



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



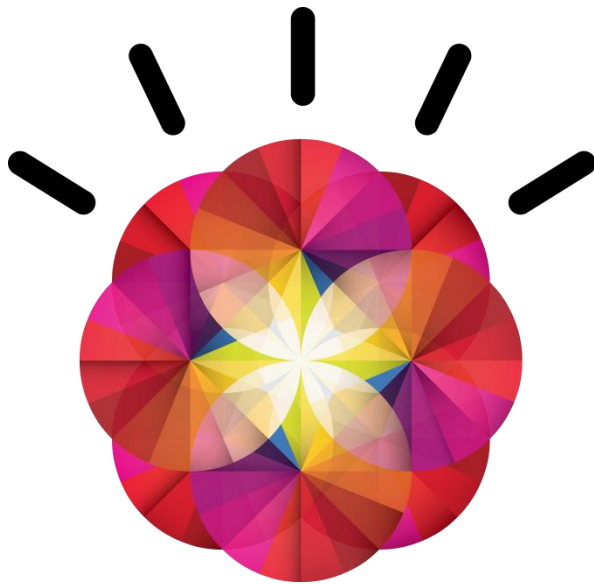
But IT budgets are growing less than 0.8% per year

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



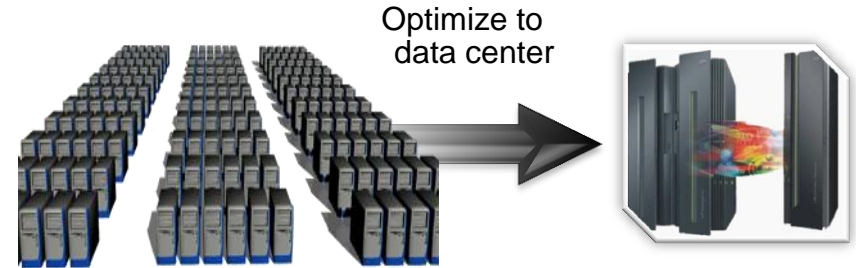
**New metric
for the age of
Smarter
Computing**



