

# Hex, Lies and Videoblogs – Debunking Mainframe Myths

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IBM

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## Quick Survey: True or False?

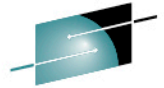
- Mainframes expensive to buy and support.
- Mainframes are an outdated platform for enterprise applications
- All Mainframe code is in COBOL or Assembler
- The only way to get to the mainframe is a green screen.
- Mainframe people are all old and about to retire
- Mainframe technology is always behind the other platforms
- Mainframes are hard to use
- Mainframes are slow

## Quick Survey: True or False?

- Mainframes expensive to buy and support.
- Mainframes are an outdated platform for enterprise applications
- All Mainframes run in CICS
- The only way to interact with a mainframe is through a green screen.
- Mainframe people are retiring
- Mainframe technology is not as good as the other platforms
- Mainframes are still used
- Mainframes are still used

**False**





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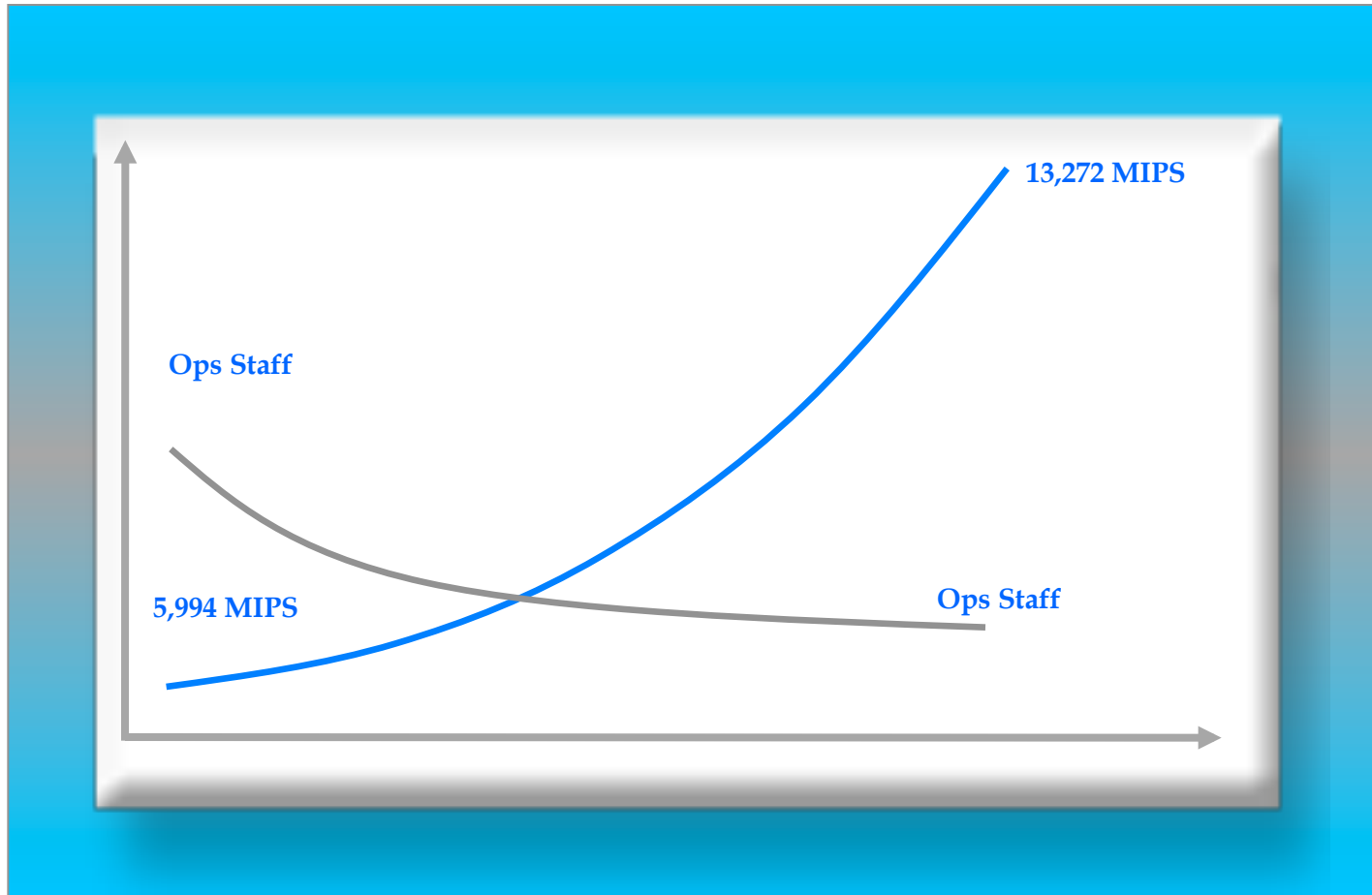
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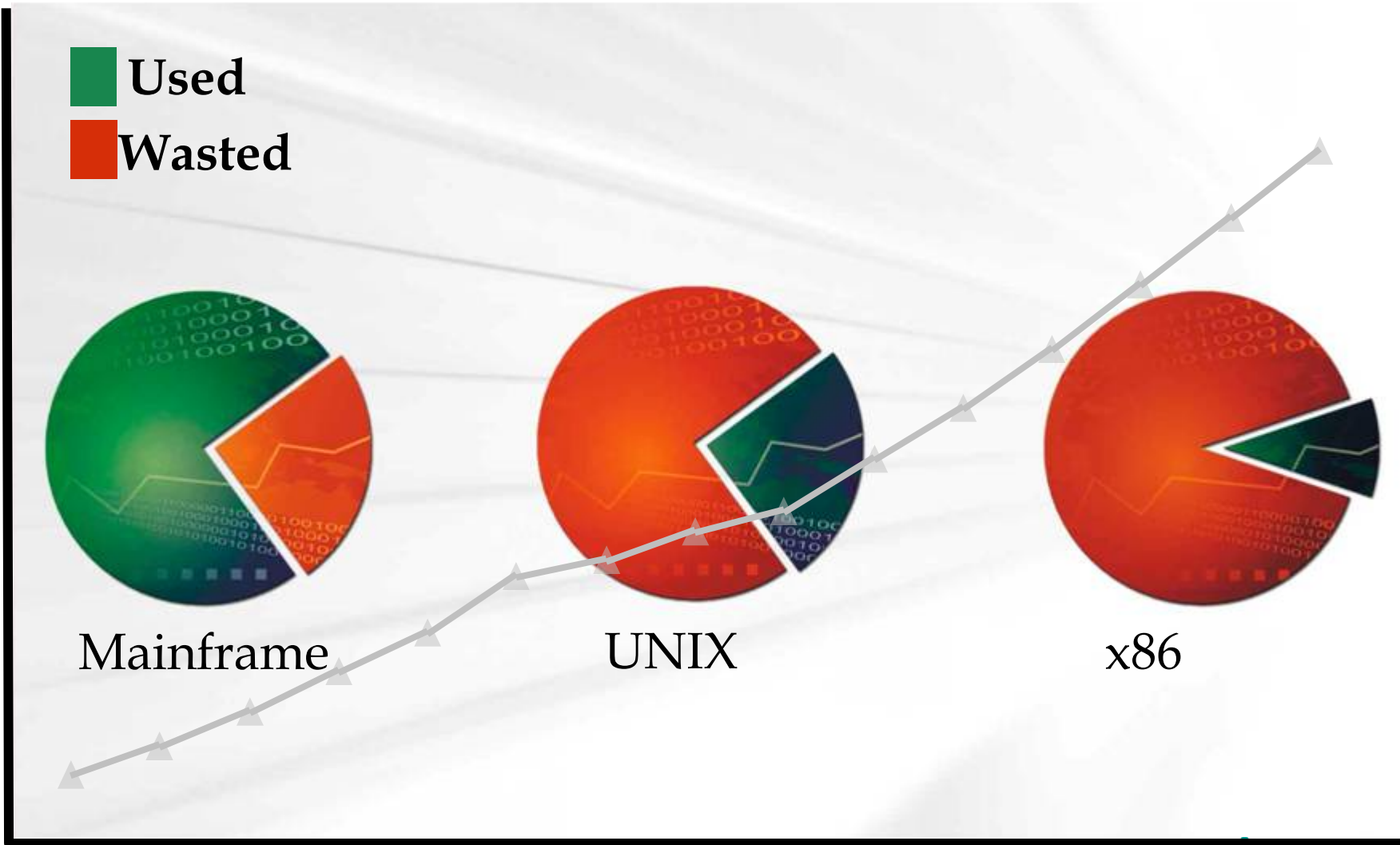
# Myth1: Mainframes are Expensive

