IBM Mainframe Strategy

Mark Anzani
VP, System z9 Hardware Products
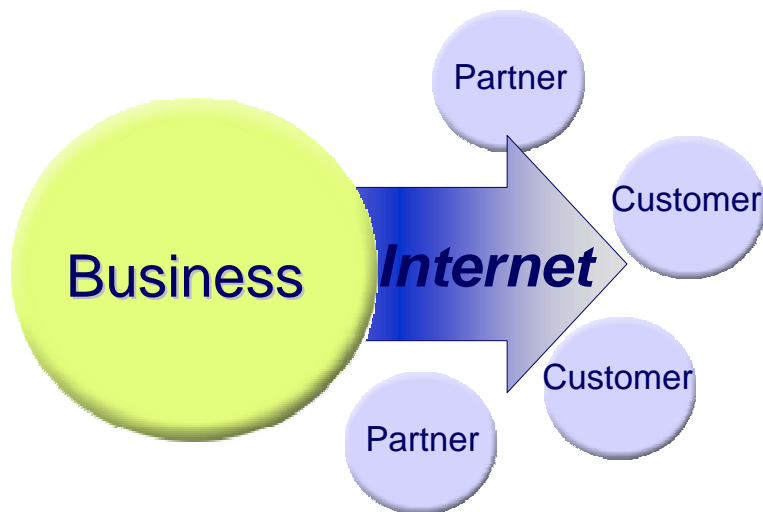
ENABLING BUSINESS. A THROUGH Z.

Agenda

- **IBM Systems Strategy and the Mainframe**

- **The Mainframe and the On Demand environment**

- **IBM's ongoing commitment to the mainframe: The IBM System z9**
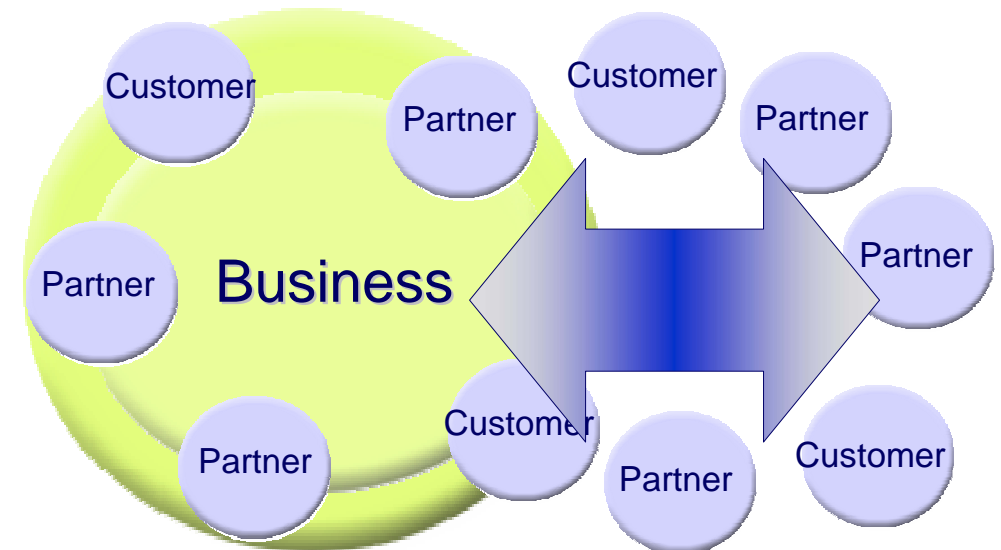
IBM Systems Strategy and the Mainframe

IT environments are constantly changing

Online transaction processing

- **Siloed**
- **Vendor defined**
- **Point-to-point**

On Demand collaborative processing

- **Shared**
- **Open**
- **Dynamic**

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The IBM Systems Agenda

Virtualize Everything

Systems-level approach to virtualization

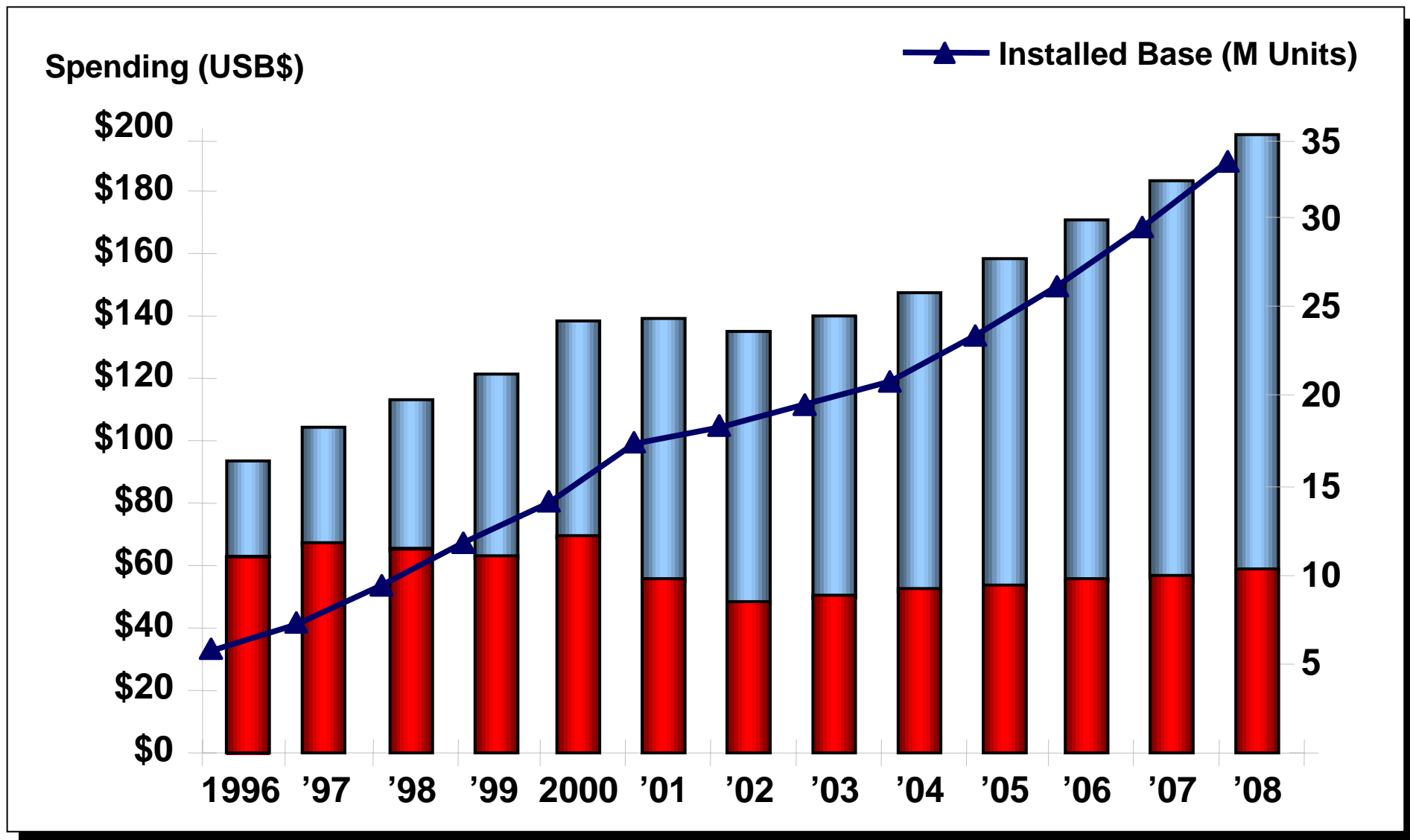**Extend virtualization across infrastructure**

