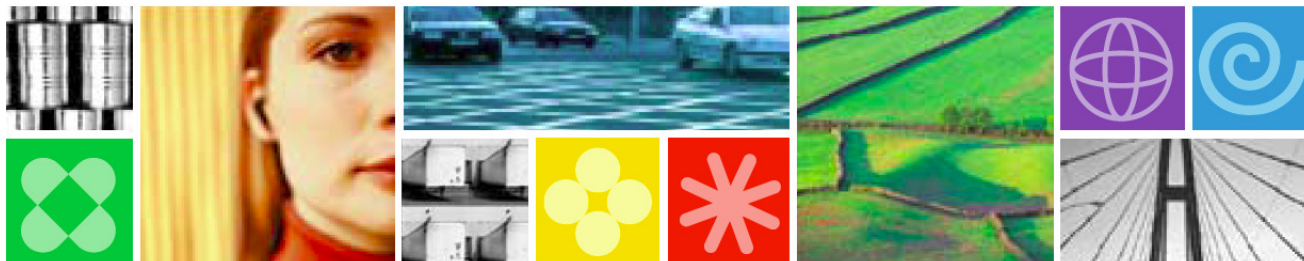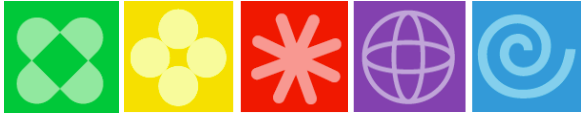# Winning with IBM System z

Trademarks

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

Cognos*	GDPS*	Parallel Sysplex*	System z9*	z10
DB2*	Geographically Dispersed	POWER6	System z10	z10 BC
ESCON*	Parallel Sysplex	S/390*	System z10 Business Class	z10 EC
FICON*	HiperSockets	System/360	Tivoli*	z/OS*
FlashCopy*	HyperSwap	System/370	WebSphere*	zSeries*
IBM*	IMS	System/390*	XIV*	z/VM*
IBM eServer	Infiniband*	System Storage	z/Architecture*	z/VSE
IBM logo	InfoSphere	System z*	z9*	
	NetView*			

* Registered trademarks of IBM Corporation

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc. in the United States, other countries, or both and is used under license there from.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

InfiniBand is a trademark and service mark of the InfiniBand Trade Association.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

ITIL is a registered trademark, and a registered community trademark of the Office of Government Commerce, and is registered in the U.S. Patent and Trademark Office.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency, which is now part of the Office of Government Commerce.

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.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.

Today, many infrastructures are at a breaking point:

- **Server sprawl is endemic in many infrastructures**
  - Costly to manage and run
  - Complex to update and modernize
  - Space constraint and energy consumption have become key issues

And, older technologies are restricting innovation:

- **Aging and non-strategic technologies**
  - Increasingly expensive to support and maintain
  - Limited new investment from ISVs
  - Uncertain technology futures and migrations forced by vendors
  - High cost of technology refresh

IBM has a long history of research and innovation
60+ Years of World Class Research

1944: Mark 1

1948: SSEC

1956: RAMAC

1957: FORTRAN

$D = B^2 - 4AC$

Equivalent FORTRAN statement:

$D = B**2 - 4*A*C$

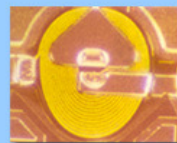1964: System/360

1966: One-Device Memory Cell

1967: Fractals
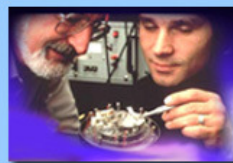
1970: Relational Database

1971: Speech Recognition

1973: Winchester Disk

1979: Thin Film Recording Heads

1980: RISC

Nobel Prizes:
1986: Scanning Tunneling Microscope

1987: High Temperature Superconductivity
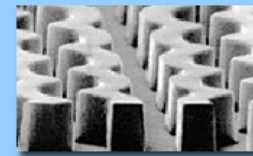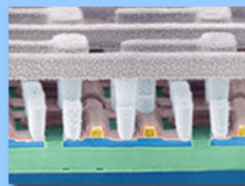
1990: Chemically Amplified Photoresists

1994: SiGe

1993: RS/6000 SP
1996,97: Deep Blue
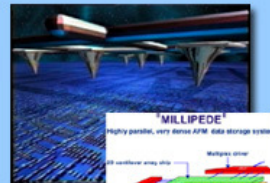
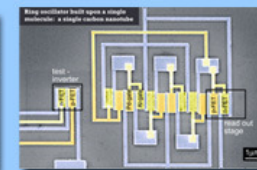1997: Copper Interconnect Wiring

1998: Silicon-on-Insulator

1998: Microdrive

2002: Millipede
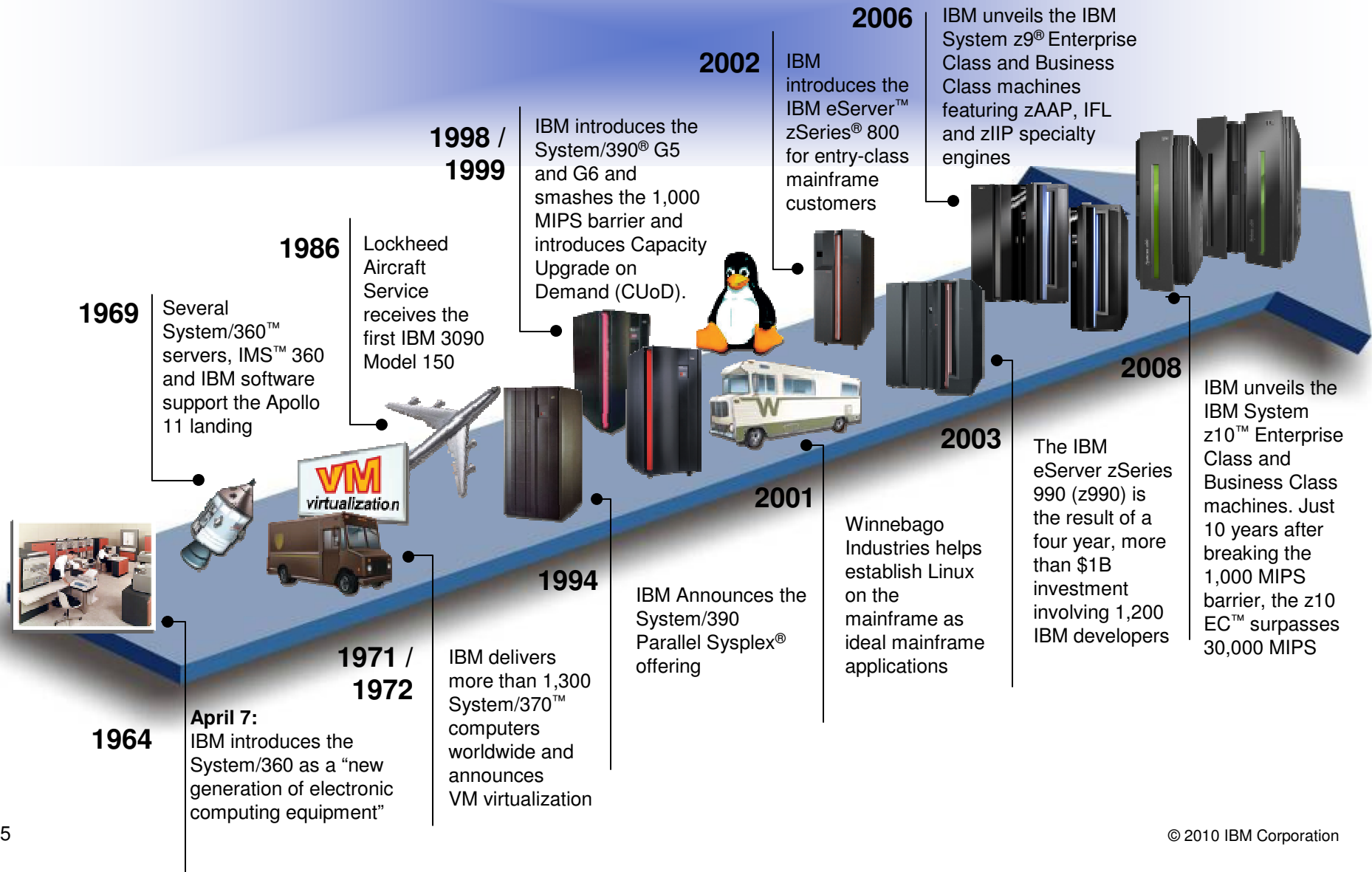
2004: Blue Gene/L
The fastest supercomputer in the world

2006: 5-stage Carbon Nanotube Ring Oscillator

2008: World's First Petaflop Supercomputer

And the Mainframe has over 45 years of innovation

2006 IBM unveils the IBM System z9® Enterprise Class and Business Class machines featuring zAAP, IFL and zIIP specialty engines

2002 IBM introduces the IBM eServer™ zSeries® 800 for entry-class mainframe customers

1998 / 1999 IBM introduces the System/390® G5 and G6 and smashes the 1,000 MIPS barrier and introduces Capacity Upgrade on Demand (CUoD).

1986 Lockheed Aircraft Service receives the first IBM 3090 Model 150

1969 Several System/360™ servers, IMS™ 360 and IBM software support the Apollo 11 landing

2008 IBM unveils the IBM System z10™ Enterprise Class and Business Class machines. Just 10 years after breaking the 1,000 MIPS barrier, the z10 EC™ surpasses 30,000 MIPS

2003 The IBM eServer zSeries 990 (z990) is the result of a four year, more than $1B investment involving 1,200 IBM developers

2001 Winnebago Industries helps establish Linux on the mainframe as ideal mainframe applications

1994 IBM Announces the System/390 Parallel Sysplex® offering

1971 / 1972 IBM delivers more than 1,300 System/370™ computers worldwide and announces VM virtualization

1964 **April 7:** IBM introduces the System/360 as a "new generation of electronic computing equipment"

VM virtualization

5

IBM System z: The hidden gem in your data center

- **A platform of choice for new and existing IBM System z® workloads:**
  – Drives hundreds of new solutions with many applications on a single platform
  – Low cost server specialty engines enable many applications (e.g. Java™, XML, Linux®) and large scale consolidation on the platform
  – Multiple analyst and consultant reports endorse the mainframe as a strategic platform for enterprise applications
  – System z Solution Editions significantly reduce the cost of deploying new applications and workloads on System z

- **Delivering quantifiable benefits to the business**
  – Dramatically reduce operating costs by up to 70%[1]
  – Spend up to 85% less on environmental expenses such as floor space and energy[1]
  – Reduce per core software licenses by a ratio of up to 30 to 1
  – Choose from more than 6,000 applications on System z from more than 1,500 Independent Software Vendors
  – Pay as you grow capabilities allows you to expand your capacity dynamically – as and when you need it

1. All performance information was determined in a controlled environment. Actual results may vary

The mainframe made over – Innovative, Cool, Affordable

IBM System z10 Business Class™ (z10 BC™)
Machine Type: 2098
1 Model: E10
Non-raised floor option

IBM System z10 Enterprise Class (z10 EC™)
Machine Type: 2097
5 Models

Processor Cores:

- Enterprise Quad Core technology
- More than 100-fold granularity in the family with over 200 choices in size
- Core sparing technology
- More SAPs come standard per system
- Configurable PUs allow you to design the system to meet your needs (e.g. CPs, specialty engines, SAPs)

Memory:

- Lower 4 GB entry point and up to 248GB on z10 BC
- Up to 1.5 TB on z10 EC
- HSA separately managed and not included in customer purchased memory

I/O:

- New I/O drawer on z10 BC with continued lower capacity / priced I/O cards
- 6 GBps InfiniBand® host buses for I/O
- FICON Express8 and High Performance FICON® for System z
- OSA-Express3 GbE, 10 GbE, 1000BASE-T
- Crypto Express3
- InfiniBand Coupling Links

… and the System z10 offers Operating System flexibility to meet your needs

FIDUCIA IT AG
IBM system automation helps ensure high availability

- **Business challenge:**
  - FIDUCIA IT AG, a leading provider of IT services to German cooperative banks, is committed to providing high availability solutions to customers. The company hoped to further improve availability in their mainframe environment by adding a system automation solution, reducing the risk that unplanned outages could threaten availability.