- **Acquisition cost** of System z is higher
- Total cost of ownership of mainframes are **lower**
  - End user operations
  - Cost of availability
  - Cost of security
  - Productivity
- Compare **apples to apples**
  - Hidden data center fees tied to the mainframe
- Current System z customers can increase **power for less**
- As the number of MIPS grows the **cost decreases**
- Support **costs** remain **consistent**

# More Powerful Mainframe – Same Staff

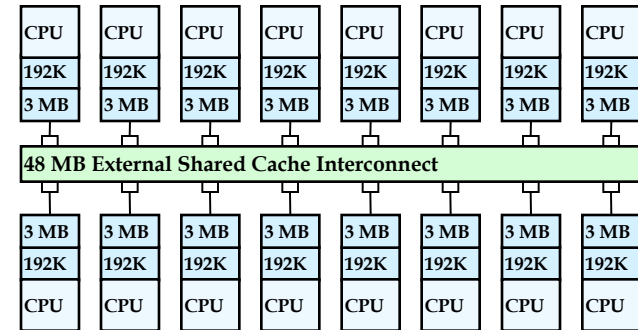
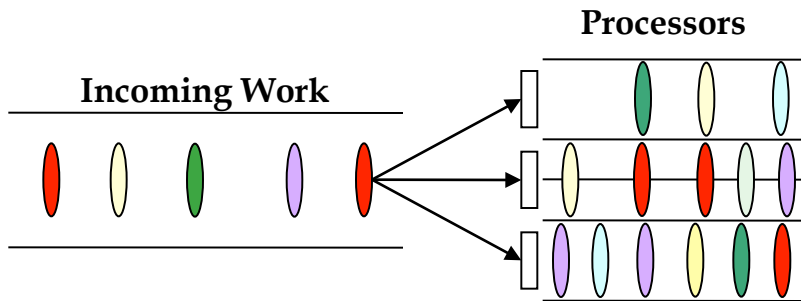


# Comparison of Utilization Rates





# System z – Shared Everything



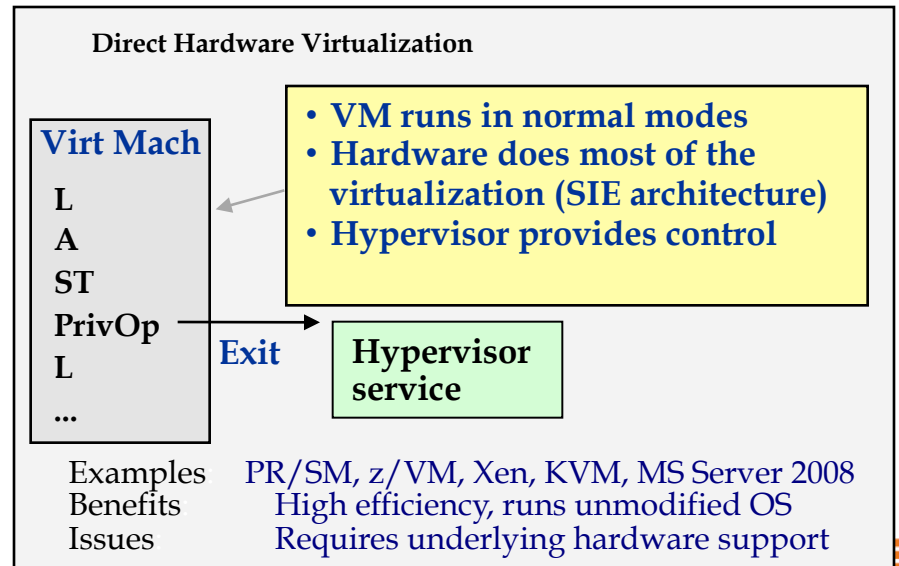
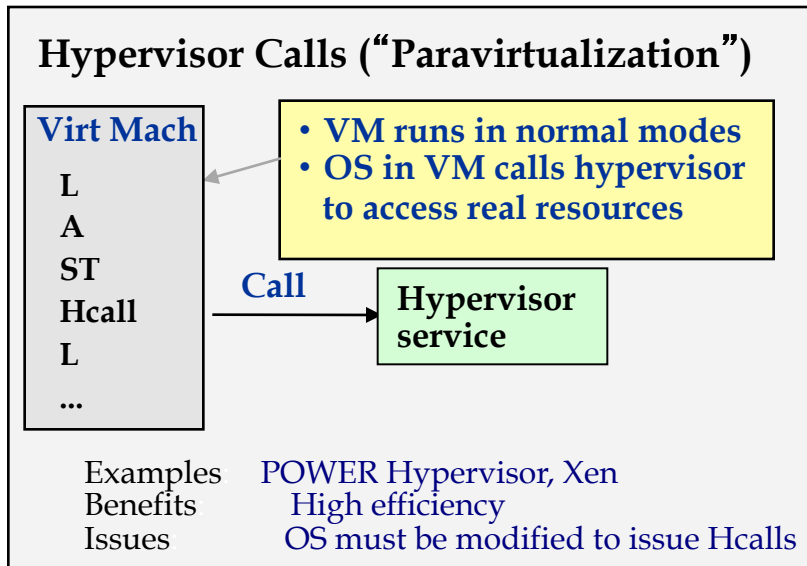
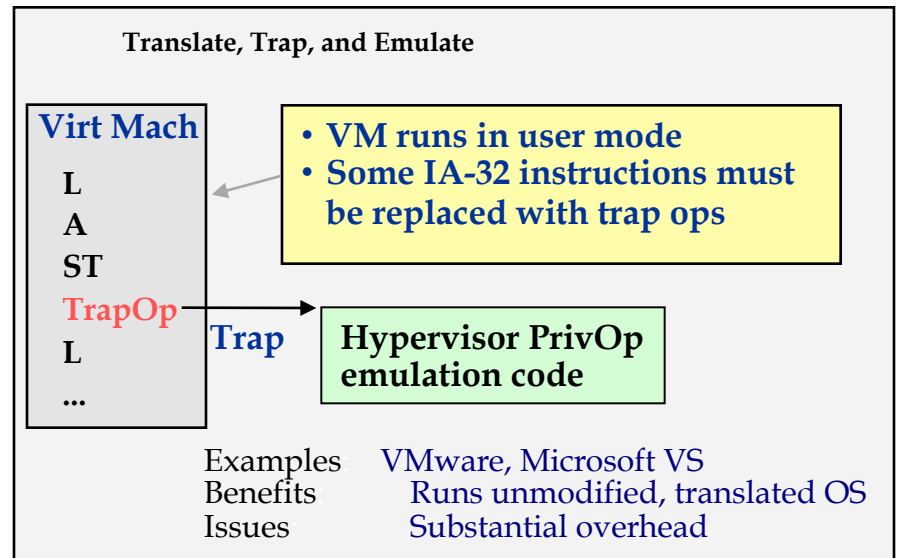
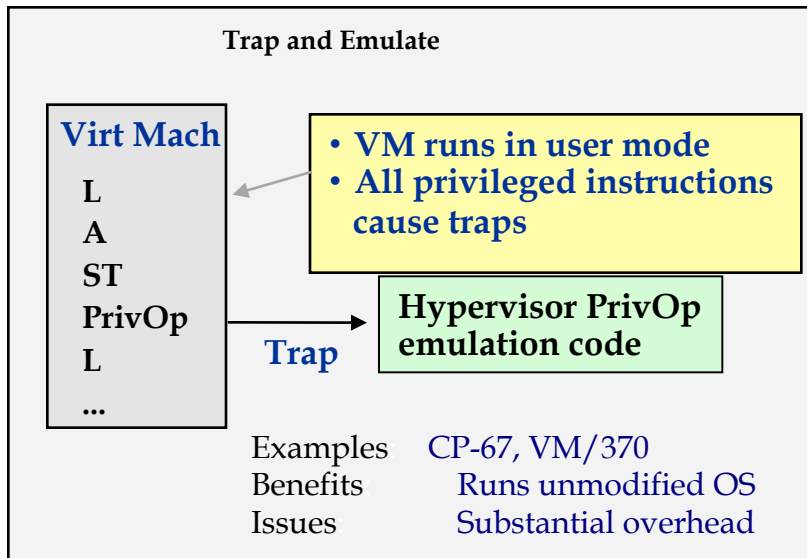
## z/OS Workload