Commit to Openness

Commitment to open standards

Choice of open and integrated systems

Collaborate to Innovate

Enhanced enterprise collaboration

Industry collaboration

Cost of Complexity

Spending (USB$)

Installed Base (M Units)

New server spending (USM$) 3% CAGR

Cost of mgmt. & admin. 10% CAGR

Source: IDC

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Virtualization Engine 2.0 – Complete Portfolio

Virtual Planning Tools

Virtual Access

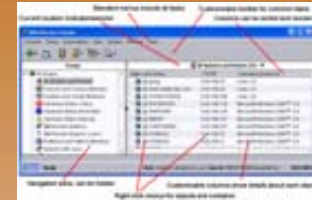| Programmatic access	Virtual view

VE Console

IBM TotalStorage Productivity Center

Virtual Management

Workload & performance managers
Resource management, modeling, mapping

Enterprise Workload Manager

IBM Director 5.10

Resource Dependency Service 2.1

Virtual Resources

Resource virtualizers
Partitioning, virtual machines, I/O, networks, VTS

IBM Server & Storage Systems

TotalStorage®

iSeries ™

System z9™ zSeries®

xSeries®

BladeCenter™

pSeries®

OpenPower®

Value of a Virtualized Infrastructure

Increase utilization

Most practical choice to achieve full consolidation
Capability to pool resources to service a workload
Can improve availability and reliability (LPAR, SAN, Clustering)

Improve productivity

Creates virtualized infrastructure for test and development
Improves rapid deployment and scaling of workloads
Use common tools across many systems, simplified resource management

Link infrastructure performance to business

Use policy to adjust resources based on requirements of the business

Analyze application performance based on business policy
Improve business resilience