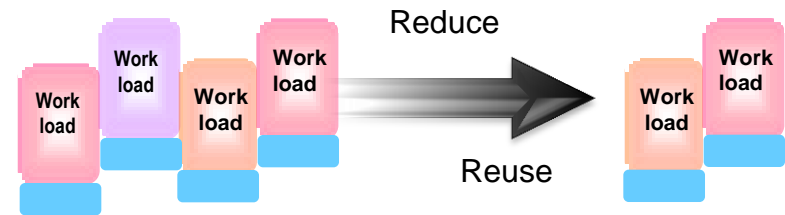
**COST PER
WORKLOAD**

Smarter Computing Strategies To Reduce Costs And Improve Value

Consolidate Infrastructure



Eliminate Redundant Software



Improve Service Delivery

Integrated Service Management



Visibility



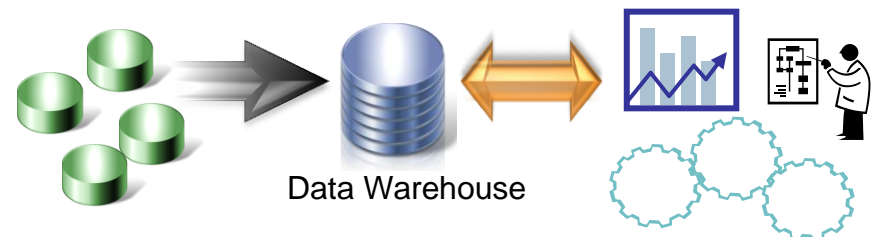
Control



Automation



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

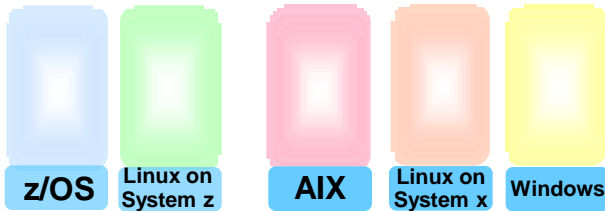


DS8000

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

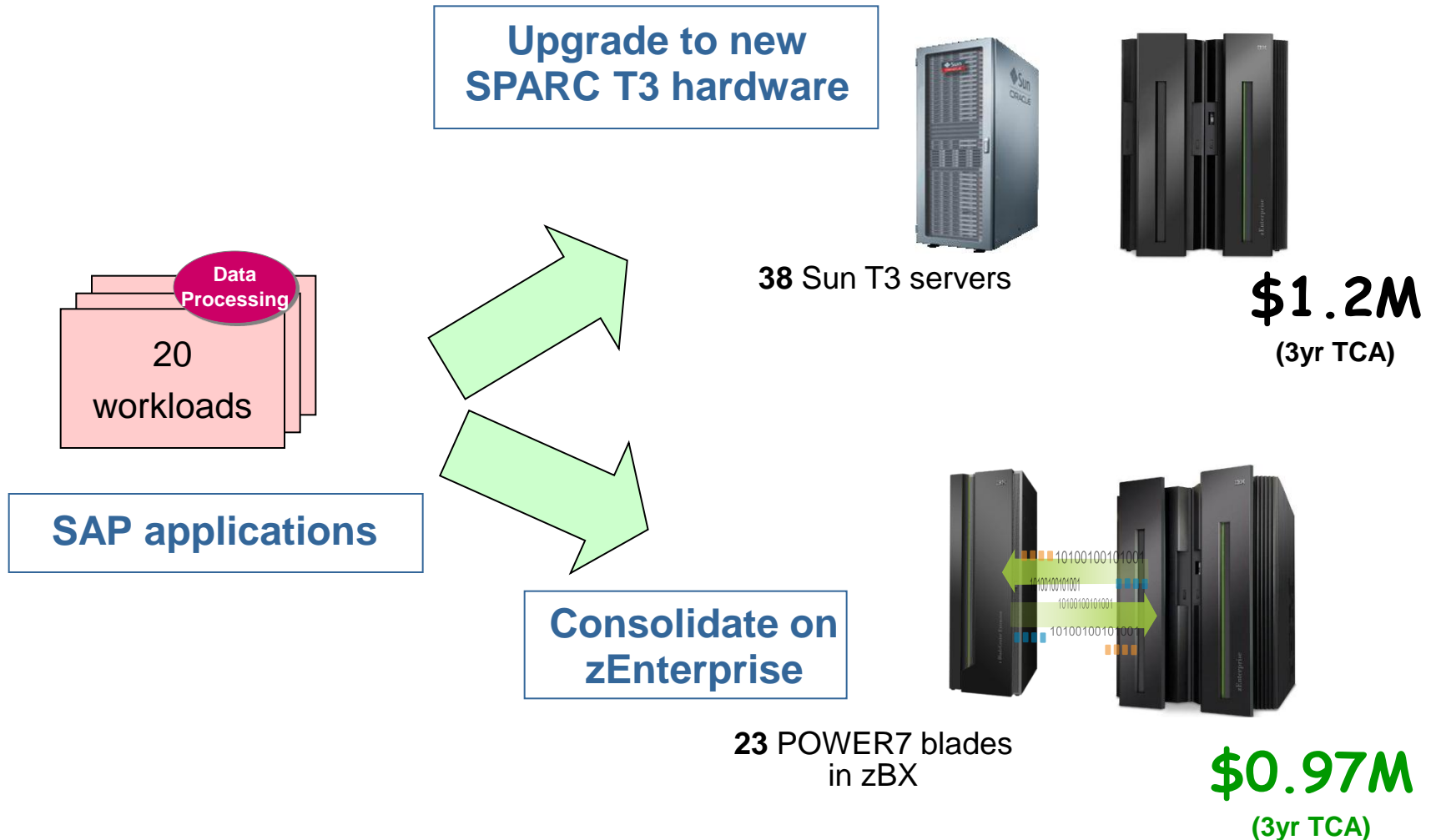
***Lowest Cost Of
Acquisition Per
Workload***



