
Frühjahrstagung 2013
z/VSE, z/VM und Linux auf System z
U30 - zTalents
TCO Betrachtungen mit System z
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The Westin Leipzig

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 „buy“ a „free“ cellphone?
  - Did you recently „win“ a „free“ holiday?
- Hidden cost can impact rentability severely
  - Cost might be hidden by accident or on purpose

„Cost“ means a variety of things:

Management cost

HW Acquisition cost

Maintenance cost

People cost

Administration cost

Data Retention cost

License cost

Compliance cost

Support cost

Migration cost

TOTAL Cost of Ownership

EAGLE TCO Consultants: **T**ake **C**ost **O**ut

Global Lead:
Craig S Bender
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US Team led by
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AP Team
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United Kingdom:

Germany:
Client Center
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Italy: Bari

High End customers qualify for EAGLE studies with IBM platforms

- System z:
  - z/OS, z/VSE, z/TPF, Linux on System z
- High End Power Systems:
  - AIX, Linux on Power
- High End Storage:
  - DS8#00, V7000, XIV
- pureSystems:
  - p and x compute nodes, storage nodes

Various scenarios qualify for EAGLE studies

- Competitive Situations:
  - Intended offload from „Legacy Systems“
  - Competitive offerings for new workload
- Server/Storage Consolidation:
  - Reduce complexity of environment
  - Optimize resource utilization
- „Cloud“-like environments
  - Shorten deployment time
  - Increase efficiency of systems management

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. Attempt to establish equivalence
4. Agree with customer on High-Level Architectures as subject of study
5. Perform financial modeling for scenarios (4 dim 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/TEST	HA	Q/A	D/R
1. Cost Items					
HW acquisition					
SW licenses					
Maintenance & Support					
Network cost					
Power and Cooling					
Facilities					
Storage					
...					

4. NFRs
Reliability
Availability
Security
Scalability
Compliance
Standards
Legal
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

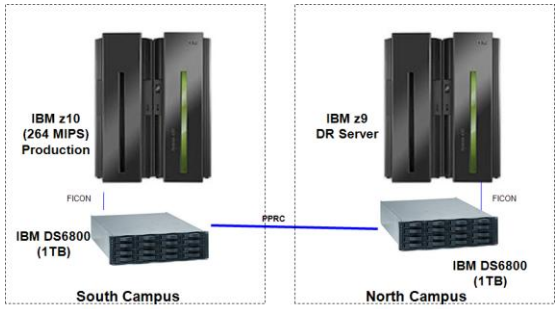
- z10 BC @ 264 MIPS
- DR Server on old z9
- DS6800 (1TB) with PPRC
- IMS and DB2 Databases

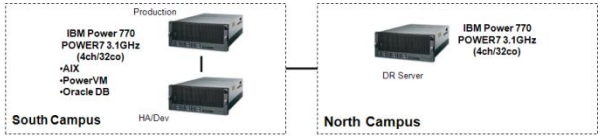
Case 2- System P

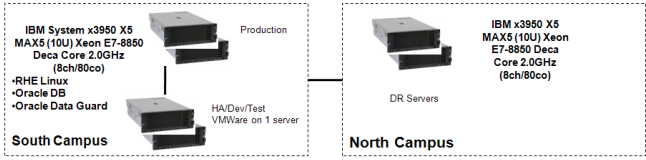
- 3x IBM - Power 770 32co@3.1GHz AIX, PowerVM(Pr./Dev./DR)
- Cold Fusion & Oracle DB