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Open Standards

SOAP

WAP

Linux

WSDL

SMTP

POP/iMAP

TCP/IP

Globus

Web Services

NNTP

SQL

XML

OGSA

IRC

HTTP/HTML

Systems & Technology Collaboration

Internal

Systems & Technology Collaboration

Industry

Systems & Technology Collaboration

Open Communities

Systems & Technology Collaboration

Clients

IBM Mainframe Strategy and the Mainframe

- **Virtualized**

- **Open**

- **Collaborative**

Q1　　Q3　　Q5　　Q7　　Q9

Market Momentum

Server market

> $250K Server market
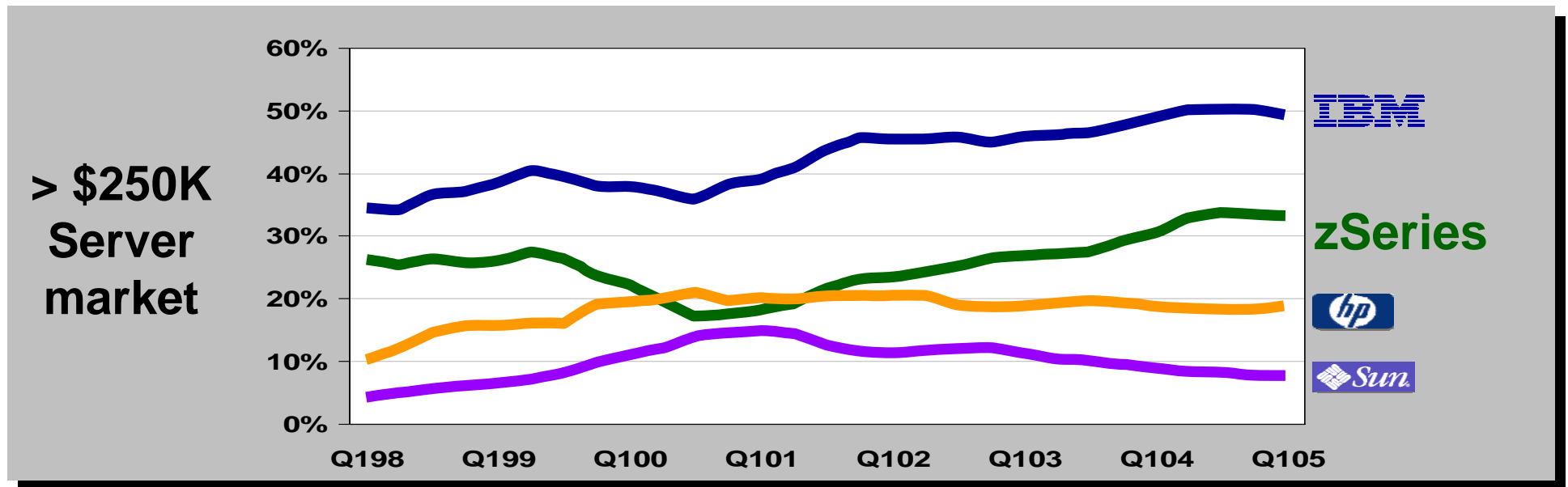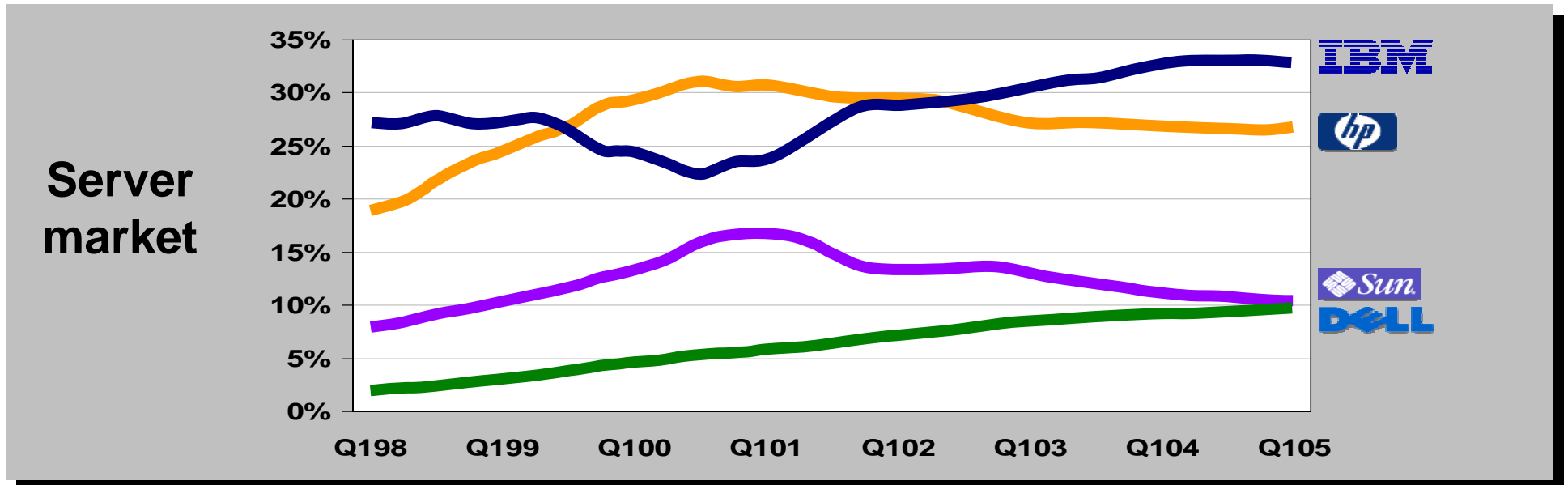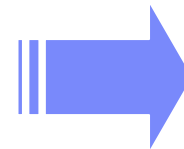

Source: IDC FY2005-Q1 Quarterly Server Tracker and STG MI

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The Mainframe and the On Demand Environment

The Journey to On Demand
Traditional Operating Environment

Network   **Edge/Web**   **Application**   **Data/Transaction**

Multiple points of Vulnerability

Storage
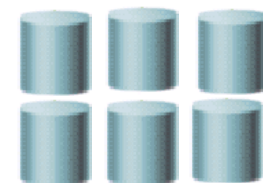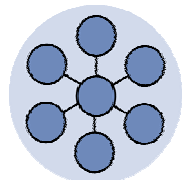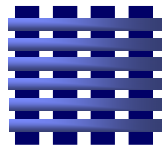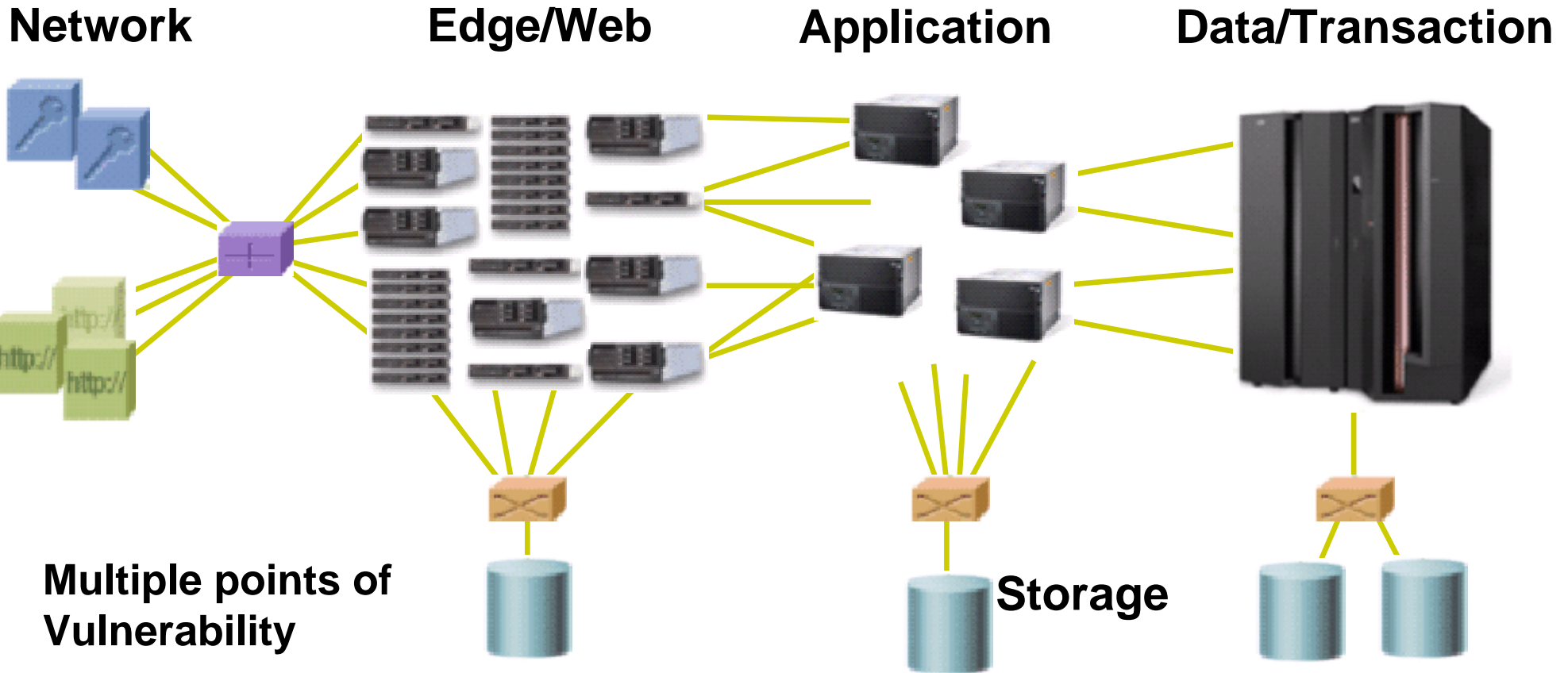
Integration