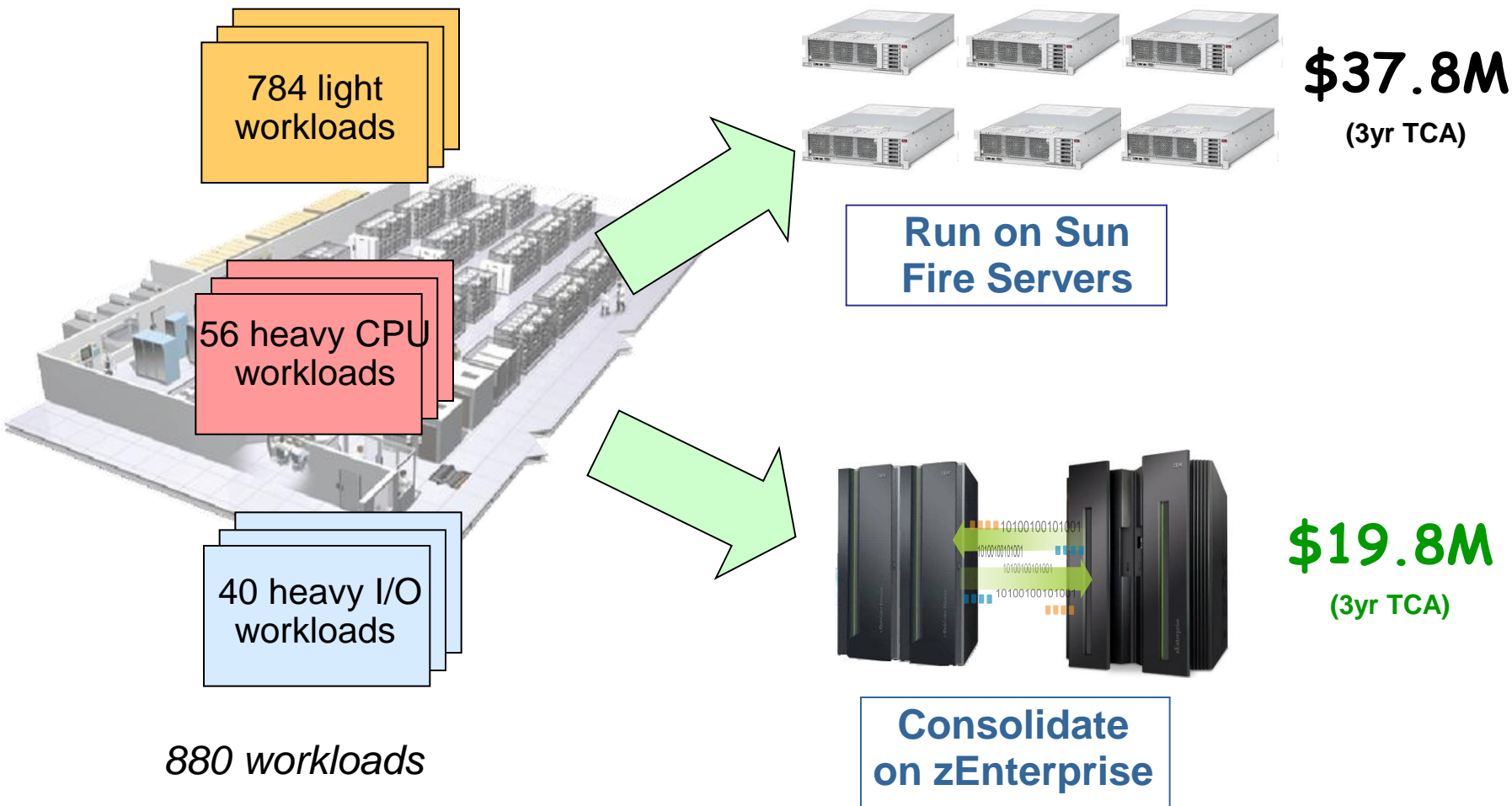
***Lowest Cost Of
Operation Per
Workload***

Lowest Cost Per Workload

Consolidate Hybrid SAP Workloads On zEnterprise And Save 20% Over Three Years



Consolidate Standalone Workloads On zEnterprise And Save 48% Over Three Years



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 58% Over Three Years

Upgrade to new SPARC T3 hardware



Competitive App Server
57 Sun T3 servers
plus 2 HP servers (ESB)

