Simplifying Your IT Infrastructure with the Mainframe and z/OS

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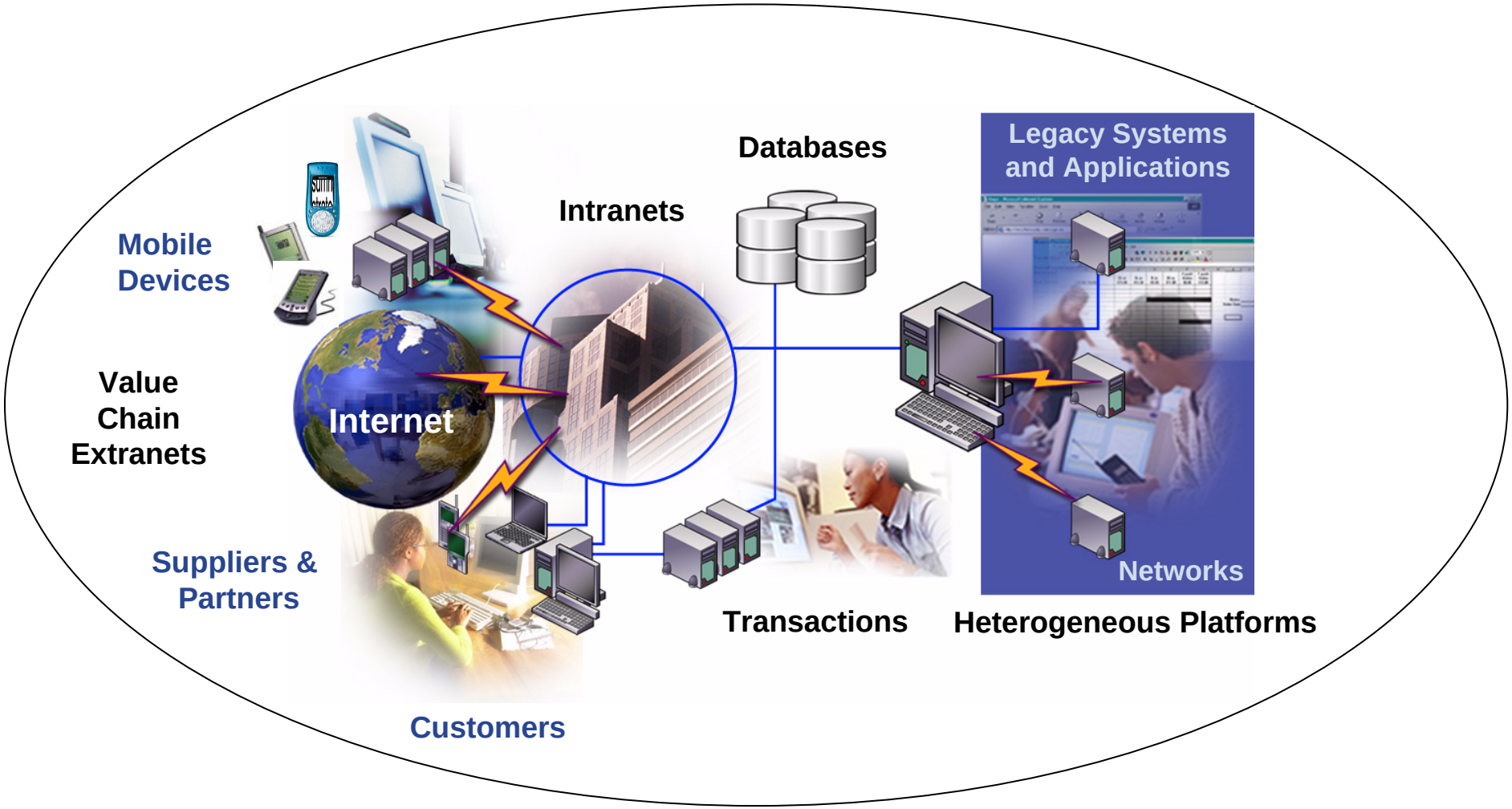
Today's IT Environment

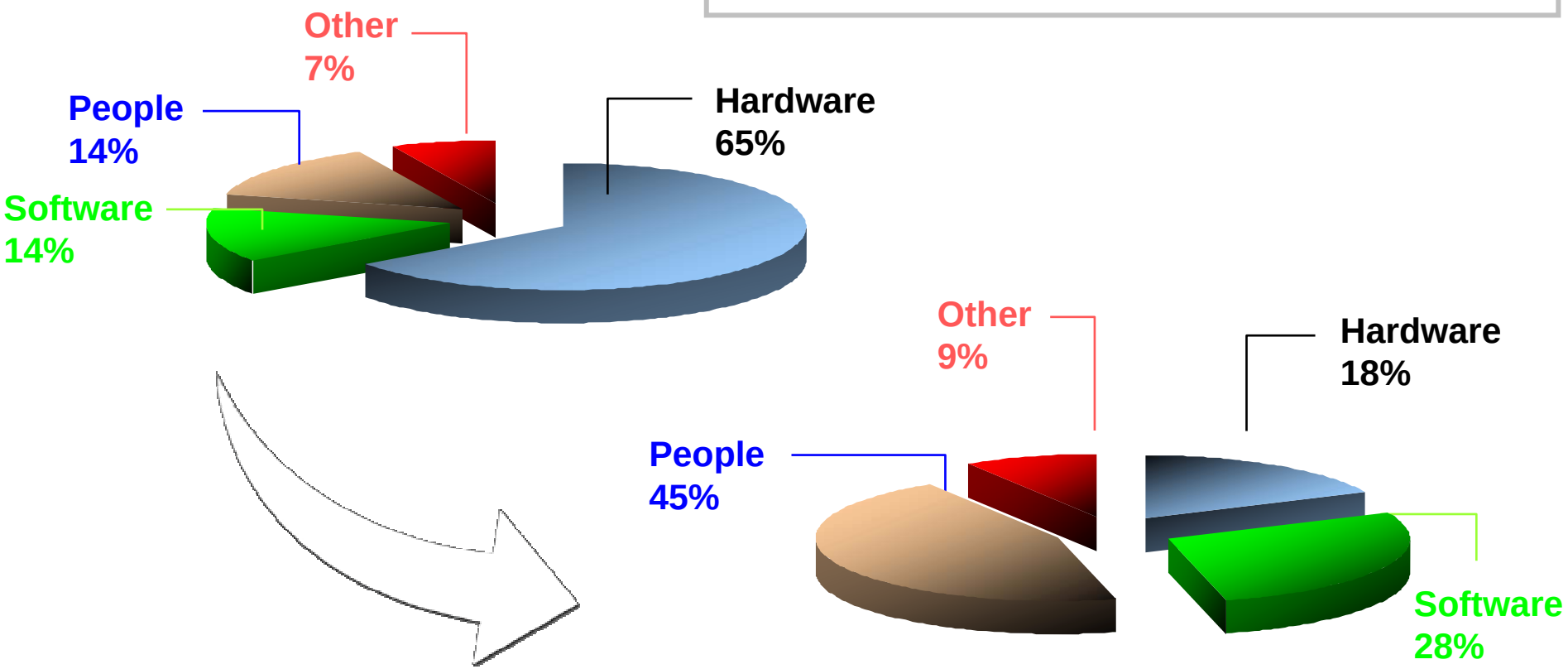
IT environments are increasingly heterogeneous and complex



Throughout the past 10 years the cost dynamics of supporting corporate IT infrastructures has changed significantly

We typically see . . .

