



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



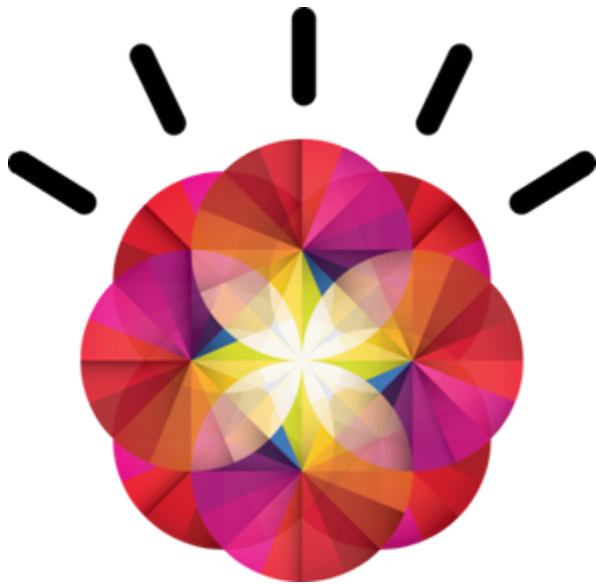
But IT budgets are growing less than 0.8% per year

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



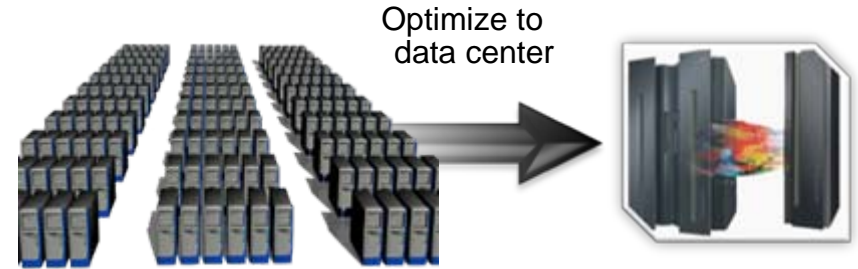
**New metric
for the age of
Smarter
Computing**