- **Solution:**
  - FIDUCIA chose IBM Tivoli® System Automation for z/OS® software to add automation capabilities to its IBM System z10-based mainframe environment. Based on IBM Tivoli NetView®, the software enables FIDUCIA to automate mainframe operations so that the system can run almost completely unattended.

- **Benefits:**
  - Helps to ensure high availability in case of faults or outages
  - Centralizes system administration and message management
  - Enables smooth integration with other Tivoli products

- *"The IBM system automation solution helps us deliver the high-availability services our customers expect."*
  - FIDUCIA IT AG
- **Solution components:**
  - IBM System z10 Enterprise Class
  - IBM Tivoli NetView
  - IBM Tivoli System Automation for z/OS

8

System z world class business resiliency solutions
Industry leadership in critical security capabilities

- **Highest levels of availability of any server platform in the world for 24/7 global operations[1]**
- **Preplanning capabilities to avoid future planned outages, e.g. dynamic LPAR allocation without a system outage and plan ahead memory**
- **Integrated enterprise level resiliency for heterogeneous data center disaster recovery management**
- **Tamper-resistant Crypto Express3 feature with enhanced secure key AES support and capability for increased Personal Account Numbers**
- **Simplified migration of cryptographic configuration data using TKE**
- **Boost in performance for Cryptographic instructions that use Protected Key CPACF**
- **NEW Crypto Express3 feature will support more than 10,000 SSL handshakes per second when both PCIe adapters are configured as accelerators.**

z/Solution Editions

System z servers are the only platform in the world with EAL5 certification

1. Software Strategies, "System z10 vs. HP Integrity, No Contest", June 2009

Bank in New Zealand
Real time fraud prevention and detection

- **Business challenge:**
  - Deliver a fraud detection solution than can monitor risky transactions in real time
  - Ensure ACI Proactive Risk Manager can process the transaction volumes and deliver automated fraud detection
- **Business objectives:**
  - Migrate from existing fraud solution provided by the card scheme to ACI Proactive Risk Manager
  - Take an enterprise approach to fraud prevention, combining information from different channels, to identify fraud quickly and accurately
- **Solution:**
  - ACI Proactive Risk Manager for Enterprise Risk running on IBM System z hardware
  - Real Time Rules in use with Near Real Time Rules
  - Monitoring for credit card transactions through ATM and POS initiated through Enterprise Risk

- **Business value:**
  - Projected savings of up to US$250,000 a month.
  - Provides rapid implementation of new or adjusted rules to combat new fraud attacks
  - Collaborates with over 10 other local PRM customers through the ACI PRM User Group
  - Real Time Rules enables the customer to over ride authorization and decline transactions that are highly suspicious
  - Customer intends to extend the enterprise capability to include debit cards, internet and cheque detection

10

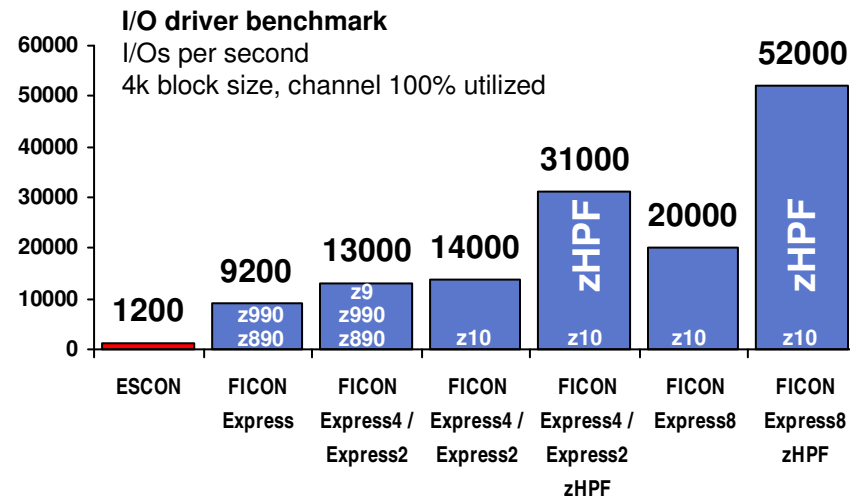# Improved Performance with System z10 and FICON

FICON performance on System z – MBps throughput
zHPF – 40% increase FICON Express8 vs. FICON Express4
FICON – 45% increase FICON Express8 vs. FICON Express4
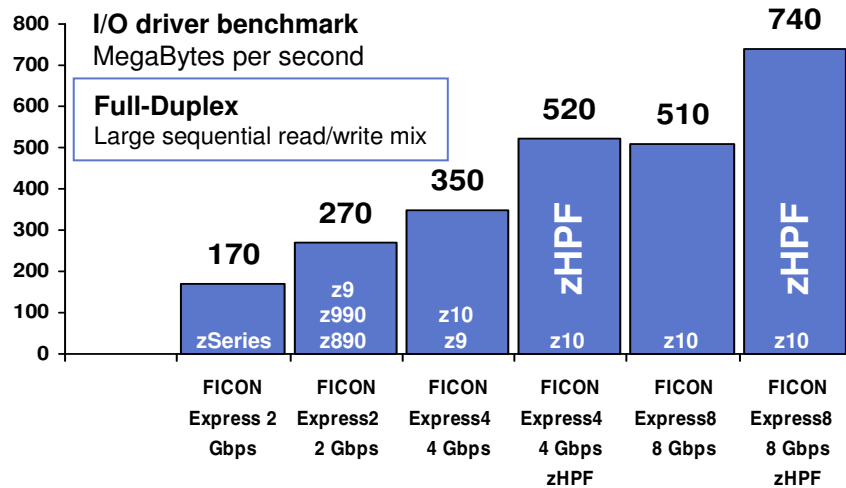
FICON performance on System z – start I/Os
zHPF – 70% increase FICON Express8 vs. FICON Express4
FICON – 40% increase FICON Express8 vs. FICON Express4

- **FICON Express8 operating at 8 Gbps may be able to:**
  - Provide performance improvements for online transaction processing (OLTP) workloads - diverse business functions including order entry, inventory tracking, hotel reservations – applications such as DB2®, VSAM, PDSE, and zFS
  - Help reduce the duration of backup/copy operations
- **Performance improvements with FICON Express8 may provide opportunities for consolidation or growth by reducing the number of I/O slots that are needed – you may be able to "do more with less"**
- **FICON Express8 and High Performance FICON for System z (zHPF) are System z10 exclusives**

* This performance data was measured in a controlled environment running an I/O driver program under z/OS. The actual throughput or performance that any user will experience will vary depending on considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed.

* Some complex channel programs can not be converted to zHPF protocol

11

System z10 and IBM System Disk Storage
The Next Chapter in IBM's Flagship Disk Platform

Introducing the new DS8700 Model

- **Performance**
  - Up to over 150% performance boost with new IBM POWER6®-based controllers
  - New, faster PCI Express (PCI-E) internal fabric enables much higher performance and scalability
  - Almost 70% faster ASICs on the device adapters
  - Increased FlashCopy® performance across the board
  - Increased SSD performance for sequential reads
- **Availability**
  - Single model, scalable via concurrent upgrade of all components
  - Shorter service windows with faster concurrent microcode updates
  - Better than 99.999% availability
- **Investment Protection and Scalability**
  - Single model, scalable via concurrent upgrade of all components
  - Full interoperability with prior model's hard drives, drive enclosures, tools, scripts, and copy services
  - SSD optimization for more effective tiered storage
- **Management**
  - Simplified management and application-aware FlashCopy
- **Security**
  - Full Disk Encryption enhancements help address PCI-DSS compliance

World Data Center
Digitizing and storing invaluable climate data with IBM solutions

ВНИИГМИ-МЦД

- **Business challenge:**
  - The organization receives more than 200 GB of new weather monitoring data each day and maintains over 1.5 petabytes of data. They also store archives on a variety of media, including paper. The organization needed a new mainframe and storage solution that would enable them to collect, process, store and share all information digitally.

- **Solution:**
  - World Data Center implemented an IBM System z9 server running IBM z/VM® and Linux. It features Integrated Facility for Linux and is connected to multiple IBM System Storage™ components. IBM Tivoli Storage Manager, IBM Content Manager OnDemand, and IBM DB2 support data management. Custom applications on the z9® server copy digital content from original documents.

