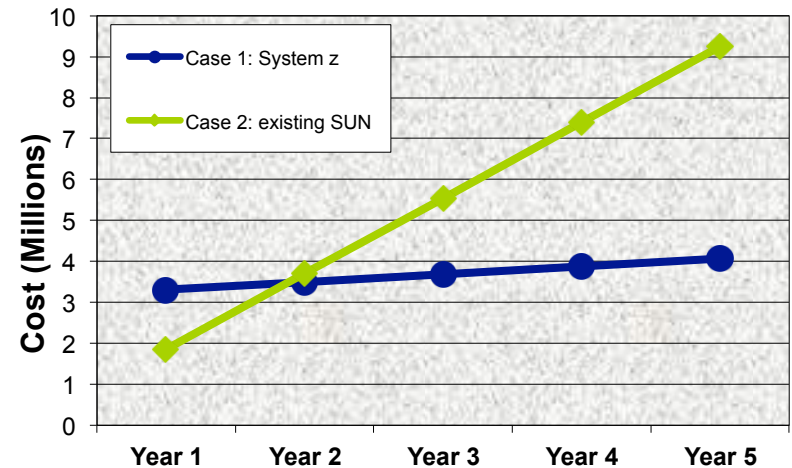
- Current environment: >300 UNIX server farm
 - ▶ SUN/SPARC, Power Systems, Intel
 - ▶ Mainly Oracle database, various Application Servers
- Servers considered for consolidation:
 - ▶ Oldest SUN servers (database), which are depreciated
 - ▶ 25 servers with 188 cores can go to 7 IFLs on zEC12
 - Average utilization rate from std. UNIX 17% up to 50% driven by consolidation effect (Overlay of Gaussian samples)
 - Size for the average + head room vs. size for the peak

Consolidation I: Cost structure and analysis

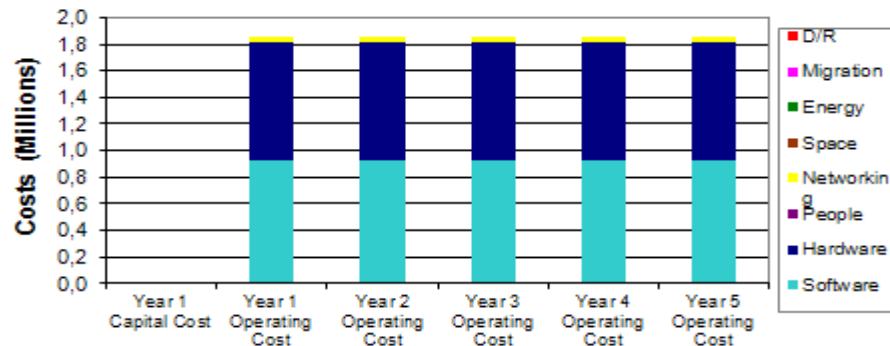
System z - EC12
5-Year OTC and Operating Costs



Accumulated TCO Cost w/ EC12



Existing SUN servers
5-Year OTC and Operating Costs



HW investment ~USD 1M for zEC12

- pays off in year 2
- Annual SW cost down 600k
 - Reduction of cores
- Annual HW cost down 700k
 - Reduction of servers

