zEnterprise – The Ideal Platform For Smarter Computing

Smarter Computing With zEnterprise

Smarter Planet Solutions Increase Demands On IT

Between 2000 and 2010 ...

- Servers grew ***6x***
- Storage grew ***69x***

Virtual machines growing ***42% per year***

32.6M servers worldwide

- ***85%*** idle computer capacity
- ***15%*** of servers run 24/7 without being actively used on a daily basis

1.2 trillion GB exist in the digital universe

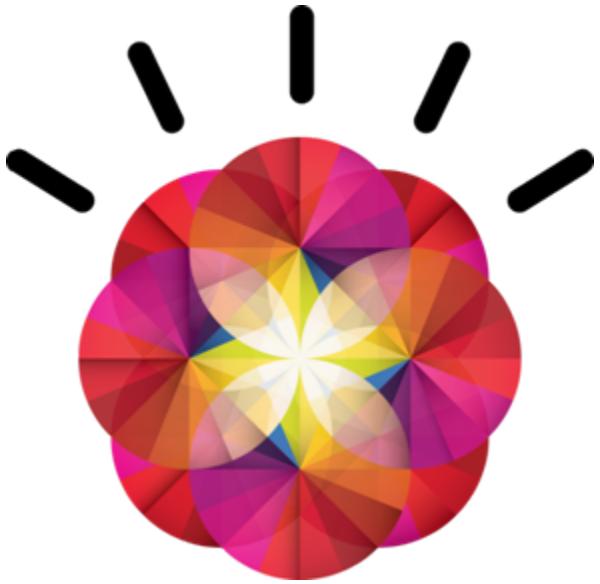
- ***50%*** YTY growth
- ***25%*** of data is unique
  75% is a copy

But IT budgets are growing less than 0.8% per year

Resulting Sprawl Drives Unsustainable Costs

Cost to Manage Growth of Inventory Consumes IT Budget

Smarter Computing...



Strategies to manage increasing demand for IT services in an environment of flat IT budgets – by achieving breakthrough reductions in cost

Smarter Computing…

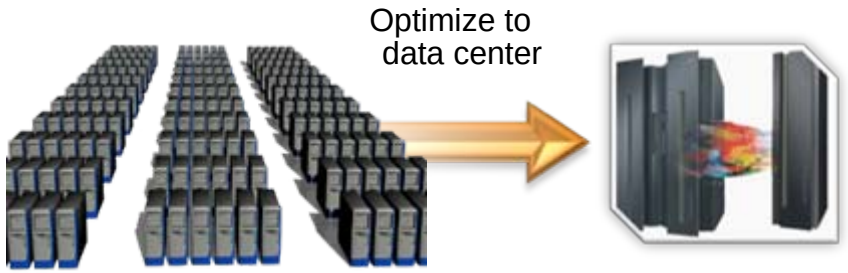
Measuring Cost

New metric for the age of Smarter Computing

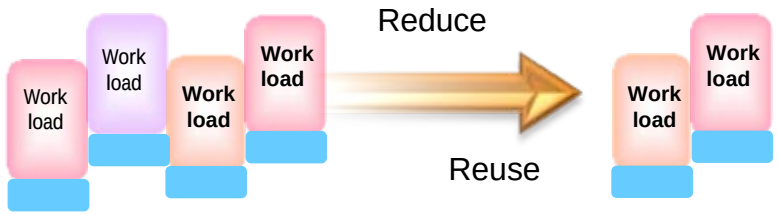
COST PER WORKLOAD

Smarter Computing Strategies To Reduce Costs And Improve Value

Consolidate Infrastructure

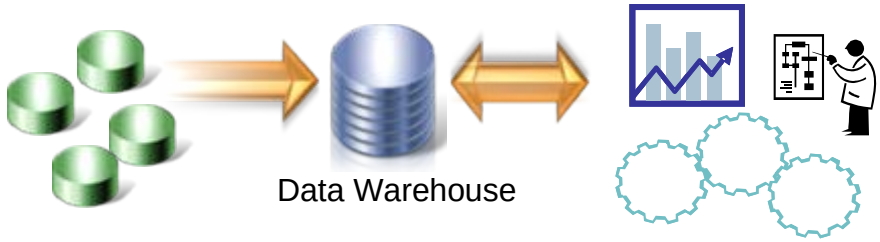


Eliminate Redundant Software



Improve Service Delivery

Leverage Data to Optimize Business



The IBM zEnterprise System Is The Ideal Platform For Smarter Computing

- World's first multi-architecture virtualization platform
- Workloads deployed on optimal platforms
- Unified system management
- Broad support for private clouds
- Superior platform for business analytics