- **Benefits:**
  - Consolidates different media types and simplifies data access
  - Manages risk by enabling backward compatibility with legacy programs
  - Accommodates a repository that grows by 200 GB each day

- *"Our new System z9 server and upgraded storage solution have enabled us to ensure continued availability and reliability of our data archive for years to come"*
  - World Data Center
- **Solution components:**
  - System z9 Business Class with Integrated Facility for Linux
  - IBM System Storage DS8300
  - IBM System Storage 3500 Tape Libraries
  - IBM Tivoli Storage Manager
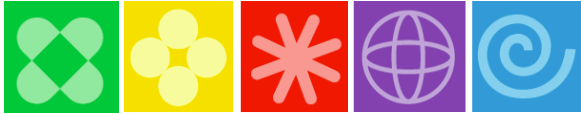 - IBM Content Manager
  - IBM DB2 9

We can do it – open storage with z/VM and Linux on System z

- **The IBM XIV® Storage System is a revolutionary open disk system that represents the next generation of high-end disk storage, designed to provide**
  - Self-tuning for consistently high performance
  - Self-healing for consistently high reliability
  - Extreme management simplicity
  - Low total costs
- **System z10 and FICON Express8 support the benefits of z/VM and Linux on System z combined with XIV**
  - Suited to fast growing, dynamic environments
  - RHEL 5.2/5.3 and SLES 10 SP2
  - IBM z/VM 5.4 and z/VM 6.1

Most current information available at: System Storage Interoperation Center

Robust Tape Storage to Protect Your Information
Helping our clients retain data securely and in compliance with regulatory requirements

- **Comprehensive tape storage product line for System z attachment**
  - TS1130 Tape Drive
    - Offers high performance (160 MBps) and high native capacity (1 TB) for storage consolidation
    - Provides information security with support for encryption and key management
    - Supports Write Once Read Many (WORM) cartridges to help satisfy compliance requirements
  - TS3400 Tape Library
    - Automated retention for smaller customers or remote locations and branch offices
    - Holds 1 to 2 tape drives, up to 54 TB capacity with 3:1 compression
    - Provides data security and regulatory compliance via support for tape drive encryption and WORM cartridges
  - TS3500 Tape Library
    - Scalable, automated data retention with up to 18.6 PB capacity with 3:1 compression
    - Offers enhanced data availability and reliability with optional dual library accessory
    - Provides data security and regulatory compliance via support for tape drive encryption and WORM cartridges
  - TS7700 Virtualization Engine
    - Virtualization solution implements a fully integrated tiered storage hierarchy of disk and tape
    - Reduces batch processing time, total cost of ownership and management overhead
    - Disk-only models with up to 70 TB native tape volume cache
    - Grid configurations for information availability and business continuity
- **Tape is often cost effective versus disk**
  - Lower price per MB
  - Lowest power and cooling storage option available today

Just in time capacity gives you control

- **Permanent and temporary offerings – with you in charge**
- **No customer interaction with IBM at time of activation**
- **Multiple offerings can be in use simultaneously**
- **Flexible offerings may be used to solve multiple situations**
- **Offerings can be reconfigured or replenished dynamically**
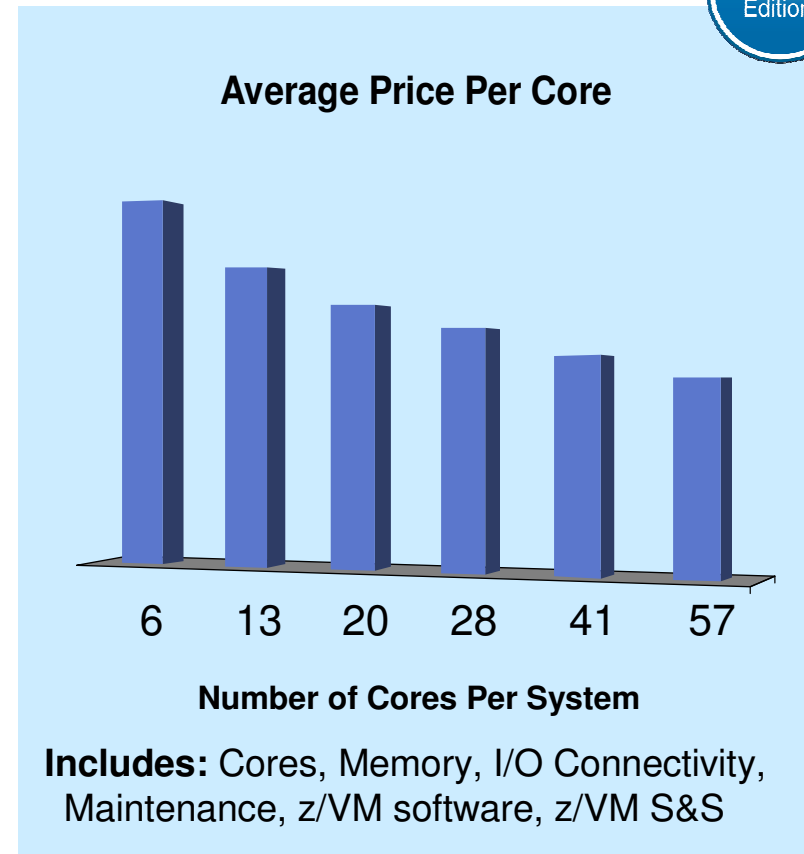- **Policy based automation capabilities**

Use System z to dramatically reduce the cost of Large Scale Consolidation

Saving money per unit of work

- **The more work you consolidate on a Server z server, the lower the cost per unit of work hosted**
- **Price / performance improves as you grow your server**
- **Virtualization on System z helps you align your IT resources with business results...**
  - Allocate additional capacity "immediately" when the demand presents itself, rather than lose the business while you wait for the new server to come online
- **Solution pricing starting at under $2,000 per virtual server for large-scale consolidations[1]**

Average Price Per Core

6   13   20   28   41   57

Number of Cores Per System

Includes: Cores, Memory, I/O Connectivity, Maintenance, z/VM software, z/VM S&S

Unprecedented Economies of Scale for Consolidation on Linux on System z

Notes: Pricing curve is based on z10 EC machine. Participation and actual pricing will vary by country.
1. Calculations based on IBM and client experiences. Results can vary.

Baldor Electric Company cuts IT costs to just one percent of sales revenue by consolidating to IBM System z
Optimization proving to be a genuine competitive advantage

- **Business challenge:**
  - Facing stiff competition from offshore manufacturers, Baldor needed to cut costs while simultaneously enhancing customer service with very rapid order processing, responsive manufacturing and swift delivery.

- **Solution:**
  - Migrated its mission-critical SAP and DB2-based applications to an IBM System z10 server running Linux, z/OS and z/VM operating systems, eliminating several large Sun servers in the process.

- **Benefits:**
  - Reduced IT costs to less than one percent of annual sales
  - Consolidation cuts power by 40 percent, aircon by 50 percent, and reduces data center floor space from 6,000 to 1,000 sq ft
  - Cut system administration and maintenance costs

- *"Migration of our SAP application servers to Linux on the z10 produced an immediate increase in performance, and has made it easier to manage and maintain our systems."*
  - Mark Shackleford, Director of Information Services, Baldor

- **Solution components:**
  - System z10, DB2, z/OS, z/VM, Linux
  - IBM Global Business Services

Source: Clabby Analytics, March 2009

Bank of New Zealand

A bank uses Red Hat Enterprise Linux on System z10 to reduce their carbon footprint, and address datacenter cost and capacity concerns

> **The Bank of New Zealand reduce their datacenter footprint by 30%, heat output by 33%, carbon footprint by 39%, and expects a 20% ROI**

- **Business Challenge:**
  - A datacenter with 200 Sun servers was at capacity
  - Bank of New Zealand needed to grow, reduce emissions and costs, become more open, and seeks to become carbon-neutral by 2010

- **Solution:**
  - Consolidate 200 Sun servers down to just 1 IBM System z10 mainframe running Red Hat Enterprise Linux

- **Benefits:**
  - Bank of New Zealand reduced power consumption by close to 40%, heat output by 33%
  - Just one administrator is needed per 200 virtual servers
  - New environments are deployed in minutes, not days

- *"Deploying IBM mainframes with Red Hat Enterprise Linux to address our carbon footprint and cost savings concerns was a very big deal, especially at the senior management level."*
  - Lyle Johnston Infrastructure Architect, Bank of New Zealand

http://www.**ibm.com**/press/us/en/pressrelease/26621.wss

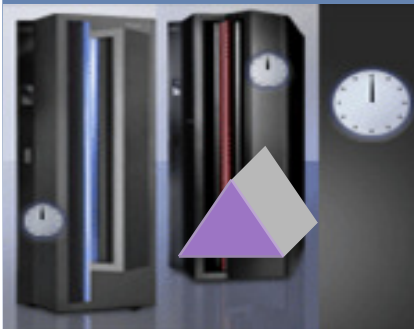Attacking Solaris and winning with Linux

System z Specialty Engines – big on service, low on cost

Building on a strong track record of technology innovation with specialty engines – DB Compression, Encryption, Vector Facility

Internal Coupling Facility (ICF) 1997

Integrated Facility for Linux (IFL) 2000

System z Application Assist Processor (zAAP) 2004

IBM System z10 Integrated Information Processor (zIIP) 2008
IBM System z9 Integrated Information Processor (zIIP) 2006

Eligible for zAAP:

- Java execution environment
- z/OS XML

Eligible for zIIP:

- DB2 remote access and BI/DW
- ISVs
- IPSec encryption
- z/OS XML System Services
- z/OS Global Mirror
- HiperSockets™ for large messages
- IBM GBS Scalable Architecture for Financial Reporting
- z/OS CIM Server *

In z/VM 5.4, IBM fulfilled plans to support the new System z10 capability to allow any combination of CP, zIIP, zAAP, IFL, and ICF processor-types to reside in the same z/VM LPAR.

Convergence to zIIP with z/OS R11

* All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represents goals and objectives only.

gkd-el boosts throughput by 2.7 and cuts costs by 30%

- **gkd-el manages the IT infrastructure for Gelsenkirchen city government and several other customers**
- **Challenges**
  - Coping with rapid workload growth while maintaining guaranteed response times according to SLAs
  - Ensuring continuous availability of key systems
  - Decreasing costs
  - Provisioning of SAP application servers within minutes
  - Complying to highest security standards
- **gkd-el implemented their SAP landscape on Linux for System z and benefits from IBM z/OS and IBM z/VM virtualization technologies.**
- **Solution**
  - IBM System z10 Enterprise Class with IBM System z Integrated Information Processor (zIIP)
  - IBM System z Integrated Facility for Linux (IFL) processor
  - IBM System Storage™ DS8100 for data storage

- **Benefits:**
  - Higher end-user satisfaction, thanks to lower average SAP dialog response times (190 ms instead of 570ms)
  - Less downtime during SAP release upgrade
  - Total cost of ownership reduced by 30% with the help of zIIP and Subcapacity settings
  - Flexible, yet easy-to-manage infrastructure
  - Balanced workload according to business goals
- *"The advantages of IBM System z – such as excellent stability, advanced virtualization technologies, high security and easy management – make us confident that we are prepared for any future challenge."*
  - Dieter Schiffer, head of IT department gkd-el, and Karl Große Vogelsang, CTO at gkd-el

System z ISV Ecosystem
*Dramatic growth responding to market demand*

- **142 ISVs added to the System z portfolio in YTD 2009**
- **900 new System z applications & tools YTD 2009**
- **1,700 + ISVs developing for our System z Ecosystem**
- **3,500 + applications available for z/OS**
- **3,000 + applications available for Linux on System z**
- **6,300 + applications available for System z**

Protecting your investment in IBM technology

- **Designed to protect your investment with two generation upgrades for both z10 EC and z10 BC**

- **Full upgradeability within each System z10 server family**
  - Plus upgrade to z10 EC from z10 BC