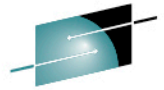
- Varying sizes, arrival rates, and workload types
- **Frequent context switches**
- Need to dispatch work to any available processor with very little affinity to achieve high utilization
- **Significant data sharing between threads**
- I/O operations offloaded to independent channel subsystem

## System z10 Book

- Designed for frequent context switches between short running applications
- **Flattest IBM memory model**
- Shared cache provides faster access and less update delay for shared data
- Strong consistency memory model provides faster updates to shared data (more efficient locking).
- **Breaks CPU affinity quickly**

# Different Virtualization Model





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# Developing a Cost / Value Model

The cost model is where you quantify the items that were developed in the evaluation model

- The choice of cost elements often dictate which platforms are considered the “lowest” cost.
- **Costs in fact go way beyond hardware, software, and maintenance**
- Values are often the inverse of indirect costs
- Develop metrics to quantify value (e.g. outages, security breaches, etc)

## Sample Direct Costs

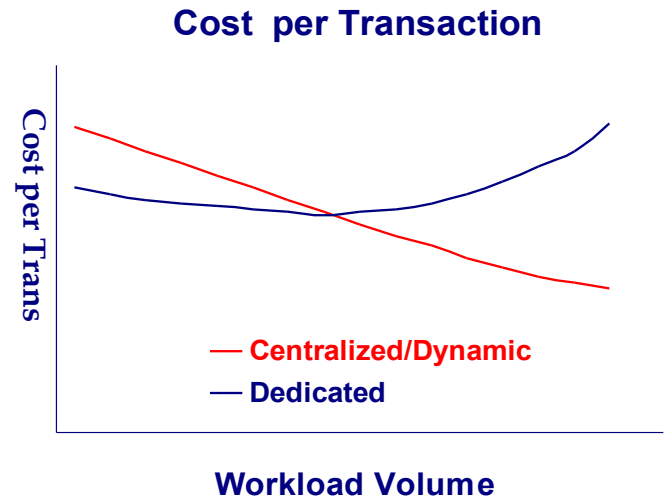
- Hardware: Prod and non-prod
- Hardware maintenance
- Internal FTEs and consultants
- Software
- Software maintenance
- Power and cooling
- Floor Space
- Network and FC ports
- Residual value
- Disaster recovery
- High Availability
- Asset management

## Sample Indirect Costs

- Cost of an outage
- Security breach
- Cluster complexity
- Business flexibility
- Risk
- Time to market

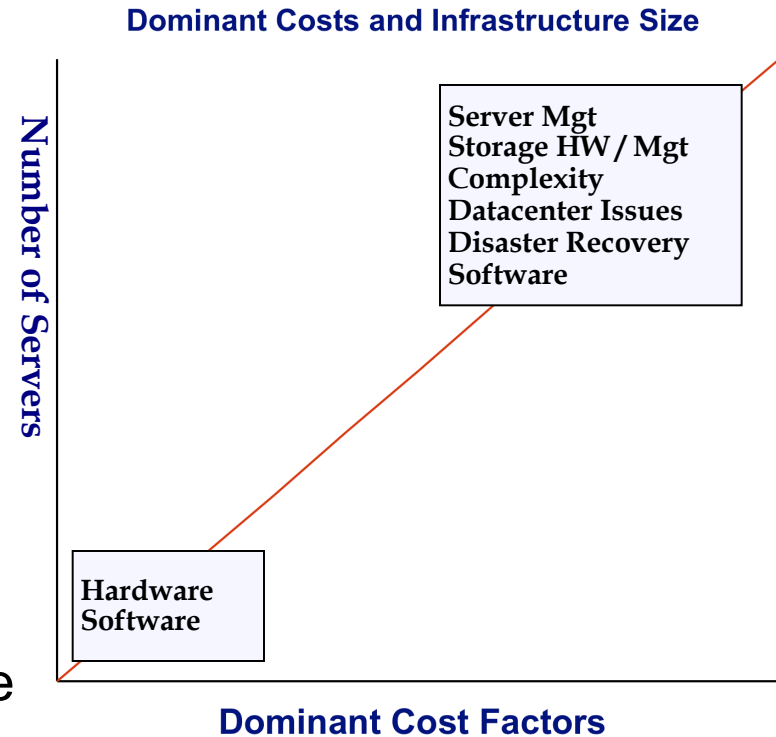
# Cost per Unit of Work

- Centralized Business Infrastructure
  - Initial cost higher
  - Costs decline per transaction
- Dedicated Business Infrastructure
  - Initial costs low
  - Sharing lowers costs per transaction
  - As workload continues to increase so do costs
- A dynamic virtualized infrastructure affects cross over point