Case 3 – System X

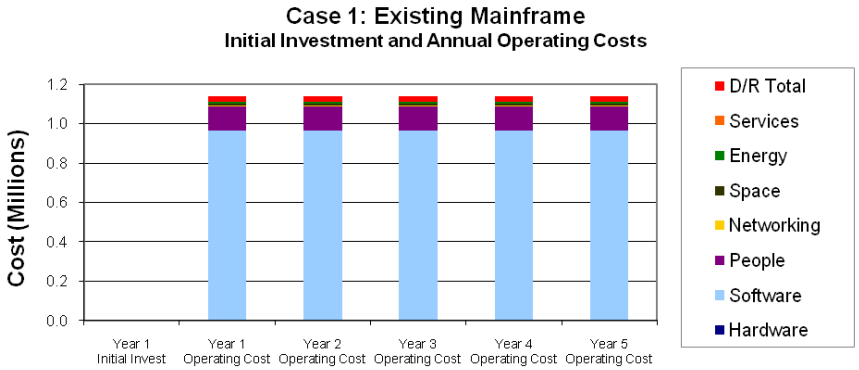
- 6x IBM System x3950 – 80xE7-8850 @2.0GHz (2x Pr./Dev./DR)
- VMWare
- Cold Fusion & Oracle DB w/Data Guard