- **Temporary or permanent growth when you need it**
  - New provisioning architecture

z990

z890

z9 BC

z9 EC

z10 BC

z10 EC
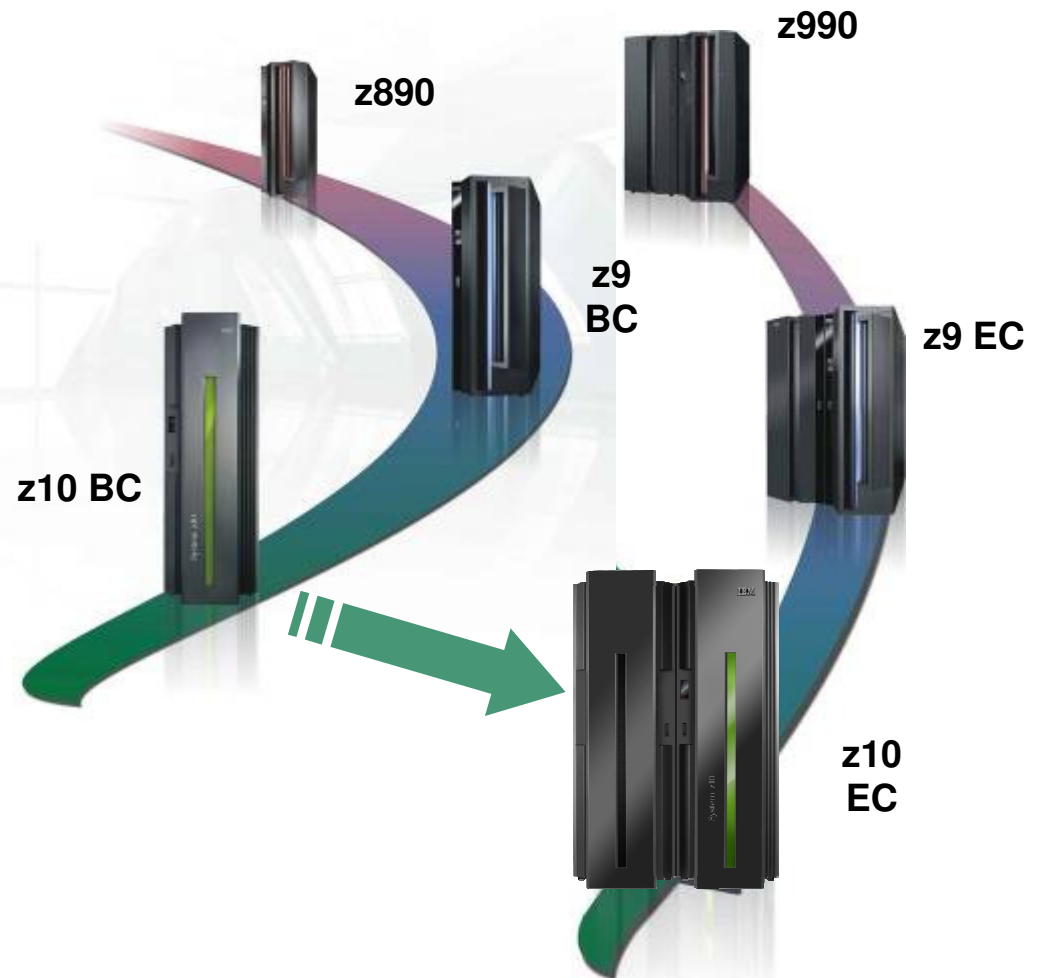
Delivering the new System z Solution Editions:

Integrated System z hardware, z/OS operating system and maintenance designed to help customers deploy new enterprise applications on the mainframe

z/Solution Editions

- **Solution package pricing for our most popular solutions**
  - System z server – standalone footprint or isolated Logical Partitions
  - Includes three years of hardware maintenance
  - Comprehensive z/OS operating system and middleware stack, includes three years of Subscription and Support
  - Services and Storage (as needed)
- **Legendary Mainframe qualities extended to new applications**
  - Unparalleled quality, security, availability and scale
  - Integration of applications with corporate data
  - Industry leading virtualization, management and resource provisioning
  - Unparalleled Investment protection
- **Tailored hardware and pre-defined software components customized for each solution**
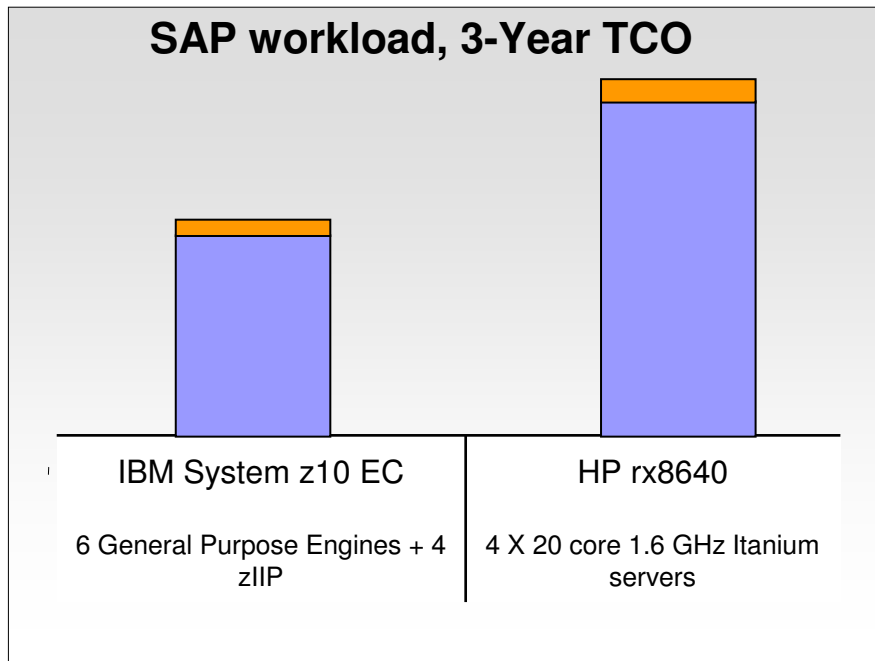
- *Chordiant*
- *Enterprise Linux*
- *Cloud Computing*
- *Data Warehousing*
- *SAP*
- *ACI*
- *WebSphere®*
- *Security*
- *GDPS®*
- *Application Development*

Plus the Enterprise Linux Server

Dramatically more affordable System z solutions with leadership TCO

System z Solution Editions
Legendary Mainframe quality, security, availability, and scale

SAP workload, 3-Year TCO

IBM System z10 EC	HP rx8640
6 General Purpose Engines + 4 zIIP	4 X 20 core 1.6 GHz Itanium servers

WAS workload, 3-Year TCO

IBM System z10 EC	HP rx8640
3 General Purpose Engines + 1 zAAP	1 X 20 core 1.6 GHz Itanium server

Save 40% when compared to HP with the System z Solution Edition for SAP

Prices are in USD. Prices may vary in other countries.
Data is based on real client opportunity and on internal standardized costing tools and methodologies.
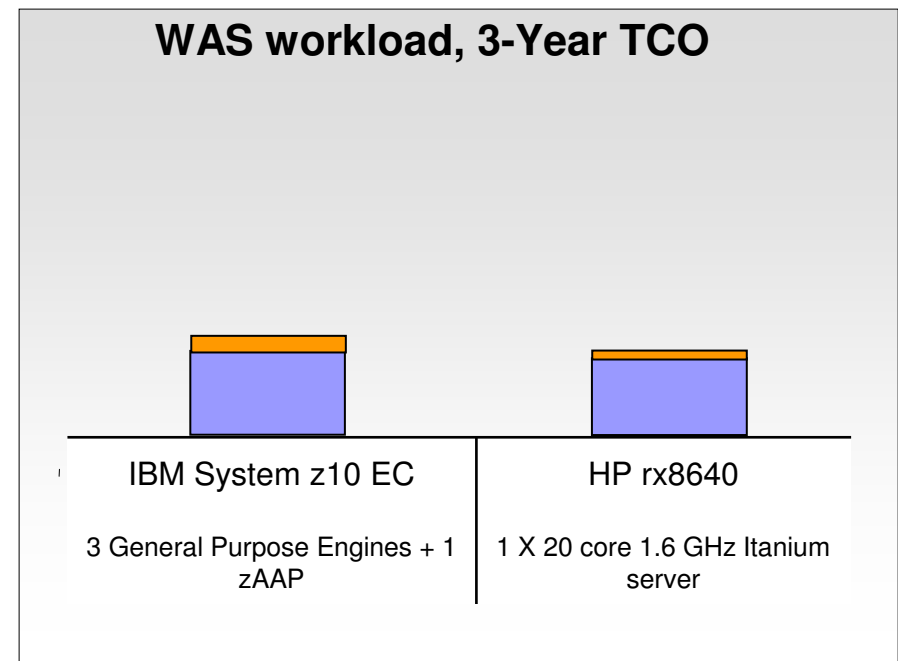
The System z Solution Edition for WAS Competitive in even _small_ configurations

Client results will vary by types of workloads, technology level of consolidated servers, utilization factor, and other implementation requirements. Savings will vary by client.

System z futures for a workload-optimized world.

Re-write the rulebook and set new standards for business-centric IT with IBM System z, to be the world's premier workload-optimized platform for enterprise applications.

Our Vision:

Deliver the best of all worlds, Mainframe, UNIX®, x86 and single function processors, integrated in a single system for ultimate flexibility and simplicity to optimize service, risk and cost across multiple heterogeneous workloads.

An example of workload-optimized systems:
Statement of Direction – The IBM Smart Analytics Optimizer

- **An integrated business intelligence solution to deliver accelerated and accurate business insight**
  - Extending System z operational control to heterogeneous environment
  - Exceptional performance
  - System z secures critical data
  - Reduced administration costs
  - Optimizes technology usage to deliver the right level of service, with lower risk and at reduced cost
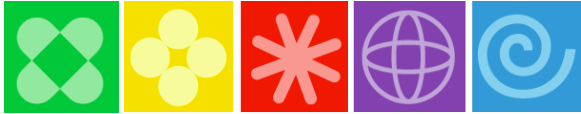
zFuture:
Integrated solutions that span heterogeneous platforms

Integration and centralized management by System z

- **zFuture: the world's premier workload-optimized platform for enterprise applications**
  - Reduces the complexity typically associated with heterogeneous multi-tier environments.
  - Extends System z qualities of service to heterogeneous platforms
  - Lowers cost of deploying new and existing workloads
  - Delivers IT service aligned to business processes

- *Deploy end-to-end solutions across heterogeneous platforms*
- *Optimize technologies on a best fit basis*
- *The service you need with reduced risk at the right price*

Hardware Statements of Direction

- **February 26, 2008 SOD on Integrated Cluster Bus-4 (ICB-4)**
  - IBM intends to not offer Integrated Cluster Bus-4 (ICB-4) links on future servers. IBM intends for System z10 to be the last server to support ICB-4 links.
- **April 28, 2009 SOD on STP**
  - The System z10 will be the last server to support connections to the Sysplex Timer® (9037).
- **April 28, 2009 SOD on ESCON® channels, Water cooling and DC Power**
  - It is IBM's intent for ESCON channels to be phased out over time. System z10 EC and System z10 BC are planned to be the last servers to support greater than 240 ESCON channels.
  - IBM intends to support optional water cooling on future high-end System z servers. This cooling technology will tap into building chilled water that typically exists within the data center for computer room air conditioning systems. External chillers or special water conditioning will typically not be required. Water cooling technology for high-end System z servers will be designed to deliver improved energy efficiencies.
  - IBM intends to support the ability to operate from High Voltage DC power on future System z servers. This will be in addition to the wide range of AC power already supported. A direct HV DC data center power design can improve data center energy efficiency by removing the need for an additional DC to AC inversion step.
- **October 20, 2009 SOD on Overhead cabling**
  - On future System z servers, IBM intends to support optional overhead cabling. This would be applicable to some data center environments and would apply to cabling for I/O (fiber optic and 1000BASE-T Ethernet). Overhead cabling is designed to provide an additional option and increased flexibility; to help remove floor hazards in a non-raised floor environment and to help increase air flow in a raised-floor environment.