People expense has tripled as a %
Software expense has doubled as a %
Hardware is less than 1/3 of its original %



A traditional approach to platform choice for new applications

- Focus on Total Cost of Acquisition (H/W, S/W, Maintenance)
- Focus on short to mid term
- Focus purely on new application IT requirements
- Focus on rollout and growth through adding another server approach
- Platform choice often made with limited input from data center

In today's environment, this approach can further exacerbate the key problems

Key factors affecting platform choice for deployment of new workloads

- Decision cannot be taken in isolation, must take into account existing infrastructure and its current challenges
- Decision should be medium to long term outlook
- Decision should take into account required Quality of Service for all elements of the application
- Decision should take into account all cost elements including implementation, maintenance, ongoing running costs and potential future growth

The choice of server platform is important. All servers are not the same.

- **Wintel and UNIX servers generally designed as Single Application servers:**
  - Great for processor intensive applications
  - Great for appliance type applications

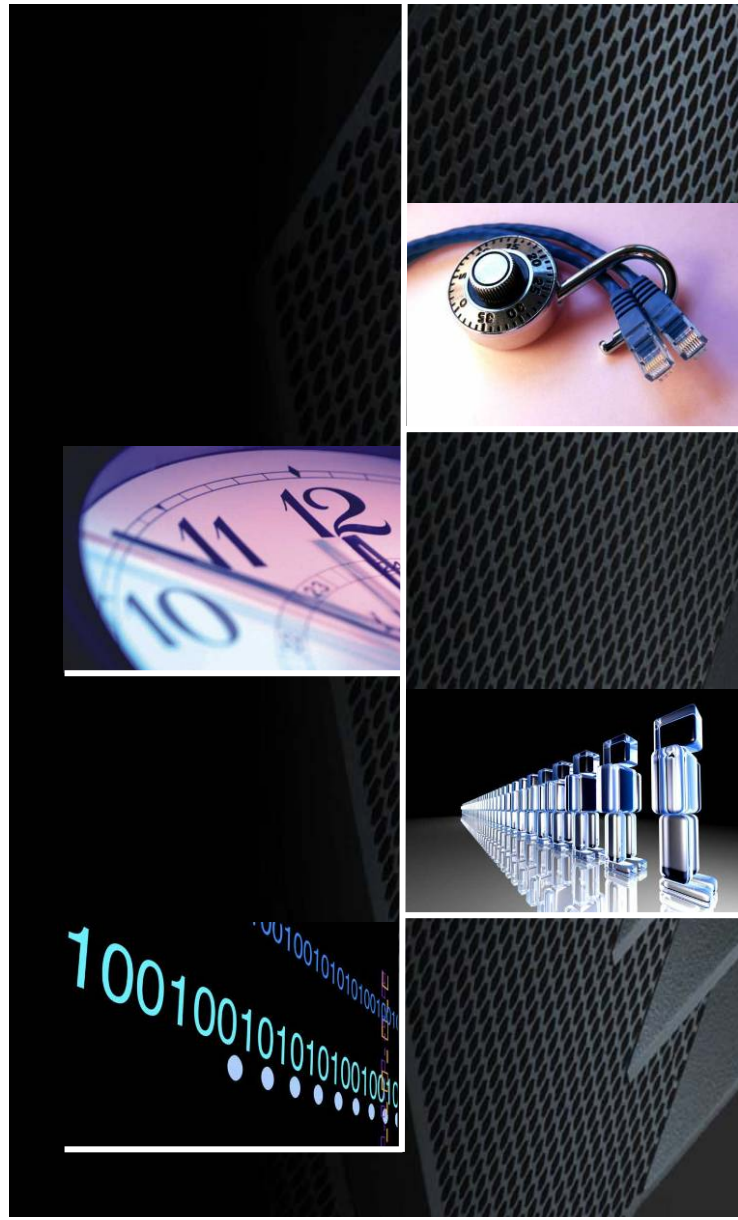
- **IBM Mainframe designed to run multiple applications simultaneously:**
  - Great for I/O intensive workloads (such as data serving)
  - Great for multiple mission critical workloads

- 40 years of technology innovation
- Continuously evolving with market needs
- Open and secure
- Powerful and energy efficient
- Reliable and scalable

Designed for today's On Demand business

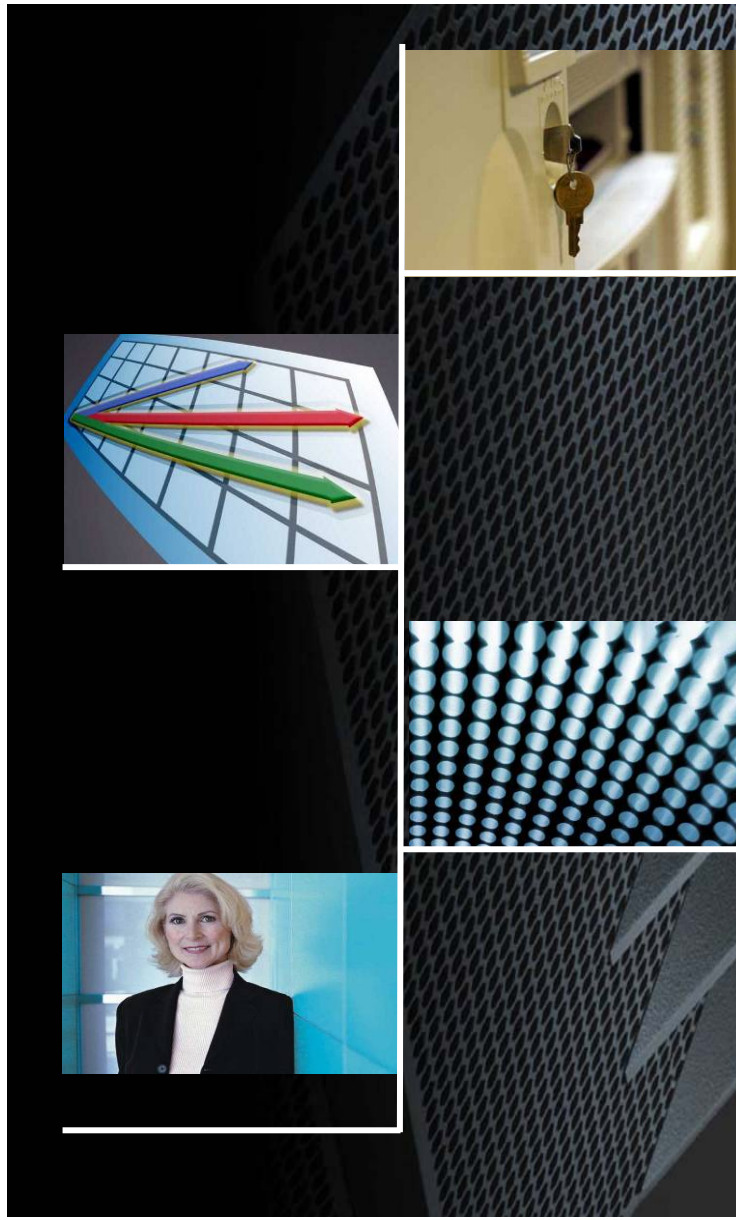
The Classic Strengths

- The mainframe historically had a reputation for specific capabilities:
  - Security
  - Availability
  - Scalability
  - Data and transaction serving
- The cornerstone for many large enterprises