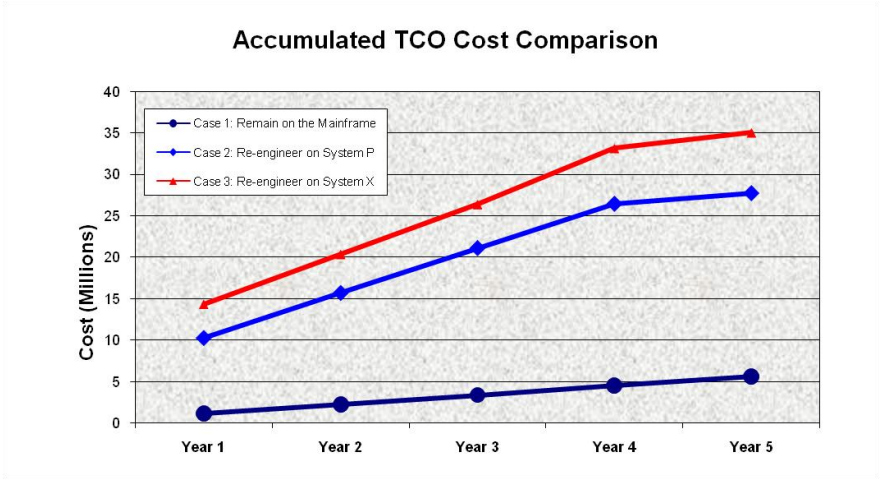


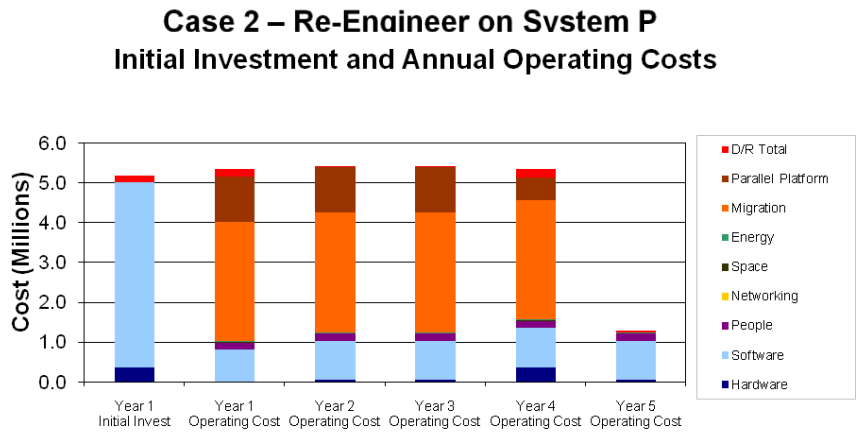


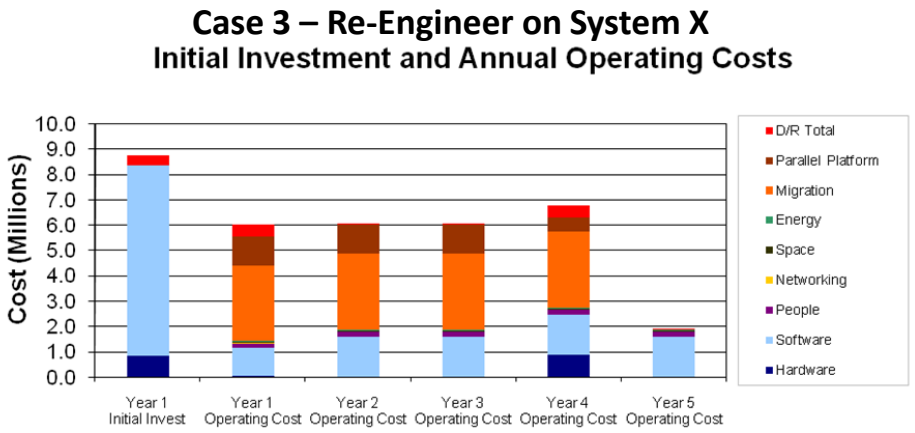


Offload: Cost structure

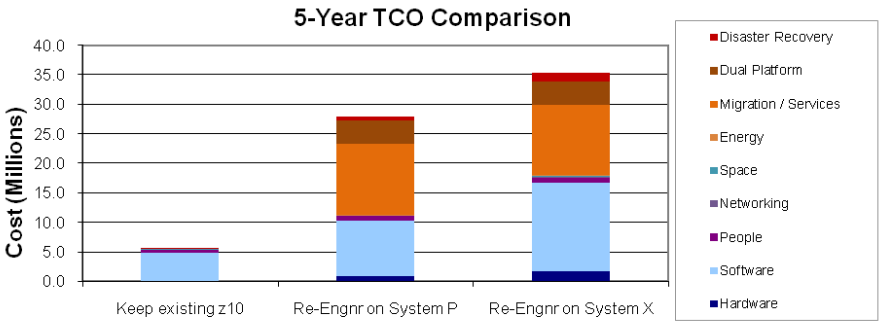


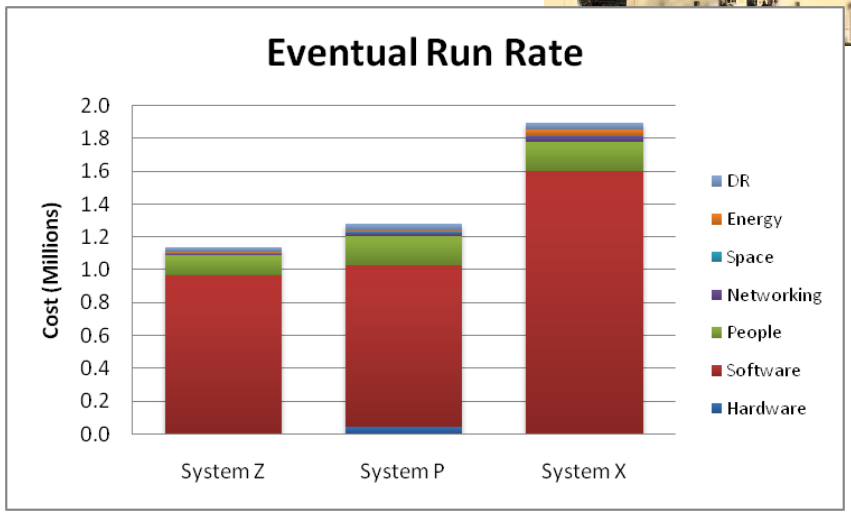






Offload: Cost Analysis





- 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

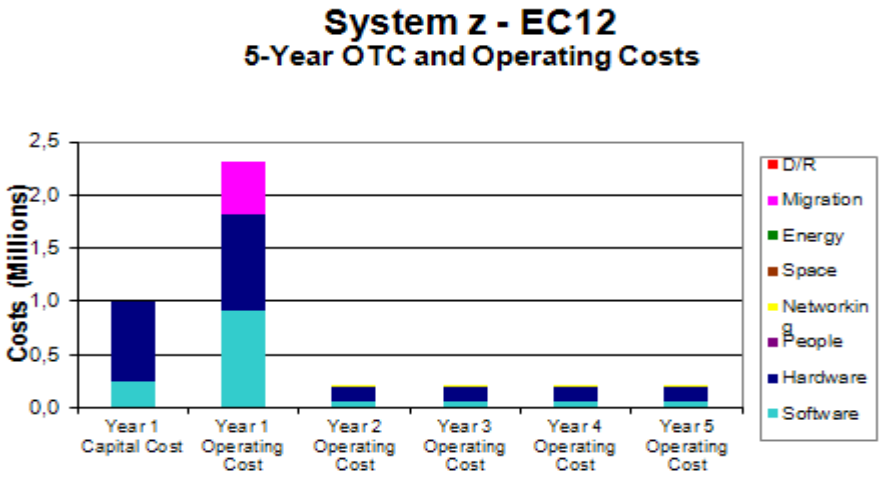
- Existing mainframe solution is cheapest:
  - In regard to Total Cost of Ownership in any year on a 5 year horizon
  - In regard to Annual Operation Cost after migration
- Migration cost never pays off