Workload Management

Security/ Business Resiliency

Multiple Data Copies

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Collaborate to Innovate
Extending Mainframe Qualities of Service to the Enterprise

Four enterprise-wide roles of the mainframe system

- enterprise business resilience manager

- enterprise security manager

- enterprise hub for data & SOA

- enterprise workload manager

The Mainframe Charter

Innovation

Value

Community

Mainframe Community Ecosystem

Academia

Open Source

Industries

Customer & User Groups

IBM Technical Support & Services

Value Net
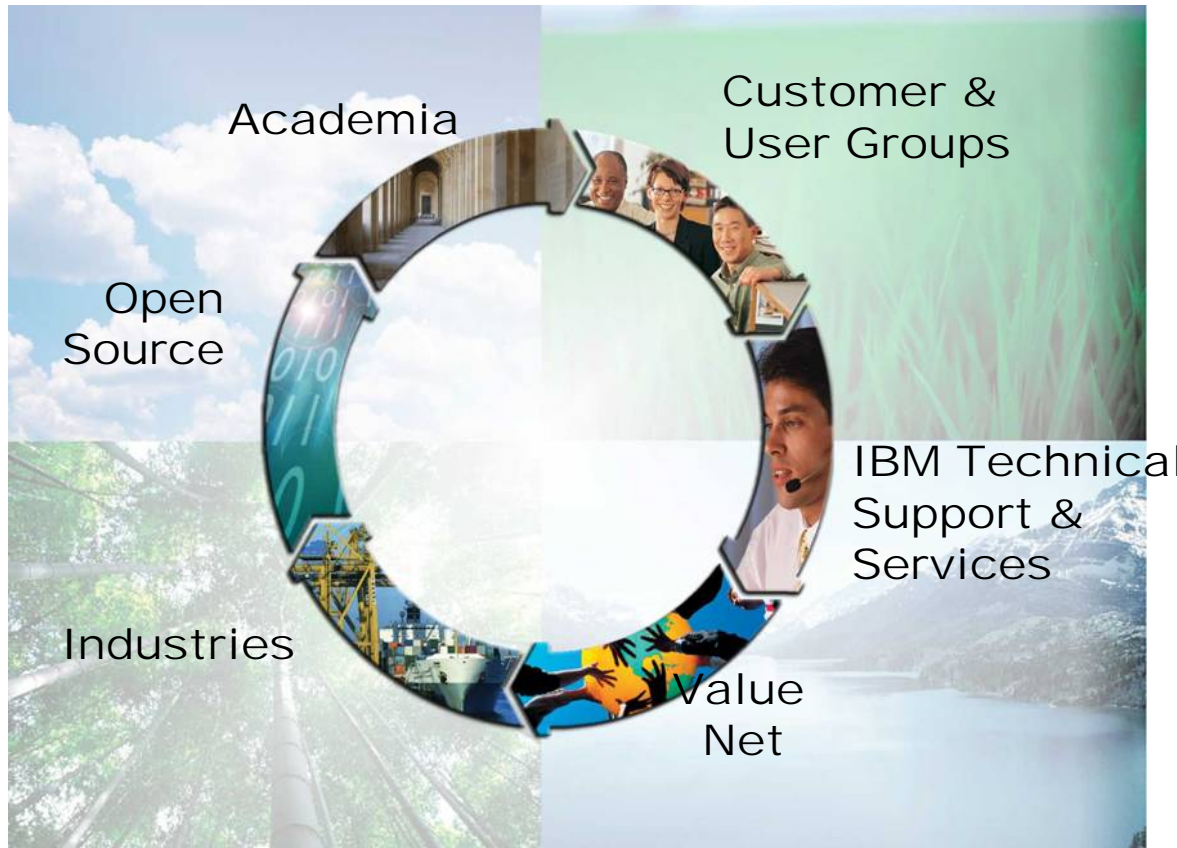
- **Customer councils**

IBM Academic Initiative
- **20,000 new skills by 2010**
- **150 colleges and universities**
- **200 professors**

Partners
- **240 mainframe Linux ISVs**
- **1,500 mainframe partners**

Mainframe blog   http://mainframe.typepad.com

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IBM's ongoing commitment to the mainframe:
The IBM System z9

IBM Announces the System z9

Investment:

• **3 years**

• **$1.2 billion**

• **5,000 tech professionals**

Mainframes: The Next Level

Capacity

Freeway   T-Rex   z9
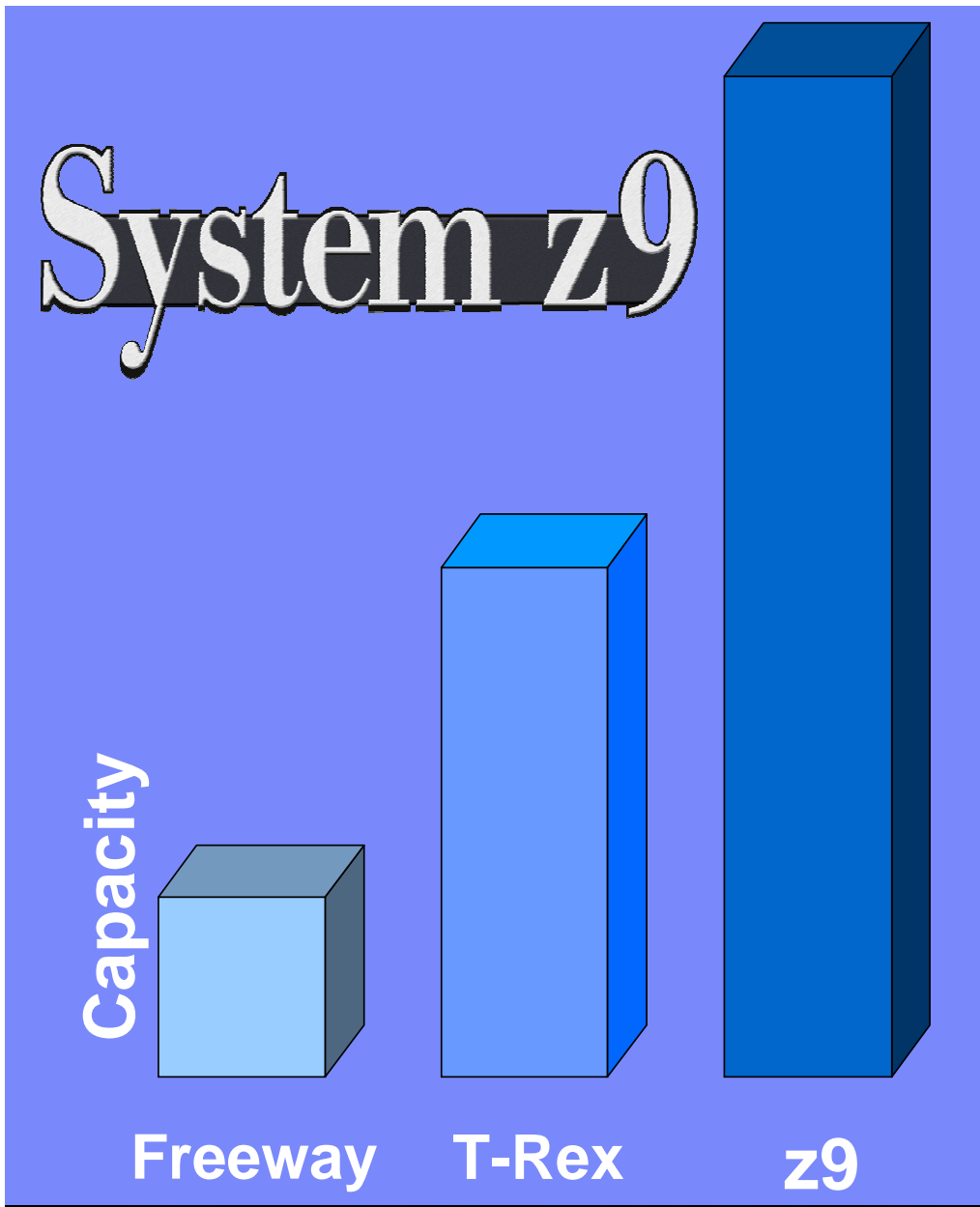
- **Twice the capacity**
- **Twice the memory**
- **Twice the LPARs**
- **80% more internal bandwidth**
- **60% more CPUs**

z9-109 – Improved performance on FICON
Modified Indirect Data Address Word (MIDAW) Facility

- **MIDAW facility – new system architecture and software exploitation designed to improve FICON performance**

  - Can improve FICON performance for

    - Extended format data sets – including DB2® and VSAM

  - Can improve channel utilization and can significantly improve I/O response times

    - Internal IBM DB2 Table Scan tests(*) with the z9-109, FICON® Express2 and the DS8000 control unit comparing MIDAW facility configurations to pre-MIDAW configurations showed:

      - 36% to 58% reduction in response times

      - 35% to 56% reduction in channel busy

      - 56% to 126% improvement in I/O throughput

  - Supported on z/OS® 1.6 and above

    * See Backup slide "Parallel DB2 Table Scan, EF 4K (single channel)" This document contains performance information

    Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the numbers stated here.
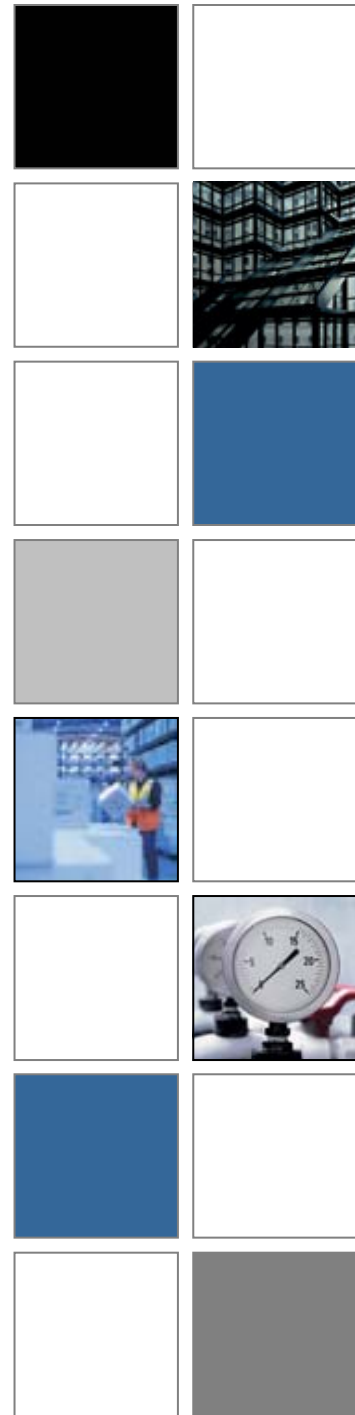
Specialty engines
Delivering improved price/performance for new applications