Today's IT requirements for an on demand business

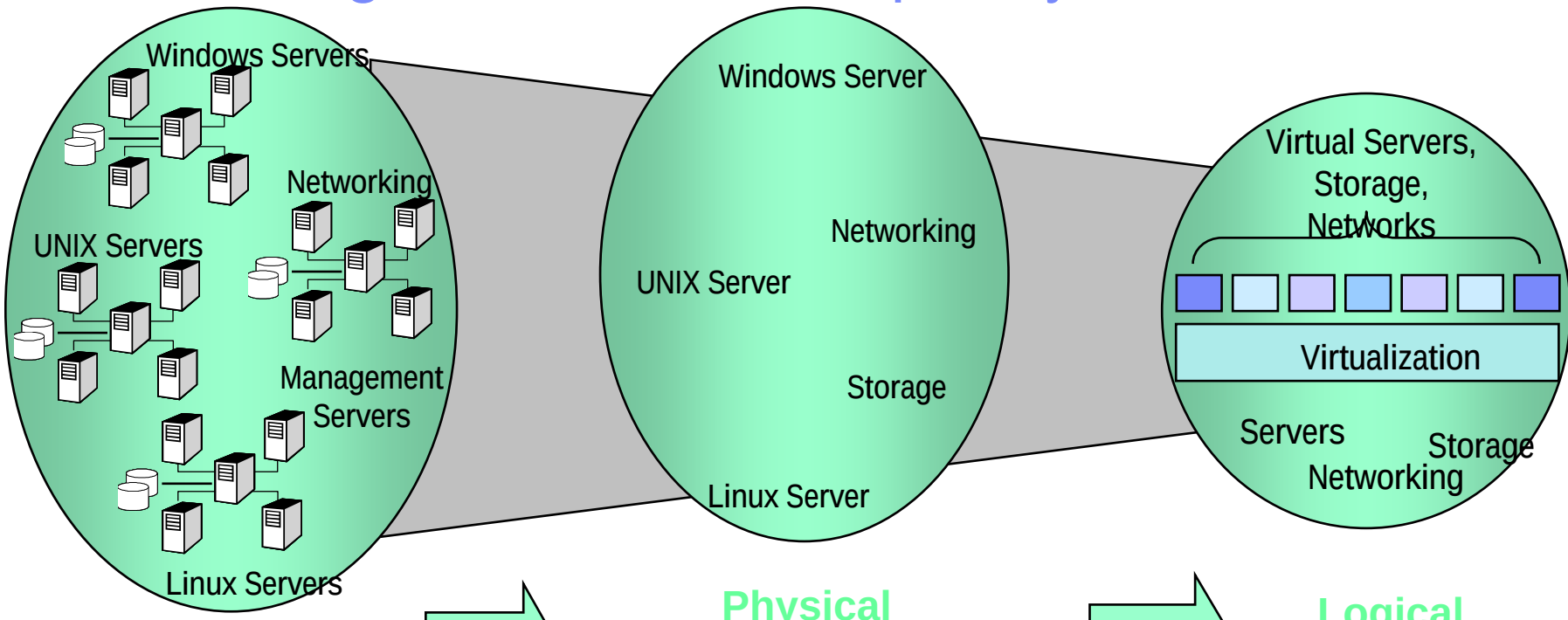
- A resilient and security-rich foundation
- Flexibility and responsiveness
- Simplified infrastructure
- Low total cost of ownership
  - Acquisition costs
  - Management costs
  - Costs of downtime and security breaches
  - Energy costs



Today's mainframe
The ultimate virtualization resource

- Massive consolidation platform, utilizes share everything design
- Up to 60 logical partitions, 100s to 1000s of virtual servers
- Virtualization is built in, not added on
- HiperSockets for memory-speed communication
- Most sophisticated and comprehensive hypervisor function available
- Intelligent and autonomic management of diverse workloads and system resources based on business policies and workload performance objectives

Virtualizing IT Reduces Complexity



Complex

- Islands of computing and data
- Disparate management tools
- Manual provisioning
- Multiple Security exposures

Physical Consolidation

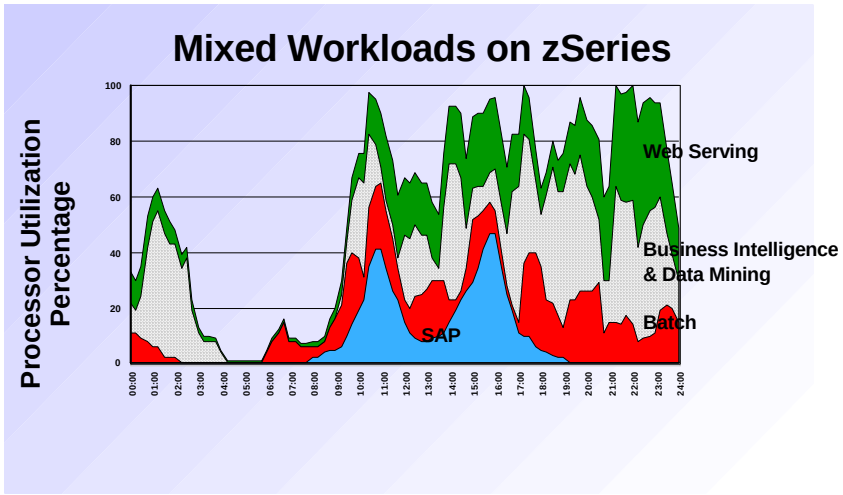
- Fewer devices and licenses
- Disparate management tools
- Labor intense provisioning

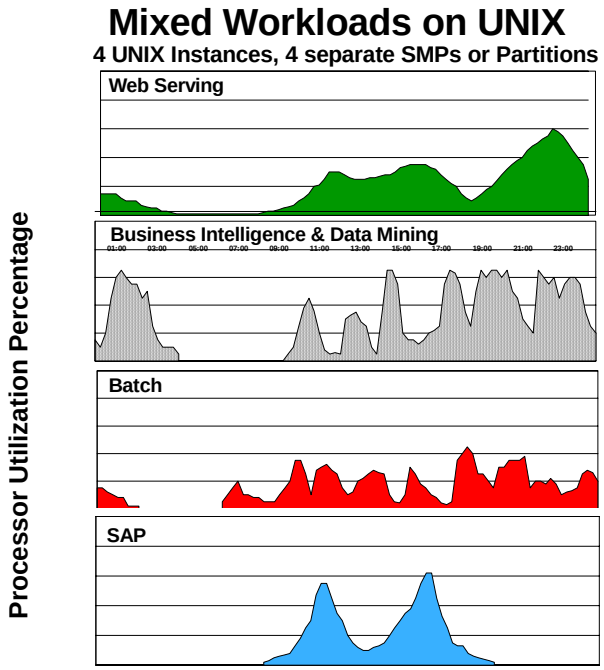
Logical Simplification

- Pool of resources
- Multiple OS's per server
- Rapid provisioning
- Automated management
- Tighter security