  - Not generally true, but frequently
- Functional and non-functional risks not valued

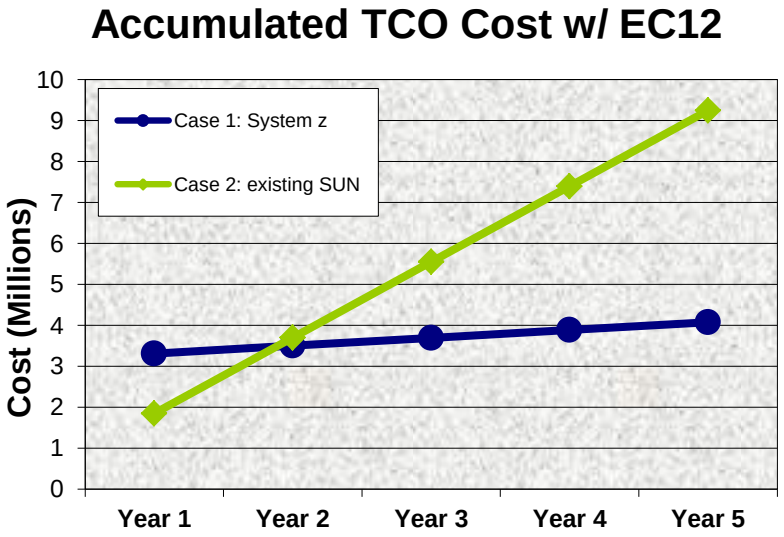
Example studies: Consolidation

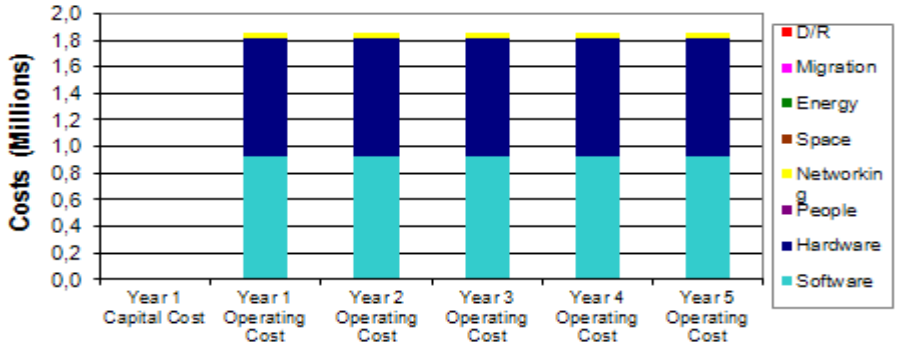
Consolidation I: Bank

- Current environment: >300 UNIX server farm
  - SUN/SPARC, Power Systems, Intel
  - Mainly Oracle database, Application Servers
- Servers considered for consolidation:
  - Oldest SUN servers, which are depreciated
  - Database servers only
  - 25 servers with 188 cores can go to 7 IFLs on zEC12
    - Average utilization rate from std. UNIX 17% up to 50%