# Dominant Costs Factors Change with Scope

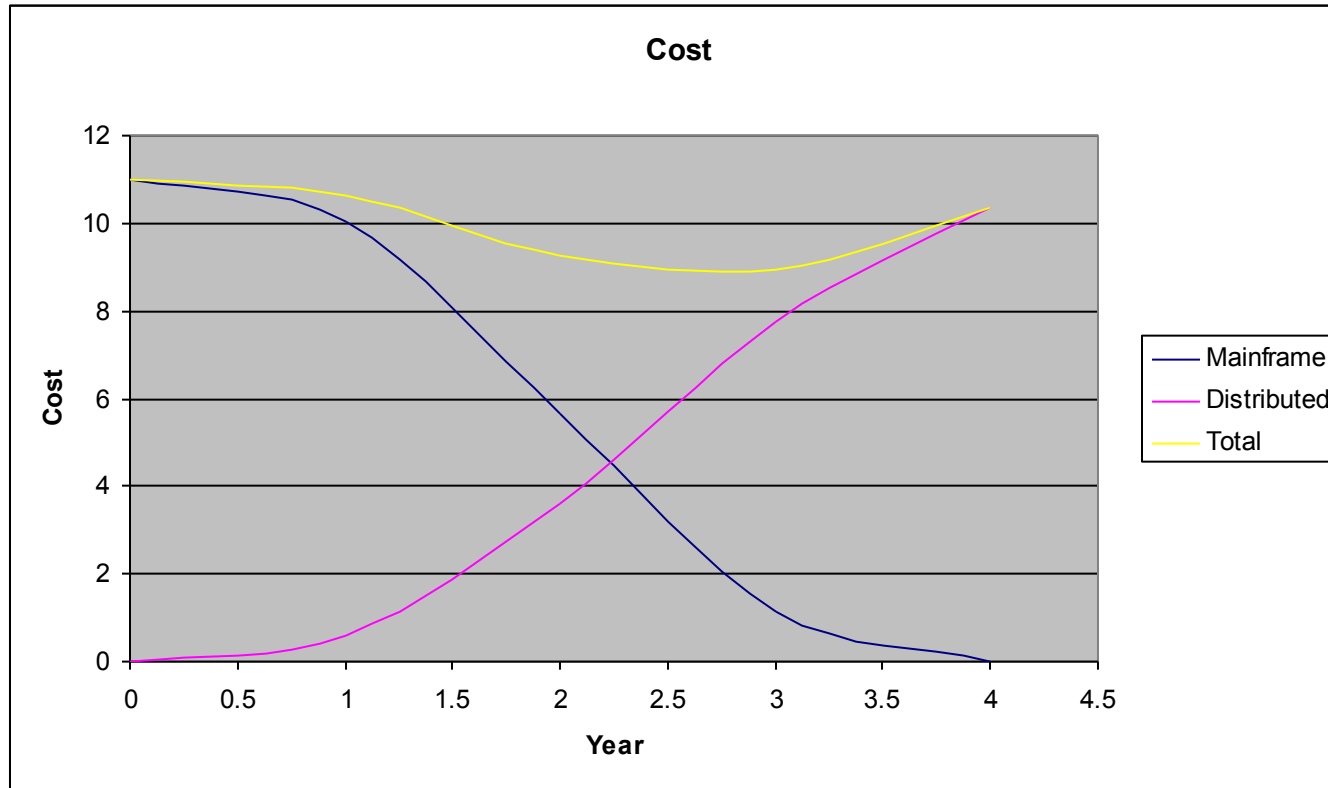
- **Cost Factors**
  - As infrastructure grows, the costs shift from HW/SW to other factors.
- **Deployment Model Matters**
  - Distributed servers offer the lowest cost for small environments.
  - Virtualized servers will most likely dominate the middle of the curve.
  - Centralized servers become critical with scale.
- **Line of Business deployment costs may be sub-optimal for the enterprise**





# Cost over time

“If technology is saving money, why does the bill go up every year?”



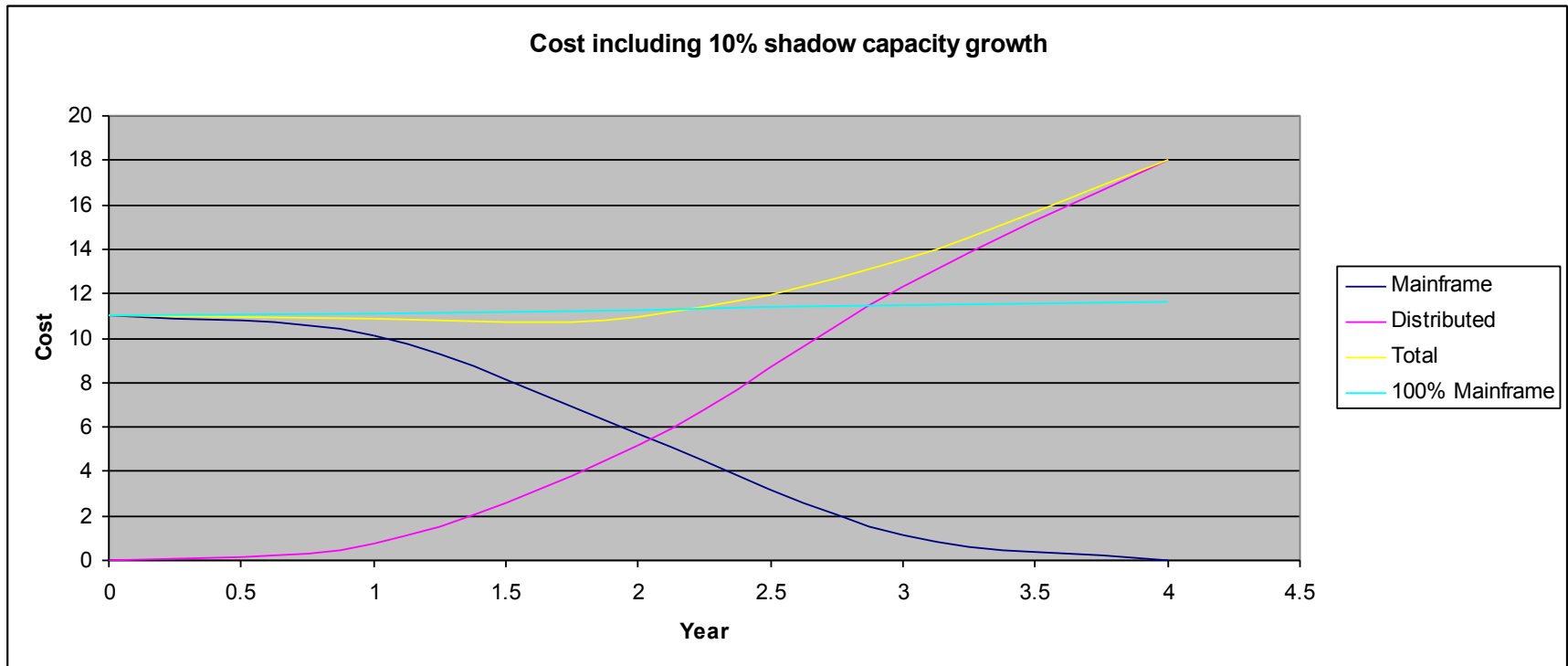
In this case you save money initially but the savings are not sustained  
*This does not include migration costs. The business case is not robust.*

# Shadow Capacity

If you “disintegrate” a z load “shadow capacity” is added to the load.