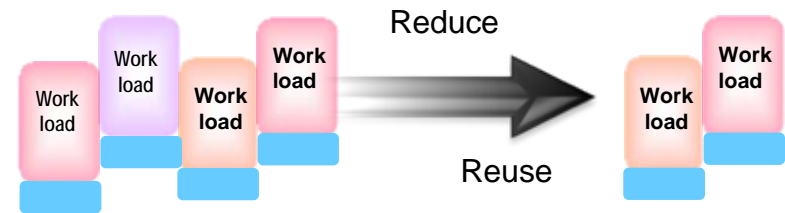
**COST PER
WORKLOAD**

Smarter Computing Strategies To Reduce Costs And Improve Value

Consolidate Infrastructure



Eliminate Redundant Software



Improve Service Delivery

Integrated Service Management



Visibility



Control



Automation



Cloud Computing

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**

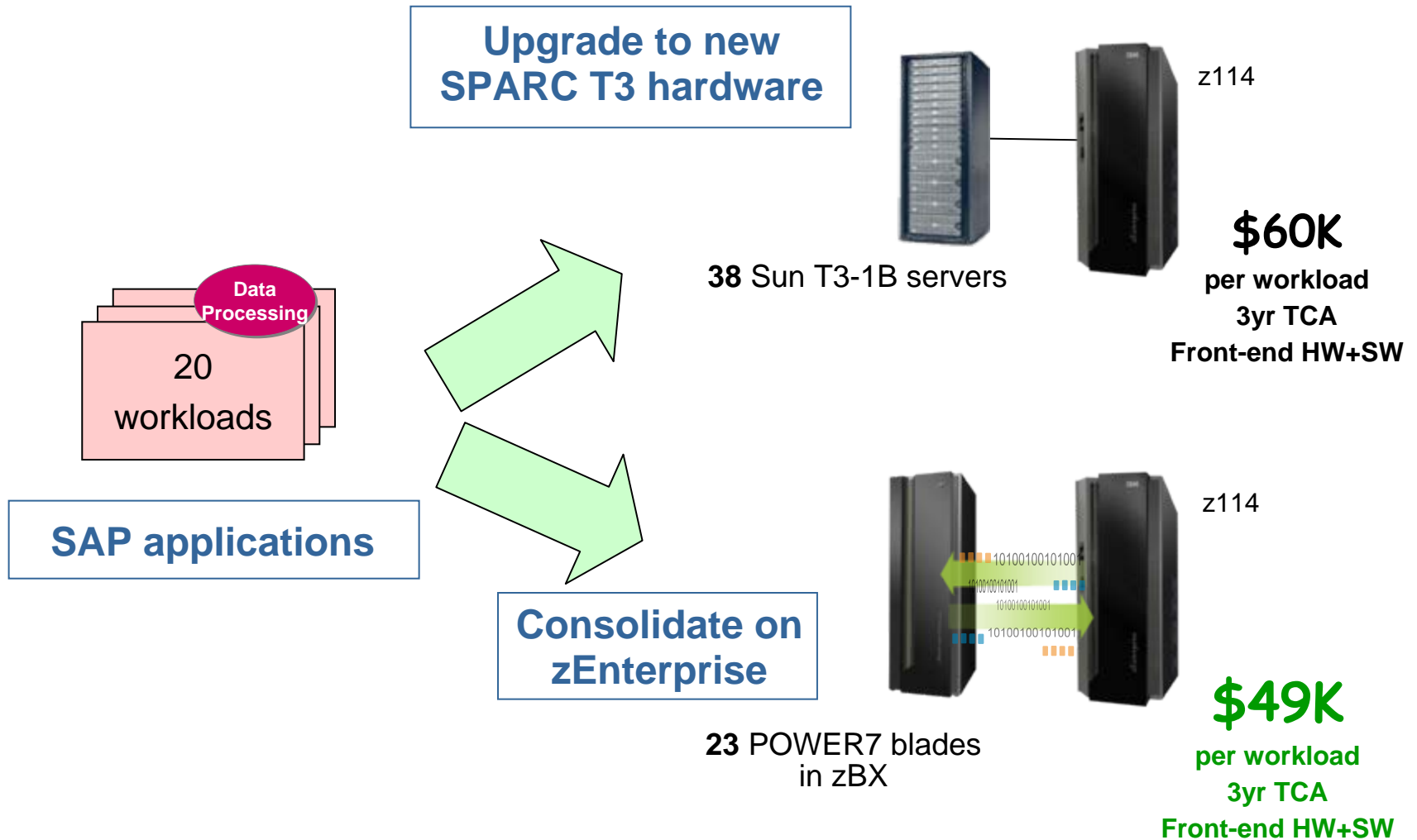
z196



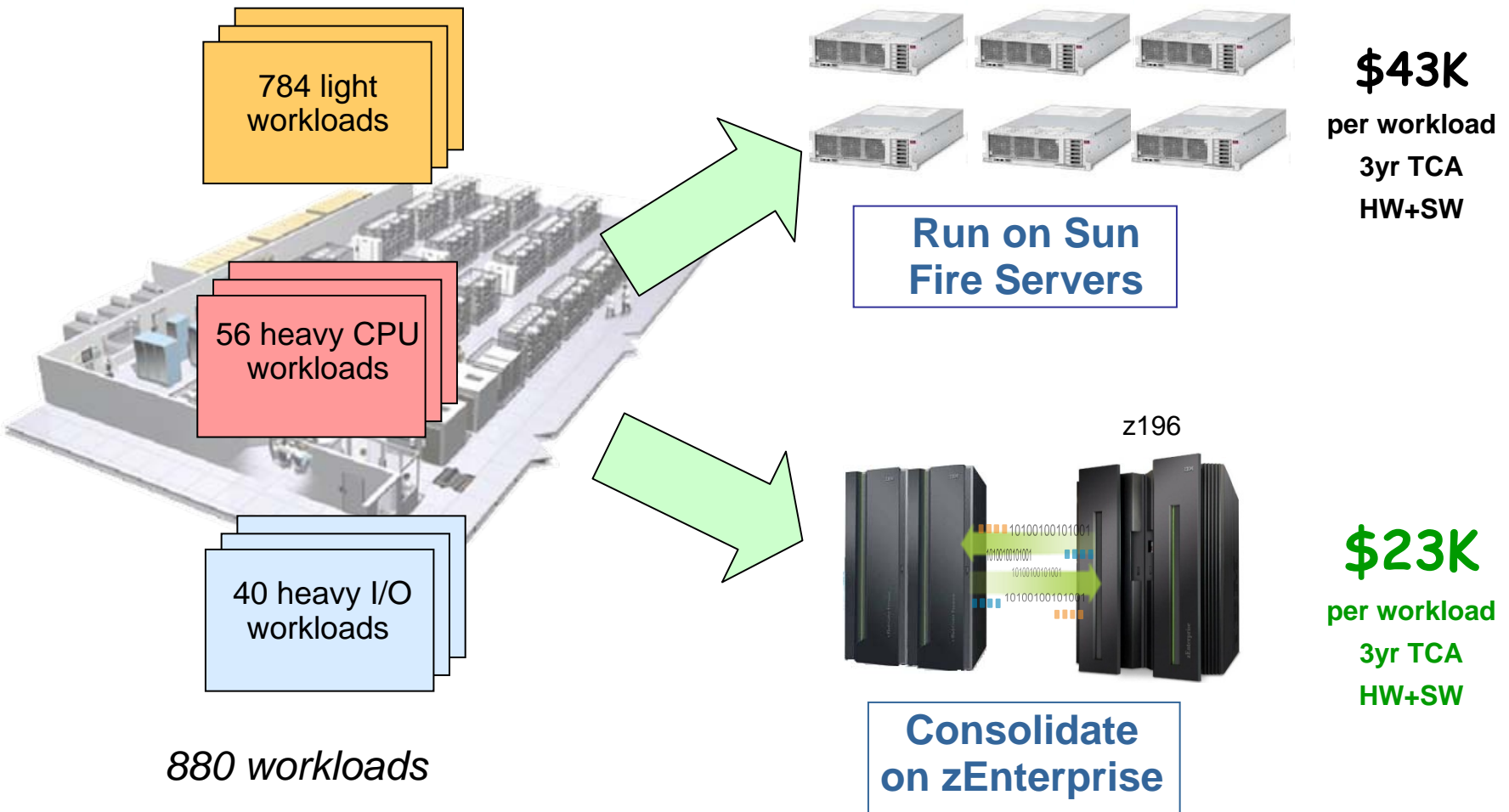
**Lowest Cost Of
Operation Per
Workload**