Consolidation I: Cost structure and analysis







HW investment ~USD 1M for zEC12

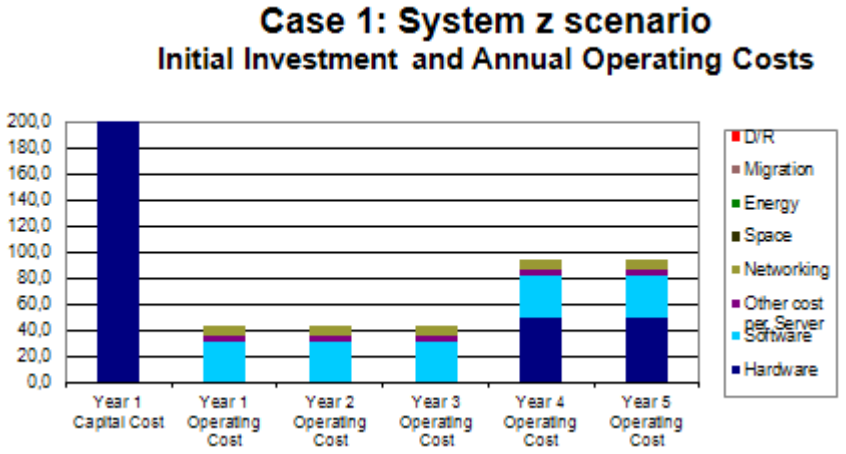
- pays off in year 2
- Annual SW cost down 600k
  - Reduction of cores
- Annual HW cost down 700k
  - Reduction of servers

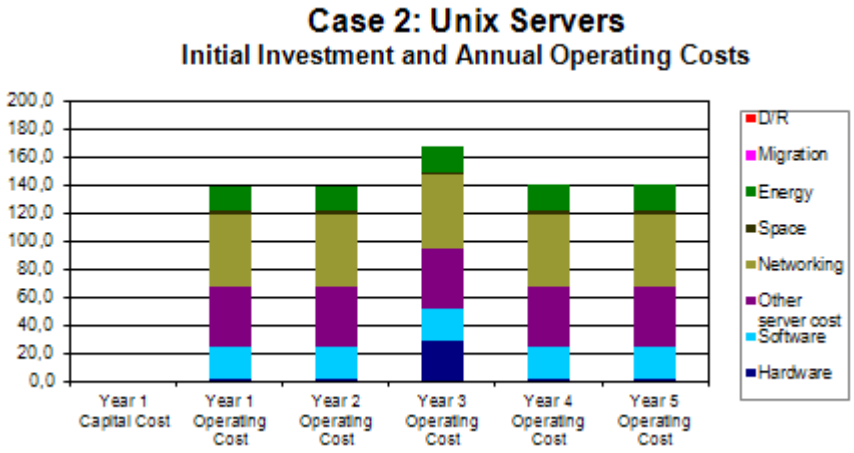
Consolidation II: Bank

- 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





Consolidation II: Analysis

- Technical advantages:
  - D/R environment added to System z with CBU
  - Reduced network and server complexity
- Financial advantages:

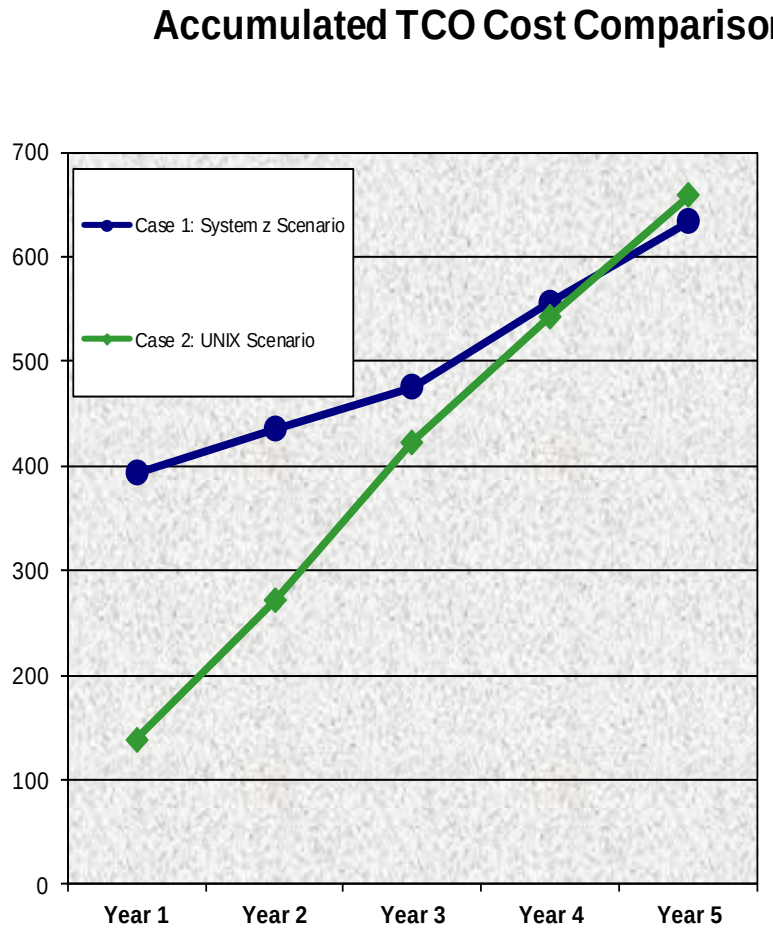
  In regard to 5yr-TCO

  $55k (8%) at 0% interest

  In regard to annual cost

  $74k avg. in years 2-5

  $46k (33%) in year 5

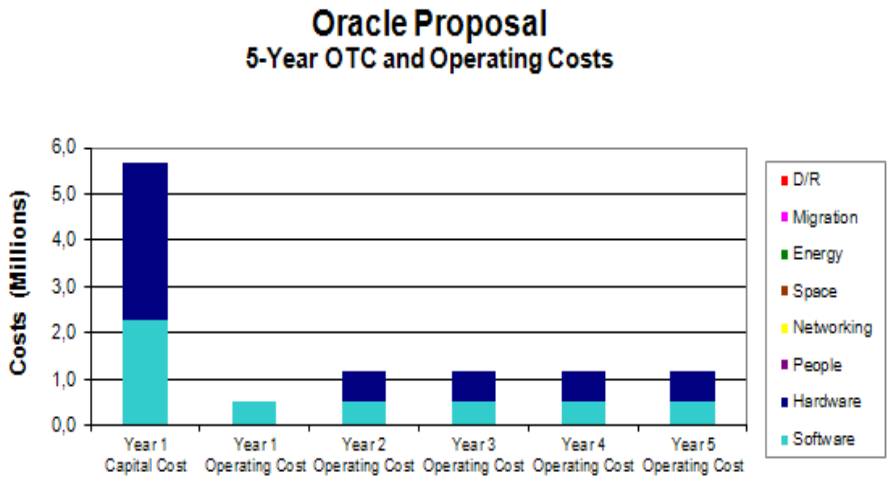


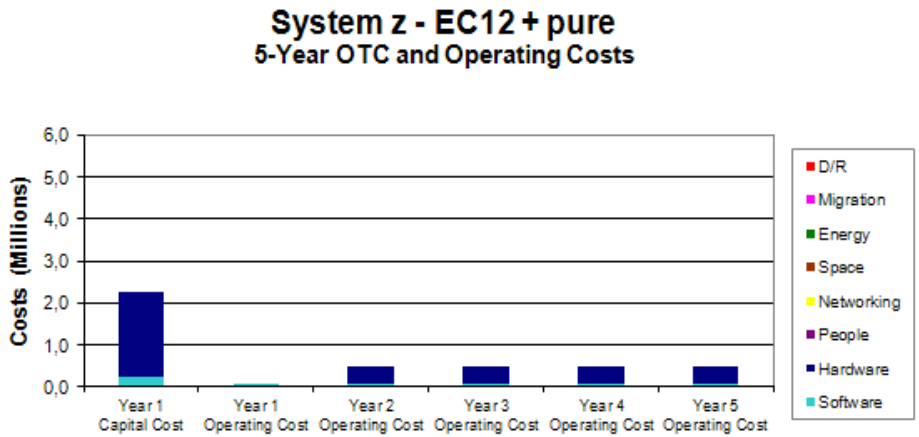
Example studies: New Workload

New Workload: Telco

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

New Workload:
Cost structure & analysis





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