- Capacity to connect distributed applications to data
- Capacity for Management/Monitoring Software
- Capacity for redundancy
- Capacity due to increases in headroom required to meet SLAs
- Capacity due to lower saturation design points
- Capacity for infrastructure management (Network, Security, Provisioning, etc.)
- Capacity due to shifts in application design and implementation (language changes, code generators, object orientation, etc.)

# Modified cost model



Shadow Capacity eliminates savings





E  
results

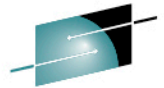


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# Myth 2: Mainframes are Outdated

- Mainframes support **latest standards**
  - J2EE
  - Linux
  - SOA
  - Open standards
- Mainframes support **collaboration**
  - Simplified integration of infrastructure facilitates collaborative infrastructures
- Rest of the world is **catching up** to System z
  - Distributed systems virtualization is behind mainframe
  - Advanced power management
  - Workload management
- Cloud – Making the distributed world more **like the mainframe**
- ITIL – Taking mainframe **procedures** to distributed environments



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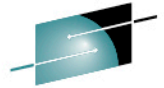


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# Myth 3: Mainframe Skills are OLD!

- Middleware direction is for **platform independent** code
  - J2EE and other containers
  - Cross platform management tools and GUI tools are growing
- Data retrieval protocols favor **platform agnosticism**
  - Cost of mainframe skills flat
  - COBOL programmers do not make more than Java programmers
  - Huge supply of programming skill worldwide
  - Mainframe skill staff are less than 5% higher than distributed skills
- Education of mainframe **skills are rising**
  - IBM's academic initiative has trained 50,000 students
  - Supported by over 600 colleges and universities





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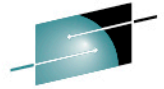


# Myth 4: ISVs Don't Do Mainframes

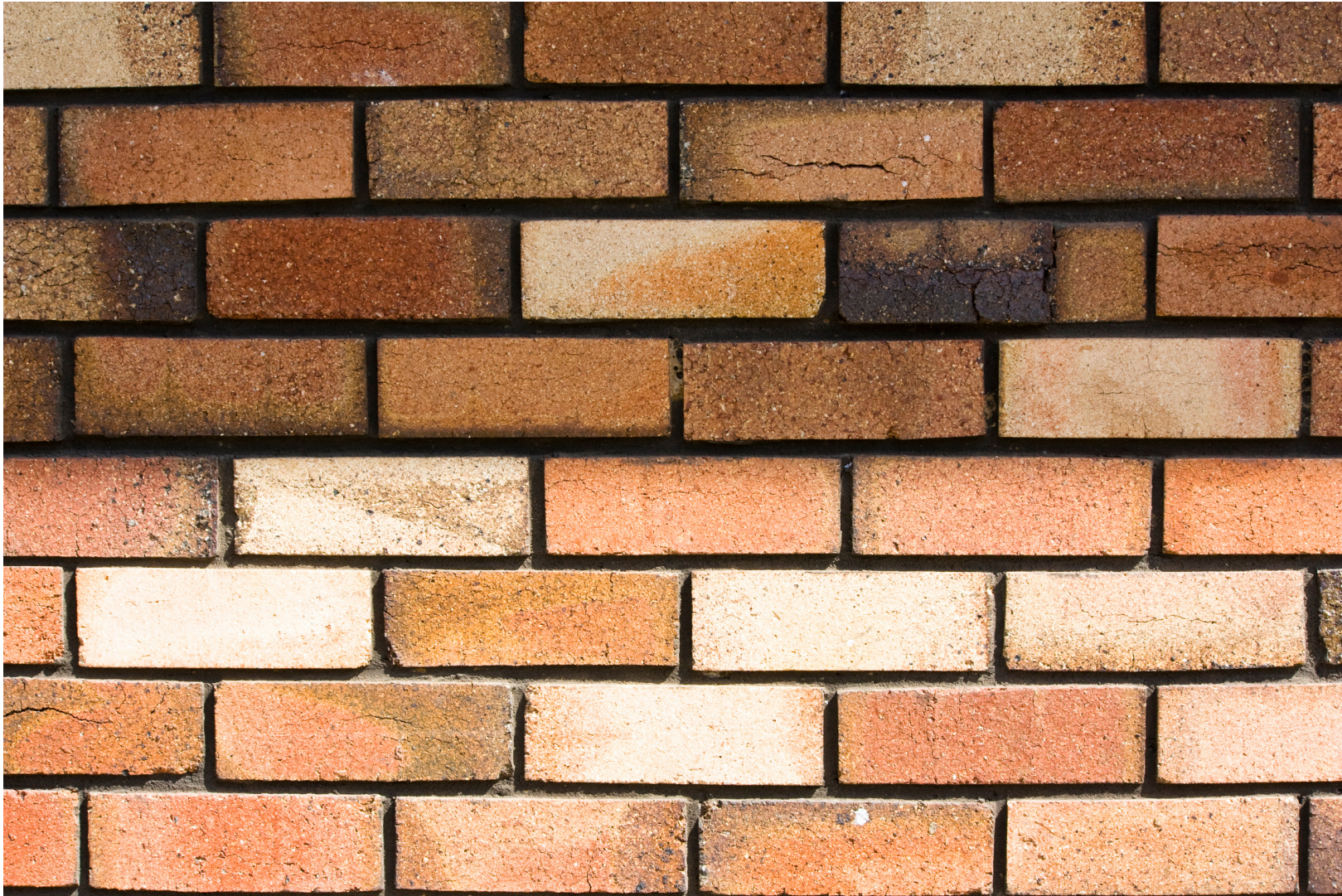


- Over **6,000** applications from **1,600** vendors on Linux on System z
- J2EE applications run on the mainframe
  - Oracle
  - Temenos
  - SAP
  - Misys
- IBM continues to improve its portfolio for the mainframe to ease ISV **utilization**
- **SOA** and services make mainframe resources more available
- **Web 2.0** Support makes “old” “new”





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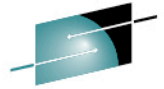




# Myth 5: Mainframes are Inflexible



- Mainframes **pioneered** Capacity Upgrade on Demand
- Can you say **LPAR**?
- Intelligent Resource Director
- **Transaction based** workload management
- **Virtualization** the other guys wish they had
- **Upgrades** without interruption
- Using zLinux & zOS **collocates** applications and data
- **More** compute power **same** staff



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# Myth 6: Mainframes are slow

- Measurements based on **benchmarks**
- Benchmarks test operations on cached data
- Not based on **real** workload
- Real workload is **messy**
- Not about chip **speeds**
- It's not about calculations



All computers wait at  
the same speed!