One Last Thought ...

- **Mainframes capably execute the largest, most complex mixed workloads**
- **Mainframes consistently demonstrate that they can function at sustained 90% utilization**
- **Mainframes, because of their core architecture, should be run hard without undue concern about failure**
- **Mainframes virtualize complex enterprise environments with unparalleled granularity**
- **Mainframes can execute tasks with incredibly low use of energy per transaction**
- **Mainframes achieve the highest security certifications**
- **Mainframes can absorb big, sudden activity spikes without significant scale up of the people supporting them**
- **Mainframes provide remarkable availability across vast geographic distances**
- **Mainframes can handle more transactions – more quickly – than any alternative**
- **Mainframes provide both flexibility *and* control that help ensure Service Level Agreements are met**
- **Mainframes handle enterprise-size workloads within a refrigerator sized footprint**

... Remember – if it's "mainframe-like" it's not a "Mainframe"

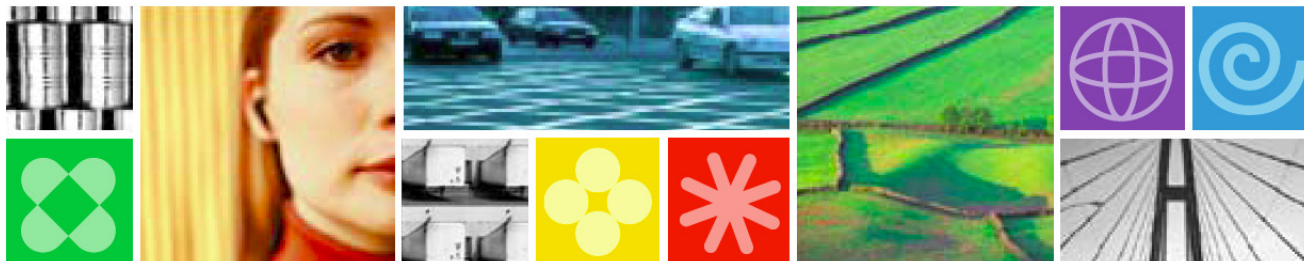## System z – the data center gem that brings value today and tomorrow

- **Platform for new and existing workloads**
- **Platform with quantifiable benefits to your business**
- **Platform with a future in where enterprise applications may be optimized on a best fit basis**
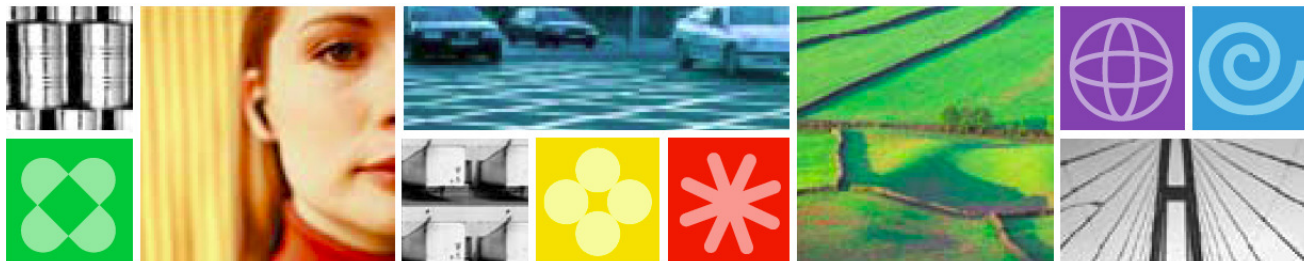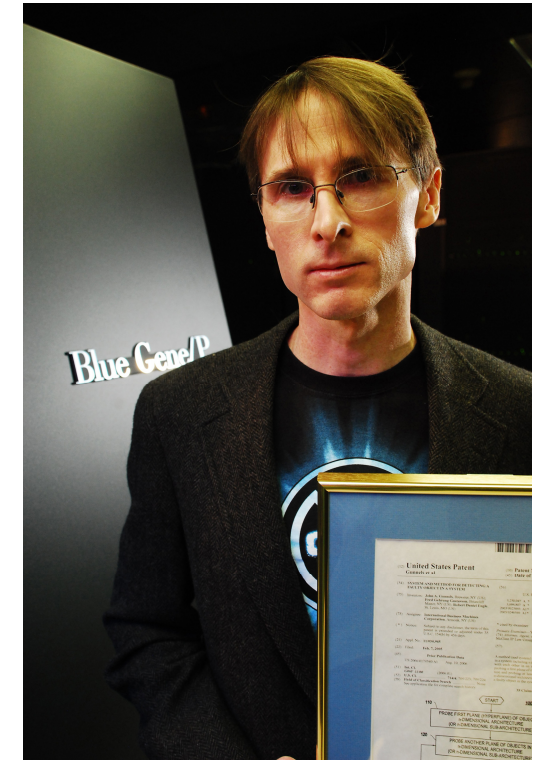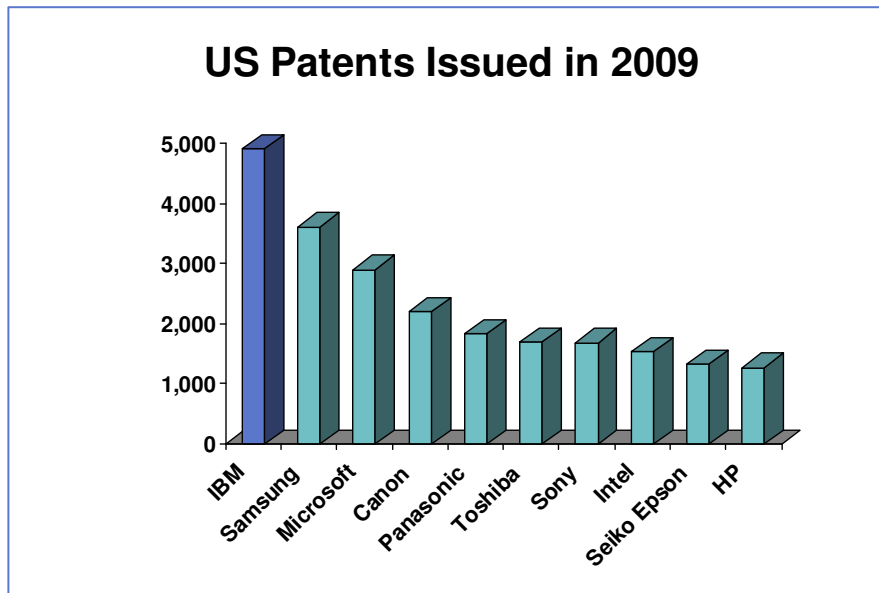
The Future Runs on System z

Thank you

Backup charts

Innovation

- **Engineering cultures backed by long term R&D investments**
- **Rich history of industry breakthrough delivering innovative client solutions**
- **Patents**
  - 48K IBM patents
  - 4,914 in 2009

US Patents Issued in 2009

IBM inventor, John Gunnels, holds U.S. Patent #7,506,196, one of 4,914 patents IBM received from the United States Patent and Trademark Office in 2009 -- the 17th consecutive year IBM topped the annual list of patent holders. Gunnels received patent #7,506,196 for an invention that enables IBM's Blue Gene supercomputer to run with the assurance that its internal communications network is functioning properly.

IBM System z family

IBM System z9 EC (2094)
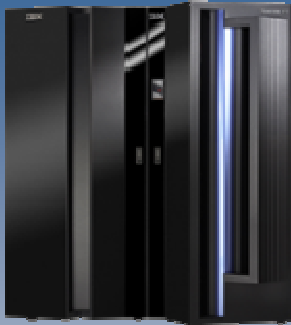
- Announced 7/05 - Superscalar Server with up to 64 cores
- 5 models – Up to 54-way
- Granular Offerings for up to 8 CPs
- PU (Engine) Characterization
  - **CP, SAP, IFL, ICF, zAAP, zIIP**
- On Demand Capabilities
  - **CUoD, CIU, CBU, On/Off CoD**
- Memory – up to 512 GB
- Channels
  - **Four LCSSs**
  - **Multiple Subchannel Sets**
  - **MIDAW facility**
  - **63.75 subchannels**
  - **Up to 1024 ESCON channels**
  - **Up to 336 FICON channels**
  - **FICON Express2 and 4**
  - **OSA 10 GbE, GbE, 1000BASE-T**
  - **Coupling Links**
- Configurable Crypto Express2
- Parallel Sysplex clustering
- HiperSockets – up to 16
- Up to 60 logical partitions
- Enhanced Availability
- Operating Systems
  - **z/OS, z/VM, z/VSE, TPF, z/TPF, Linux on System z**

IBM System z9 BC (2096)

- Announced 4/06 - Superscalar Server with 8 cores
- 2 models – Up to 4-way
- High levels of Granularity available
  - **73 Capacity Indicators**
- PU (Engine) Characterization
  - **CP, SAP, IFL, ICF, zAAP, zIIP**
- On Demand Capabilities
  - **CUoD, CIU, CBU, On/Off CoD**
- Memory – up to 64 GB
- Channels
  - **Two LCSSs**
  - **Multiple Subchannel Sets**
  - **MIDAW facility**
  - **63.75 subchannels**
  - **Up to 420 ESCON channels**
  - **Up to 112 FICON channels**
  - **FICON Express2 and 4 Gbps**
  - **OSA 10 GbE, GbE, 1000BASE-T**
  - **Coupling Links**
- Configurable Crypto Express2
- Parallel Sysplex clustering
- HiperSockets – up to 16
- Up to 30 logical partitions
- Enhanced Availability
- Operating Systems
  - **z/OS, z/OS.e, z/VM, z/VSE™, TPF, z/TPF, Linux on System z**

IBM System z10 EC (2097)

- Announce 2/08 - Server with up to 77 cores
- 5 models – Up to 64-way
- Granular Offerings for up to 12 CPs
- PU (Engine) Characterization
  - **CP, SAP, IFL, ICF, zAAP, zIIP**
- On Demand Capabilities
  - **CoD, CIU, CBU, On/Off CoD, CPE**
- Memory – up to 1.5 TB for Server and up to 1 TB per LPAR
- Channels
  - **Four LCSSs**
  - **Multiple Subchannel Sets**
  - **MIDAW facility**
  - **63.75 subchannels**
  - **Up to 1024 ESCON channels**
  - **Up to 336 FICON channels**
  - **zHPF and FICON Express8 (8, 4 and 2 Gbps)**
  - **OSA 10 GbE, GbE, 1000Base-T**
  - **InfiniBand Coupling Links**
- Configurable Crypto Express3
- Parallel Sysplex clustering
- HiperSockets – up to 16
- Up to 60 logical partitions
- Enhanced Availability
- Operating Systems
  - **z/OS, z/VM, z/VSE, TPF, z/TPF, Linux on System z**