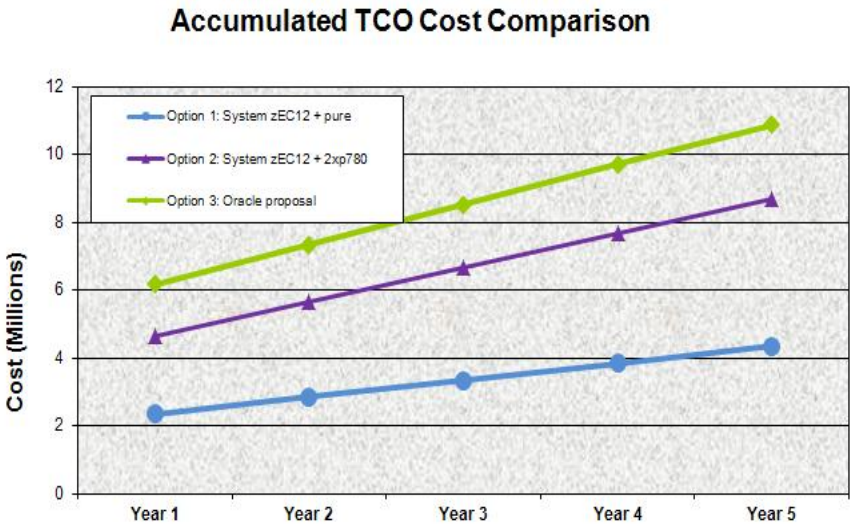
New Workload: financial analysis

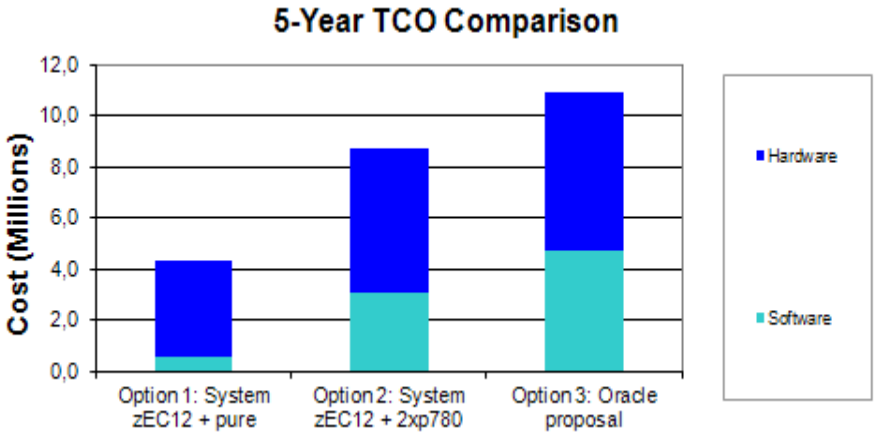
Recommendation:

Implement Siebel CRM

on zEC12 with pureFlex for flexibility and minimal cost

or zEC12 with 2xp780 for maximum consolidation





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	

Summary: Functional and financial advantages

- 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 addt'l 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