zEnterprise – Optimized to deliver the lowest cost per workload

Consolidate Infrastructure With zEnterprise

Consolidate Servers

- Server virtualization and consolidation
- Hybrid and standalone workloads
- Best fit to workload

Consolidate and Optimize Storage

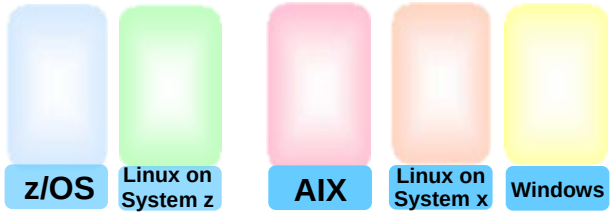
- Storage virtualization and consolidation
- Automated tiering
- Automated data migration
- Policy-based management

zEnterprise
Hybrid workload consolidation

DS8000
Virtualized storage
Easy Tier

Smarter Computing With zEnterprise Delivers Breakthrough Economics

Platforms Optimized For Different Workloads



Best fit for workload

Consistent Structured Management

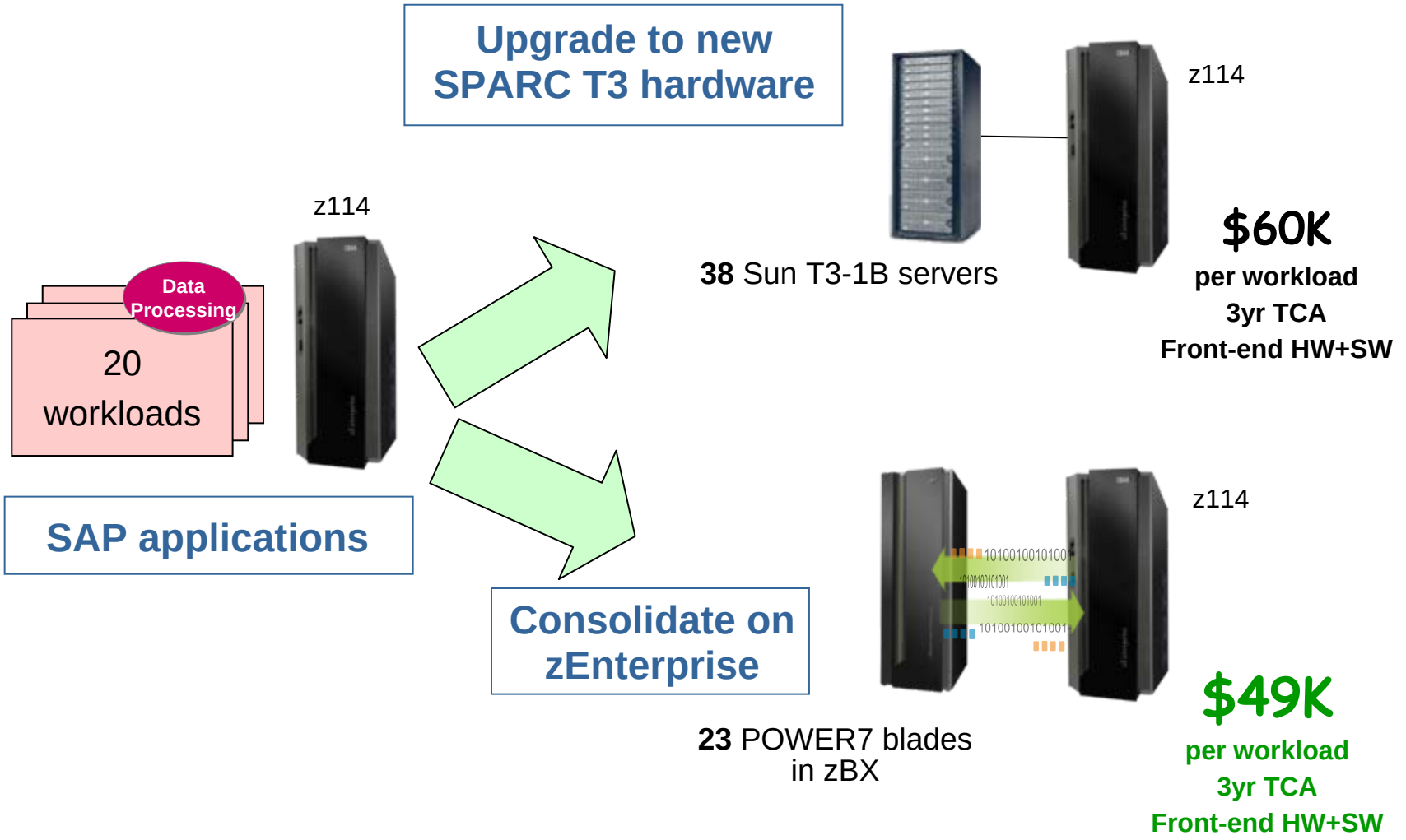
Lowest labor costs

Lowest Cost Of Acquisition Per Workload

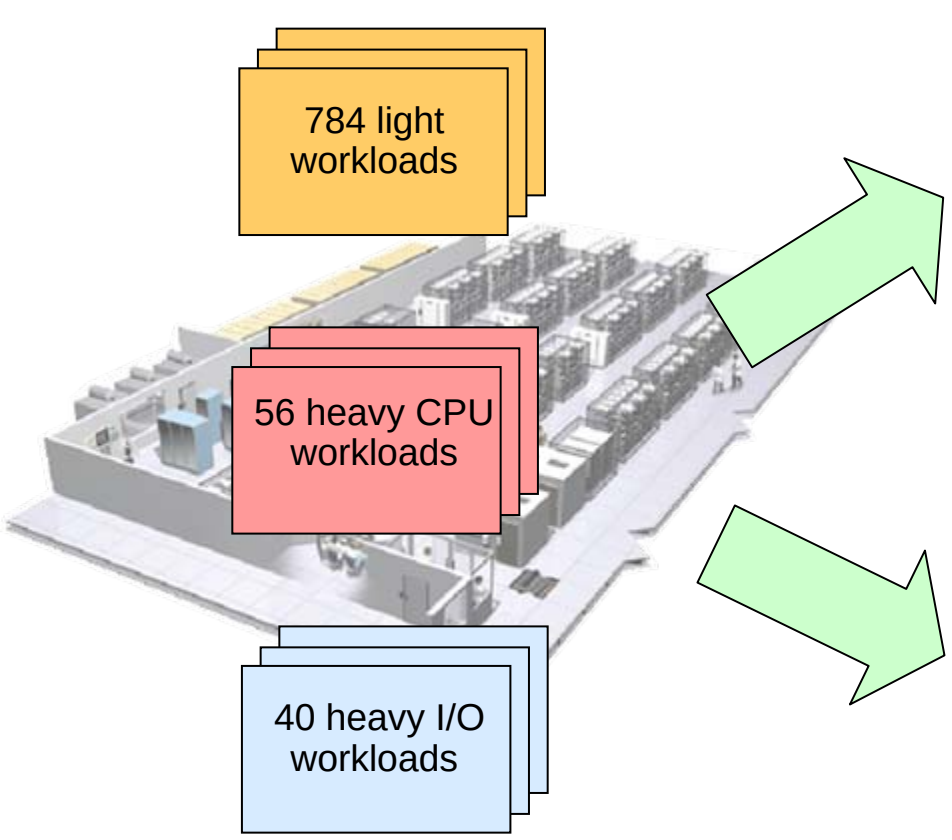
Lowest Cost Of Operation Per Workload

Lowest Cost Per Workload

Consolidate Hybrid SAP Workloads On zEnterprise And Save 18% Over Three Years



Consolidate Standalone Workloads On zEnterprise And Save 47% Over Three Years



880 workloads

Run on Sun Fire Servers

$43K
per workload
3yr TCA
HW+SW

z196

Consolidate on zEnterprise

$23K
per workload
3yr TCA
HW+SW

Server configurations are based on consolidation ratios derived from IBM internal studies. Prices are in US currency, prices will vary by country