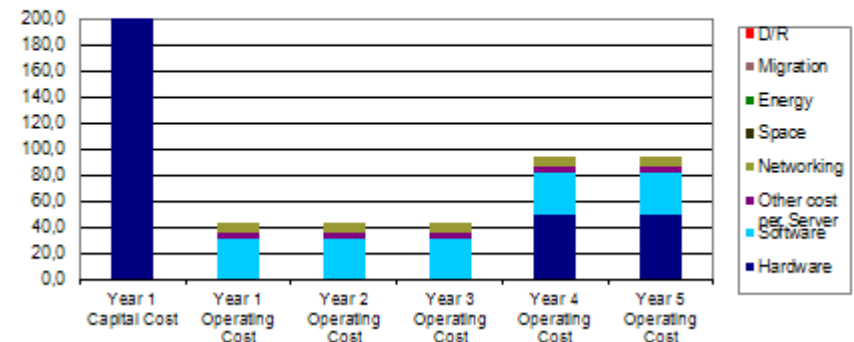
Consolidation II: Bank

- Current Environment:
 - ▶ 8x Fujitsu BX6000 + 2x HP DL 380 w/ Linux
 - ▶ Complex network topology
 - ▶ Home-grown application based on Open Source Middleware
- Target environment:
 - ▶ zEC 12 with 5 IFLs
 - ▶ z/VM virtualization
 - ▶ VSWITCH virtual and secure networks

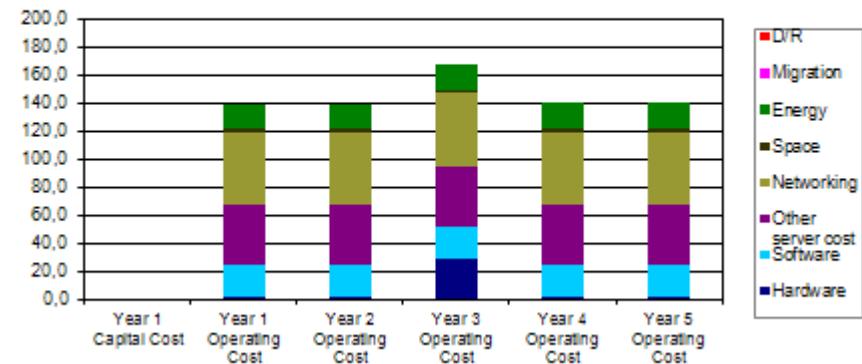
Consolidation II: Cost structure and analysis

- Networking cost
 - ▶ VSWITCH and HiperSockets eliminate physical network ports
- Other server cost
 - ▶ Reduced server inventory
 - ▶ System z RAS reduced number of OS images
- Higher avg. system utilization
 - ▶ 45% vs. 1-20%
 - ▶ 66 cores to 5 (13.2:1)
- Energy and space cost covered by existing System z

Case 1: System z scenario
Initial Investment and Annual Operating Costs



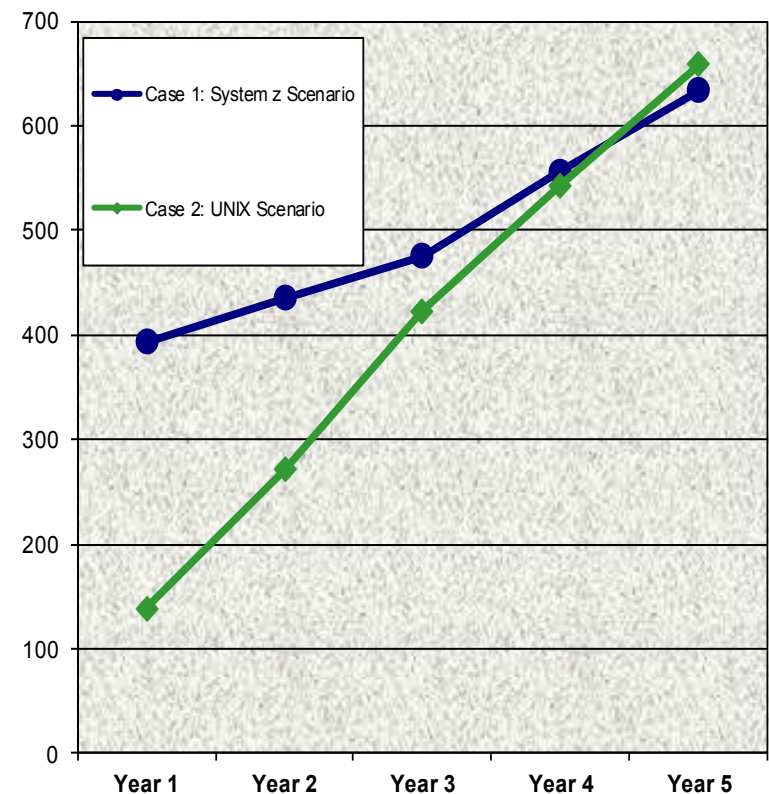
Case 2: Unix Servers
Initial Investment and Annual Operating Costs