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



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

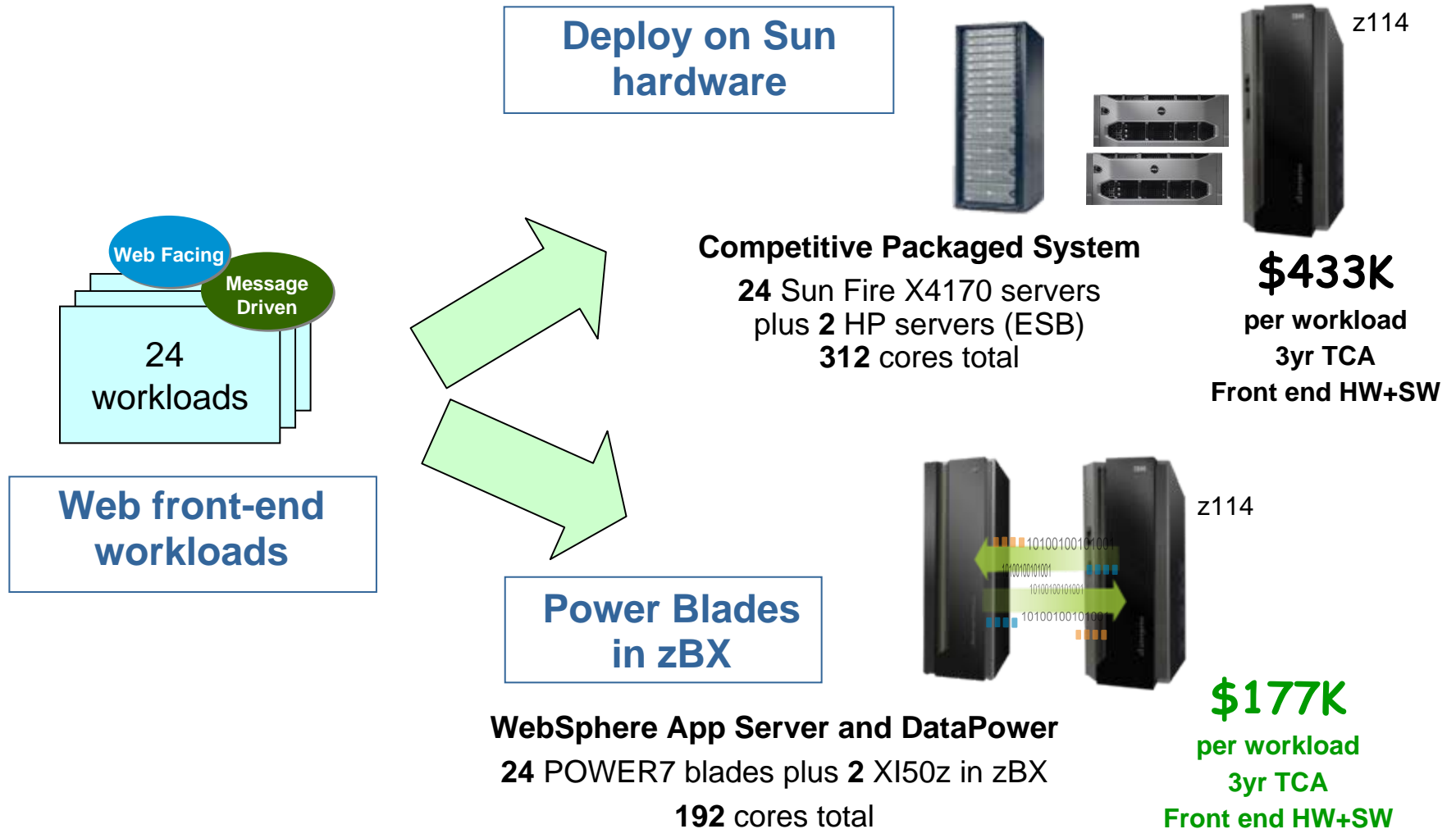
Tivoli

**Application
Dependency
Discovery
Manager**



IBM WebSphere
SOA
Web Services

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