Optimizing Workloads on a Mainframe is more effective

Same workload





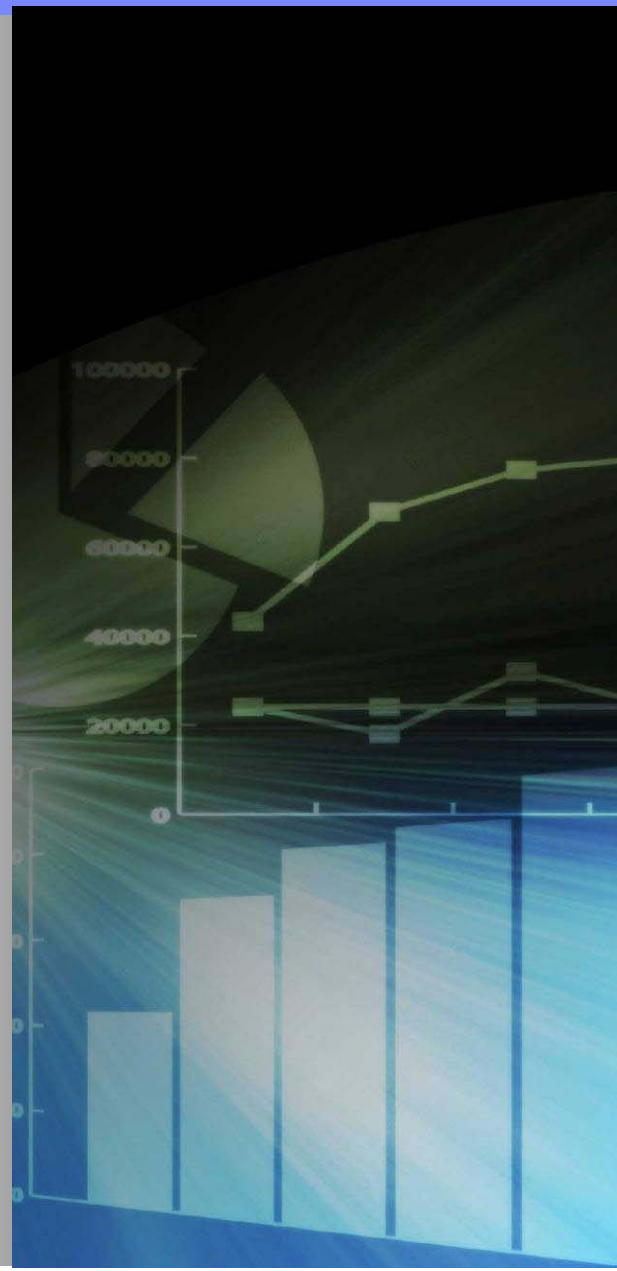
z/OS WLM balances resources for you

- **Based on business goals**
- **No other platform comes close**

- **IBM Mainframes: Up to 100% Utilization**
  - Highly virtualized and shared resources
  - "hands off", business priority driven intelligent workload management
  - Fewer servers, less power, cooling & admin
  - Optimized use of SW assets
- **UNIX processors: typically under 25% utilization**
  - More of them and more SW license
  - Static scripted workload management
  - Higher admin and environmental cost
  - Intel worse, typically <10% utilization

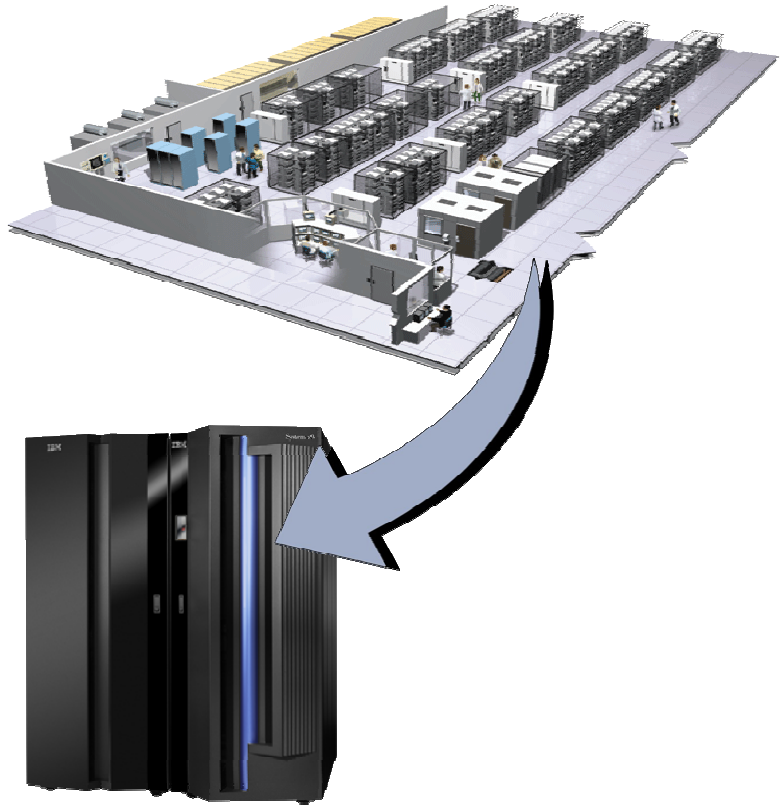
Economics of the mainframe

- Focus on price / performance
- Attractive pricing for new workloads
- New pricing models for open applications
- Consolidation versus server sprawl
- Addressing the indirect costs of computing



IT Optimization starts with a data center in a box … not a server farm

- Central point of management
- Higher resource utilization
- Lower cost of operations
  - Less servers
  - Fewer SW licenses
  - Fewer resources to manage
  - Less energy, cooling and space
- Fewer intrusion points
  - Tighter security
- Fewer points of failure
  - Greater availability



"We needed a solution that could provide high levels of availability around the clock, along with the flexibility to quickly and cost-effectively deploy new services both internally and externally. The mainframe fit the bill perfectly on both counts, enabling us to run multiple Linux virtual machines on a single, ultra-reliable hardware platform."