Consolidation II: Analysis

- Technical advantages:
 - D/R environment added to System z with CBU
 - Reduced network and server complexity
- Financial advantages:
 - In regard to 5yr-TCO
 - \$55k (8%) at 0% interest
 - In regard to annual cost
 - \$74k avg. in years 2-5
 - \$46k (33%) in year 5

Accumulated TCO Cost Comparison



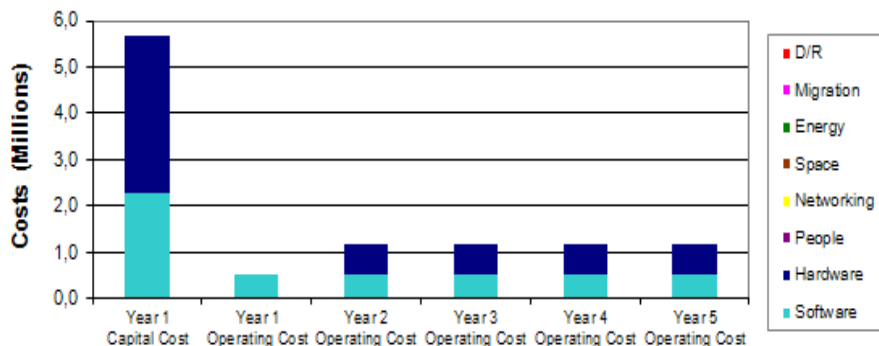
Example studies: New Workload

New Workload: Telco

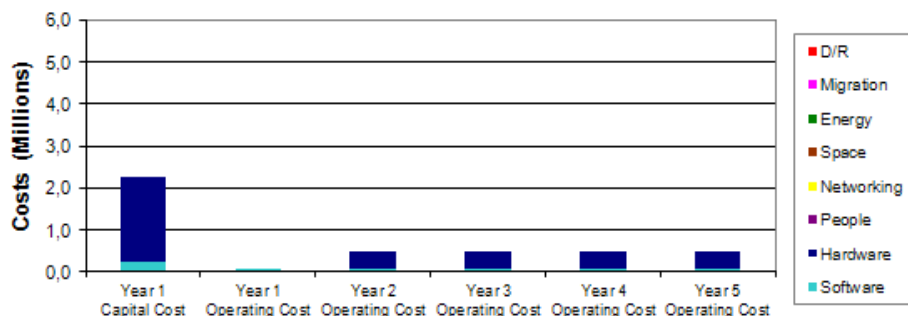
- New CRM System needs to be hosted
 - ▶ Siebel with Oracle DB
- Platform candidates:
 - ▶ Competitive proposal:
 - 2x SUN M9000 (64 core each) for DB
 - 32 T4-2/4 servers + 2 HS22 Blades for Apps
 - ▶ zEC12 assessment requested by customer:
 - 7 IFL processors required for Oracle DB
 - Siebel application cannot run on IFL:
 1. Option: 2x Power 780+ w/ Power VM&HA for Apps
 2. Option: 20x p460 nodes in pure Flex

New Workload: Cost structure & analysis

Oracle Proposal
5-Year OTC and Operating Costs



System z - EC12 + pure
5-Year OTC and Operating Costs



Savings driven by:

1. Acquisition cost for
Oracle SW Licenses (down 2M on EC12)
#licenses down 64:7
Server HW (down 1.4M with pure)
2. Maintenance cost
Oracle DB+RAC (down 440k on EC12)
Server HW (down 240k with pure)
3. Year 1 S&S included for IBM SW&HW

Factors not considered

1. Simplified network and server topology
2. Ease of administration with pureFlex
3. Add D/R capability with zEC12/CBU
4. Dev/Test & QA environment