- **Continuing support for integrated hardware specialty engines**

  – System z9 Application Assist Processor (zAAP)

  – Integrated Facility for Linux (IFL)

  – Internal Coupling Facility (ICF)

- **z9-109 specialty engines provide price / performance improvements over z990** ⭐

- **Capacity Backup Upgrade (CBU) extended to specialty engines** ⭐

- **Management of specialty engines as individual types/pools** ⭐
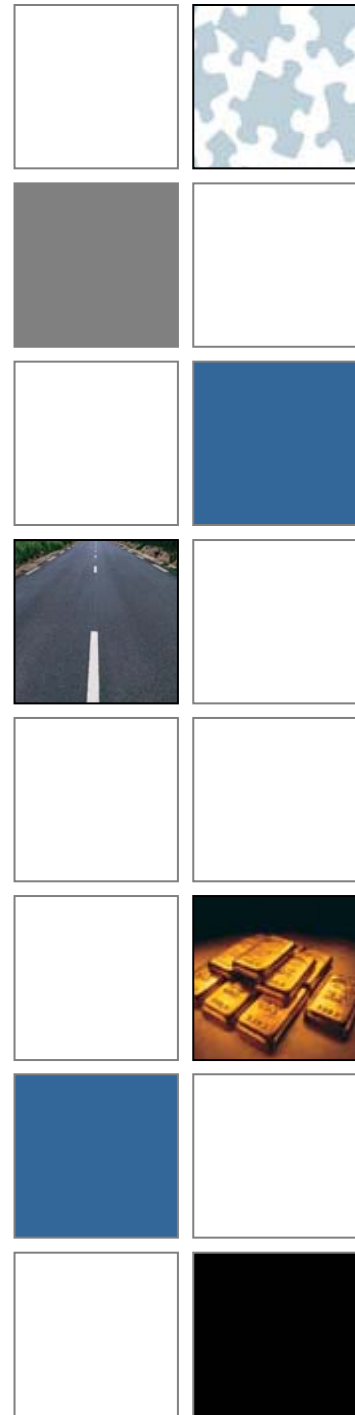
z9-109 – Providing new levels of availability

- **New enhanced book availability and redundant I/O interconnect – increasing z9-109's availability by helping to avoid unplanned outages:***

  – Enhancing recovery of resources

  – Improving ability to nondisruptively add and repair memory resources

- **Improving the application of hardware driver maintenance:***

  – Potentially reducing planned outages using enhanced driver maintenance

- **Extending capability for Capacity Backup Upgrade (CBU) to include specialty engines**

- **Improving memory availability with flexible memory offering**

*Customer pre-planning is required and may require purchasing additional hardware resources
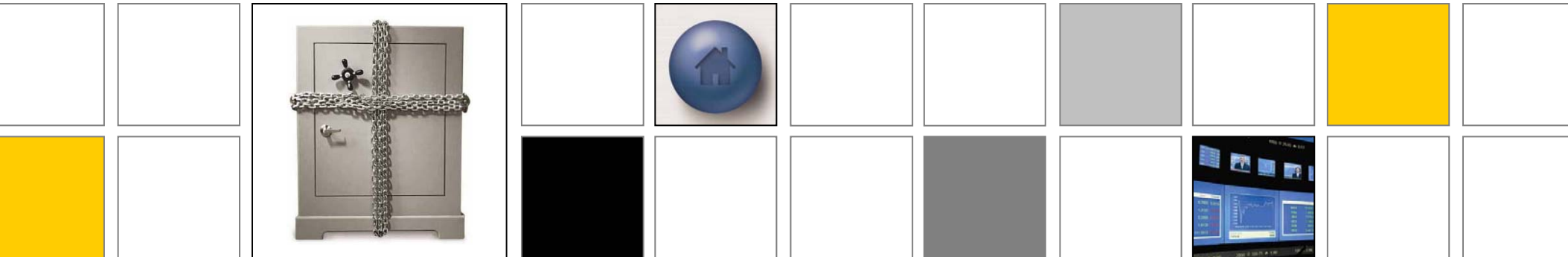
Security
Security breaches are becoming more prevalent and can be very costly

- **IT security concerns continued to grow in 2004**
  - Known computer viruses increased by 25% to 112,438 known viruses*
  - Sources of viruses began to expand as well: i.e., cell phones, PDAs, wireless networks, and embedded computers*
  - Of 147 billion e-mails scanned, 6.1% contained a virus
    - The growth rate has doubled from prior years*
  - Network attacks on utilities, telecommunication companies and government agencies surged 55% from July to August 2004*
  - May 2005: largest breach of banking security in US history
    - 676,000 customer records stolen and up to $Billions in losses to consumers**

*   Source: *© 2005 IBM Global Security Index Report*
* * Source: *© 2005 Computerworld, Todd Weiss, May 20, 2005*