Eliminate Redundant Software And Optimize On zEnterprise

Find and Remove Redundant Assets

- Discover existing assets and map their dependencies
- Consolidate multiple instances of same application systems

Reuse Services

- Identify componentized software as services
- Categorize and pool services
- Implement a reusable, services-based architecture

Tivoli

Application Dependency Discovery Manager

IBM WebSphere
SOA
Web Services

Consolidate SOA Workloads On zEnterprise And Save 59% Over Three Years

z114

Web Facing

Message Driven

24 workloads

Web front-end workloads

Deploy on Sun hardware

Competitive Packaged System

24 Sun Fire X4170 servers
plus **2** HP servers (ESB)
312 cores total

$433K

per workload
3yr TCA
Front end HW+SW

z114

Power Blades in zBX

z114

WebSphere App Server and DataPower

24 POWER7 blades plus **2** XI50z in zBX
192 cores total

$177K

per workload
3yr TCA
Front end HW+SW

Use zEnterprise To Improve Service Delivery And Adopt Cloud Computing

Transform to Private Cloud Delivery Model

- Self-service automated provisioning and workload scheduling
- Elastic capability to expand
- Pay-as-you-go

Integrate Service Management

- Visibility, control, automation
- Simplified, Web-based user interaction

Improve Labor Productivity and Flexibility

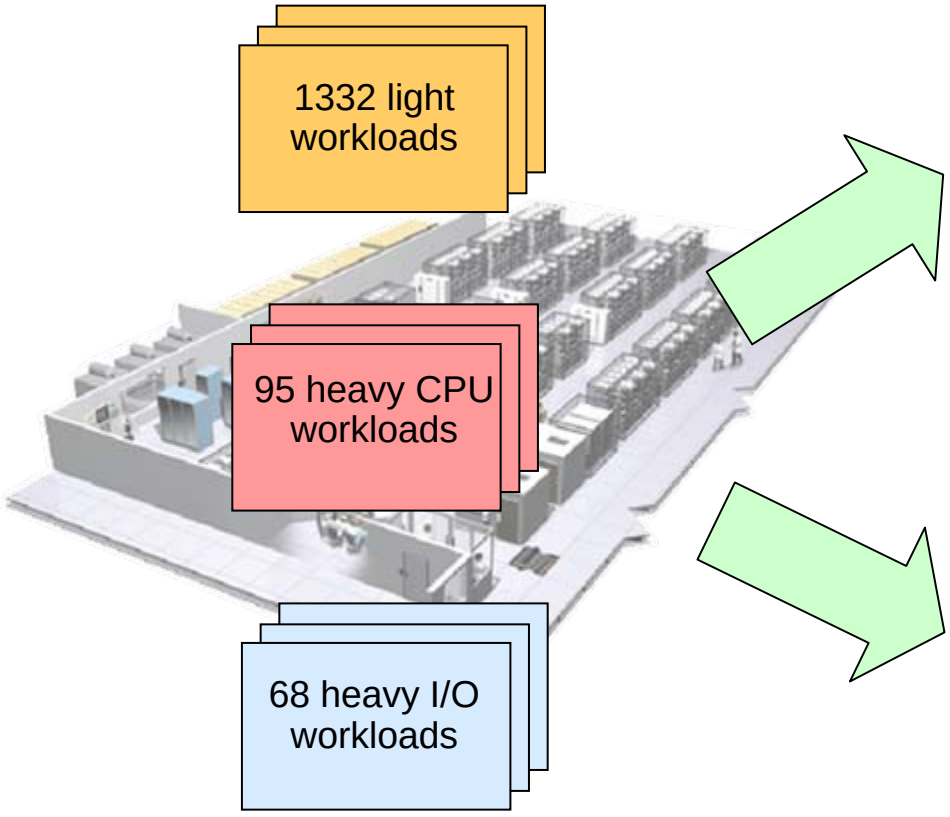
- Automatic, dynamic resource reallocation