IBM System z10 BC (2098)

- Announced 10/08 – Server with 12 cores
- Single model – Up to 5-way
- High levels of Granularity available
  - **130 Capacity Indicators**
- PU (Engine) Characterization
  - **CP, SAP, IFL, ICF, zAAP, zIIP**
- On Demand Capabilities
  - **CoD, CIU, CBU, On/Off CoD. CPE**
- Memory – up to 248 GB
- Channels
  - **Two LCSSs**
  - **Multiple Subchannel Sets**
  - **MIDAW facility**
  - **63.75 subchannels**
  - **Up to 480 ESCON channels**
  - **Up to 128 FICON channels**
  - **zHPF and FICON Express8 (8, 4 and 2 Gbps)**
  - **OSA 10 GbE, GbE, 1000BASE-T**
  - **InfiniBand Coupling Links**
- Configurable Crypto Express3
- Parallel Sysplex clustering
- HiperSockets – Up to 16
- Up to 30 logical partitions
- Enhanced Availability
- Operating Systems
  - **z/OS, z/OS.e, z/VM, z/VSE, TPF, z/TPF, Linux on System z**

z10 BC – The Mainframe Made Over
Innovative, Cool, Affordable

One Hardware Model

New CPC and I/O Drawers

Faster Uni Processor – 3.5 Ghz

Up to 5 CPs and 5 zAAP/zIIP or up to 10 IFLs or CFs

130 CP Capacity Settings

Replaceable PU and SC SCMs

Up to 248 GB Customer Memory

Separate 8 GB of fixed HSA

HiperDispatch

Capacity Provisioning Support

Large Page Support (1 MB)
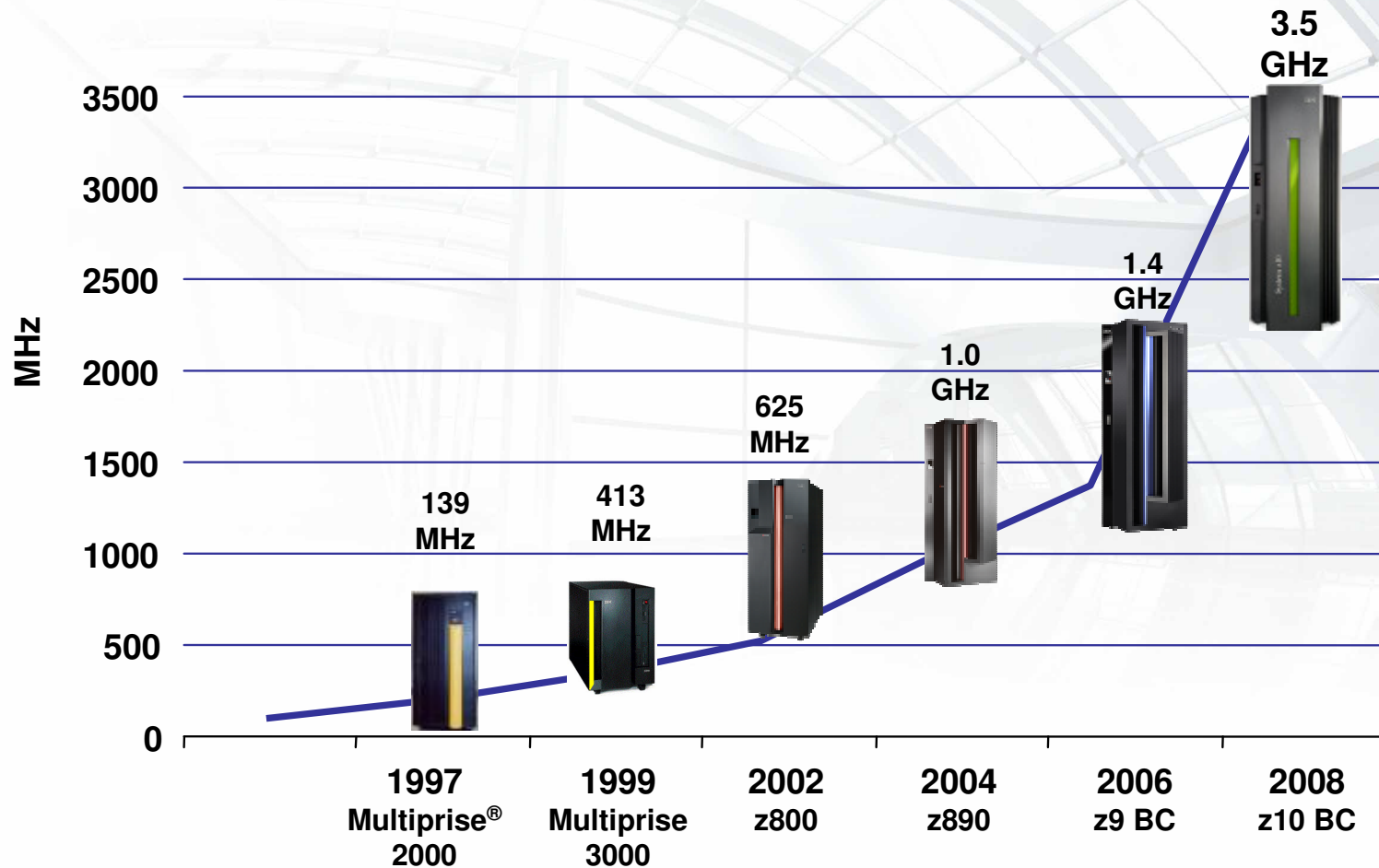
Hardware Decimal Floating Point

Hot Pluggable I/O Drawer

WWPN – preplanning & setup for SAN

InfiniBand Coupling Links

STP over InfiniBand and system management enhancements

NEW Crypto & TKE Enhancements

New FICON Express8

High Performance FICON for System z (zHPF)

New Family of OSA-Express3

HiperSockets Layer 2 Support

Enhanced CPACF with SHA 512, AES 192 and 256-bit keys

CBU & On/Off CoD Increased Functionality and Flexibility

Scheduled Outage Reduction

Improved RAS

Power Monitoring Support

If it's "mainframe-like" it's not a "Mainframe"

IBM z10 BC continues the CMOS Mainframe heritage

Chart (MHz vs. year) showing processor frequency progression:

- **1997 Multiprise® 2000** — 139 MHz
- **1999 Multiprise 3000** — 413 MHz
- **2002 z800** — 625 MHz
- **2004 z890** — 1.0 GHz
- **2006 z9 BC** — 1.4 GHz
- **2008 z10 BC** — 3.5 GHz

- Multiprise® 2000 – 1st full-custom CMOS S/390®
- Multiprise 3000 – Internal disk, IFL introduced on midrange

- IBM eServer zSeries 800 (z800) – Full 64-bit z/Architecture®
- IBM eServer zSeries 890 (z890) – Superscalar CISC pipeline
- z9® BC – System level scaling

- z10 BC – Architectural extensions
- Higher frequency CPU

37

© 2010 IBM Corporation

z10 BC to z9 BC Functional Comparison

Processor / Memory	▪ Uniprocessor Performance	▪ Up to 1.40 performance improvement over z9 BC uniprocessor*
	▪ System Capacity	▪ Up to 1.50 times system capacity performance improvement over z9 BC**
	▪ Processor Design	▪ 3.5 GHz processor chip for z10 BC vs. 1.4 GHz for z9 BC
	▪ Models	▪ z10 BC has 1 and z9 BC has 2 models
	▪ Processing Units (PUs)	▪ z10 BC has up to 10 cores to configure, up to 7 on z9 BC
	▪ Granular Capacity	▪ z10 BC has up to 130 Capacity settings vs. 73 on the z9 BC
	▪ Memory	▪ z10 BC has up to 256 GB vs. up to 64 GB on z9 BC
	▪ Fixed HAS	▪ z10 BC has fixed 8 GB HSA, z9 BC had HSA from purchased memory
Virtualization	▪ LPARs	▪ z10 BC has up to 5 logical processors in an LPAR vs. 4 on z9 BC
	▪ HiperDispatch	▪ z10 BC has HiperDispatch for improved synergy with z/OS Operating System to deliver scalability and performance
Connectivity	▪ HiperSockets	▪ z10 BC New HiperSockets Layer 2 and Multiple Write Facility
	▪ FICON	▪ zHPF and FICON Express8 on System z10
	▪ Total channels	▪ Up to 128 FICON channels on z10 BC vs. 112 on z9 BC
		▪ z10 BC can support up to 480 vs. 420 for z9 BC
	▪ Internal I/O Bandwidth	▪ z10 BC has industry standard 6 GBps InfiniBand supports high speed
	▪ Enhanced I/O structure	connectivity and high bandwidth vs. z9 BC using 2.7 GBps Self Time Interconnects (STIs)
	▪ Coupling	▪ New I/O Drawer
	▪ Cryptography	▪ Coupling with InfiniBand[1] – improved distance and potential cost savings
	▪ LAN Connectivity	▪ New generation of Crypto Express3 with improved RAS. Throughput improvements with Protected Key CPACF
		▪ New family of OSA-Express3 features for z10
On Demand / RAS	▪ Capacity Provisioning Mgr	▪ z10™ & z/OS (1.9) for policy based advice and automation
	▪ RAS Focus	▪ z10 can help eliminate preplanning required to avoid scheduled outages
	▪ Just in Time deployment of Capacity	▪ Capacity on Demand offerings CBU and On/Off CoD plus new Capacity for Planned Events are resident on z10
	▪ Enhanced I/O structure	▪ z10 BC has 'hot-pluggable' I/O drawers
Environmentals	▪ Monitoring	▪ z10 displays energy efficiency on SAD screens
		▪ Utilizes IBM Systems Director Active Energy Manager for Linux on System z for trend calculations and management of other servers that participate