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

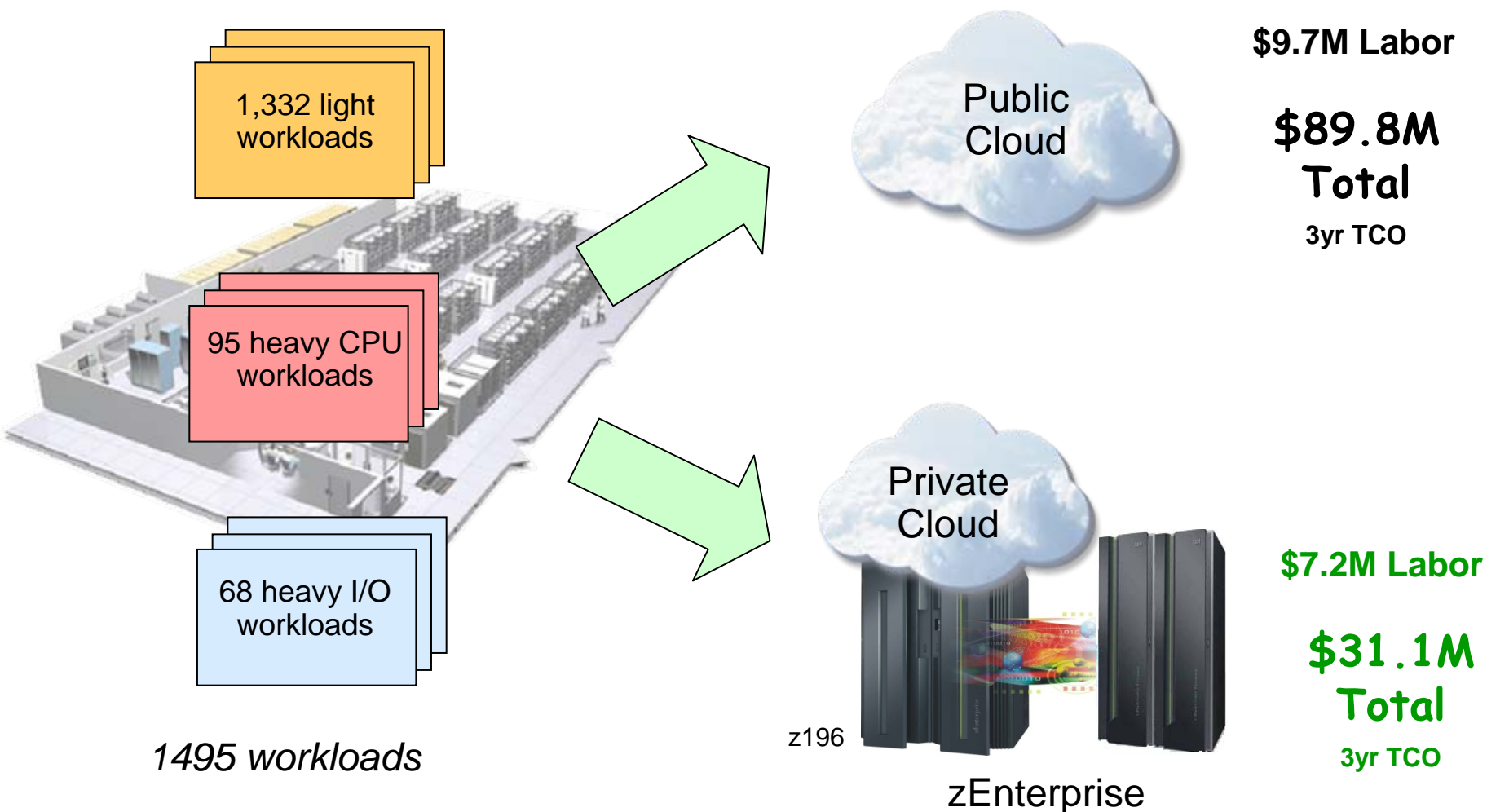


Integrated Service
Management



Private
Cloud

Deploying A Private Cloud On zEnterprise Is 65% 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**