Quote from IT Support Manager

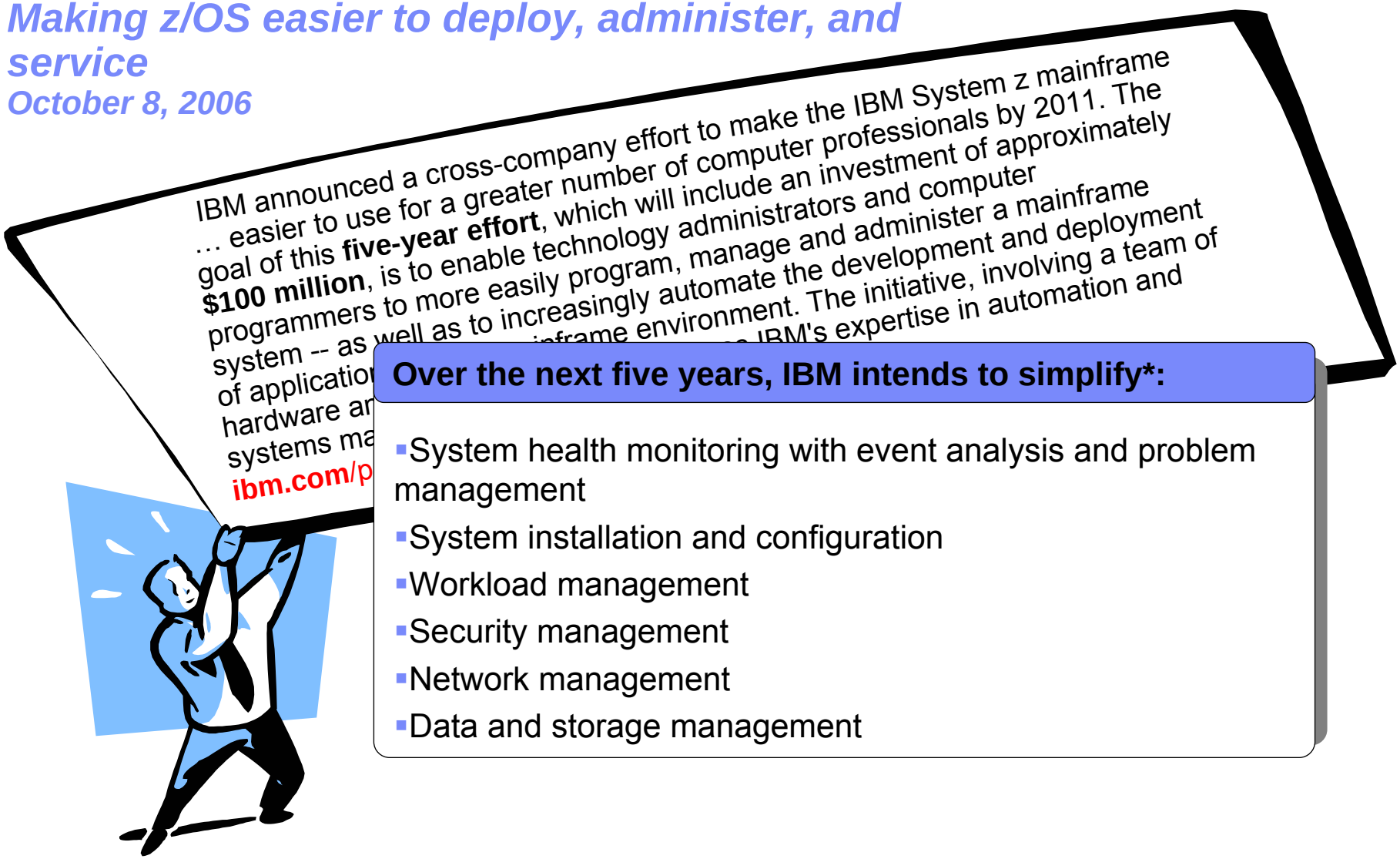
Infrastructure simplification is *REAL*

How Hannaford Markets simplified it's infrastructure

z/OS System Management Strategy

Making z/OS easier to deploy, administer, and service

October 8, 2006

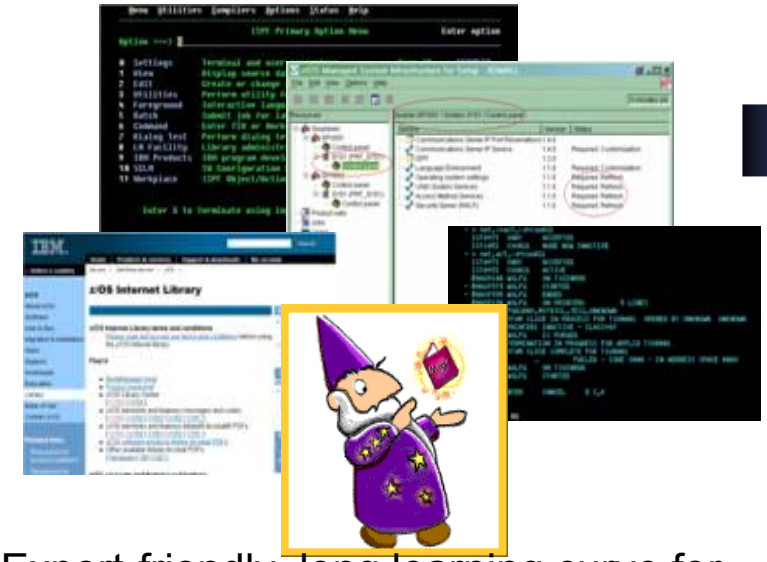


Over the next five years, IBM intends to simplify*:

- System health monitoring with event analysis and problem management
- System installation and configuration
- Workload management
- Security management
- Network management
- Data and storage management

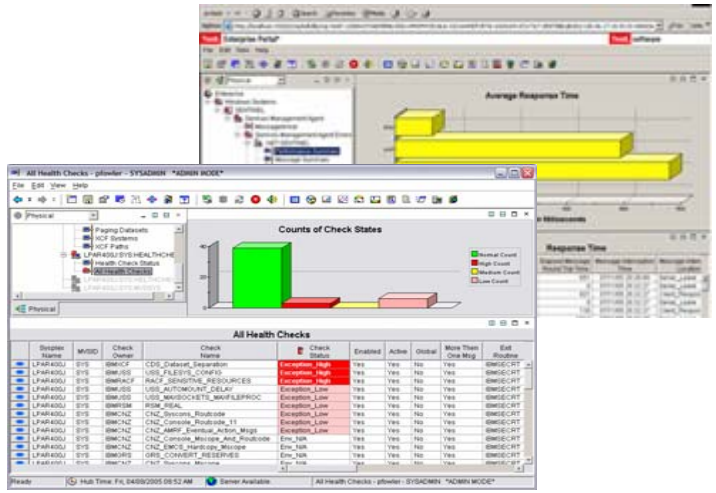
z/OS Management Simplification

Today



- Expert-friendly, long learning curve for people new to platform
- Multiple, inconsistent interfaces
- Many interfaces foreign to those new to platform
- Manual tasks requiring extensive documentation
- Years of experience

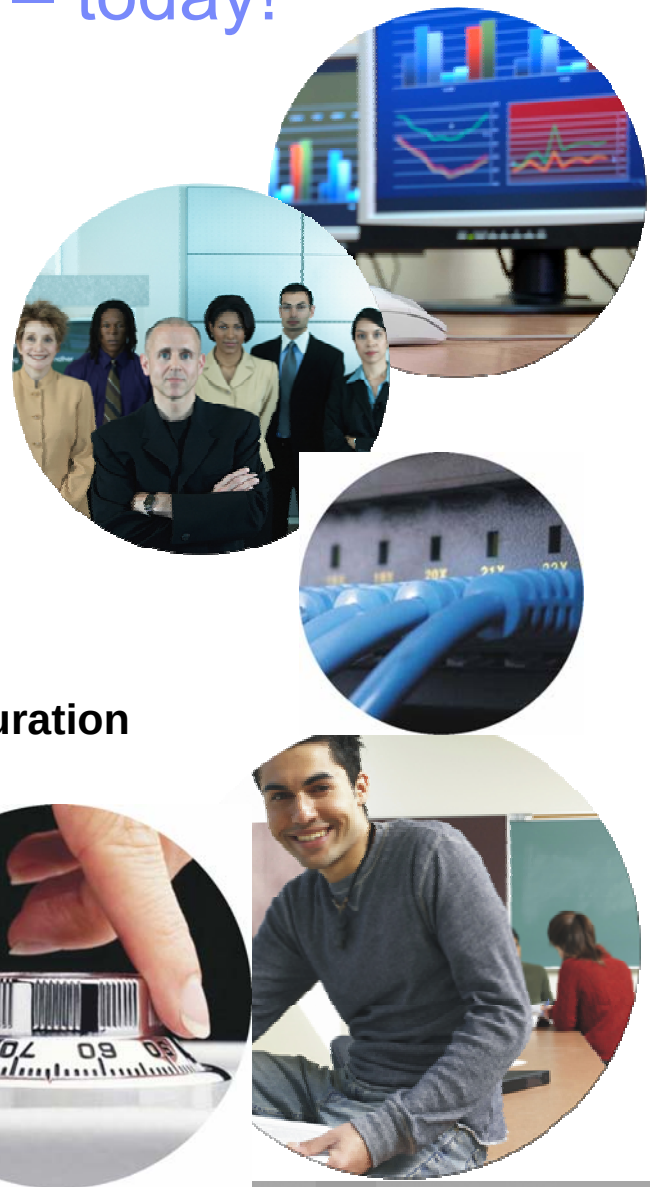
*Tomorrow**



- **Central** z/OS management portal
- **Simplified**, **automated** task-oriented mgmt interface, with integrated user assistance
- **Modern** look & feel; more familiar to those new to platform
- Focus on **customer goals**
- Months of training

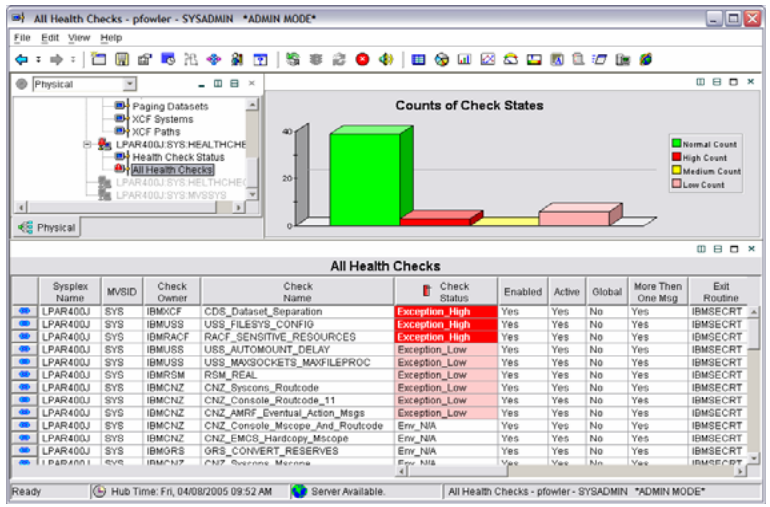
Simplifying mainframe management – today!