*   LSPR mixed workload average running z/OS 1.9 - z10 BC Z01 versus z9 BC Z01
** This is a comparison of the z10 BC 10-way and the z9 BC 7-way and is based on LSPR mixed workload average running z/OS 1.9

z9 BC to z890 Functional Comparison

Processor / Memory		
	▪ Uniprocessor Perf.	▪ Up to 1.35x performance improvement over z890 Capacity Setting 170 uniprocessor *
	▪ System Capacity	▪ Up to 1.30x system capacity performance improvement over z890 Capacity Setting 470 **
	▪ Processor Design	▪ z9 BC adds instructions, new technology, larger L2 cache
	▪ Models	▪ z890 has one and z9 BC has 2 hardware models, both with a book
	▪ Processing Units (PUs)	▪ z9 BC has up to 7 PUs to configure Vs 4 on z890
	▪ Granular Capacity	▪ z9 BC has up to 73 Capacity settings
	▪ Memory	▪ z9 BC has up to 64 GB vs. up to 32 GB on z890
Virtualization	▪ LPARs	▪ z9 BC has up to 30 LPARs
	▪ FCP	▪ z9 BC supports N_Port ID Virtualization
	▪ PR/SM™ Dispatching	▪ z9 BC has separate Processor core pools for CPs, IFLs, ICFs, zAAPs, zIIPs
Connectivity	▪ HiperSockets	▪ Both - 16 HiperSockets, z9 BC adds IPv6 support, z890 IPv4 only
	▪ FICON for SANs	▪ Up to 112 FICON channels on z9 BC, 80 on z890
	▪ OSA for LANs	▪ Both - 48 OSA ports, z9 BC adds OSA-Express2 1000BASE-T
	▪ Total channels	▪ Same - Up to 420 channels
	▪ Internal I/O Bandwidth	▪ z9 BC has up to 16 STIs at 2.7 GB/s, z990 has 8 STIs at 2GB/s
	▪ Enhanced I/O structure	▪ z9 BC has RII for availability, z890 Single I/O Bus
On Demand / RAS	▪ Capacity BackUp	▪ For CPs, IFLs, ICFs, zAAPs, zIIPs on z9 BC, CPs only on z890
	▪ MBA repair	▪ Concurrent on z9 BC, unscheduled outage on z890
	▪ STI repair	▪ Concurrent on z9 BC without loss of I/O (RII). z890, I/O for STI lost
	▪ Driver Upgrade	▪ Concurrent on z9 BC versus scheduled outage on z990[1]

* LSPR mixed workload average running z/OS 1.7 – z9 BC Z01 versus z890 capacity setting 170
** This is a comparison of the z9 BC 7-way and the z890 4-way and is based on LSPR mixed workload average running z/OS 1.7
Note 1: Concurrent driver upgrades possible only at certain MCL levels.

z10 EC – Designed to increase capacity, to help reduce outages and enhance capabilities

- **Five hardware models**
- **Faster Uni Processor [1]**
- **Up to 64 customer cores**
- **36 CP Subcapacity Settings**
- **Star Book Interconnect**
- **Up to 1.5 TB memory [2]**
- **Fixed 16 GB HSA as standard**
- **Large Page Support (1 MB)**
- **HiperDispatch**
- **NEW Crypto Express3**
- **Crypto TKE Enhancements**
- **Hardware Decimal Floating Point**
- **Capacity Provisioning Support**

- **WWPN – preplanning & setup for SAN**
- **6 GBps host bus for I/O interconnect**
- **High Performance FICON for System z (zHPF)**
- **FICON Express8**
- **OSA-Express3 for the LAN**
- **InfiniBand Coupling Links**
- **STP over InfiniBand and system management enhancements**
- **NTP Server on HMC**
- **Scheduled Outage Reduction**
- **Improved RAS**
- **Plan Ahead Memory**
- **CBU & On/Off CoD Enhancements**
- **FICON LX Fiber Quick Connect**
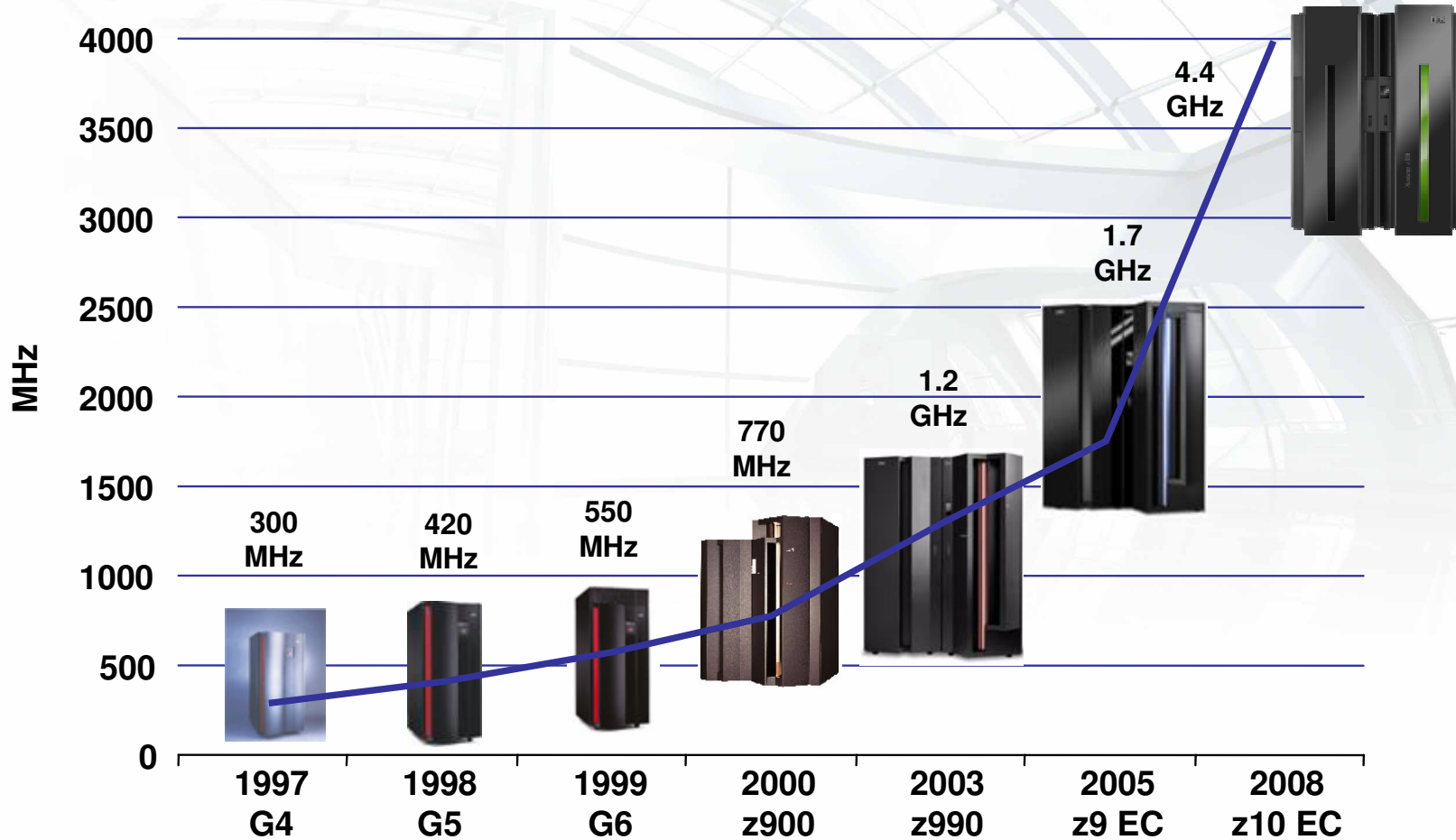- **Power Monitoring support**
- **HMC Instant Messenger**

[1] Compared to z9 EC
[2] 1 TB / LPAR
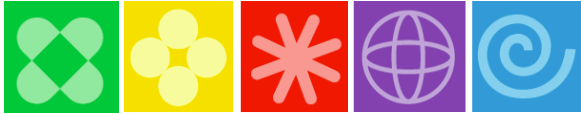
If it's "mainframe – like" it's not a "Mainframe"

IBM z10 EC Continues the CMOS Mainframe Heritage

MHz (y-axis): 0, 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000

- 1997 G4 — 300 MHz
- 1998 G5 — 420 MHz
- 1999 G6 — 550 MHz
- 2000 z900 — 770 MHz
- 2003 z990 — 1.2 GHz
- 2005 z9 EC — 1.7 GHz
- 2008 z10 EC — 4.4 GHz

- G4 - 1st full-custom CMOS S/390
- G5 - IEEE-standard BFP; branch target prediction
- G6 - Cu BEOL

- IBM eServer zSeries 900 (z900) - Full 64-bit z/Architecture
- IBM eServer zSeries 990 (z990) - Superscalar CISC pipeline
- z9 EC - System level scaling

- z10 EC - Architectural extensions

z10 EC functional comparison to z9 EC

Processor / Memory	• Uniprocessor Performance • n-way Performance • System Capacity • Processor Design • Models • Processing Cores • Granular Capacity • Memory • Fixed HSA	• Up to 62% performance improvement over z9 EC uniprocessor * • On average up to 50% more performance than z9 EC in a n-way configuration • Up to 70% system capacity performance improvement over z9 EC 54-way ** • 4.4GHz processor chip • z10 EC has 5 and z9 EC has 5 models, both with up to 4 books • z10 EC has up to 64 cores to configure, up to 54 on z9 EC • z10 EC has up to 100 Capacity settings versus 78 on the z9 EC • z10 EC has up to 1.5 TB *** vs. up to 512 GB on z9 EC • z10 EC has fixed 16 GB HSA, z9 EC had HSA carved from purchased memory
Virtualization	• LPARs • HiperDispatch	• z10 EC has up to 64 logical processors in an LPAR versus 54 on z9 EC • z10 EC has HiperDispatch for improved synergy with z/OS Operating System to deliver scalability and performance
Connectivity	• HiperSockets • FICON • Total channels • Internal I/O Bandwidth • Enhanced I/O structure • Coupling • Cryptography • LAN Connectivity	• z10 EC HiperSockets Layer 2 and Multiple Write Facility • zHPF and FICON Express8 on System z10 - up to 336 FICON channels on z10 EC and z9 EC • Same - Up to 1024 channels • z10 EC has 6 GBps host bus (InfiniBand) versus z9 EC 2.7 GBps Self-Timed Interconnect (STI) host bus • Star L2 Cache Book Interconnect versus Ring Topology interconnect on z9 EC • Coupling with InfiniBand – improved distance and potential consolidation savings • New generation of Crypto Express3 with improved RAS, support for smart card applications, enablement of SSL along with AES, SHA, and longer Personal Account number support. Throughput improvements with Protected Key CPACF • OSA-Express3 SX/LX,10 GbE LR/SR and 1000BASE-T
On Demand / RAS	• Capacity Provisioning Mgr • RAS Focus • Just in Time deployment of Capacity	• z10 EC & z/OS (1.9) for policy based advice and automation • z10 EC can help eliminate preplanning required to avoid scheduled outages • Capacity on Demand offerings CBU and On/Off CoD plus Capacity for Planned Events are resident on z10 EC
Environmentals	• Monitoring	• z10 EC is designed to display energy efficiency on SAD screens • Utilizes IBM Systems Director Active Energy Manager for Linux on System z for trend calculations and management of other servers that participate

*   LSPR mixed workload average running z/OS 1.8 - z10 EC 701 versus z9 EC 701
** This is a comparison of the z10 EC 64-way and the z9 EC S54 and is based on LSPR mixed workload average running z/OS 1.8
*** 1 TB / LPAR

Solution Edition for SAP
The platform of choice for a highly available database for SAP

z/Solution Editions

What it is

- **System z server and maintenance**
- **A complete stack of software needed to create a database environment in support of a new SAP application**
  - Including the functionally rich products of z/OS operating system and DB2 database
  - Including Subscription & Support
- **With a robust suite of DB2 utilities and tools:**
  - DB2 for SAP offers administrative, performance, and automation tool kits:
  - Automate maintenance tasks, allowing DBAs to focus on database optimization, vs. administrative tasks.
  - Software to automatically coordinate the execution of DB2 Utilities, DB2 Recovery Management Tools, DB2 Archive Log Accelerator, to reduce database costs as well as disk storage.