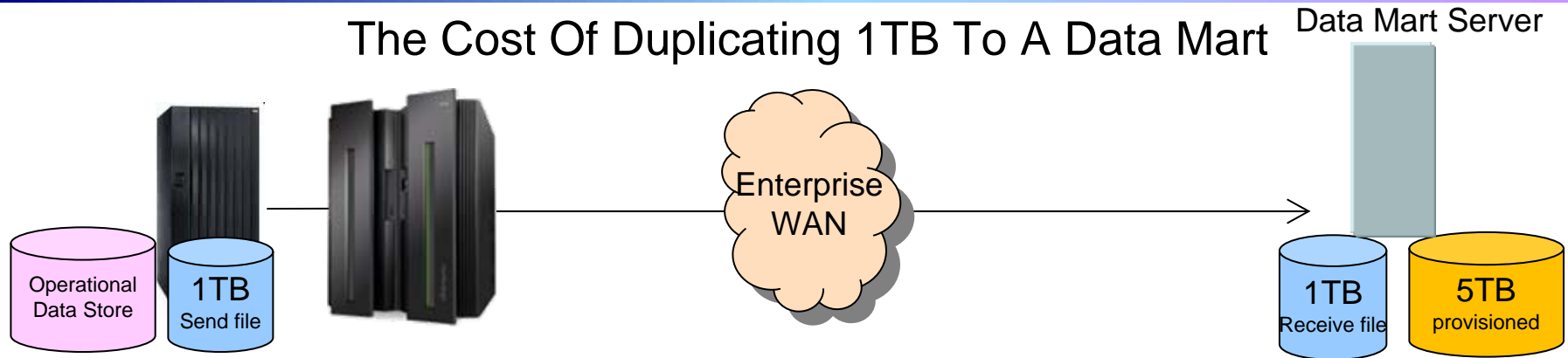
Data Warehouse

**Cognos
Business
Intelligence**

SPSS

Duplicating Data Off The Mainframe Is Costly

The Cost Of Duplicating 1TB To A Data Mart



Cost of storage - send file \$12.33/GB x 1,024 GB	\$13K
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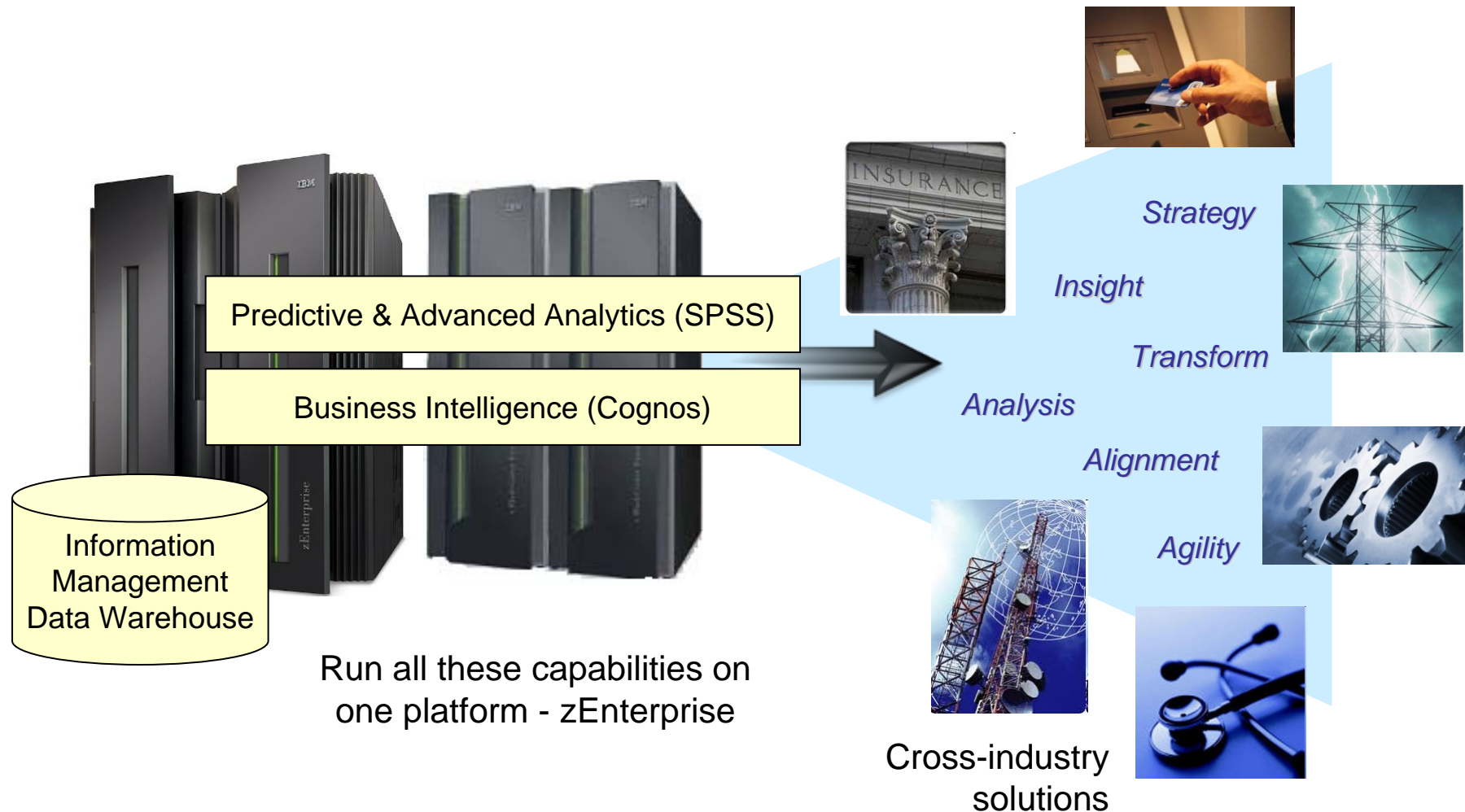
Storage acquisition cost
\$13K