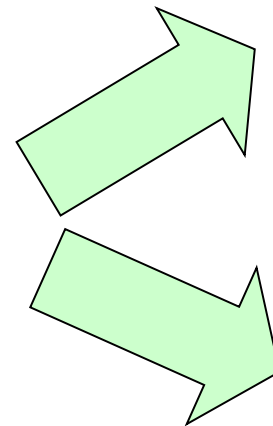
\$11.7M
(3yr TCA)

Web Facing

Message Driven

28
workloads

Web front-end
workloads



Consolidate on
zEnterprise



**WebSphere App Server
and DataPower**

28 POWER7 blades
plus 2 XI50z in zBX

\$4.9M
(3yr TCA)

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



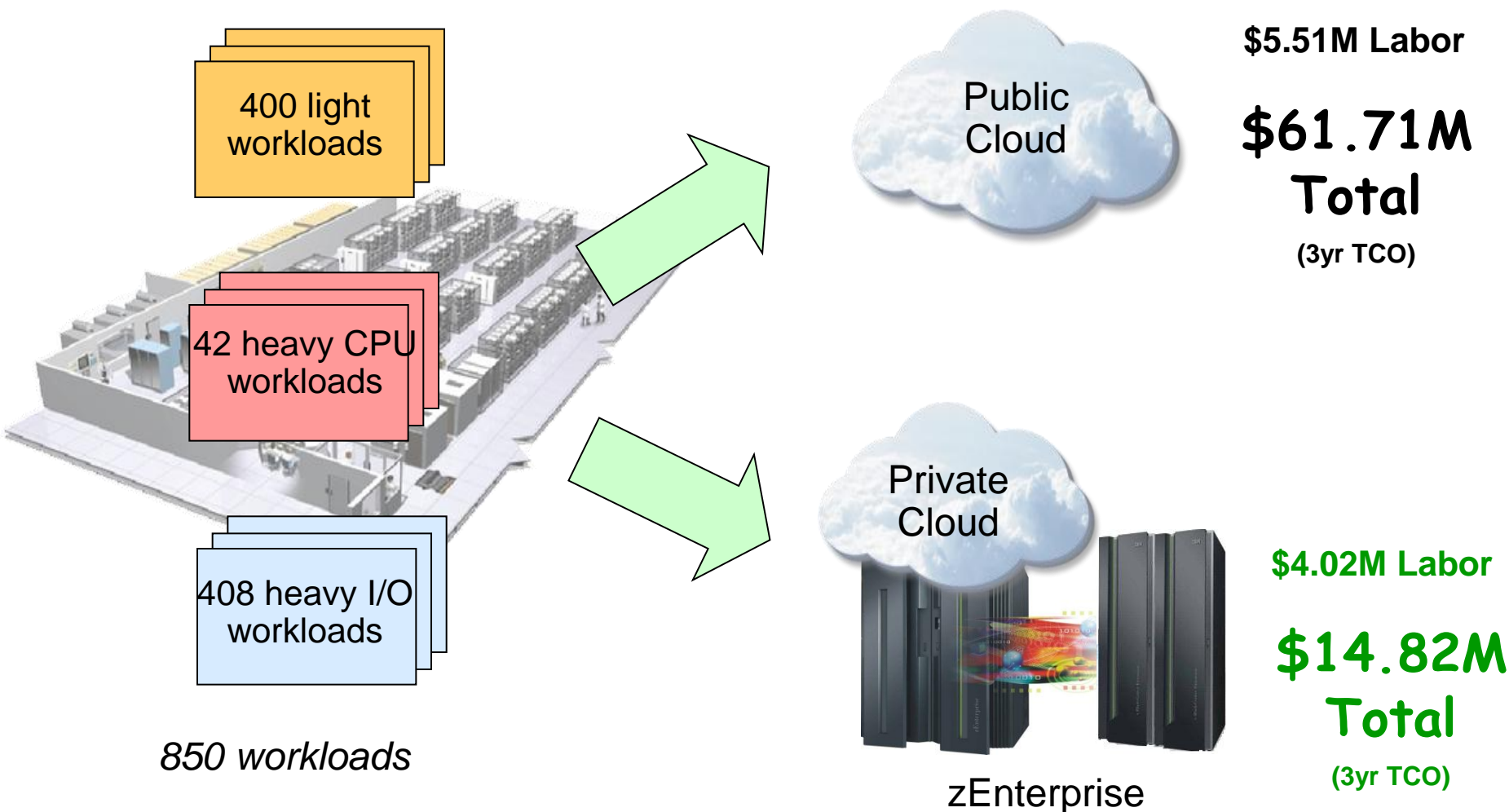
zEnterprise
Unified Resource
Manager

Tivoli

Integrated Service
Management

Private