# Not All Computers are Created Equally

Sharing the Computer

Shared Everything  
**Low Latency**  
(OLTP, Mixed Workload)

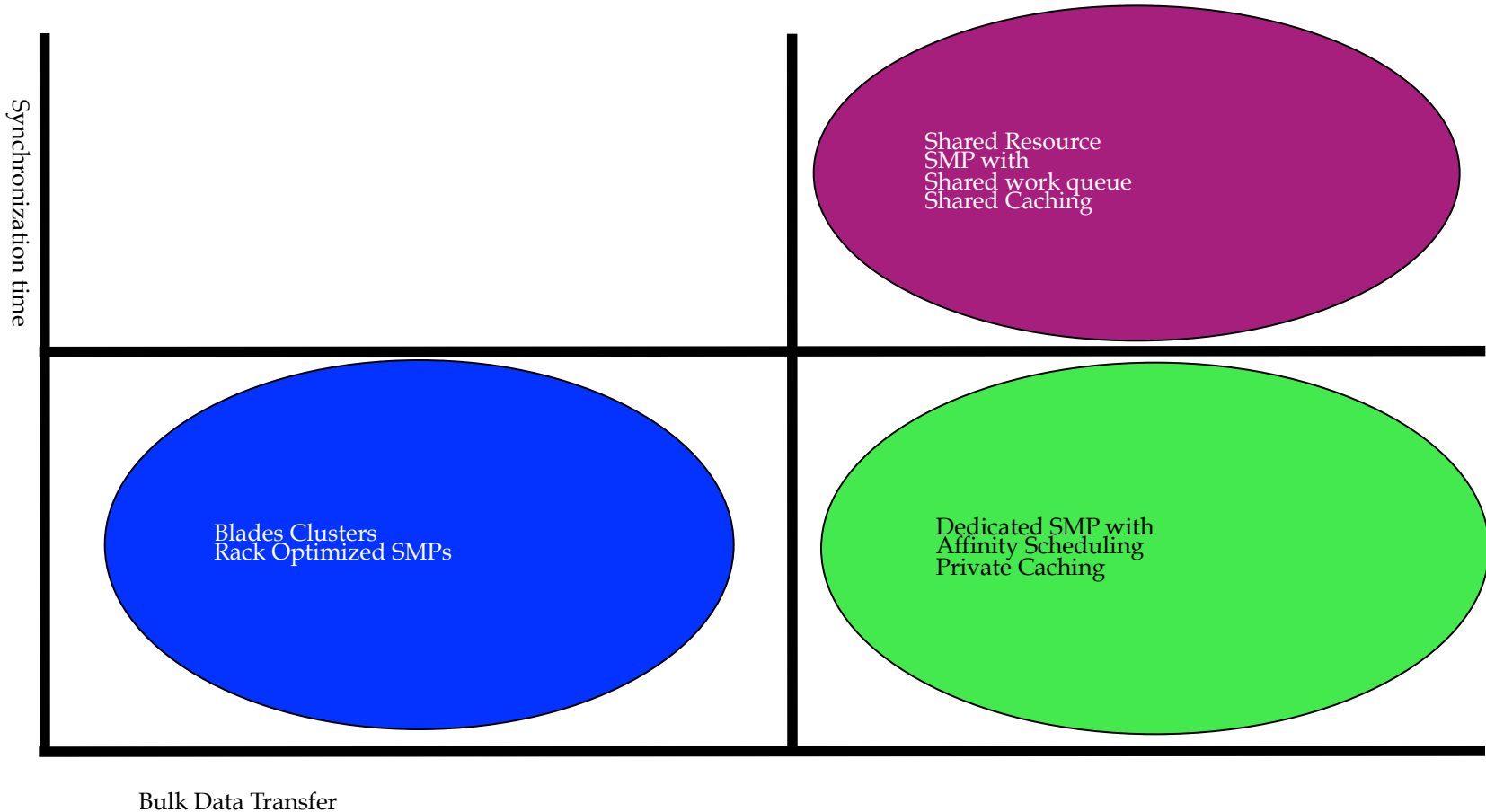
Shared Memory  
**Low - Medium Latency**  
(OLTP, Legacy SMP)

Shared Nothing  
**High Latency**  
(Read Only Web Serving, Some DSS)

Shared Memory  
**High - Medium Latency**  
(Data Warehouse, Some DSS)

Bulk Data Transfer

# Computers and Their Strengths



# Beware of Distributed Platform Bigots

- **Evangelists** understand why theirs is cool
- Just because you **can** doesn't mean you **should**
  - “Just give me enough machines!”
- Beware of distributed use of mainframe terms
- Think about **capabilities** as well as function
  - Non Functionals
    - Security
    - Availability
    - Performance
- Understand the **workload**

# Which is the Better Vehicle?



Maserati MC12

VS



Peterbilt Semi

## The Race - 1/4 Mile Dragstrip

# Which is the Better Vehicle?



100 Maserati MC12s

VS



Peterbuilt Semi

## The Race - $\frac{1}{4}$ Mile Dragstrip Carrying 10 tons of crates

# Is this better ?



**VS**  
**?**



10 - Ford F-450 1 Ton Pickups

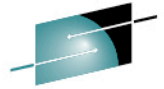
1- Peterbuilt Semi

## The Race - ¼ Mile Dragstrip Carrying 10 tons of crates



# More than analyzing the speed....

- Can the load be **split** into parts?
  - Can you make more trips with fewer pickups?
- **Where** is the load going?
  - Can the truck go there ?
- 10 drivers vs. 1 driver (**skills**)
- Fuel **cost** differences
- **Maintenance** differences
- Loading/Offloading differences
- Parking differences



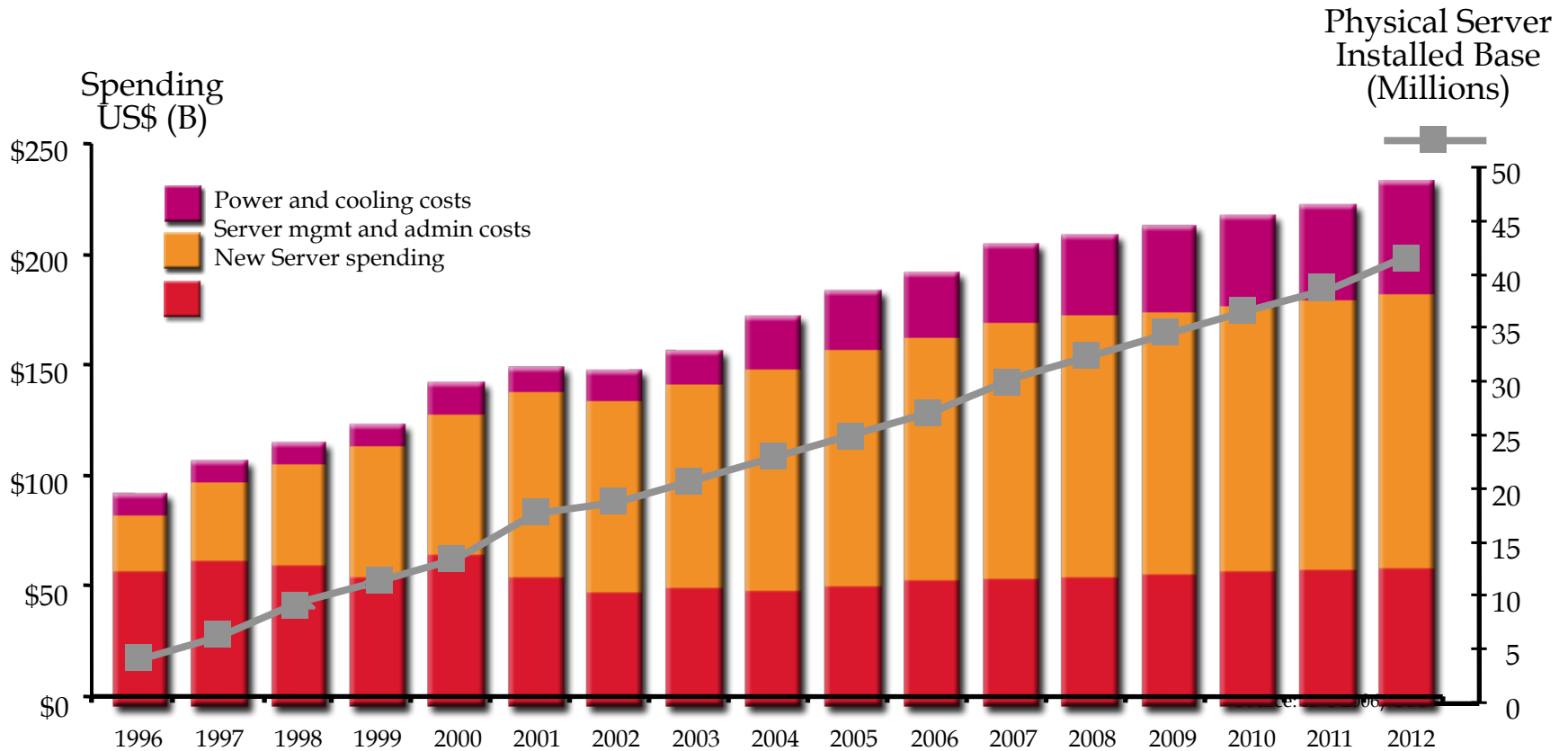
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# Myth 7: Small Servers are Cheap