zEnterprise
Unified Resource Manager

Tivoli
Integrated Service Management

Private Cloud

Deploying A Private Cloud On zEnterprise Is 65% Less Expensive



1495 workloads

Public Cloud

$9.7M Labor

$89.8M Total

3yr TCO

Private Cloud

z196

zEnterprise

$7.2M Labor

$31.1M Total

3yr TCO

Use zEnterprise To Leverage Data And Optimize Business

Reduce Cost of Data Storage

- Reduce database size via data compression
- Avoid duplicating multiple copies

Extract Greater Value From Data

- Consolidate heterogeneous data sources into a data warehouse
- Apply intelligence and predictive analysis for greater business insight

Data Management

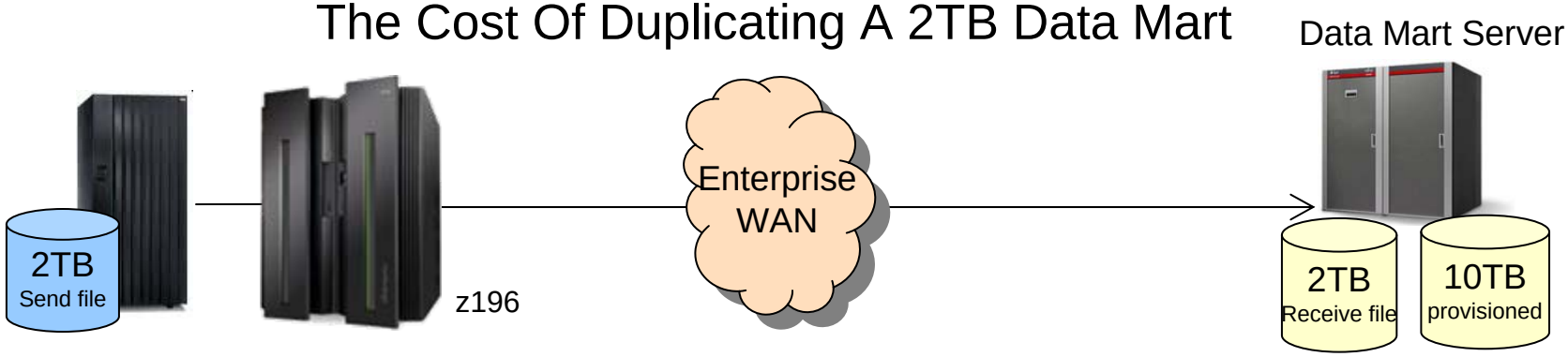
Data Warehouse

Cognos Business Intelligence

SPSS

Hidden Costs Of Duplicating Data

The Cost Of Duplicating A 2TB Data Mart



Cost of storage - send file $12.33/GB x 2048 GB	$25,252

Storage acquisition cost
$246,436

Cost of storage - receive file $18/GB x 2048 GB	$36,864
Cost of storage - data mart $18/GB x 10,240 GB	$184,320

System z Storage Admin $5.88/GB/yr x 2048 GB	$12,042

Annual storage admin cost
$122,511

Distributed Storage Admin $8.99/GB/yr x 12,288 GB	$110,469

System z CPU extract $1.38/GB x 2048 GB x 365	$1.03M
System z CPU cost FTP $0.58/GB x 2048 GB x 365	$434K
System z extract labor $9.33/job x 365	$3.3K
System z FTP labor $5.88/job x 365	$2.2K