Cloud

Deploying A Private Cloud On zEnterprise Is 76% Less Expensive



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**

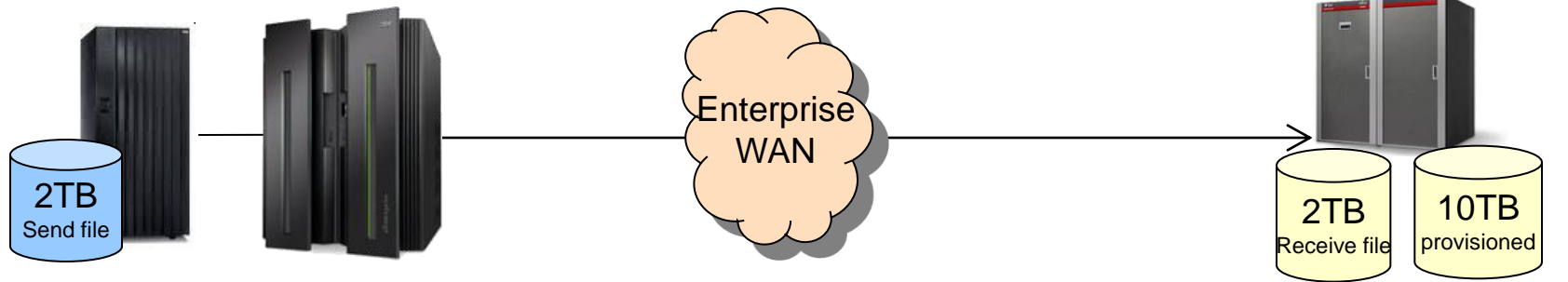
Data Warehouse

**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
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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
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Annual storage admin cost
\$122,511