IBM System z9
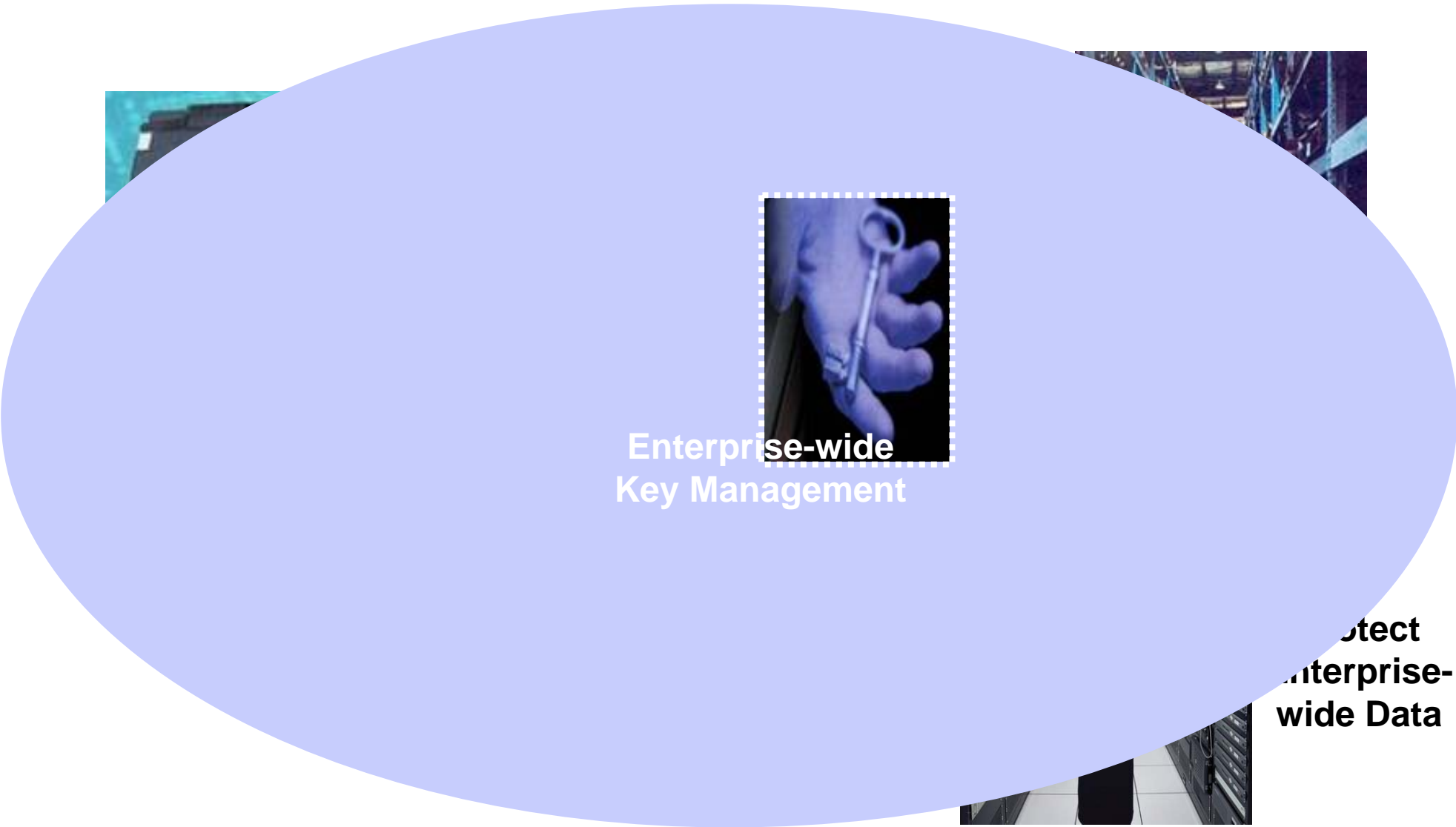## *The Benchmark for IT Security*

- **Security built into all system layers**

- **Faster secure online transactions**

- **More secure internet transmission**

- **Preemptive intrusion detection**

- **Collaborate with partners for enterprise wide security**

Vision to Secure Enterprise Data
Solutions for a Heterogeneous Environment

**Enterprise-wide
Key Management**

...tect
...nterprise-
wide Data

z9-109 – Enhancing security

- **New integrated cryptography features offer more security options on z9-109**
  - Advanced Encryption Standard (AES) support in z9-109 hardware
  - Stronger hash algorithm with SHA-256
  - Pseudo Random Number Generator
- **Crypto Express2 improved flexibility and speed**
  - Configurability options, two coprocessors, two accelerators or one of each
  - With both adapters configured as accelerators each Crypto Express2 card is designed to provide up to 6000 SSL handshakes per second *
- **Secure encryption facility for z/OS to help protect data shared with partners, suppliers, and customers ***
  - Designed to leverage z/OS key management and high performance hardware encryption
- **Can help to achieve higher levels of certifications and compliance**
- **Virtualized cryptographic capabilities for card sharing by Linux virtual servers**
- **Complementary IBM technology and vendors' advanced security solutions**
  - Can enable a cross-platform model that can extend RACF capabilities to the enterprise
  - May provide the capability of integrating security enforcement across the networking enterprise

* These measurements are examples of the maximum transaction/second achieved in a lab environment with no other processing occurring and do not represent actual field measurements. Details available on request.
** This statement represents IBM's current intentions. IBM development plans are subject to change or withdrawal without further notice.
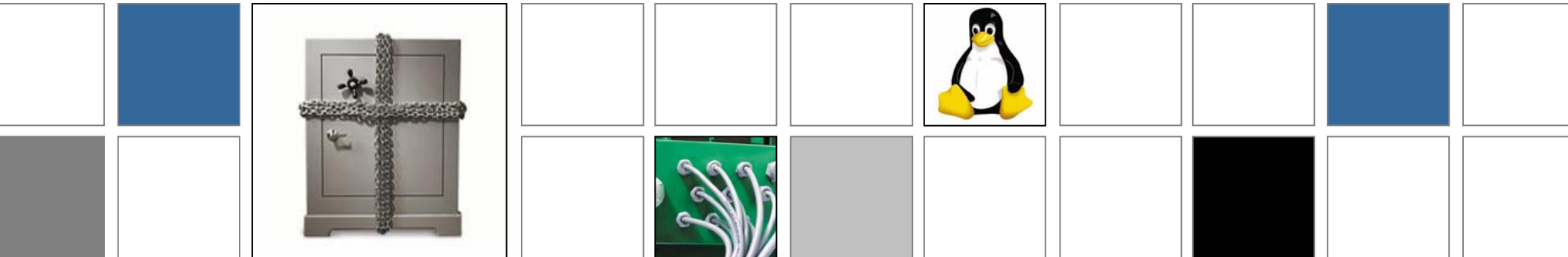
z9-109 delivering new functions and features