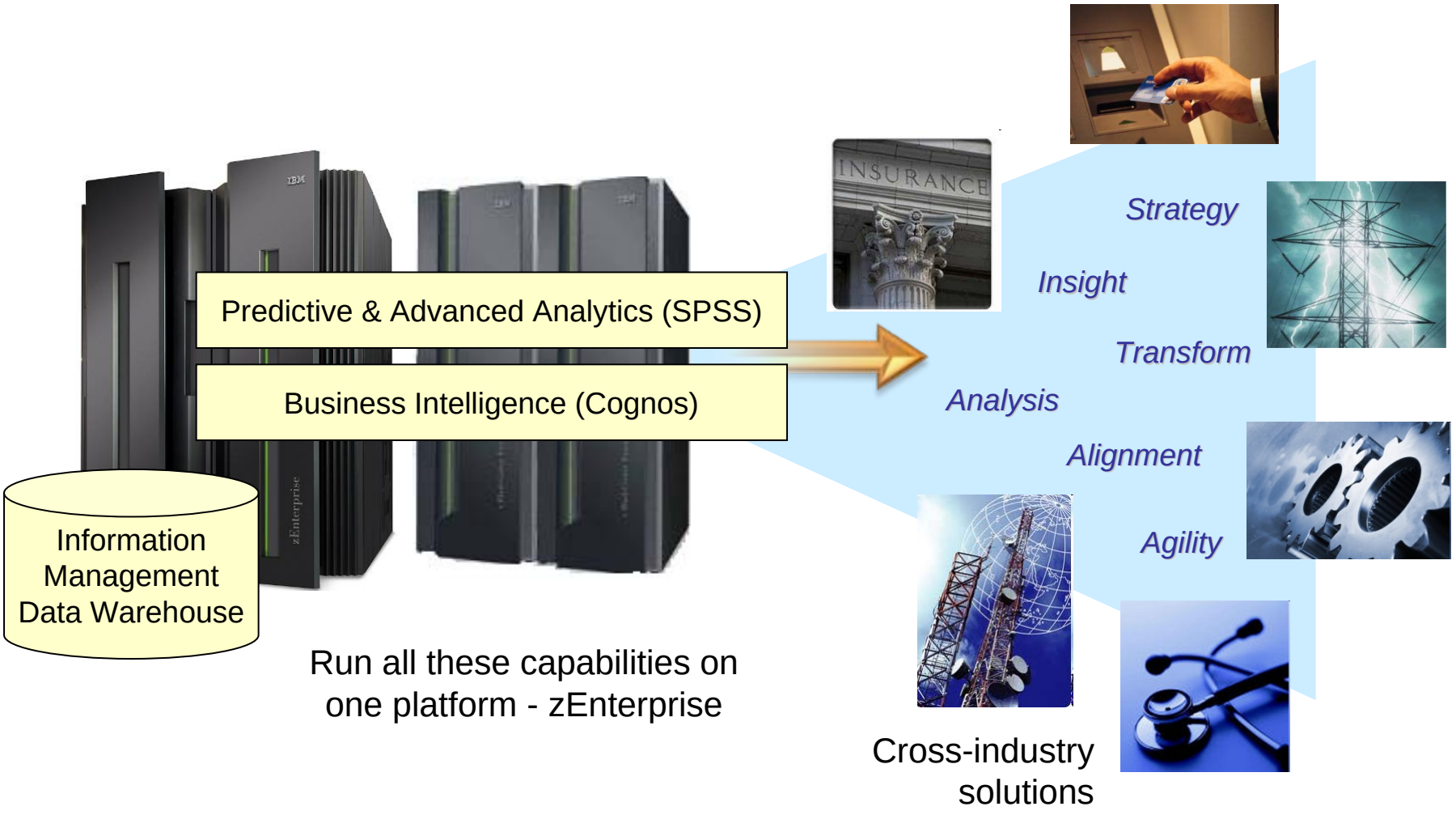
On Premises Network $0.0024/GB x 2048 GB x 4 hops x 365	$7.1K
Off Premises Network $0.29/GB x 2048 GB x 2 hops x 365	$434K

Annual Transfer Costs
$2,243,290

Distributed CPU cost load $0.39/GB x 2048 GB x 365	$292K
Distributed CPU cost FTP $0.05/GB x 2048 GB x 365	$35K
Distributed load labor $14.00/job x 365	$5.1K

Data Mart analysis costs not included
Based on IBM internal study

A Complete Solution For Business And Predictive Analytics On One Platform



Source: IBM Global CIO Study

Extend Smarter Computing To Unified Development Teams

Unified, collaborative work environment

- Break down cultural barriers across teams
- Share common set of development tools and processes across all environments
- Integrated requirements, collaboration, edit/compile/debug, and test support
- Virtualized test systems deployed only as needed to reduce costs