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

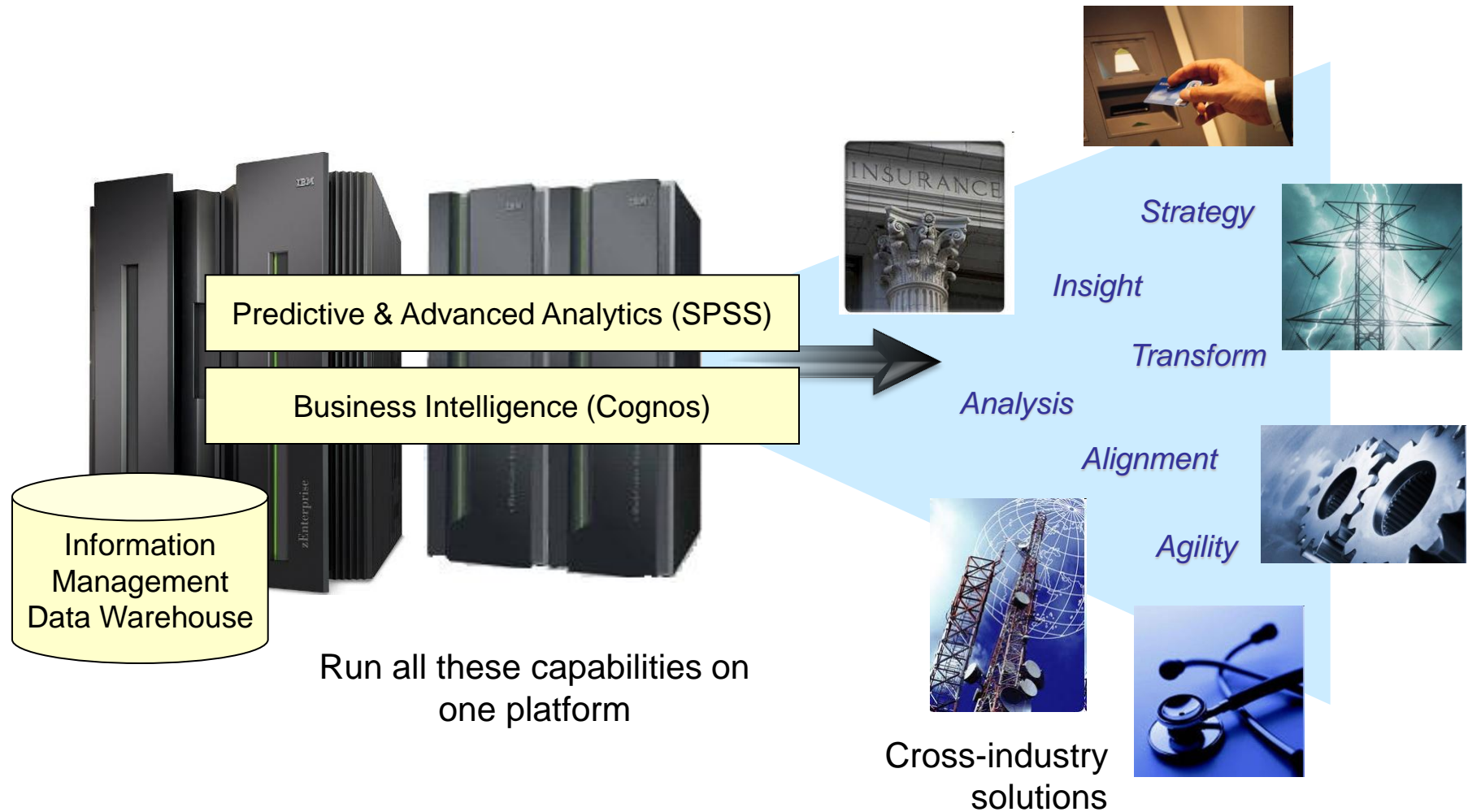
On Premises Network \$0.0024/GB x 2048 GB x 4 hops x 365	\$7.1K
Off Premises Network \$0.29/GB x 2048 GB x 2 hops x 365	\$434K

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



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

Smarter Computing ... With zEnterprise!

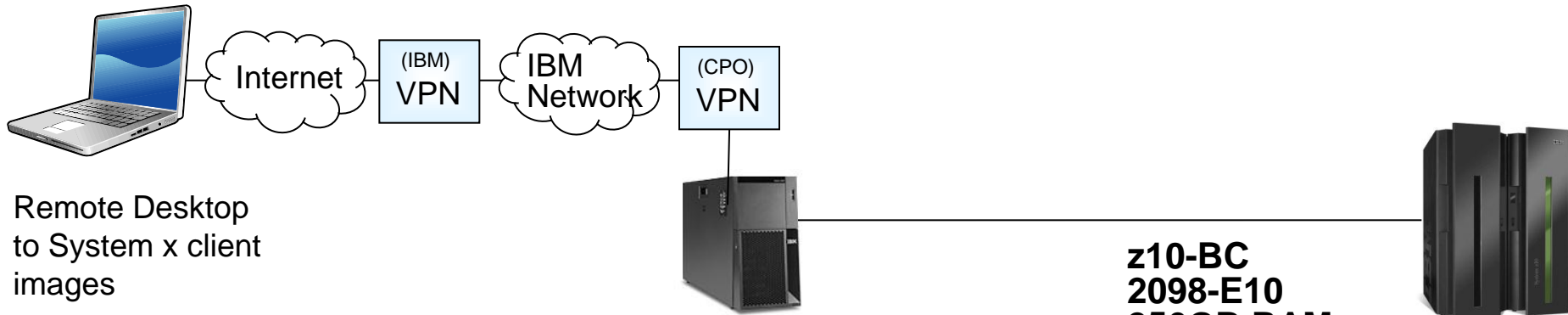
- Lowest cost of acquisition per workload
- Lowest cost of operation per workload
- Lowest cost per workload overall



Agenda

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

DEMO: Architecture



System x 3950
8 x 3.5GHz Xeon MP
64GB RAM

System x VMware images running as desktop or server clients to System z



z10-BC
2098-E10
256GB RAM