- System health and monitoring:
  - **Modern monitoring console**
  - **Automatic health checking**
- Installation, configuration, and maintenance:
  - **On-line ordering and inventory management**
  - **Automated on-line service acquisition**
  - **Shortened release to release migrations**
  - **Single view of enterprise devices**
  - **Consistent user experience with hardware configuration**
- Other simplification management:
  - **Workload management**
  - **Network management**
  - **Security management**



Simplifying mainframe management – today!

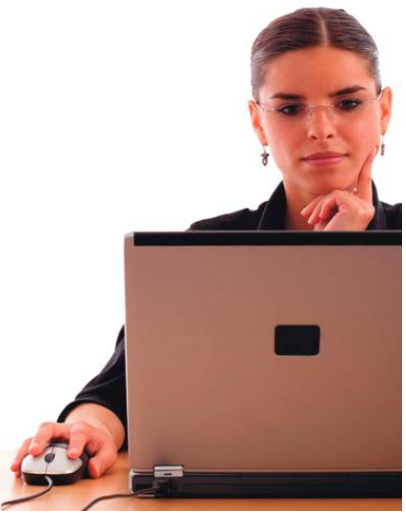
- System health and monitoring**:**
  - **Modern monitoring console – IBM OMEGAMON z/OS Management Console**
  - **Automatic health checking – IBM Health Checker for z/OS**

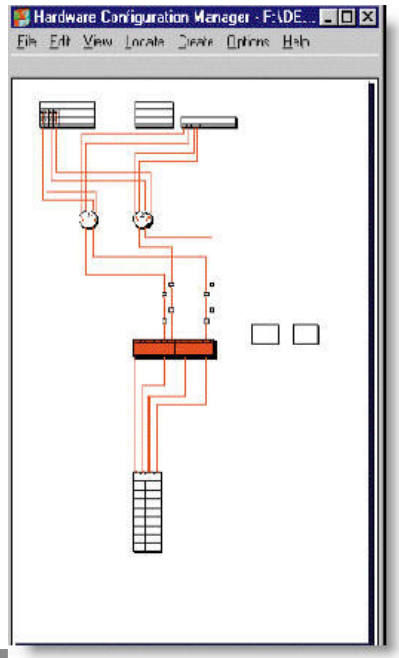


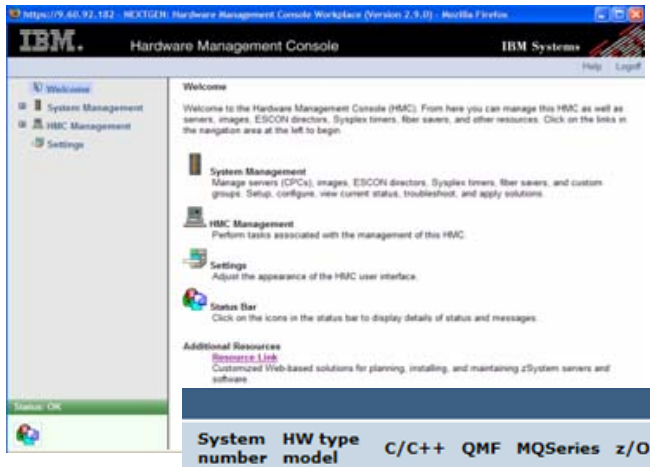
Over 50 Checks with more planned

Simplifying mainframe management – today!

- Installation, configuration, and maintenance:
  - **On-line ordering and inventory management - ShopzSeries**
  - **Automated on-line service acquisition – SMP/E**
  - **Shortened release to release migrations – Migration Checker for z/OS**
  - **Single view of enterprise devices – Hardware Configuration Manager**
  - **Consistent user experience with hardware configuration – Hardware Management Console**

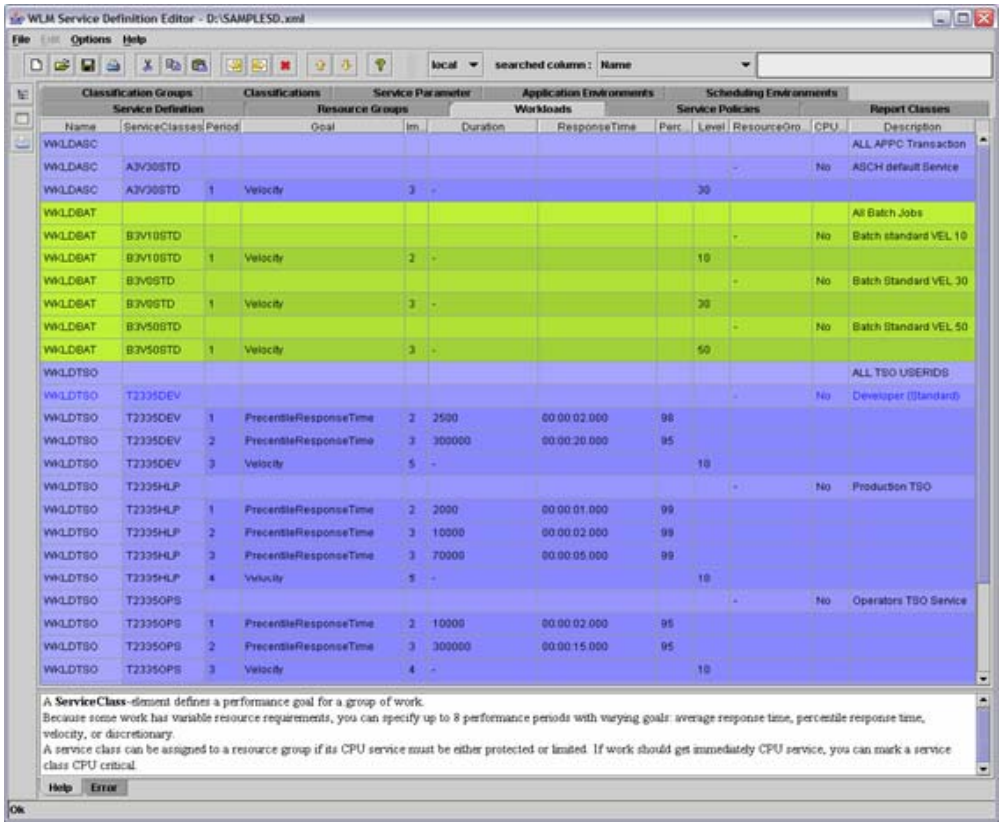


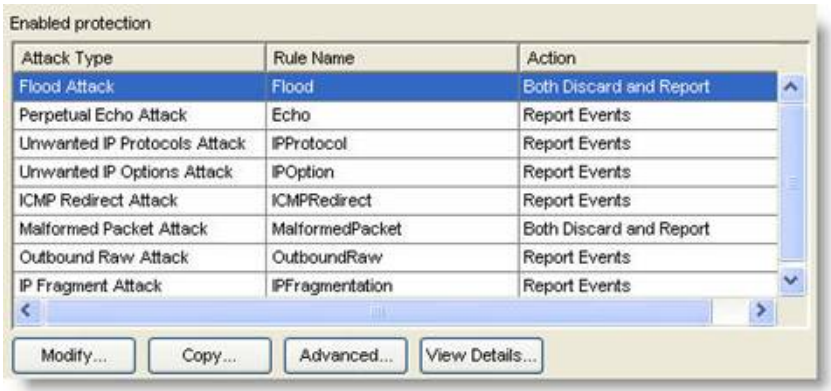




System number	HW type model	C/C++	QMF	MQSeries	z/OS	IMS DBM	IMS TM	DB2 UDB	COBOL
	2063-AG1	1	1	-1	1	1	1	1	1
0000C	2064-1C9	1	1	-1	1	1	1	1	1
0001Z	2064-108	1	1	-1	1	1	1	1	
0001Z	2064-107	1	1	-1	1	1	1	1	
0000C	2064-1C9	1	1	-1	1	1	1	1	
0000C	2064-1C9	1	1	-1	1	1	1	1	
0000C	2064-108	1	1	-1	1	1	1	1	

Simplifying z/OS management – today!