System z CPU extract \$1.38/GB x 1,024 GB x 365	\$515K
System z CPU cost FTP \$0.58/GB x 1,024 GB x 365	\$217K

On Premises Network \$0.0024/GB x 1,024 GB x 4 hops x 365	\$3.6K
Off Premises Network \$0.29/GB x 1,024 GB x 2 hops x 365	\$217K

Annual Transfer Costs
\$953K

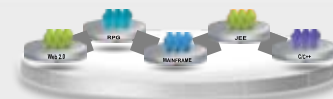
A Complete Solution For Business And Predictive Analytics On One Platform



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 5,000 server images onto larger servers (System z, Power, and System x)
- Energy savings - > 20,000 megawatt hours per year
- Reduction in floor space - 47,000 square feet
- 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	
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	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

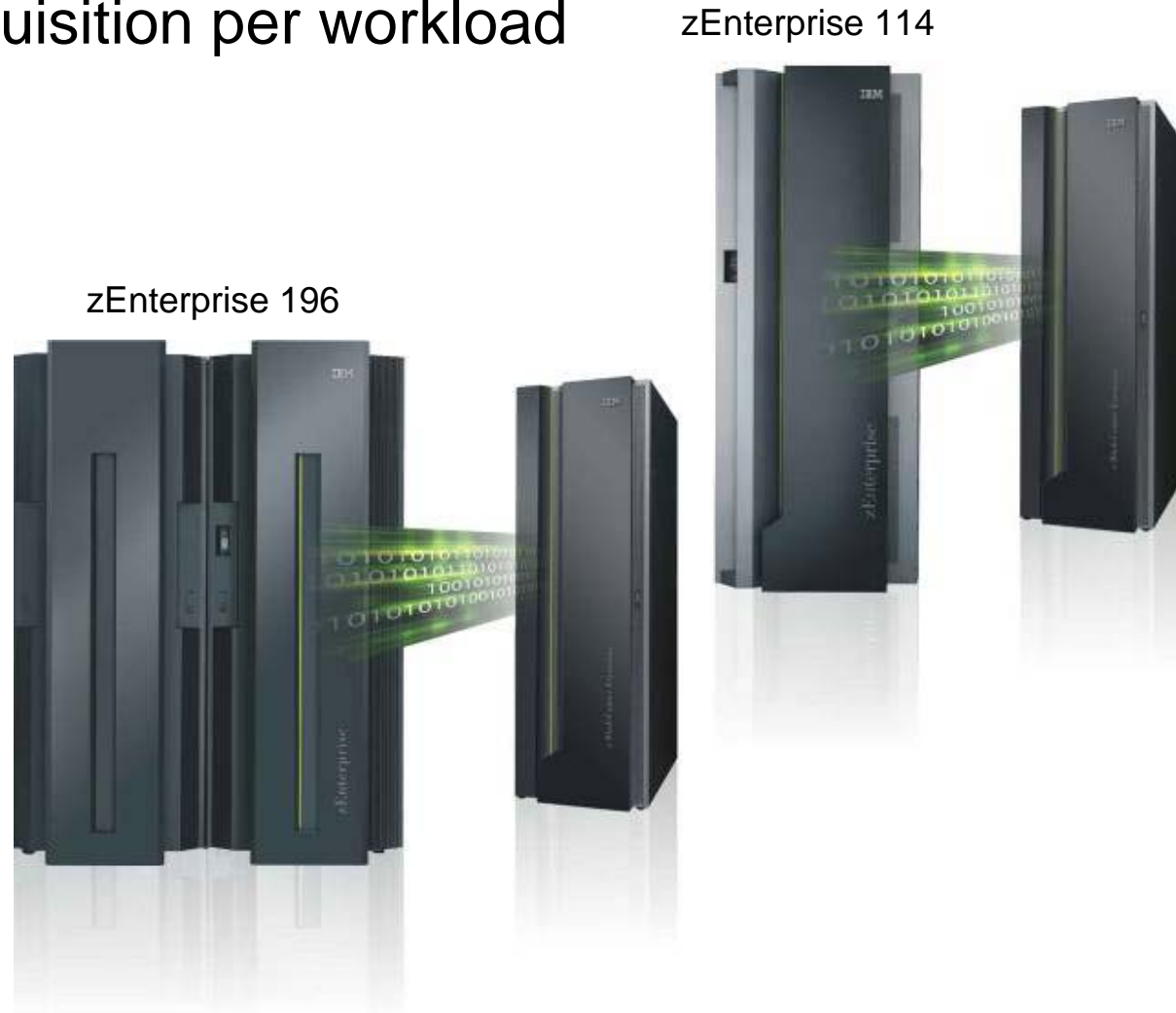
Billing and call center costs would be the same for either option