Worldwide IT Spending on Servers, Power, Cooling and Management Administration

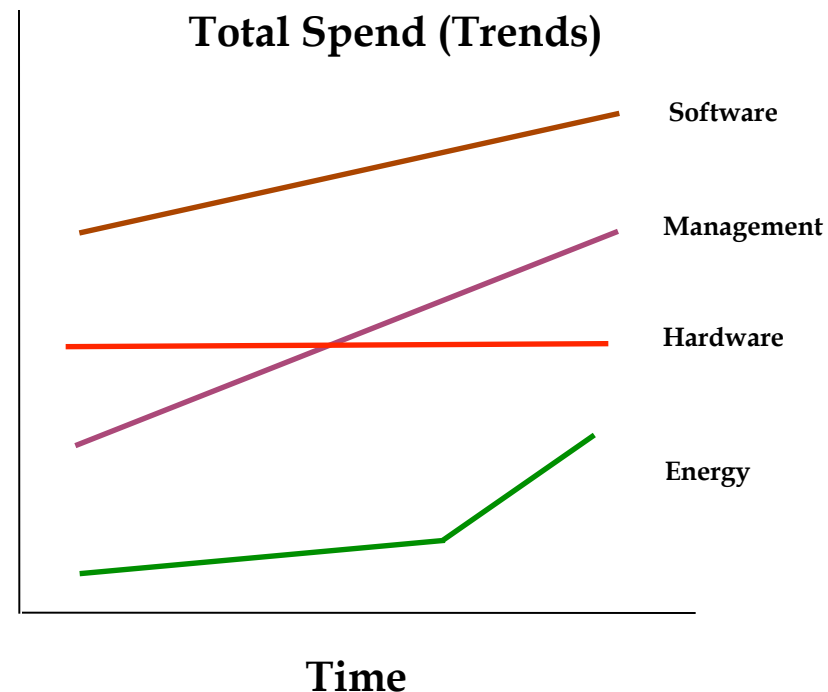


Source: IDC

# IT Cost Trends – Alternative view

- Management costs are **growing** rapidly
- Software costs grow **linearly**
- Energy costs are **rising**
- Hardware spend is **flat**