New Workload: financial analysis

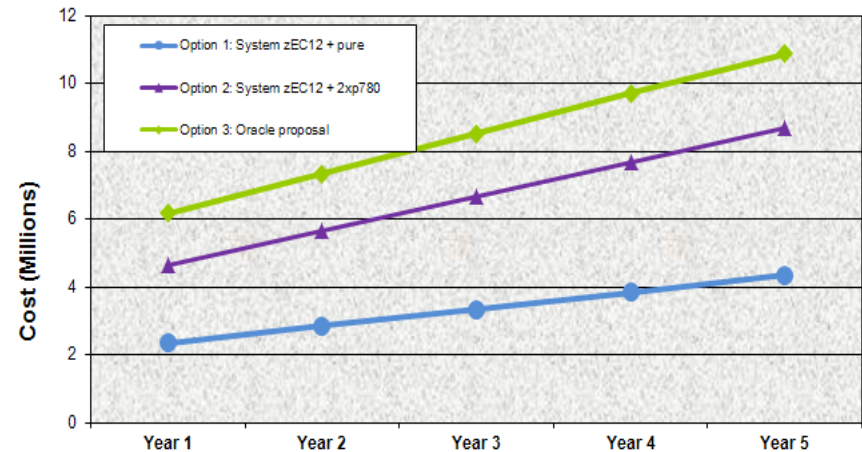
Recommendation:

Implement Siebel CRM

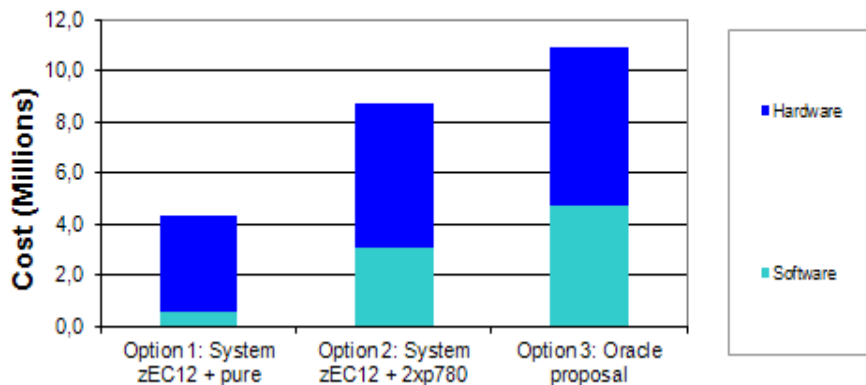
on zEC12 with pureFlex for flexibility
and minimal cost

or zEC12 with 2xp780 for maximum
consolidation

Accumulated TCO Cost Comparison



5-Year TCO Comparison



Case	5yr TCO	Savings	Annual in year 5	Savings
EC12 + pure	\$ 4.3M	-\$ 6.5M (-60%)	\$ 0.5M	-\$.7M (-57%)
EC12 + 2xp780	\$ 8.7M	-\$ 2.2M (-20%)	\$ 1.0M	- \$ 160k (-14%)
Oracle proposal	\$ 10.8M		\$ 1.2M	

Take Cost Out / Add Value with zEnterprise

- Functional advantages
 - ▶ Virtualization of any resources, higher utilization
 - ▶ LPAR/guest isolation
 - ▶ Availability advantages (z-ero downtime)
 - ▶ Hybrid systems w/ zBX
 - ▶ Unique functions: Parallel Sysplex, DB2 for z/OS
- Total Cost of Ownership advantages
 - ▶ If many servers need to be replaced – old ones preferred
 - ▶ If development/test systems sprawl
 - ▶ If servers are low utilized
 - ▶ If complex topologies need to be simplified
 - ▶ If a System z exists and new workload can be put in whitespace or incremental capacity
 - ▶ If legacy systems are intended to be migrated
 - ▶ If non-functional requirements are important
 - ▶ If large new workload needs to be hosted
- Migration of legacy systems tends to never pay off
- Consolidation can pay off starting at 10 servers