- Other simplification management**:**
  - **Workload management**
  - **Network management**
  - **Security management**

The New Face of z/OS

Simplifying and Modernizing the Mainframe for the New Generation of IT Professionals

Fill the pipeline with new talent:

- Academic initiative
- z/OS Basic Skills Information Center for new and experienced users
- IBM Education Assistant (IEA)
  - ▸Get online education on z/OS performance, tuning, and best practices tips.

Helping to reduce z/OS complexity

- Make it easier to develop experts
- Eliminate, automate, and simplify complex tasks
- Modernize the “face” of z/OS
  - ✓ Maintain current “faces” for experienced users
- Leverage mainframe’s centralized management

Advancing toward goal of 20,000 additional mainframe educated students in marketplace by 2010

Academic Initiative to educate students on mainframes and enterprise skills

- **>23,000 students worldwide educated to date – reported by professors**
- **School enrollments grew 900% in 2 years, Over half outside of US**
- **14 courses available to all schools**
- **2005, 2006 Student Mainframe Contests – 2,523 students from 302 schools**
- **6 University HUB systems actively sharing academic mainframe resources worldwide**
- **zNextGen community kicked off with SHARE/IBM**
- **Over 200 IBM mainframe ambassadors assisting schools**

And more planned …

- **Student Mainframe Contest**
- **3 more courses (17 total)**
- **Faculty Education Seminars ongoing**
- **More Majors and Certifications**
- **Matching schools with customers**
- **Faculty Awards**

Student Mainframe Contests

Completed first contest in North America, Fall 2005

- **750 students enrolled from 85 schools in first ever remote "hands-on" contest**
- **Three levels of challenges, prizes awarded at each level (T-shirts to ThinkPads)**
- **Winners invited to Poughkeepsie; Interviewed by IBM & Customers**

New contests for 2006 – and planned for 2007

- **2nd NA contest complete – 1,085 students from 177 schools (plus China contest)**
- **1st Europe (UK) contest - 725 students from 40 schools (additional European contests in Spring 2007)**
- **Brazil contest running in Spring 2007**
- **Additional global contests being considered – Asia etc.**

Master the Mainframe

mainframes do IT 24/7

"z/OS has blown me away in terms of polish and usability compared to MVS."

– student,
Michigan State

"I'm enjoying it more than I can admit in public."

– student,
Rutgers University

Worldwide Mainframe Hubs

Locations:

- **Marist College, New York**
- **Colorado State : >500 Linux images**
- **University of Arkansas**
- **Montpellier, France: IBM site “ZEUS”**
- **Brazil**
- **China: 5 systems, serving 8 schools**
- **IBM Developer Technical Support Center**

ibm.com/systems/z/about/charter/university.html

IBM System z entry level for z/OS System Programmer Mastery Test

- Measure and validate mainframe z/OS knowledge
  - ***Introduction to the Mainframe: z/OS Basics***
- Panel of subject matter experts
  - **IBM**
  - **College and university faculty**
  - **Mainframe customers**
- Worldwide proctored exam

THOMSON PROMETRIC

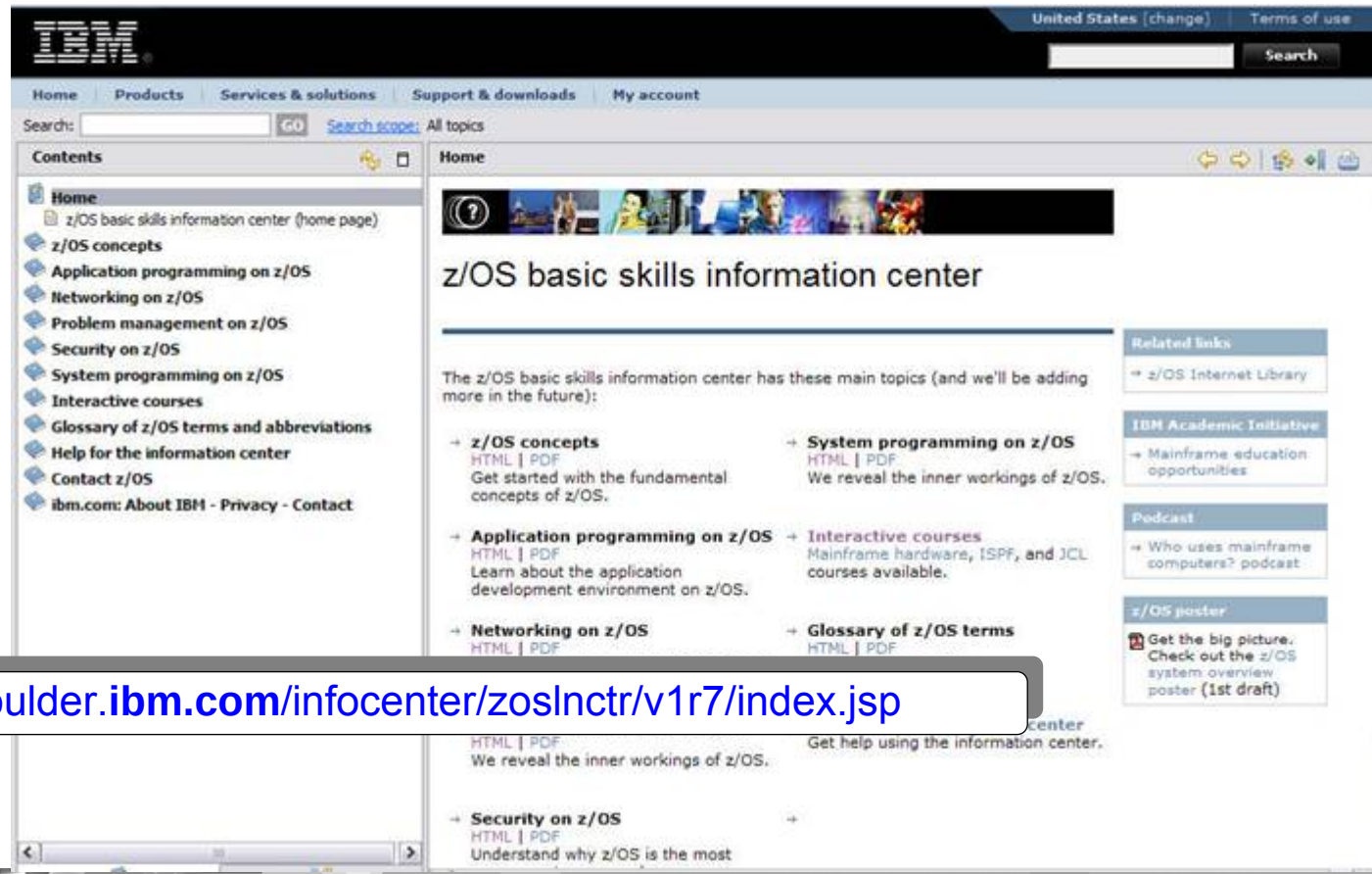
PEARSON VUE

- Results recorded in IBM certification database
  - Goal: **Increase the chances for success within an organization's mainframe community**
  - **Qualifies students to submit their resumes to the Student Opportunity System Database (Accessible by customers)**
  - **Leverage the value and importance of System z courses in academia**

ibm.com/certify/mastery_tests/az_index_mt.shtml

z/OS Basic Skills Information Center

- Great for new users or for current users can brush up on existing skills
- Information for “on-the-job” training
- Educational topics plus interactive exercises