Development cost to customize ISV packaged software for each new contract

Mainframe actually has lower cost per claim

Smarter Computing ... With zEnterprise!

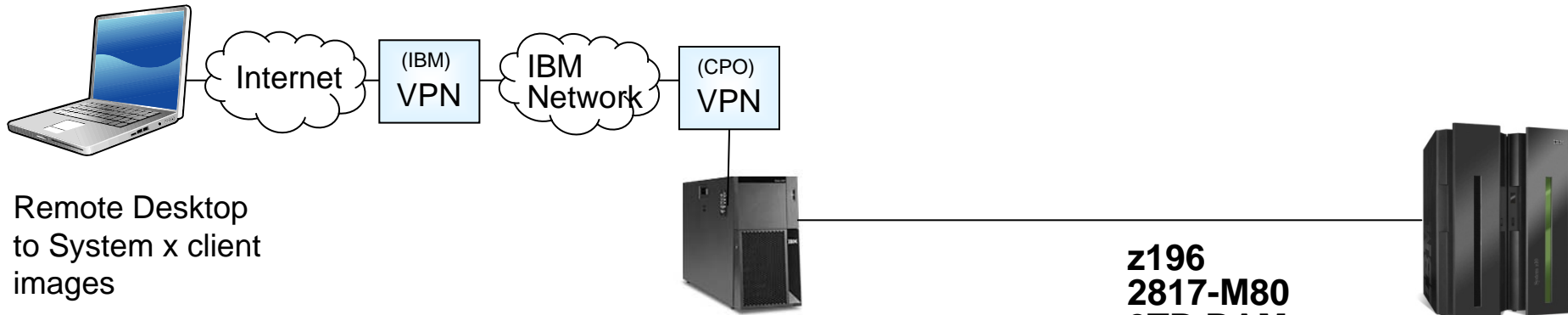
- Lowest cost of acquisition per workload
- Lowest cost of operation per workload
- Lowest cost per workload overall



Agenda

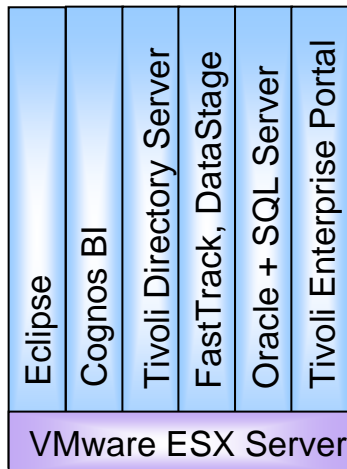
20 minutes	1 – Smarter Computing With zEnterprise
50 minutes	2 – A Closer Look At The Value Of zEnterprise
20 minutes	<i>Break</i>
50 minutes	3 – Consolidating Server Infrastructure With zEnterprise
35 minutes	4 – The Benefits Of Storage Consolidation
10 minutes	<i>Academic Initiative</i>
60 minutes	<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



z196
2817-M80
2TB RAM