SMART IS

Achieving the highest level of Business Resilience with IBM z/OS and SAP

Postbank

Click above for Press Release

Postbank Systems AG "bullet-proofs" its business resilience with IBM and SAP with leading-edge availability and Disaster Recovery capabilities for its core transactional SAP systems. The new banking system supports true 24x7 operations.

Postbank Systems AG is the IT service provider for Postbank, one of the largest retail banks in Germany. Postbank has more than 12 million clients, total assets of €128 billion and some 10,000 employees.

System z Solution Edition for Data Warehousing
To deploy a total, end-to-end Business Intelligence solution

What it is

- **Solution Edition for Data Warehousing – provides a foundation database environment on System z server**
  - System z hardware with maintenance included
  - DB2 for z/OS database with Subscription & Support included
  - IBM Storage (optional)
- **Combine Solution Edition with Integrated Linux environment for end-to-end solution**
  - Linux can be used to support end user tools:
    - InfoSphere™ Warehouse on System z
      - IBM Flagship warehouse tooling suite
        - Cubing Services, Design Studio, SQL support for DB2
    - Cognos® end user tools on System z
      - Go!Mobile, Go!Dashboards, Go!Search
      - Cognos 8.4 BI

SMART IS
deploying data warehousing environments on System z gaining business efficiencies.

Click here for Press Release

University of North Carolina Health Care (UNCHC)
"Sharing data on this scale heralds a new era of healthcare, where coordinated, patient-centered care and an adherence to evidence-based medicine can improve the quality of care delivered to people around the world."

Dan Pelino, General Manager, Global Healthcare and Life Sciences, IBM.

UNCHC is a major U.S. medical school and healthcare facility; develops new treatments for a variety of life threatening diseases including cancer and cystic fibrosis.

System z Solution Edition for ACI

Tailored for the ACI payments applications optimized for System z server

What it is

- **A package offering for ACI retail and fraud payments applications on the Mainframe delivering new economics in the enterprise**
  - System z server and maintenance
  - z/OS operating system
  - DB2 for z/OS
  - IBM messaging middleware
  - Tools and utilities
  - Subscription and Support
- **Requires ACI BASE24-eps or ACI Proactive Risk Manager software application; client may also run other ACI applications**

SMART IS
deploying ACI Fraud applications to reduce losses and gain operational efficiencies.

Click here for Press Release

Westpac New Zealand: Detected fraud exposure within a few days of implementing ACI Proactive Risk Manager on System z. Implemented real-time rules to monitor potentially suspicious transactions during the authorization process to identify and prevent fraud Protects against the rapidly rising volume of fraudulent activities occurring worldwide with the agility to respond to changing fraud patterns

Westpac is one of New Zealand's largest full service banks, with 1.2 million active customers, over 5,500 staff, almost 200 branches and over 500 ATMs nationwide.11

Solution Edition for WebSphere

What it is

- **This offering provides competitive pricing for clients who want to build and deploy Java applications to run on the System z server**

- **Offering elements**
  - System z server
  - z/OS operating system and
  - Operating system functions such as Security Server, Utilities for data, logging and records management and performance management
  - DB2 for z/OS database software
  - WebSphere Application Server for z/OS

SMART IS
Delivering the lowest cost per transaction in the world

Click here for Press Release

DTCC: re-architected its core processing infrastructure to enable it to push its already world-leading transaction capabilities even further to accommodate their global growth vision. By re-architecting its systems and doubling its unmatched processing capabilities, DTCC has been able to enter new global markets while developing new services.

The Depository Trust & Clearing Corporation (DTCC) is the world's largest post-trade financial services company and depository. It "clears and settles" transactions and provides custody for 3.5m securities issues from USA and 110 other countries and territories, valued at $40 trillion.

System z Solution Edition for Security: Capabilities

What it is

Five offering Packages

1. Solution Edition for Security: z/OS operating system

2. Solution Edition for Security: Linux for System z operating system

3. Security Management for z/OS

4. Identity and Access Assurance

5. Data and Application Security

Capabilities provided by offering packages:

- **Enterprise Fraud Analysis**
  - Record and playback of insider actions, forensic analysis tools, real time prevention workflow applied to distributed and mainframe operations
  - Discover relationships via analytics
- **Centralized Identity & Access Management**
  - Cross platform user provisioning and management; Web 2.0 and cross platform authentication services
- **Enterprise Encryption and Key Management**
  - Protecting personally identifiable data; enterprise encryption management services: Discover, audit and monitor encryption keys
- **Securing Virtualization: z/VM, Linux**
  - Easily secure applications; security lifecycle management of server images running in Linux for System z server
- **Compliance / Risk Mitigation / Secure Infrastructure: z/OS**
  - Audit and Alerts processing, Simplified management operations, Data anonymization for development and test processes

SMART IS

Gaining a competitive advantage in key business areas.

Click here for Press Release

Petrol: "The System z platform offers unmatched scalability, availability and security. These are the reasons why we are using this platform for new application workloads."
 Pavel Batista, chief information officer, Petrol d.d

Petrol is the leading Slovenian Energy Company, with 70% market share. They operate more than 370 service stations in Slovenia, Croatia, Bosnia, Herzegovina and Serbia. Petrol is also in the general energy and utilities business.

IBM System z Solution Edition for GDPS

What it is

- **Offering provides new attractive prices on a range of the most popular near continuous availability and disaster recovery configurations for Geographically Dispersed Parallel Sysplex (GDPS). For example, but not limited to:**

  – GDPS / PPRC HyperSwap® Manager for automatic and transparent switching from primary to secondary disk and entry level disaster recovery.

  – GDPS / PPRC and GDPS / XRC for disk and application availability, and highly automated disaster recovery

  – Offerings include IBM System z hardware, IBM System Storage™ hardware, IBM software, and services.

- **This offer is for those who need continuous availability / disaster recovery, or for those who are frustrated with complex in-house distributed or inflexible 3rd party continuous availability / disaster recovery.**

SMART IS
Protecting your customer... and your brand with no loss of data

enter password:_

Click above for Press Release

Bank of Montreal: Providing a recovery point of zero and a recovery time of 2 hours helps reduce operational risk, increases client trust, improves availability, and meets stringent regulatory compliance requirements.

Bank of Montreal is Canada's oldest bank, one of Canada's five largest bank and has over 900 branches, as well as operations in USA.

PPRC= Peer to Peer Remote Copy
XRC= Extended Remote Copy

Solution Edition for Application Development

What it is

- **A customized package of IBM System z10 Business Class (z10 BC) server, software, and three – five years of hardware and software maintenance**

- **A wealth of IBM middleware, z/OS and z/VM operating systems, from which individual developers may operate their own instance of a mainframe operating system**

- **Solution Edition when combined with Rational Developer for System z (separately priced), provides an affordable, accessible and simple development and function test environment that is consistent with similar functionality on other platforms.**

SMART IS
Delivering higher efficiency, improved quality and enhanced developer productivity.

Click above for Press Release

KfW Bankengruppe: Modernized application deployment: unify distributed and mainframe IDE for 15% savings; Replace competitive solutions for 50% annual savings; Drive mainframe and SOA deployments with mainframe TCO deployments – pays for itself in under a year.

KfW Bankengruppe is a promotional bank owned by the Federal Republic of Germany and its states. It is a strategic adviser to the government, provides global loans to partner banks throughout Europe, funding for SMBs, environmental protection, housing, infrastructure, education and finance projects, export finance, and development cooperation.

System z Solution Edition for Chordiant
When customer information and interaction is Mission Critical

- **A packaged offering to deliver an ideal System z infrastructure for deploying Chordiant workloads, at a very attractive price**
- **The Solution Edition for Chordiant delivers significant benefits:**
  - Faster time to value and accelerated ROI
  - Collocation of applications and data for improved performance and security
  - The qualities of service inherent in the System z platform
  - The scale to deliver exceptional service for large and complex implementations

IBM Solution Edition for Cloud Computing
A framework for delivering cloud computing solutions on System z

Delivers a service automation management infrastructure for cloud computing on System z

- Quicker time to value - IBM services creates the private cloud framework on System z at the customer location and provides user training

- Easier implementation - cloud computing management software from Tivoli for automating and maintaining workloads in a cloud

- Greater efficiency - System z with z/VM and Linux provide the foundation to centralize, standardize and virtualize cloud computing workloads

Customer benefits:

- **Faster ROI**
- **Self service access to mainframe assets**
- **Reduced operations and labor expenses**
- **Internet scale**
- **Rapid provisioning of workloads**
- **Enterprise qualities of service for cloud workloads**

In the spotlight

"We are using System z to deliver cloud computing and hosting services while advancing our innovative business models.
Doug Bourgeois - Director, National Business Center

Learn more: http://www.**ibm.com**/systems/z/solutions/editions/cloud/index.html

IBM System z Solution Edition for Enterprise Linux
Industry-leading virtualization, built with security and availability

- **Overview**
  - A Linux-ready virtualization offering that combines the outstanding z/VM virtualization and the industry-leading IBM System z10 technologies with solution pricing that accelerates return on investment for workload consolidation and new Linux workload deployments. This solution easily scales to meet your consolidation needs though unmatched virtualization and server capabilities.

- **Highlights**
  - The IBM System z Solution Edition for Enterprise Linux provides:
    - A highly scalable and flexible virtual infrastructure inside a single IBM System z10 server
    - The ability to share all system resources with all virtual servers with unmatched levels of efficiency and security
    - The ability for a tight integration of consolidated workload with existing applications and data

Introducing New offerings for large scale consolidation

The Enterprise Linux Server	The Solution Edition for Enterprise Linux
A dedicated System z server for large Linux workloads	Additional capacity on installed System z server for large Linux workloads

- **Offerings include**
  - System z Cores*
  - 16 GB of memory per core**
  - Hardware maintenance for three to five years
  - z/VM Virtualization software package with three to five years of subscription and support
  - Minimum of three 4-Port FICON cards and two 4-Port OSA cards (ELS ONLY)
  - Clients can optionally add more memory or I/O connectivity
- **Economics further improved with new pricing and promotions from Linux Development partners Novell and Red Hat**
- **Very Competitive pricing**
  - Competitive TCA with x86 and UNIX alternatives
  - Total Cost of Ownership and quality of service that blows the competition away

* Entry configurations for ELS are 6 Cores for z10 EC and 2 Cores for z10 BC
** Subject to maximum server configurations
TCA (hardware, virtualization software, memory, maintenance)
Entry configuration for EC machine may vary by country