Five New Hardware Models

Faster Uni Processor

Up to 54 CPs

Up to 512 GB Memory

Up to 60 LPARs

CBU for IFL, ICF and zAAP

Separate PU Pool Management

Redundant I/O Interconnect

Enhanced Driver Maintenance

Enhanced Book Availability

Dynamic Oscillator Switchover

Preview*
Server Time Protocol

Faster 2.7 GB STI and more of them

MIDAW facility

Multiple Subchannel Sets per LCSS

63.75K Subchannels for Set-0

Up to 336 FICON® Express2 Channels

N_Port ID Virtualization

IPv6 Support for HiperSockets™

OSA-Express2 1000BASE-T

OSA-Express2 OSN (OSA for NCP)

Enhanced CPACF with AES, PRNG and SHA-256
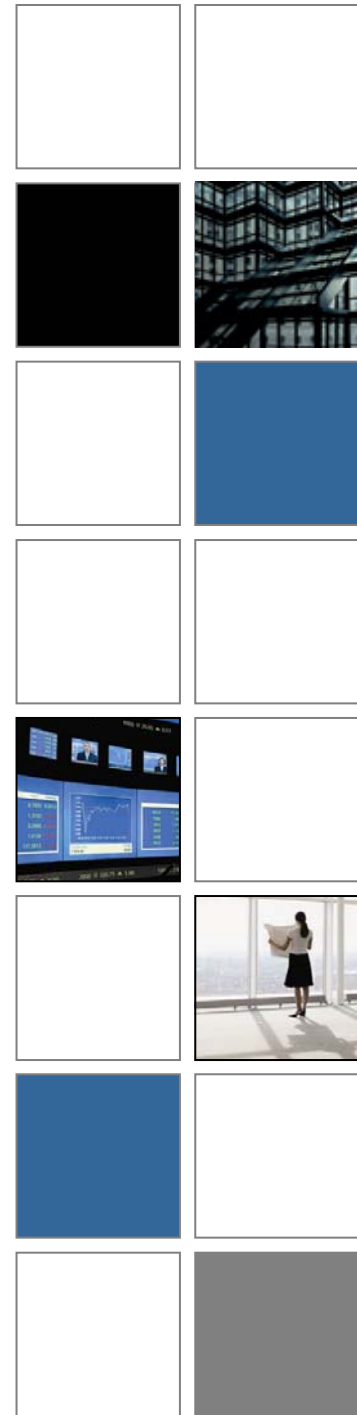
Configurable Crypto Express2

*This statement represents IBM's current intentions. IBM development plans are subject to change or withdrawal without further notice.

z9-109 Operating System Software

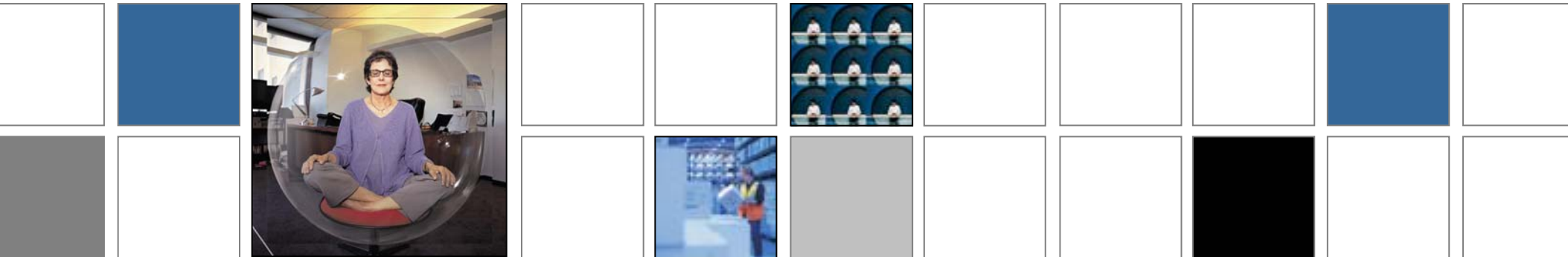| Operating System	ESA/390 (31-bit)	z/Arch (64-bit)
z/OS Version 1 Release 4, 5, 6, 7	No	Yes
Linux, 64-bit distribution	No	Yes
Linux, 31-bit distribution	Yes	No
z/VM Version 5 Release 1, 2	No	Yes
z/VM Version 4 Release 4	Yes	Yes
z/VSE™* 3.1, VSE/ESA™ 2.6, 2.7	Yes	No
z/TPF Version 1	No	Yes
TPF Version 4 Release 1 (ESA mode only)	Yes	No

*z/VSE can execute in 31-bit mode only. It does not implement z/Architecture™ and specifically does not implement 64-bit mode capabilities. z/VSE is designed to exploit select features of IBM System z9 and eServer zSeries hardware.

Note: Please refer to the latest PSP bucket for latest PTFs for new functions/features.

Leadership in systems innovation

- **New innovations in business resiliency help to keep your business secure and provide peace of mind**
  - Helping to keep your applications protected against planned and unplanned outages
  - New security options help to tighten system security

- **Advanced virtualization and intelligent workload management help you maximize resources**
  - z9-109 offers improved scalability, increased logical partitions and management of specialty engines

- **The System z9 environment provides the ability to integrate applications and data**
  - Specialty engines can provide price/performance improvements
  - Upgradeability options to z9-109 help provide investment protection

Thank You

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Notes:

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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