Rational software

Rational Requirements Manager

Rational Team Concert

Rational Developer for zEnterprise

Rational Quality Manager

IBM IT Transformation = Cost Savings

- Consolidated and virtualized over 3,900 server images onto 30 System z mainframes
- 80% less energy used
- 85% less floor space … 16,500 sq. ft. reduction
- Cumulative benefit yield of ***$4.1B over the last 5 yrs***

	1997	Today
Host Data Centers	**155**	**7**
Web Hosting Centers	**80**	**5**
Network	**31**	**1**
Applications	**15,000**	**4,700**

Why Do Customers Continue To Think The Mainframe Is More Expensive?

Old charge-back practices are outdated and misleading

- Mainframe costs are centralized and easy to track
- Distributed costs are more difficult to track and allocate
- Data centers often lump unrelated costs into the mainframe category

Result:

- Mainframe users are charged more than actual cost
- Distributed users are charged less than actual cost

Example: Two Commercial Claims Processing Systems

HP Servers + ISV

Production Servers

HP 9000 Superdome rp4440
HP Integrity rx6600

Dev/Test Servers

HP 9000 Superdome rp5470
HP Integrity rx6600

Claims per year **327,652**

Buy

Which system costs less for future growth?

Calculate cost per workload

IBM System z CICS/DB2

Total MIPS 11,302

MIPS used for commercial claims processing production/dev/test **2,418**

Claims per year **4,056,000**

Build

Allocated Annual Costs for Two Systems

	Mainframe	Distributed
Hardware	$1,302,205	$87,806
Hardware Maintenance	$315,548	
Software IBM MLC	$4,842,384	
Software Non IBM OTC	$647,843	$196,468
Software Non IBM MLC	$5,027,936	
Storage	$877,158	
Network	$418,755	
Support Staff	$2,324,623	$257,289
Platform + Staff Total	$15,756,452	$541,563
Platform + Staff Claims Allocation	$3,371,880	$541,563
Billing Center	$1,611,650	
Call Center	$2,920,090	
Development	$1,907,382	
Total	$9,811,002	$541,563
Claims Processed	4,056,000	327,652
$ Per Claim	**$2.42**	**$1.65**

Provided by customer finance department

Mainframe costs easily identified, distributed costs difficult to identify

Billing and call center costs allocated to mainframe, but would be the same for either option

Development still required to customize packaged software for each new contract

Chargeback says distributed is lower cost

True Costs Per Workload

	Mainframe	Distributed
Hardware	$1,302,205	$87,806
Hardware Maintenance	$315,548	
Software IBM MLC	$4,842,384	
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Storage	$877,158	?
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Platform + Staff Total	$15,756,452	$541,563
Platform + Staff Claims Allocation	$3,371,880	$541,563
Billing Center	Same	Same
Call Center	Same	Same
Development	$1,907,382	$193,271
Total	$5,279,262	$734,834
Claims Processed	4,056,000	327,652
$ Per Claim	**$1.30**	**$2.24**

Still can't identify distributed storage and network costs

Billing and call center costs would be the same for either option

Development cost to customize ISV packaged software for each new contract

Mainframe actually has lower cost per claim

Smarter Computing ... With zEnterprise!

- Lowest cost of acquisition per workload
- Lowest cost of operation per workload
- Lowest cost per workload overall

Agenda

20 minutes	1 – Smarter Computing With zEnterprise
50 minutes	2 – A Closer Look At The Value Of zEnterprise
20 minutes	*Break*
50 minutes	3 – Consolidating Server Infrastructure With zEnterprise
35 minutes	4 – The Benefits Of Storage Consolidation
10 minutes	*Academic Initiative*
60 minutes	*Lunch*
35 minutes	5 – Eliminating Redundant Software
40 minutes	6 – Improving Service Delivery With Private Cloud Computing
20 minutes	*Break*
40 minutes	7 – Leveraging Data To Optimize Business
40 minutes	8 – Developing Hybrid Applications For zEnterprise

DEMO: Architecture