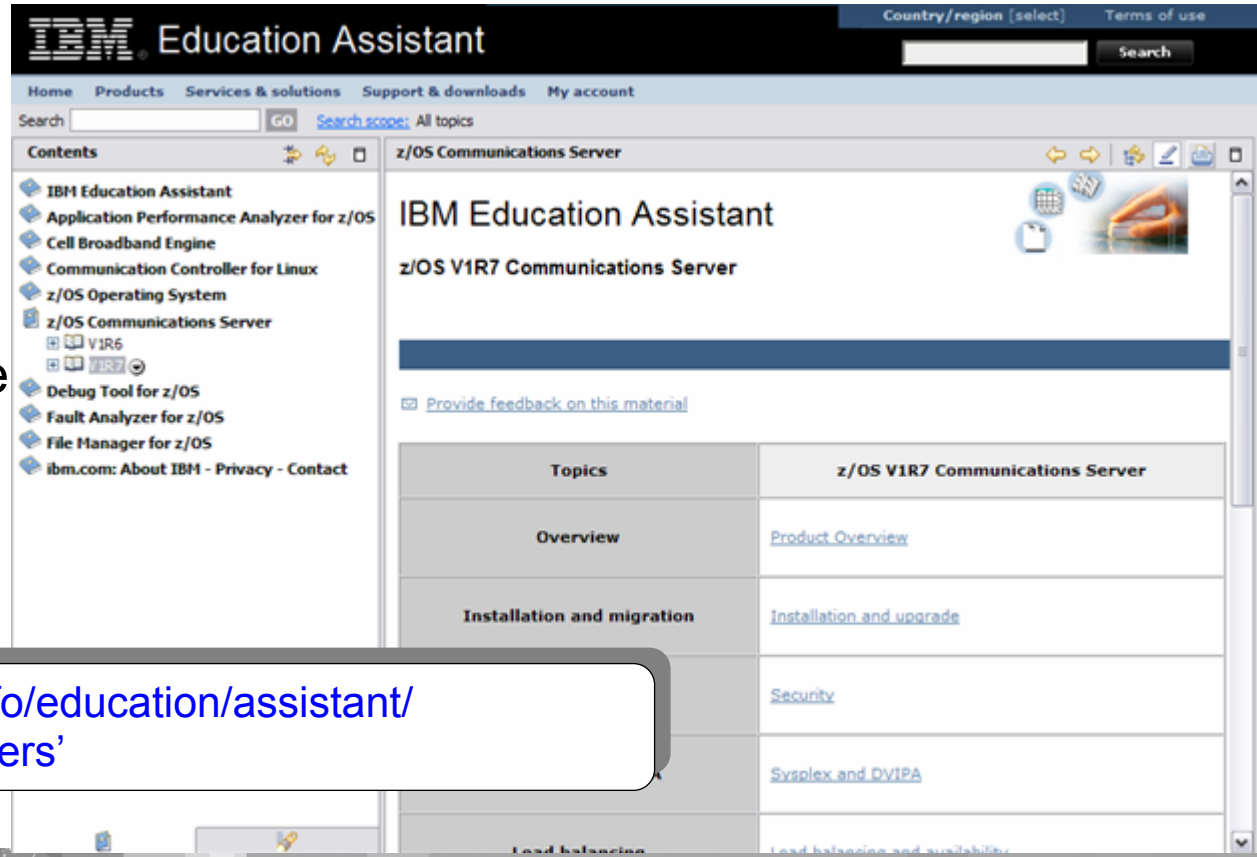


http://publib.boulder.**ibm.com**/infocenter/zoslnctr/v1r7/index.jsp

IBM Education Assistant

- IBM Education Assistant provides narrated presentations, flash simulations, tutorials, and resource links to help you use IBM software products more successfully and effectively.

- On-line education on z/OS performance tuning, and best practices tips.



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Click on 'Systems and Servers'

Mainframe Headlines

“IBM aims for user-friendly mainframes”

“Big Blue on mission to make mainframes easier to use”

“IBM to Spend $100 Million on Mainframes ”

“Mainframe Simplicity Not an Oxymoron?”

“IBM Commits $100 Million to Make Mainframes Easier to Use”

“IBM puts up $100 million to simplify mainframe operations”

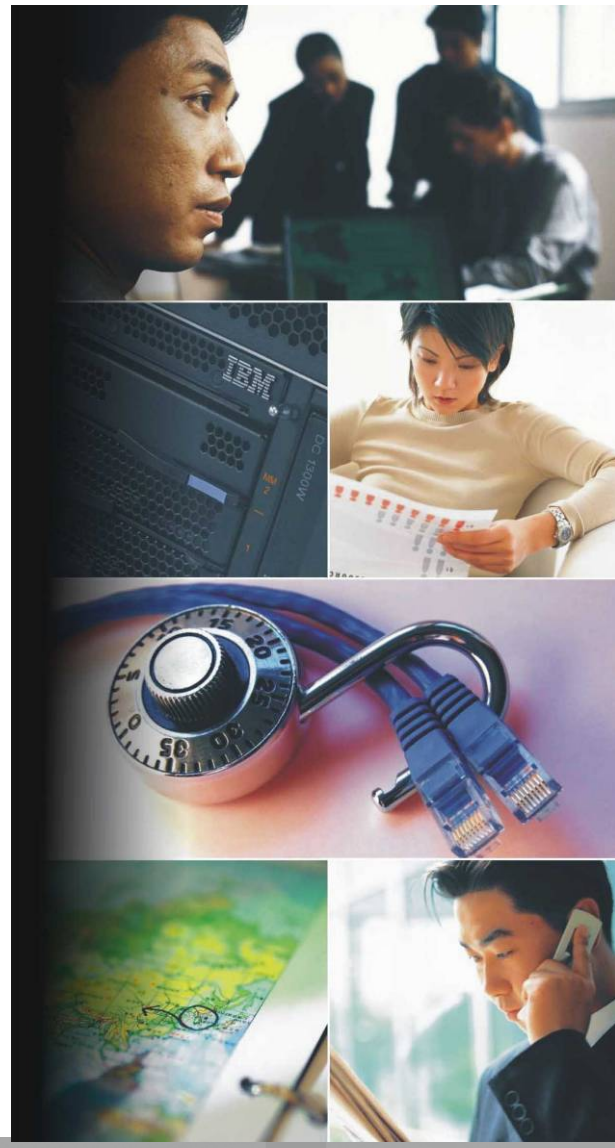
“IBM announces the magnitude of its plans to simplify the mainframe”

“IBM makes mainframes simpler”

“IBM in 5-year, $100 mln plan to simplify mainframe”

System z delivers many other benefits to the business

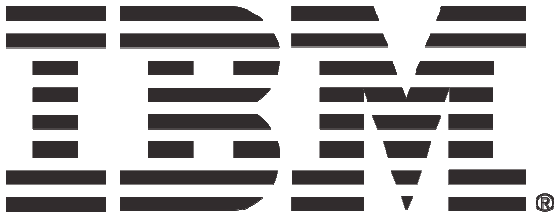
- **Extremely High Availability and Overall Reliability**
- **Massive end-to-end Scalability**
- **Capacity on Demand**
- **Utilizes Open and Industry Standards**
- **World-class Integrated Support**
- **Higher Utilization and Balanced System Design**



Today's mainframe delivers the capabilities required by an on demand business

IBM Mainframe – Innovative technology helping you simplify your IT environment

- z/OS – the mainframe operating system designed to deliver
  - **A highly available and security-rich base for integrating applications**
  - **Resources optimized to meet business priorities**
  - **Scalability for data and transaction growth**
  - **Robust and resilient networking**
  - **Business resiliency**
- With new directions
  - **Simplifying z/OS management**
  - **Extending z/OS capabilities to help manage your mixed environment**



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