**New datacenters  
are expensive!!**

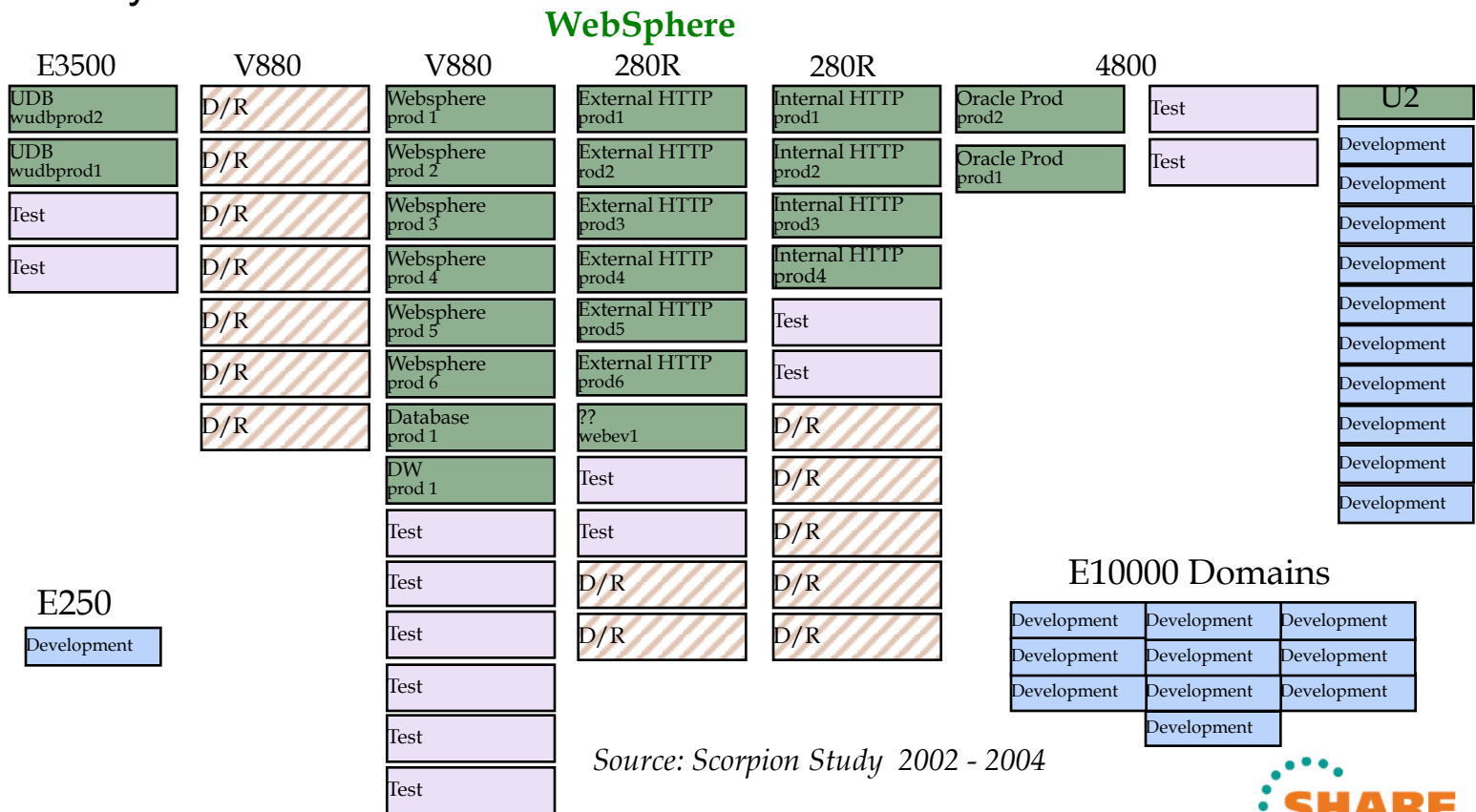




# Case Study: A Sun Loving Finance Co.



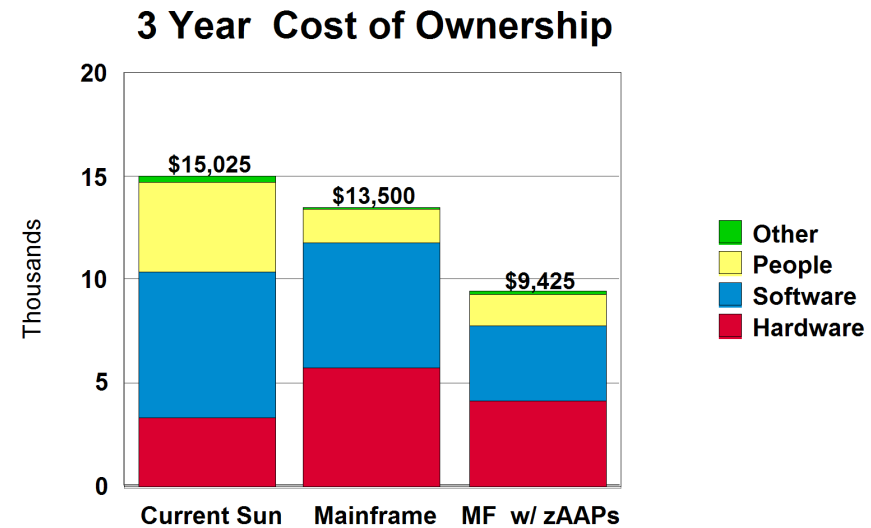
- US Finance customer thought they only had 24 UNIX servers
  - But these were just the PRODUCTION servers
  - In addition they had 49 servers for Development, Test and Disaster Recovery



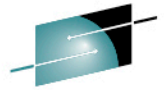
Source: Scorpion Study 2002 - 2004

# The Hidden Costs Kill

- Servers: Distributed **63** vs mainframe **20**
- Admins: Distributed **14** vs mainframe **5**
- Software: Distributed **\$7M** vs mainframe **\$6M**
- The **client thought** Sun was 1/5 the Cost
- With IFLs System z was 37% **cheaper**







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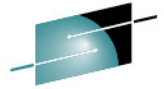
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# Myth 7: Cloud Computing Replaces Mainframes



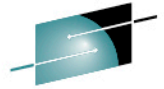
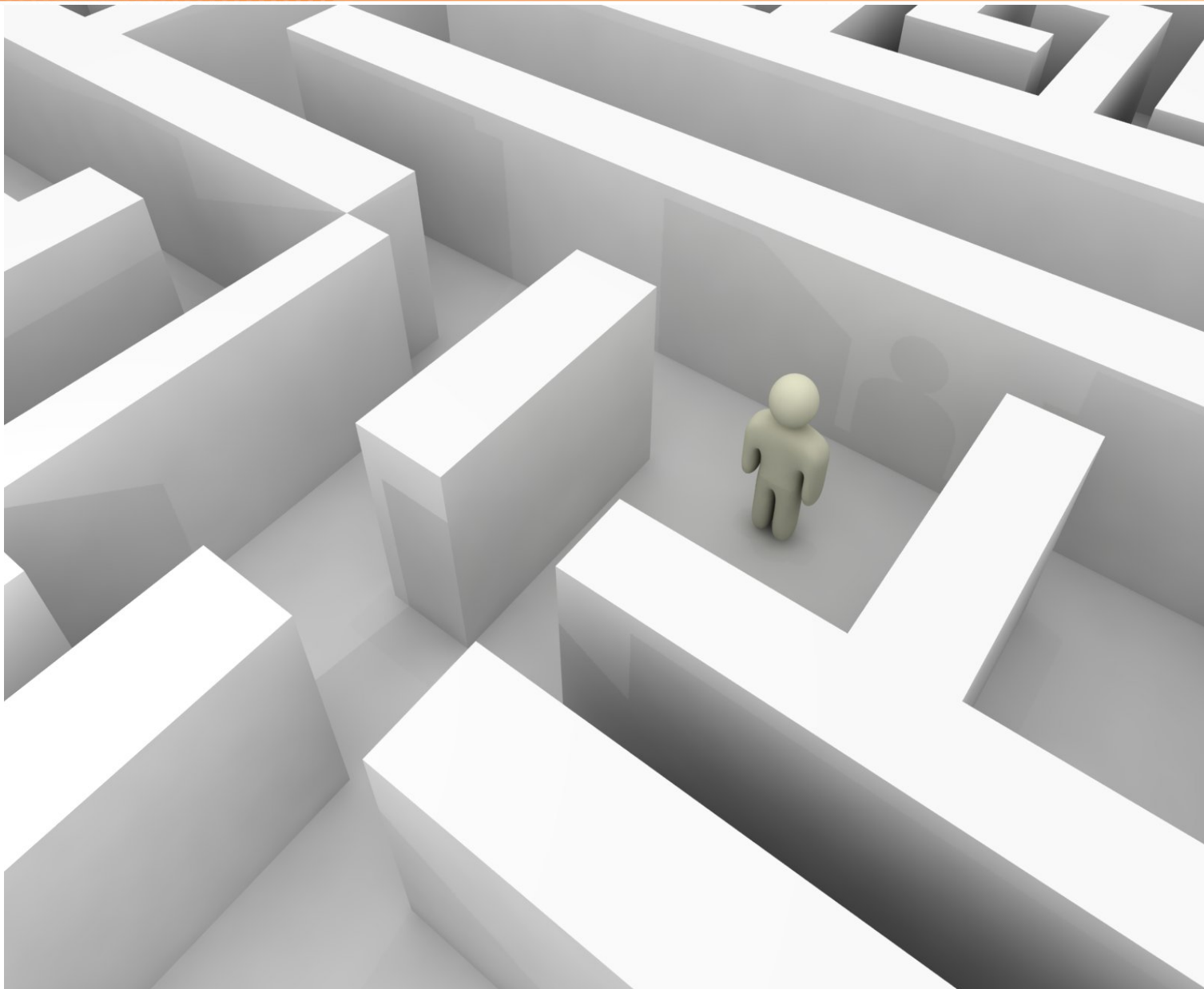
- **Stateless** model
  - Availability based on **replication**
  - **Commit Scope?**
- Relies on **software** only
- Security is an issue
  - Data **Privacy**
- Value for variable workload
- Compliance



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# Myth 8: Mainframe is too Complex

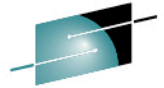


- Complex **business** problems
- Intricate **process**
- Distributed **complexity** abounds
  - **Hidden** in the data center
- **Green** screen



# Summary

- Too much **disinformation** on mainframe
  - The conspiracy is widespread
- Think **Holistically**
- All you need are the real **facts**
- Create a **level** playing field
- Make sure that you look at the **full picture**
- Understand the **workload**
- Remember the **cost mode**
- Don't be **fooled** by terms



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**Please Make those Distributed Weenies Stop!!**

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