z/OS Directions

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Topics

- Industry Trends
- Technology Drivers
- System z Platform Directions
- z/OS Directions

Monday 1:30
What's new in z/OS 2.1
John Eells, IBM

Eight major trends that will affect the industry in coming years

Growth Markets
By 2015, IDC expects emerging markets to generate over 33% of all IT spending

Big Data
Through 2015, more than 85% of Fortune 500 organizations will fail to effectively exploit big data for competitive advantage

Security
Through 2016, the financial impact of cybercrime will grow 10% per year, due to the continuing discovery of new vulnerabilities

Analytics
Through 2015, more than 90% of business leaders contend information is a strategic asset, yet fewer than 10% will quantify its economic value

Cloud
Economic benefits of cloud will continue to be the #1 driver of adoption through 2016 for most companies.*

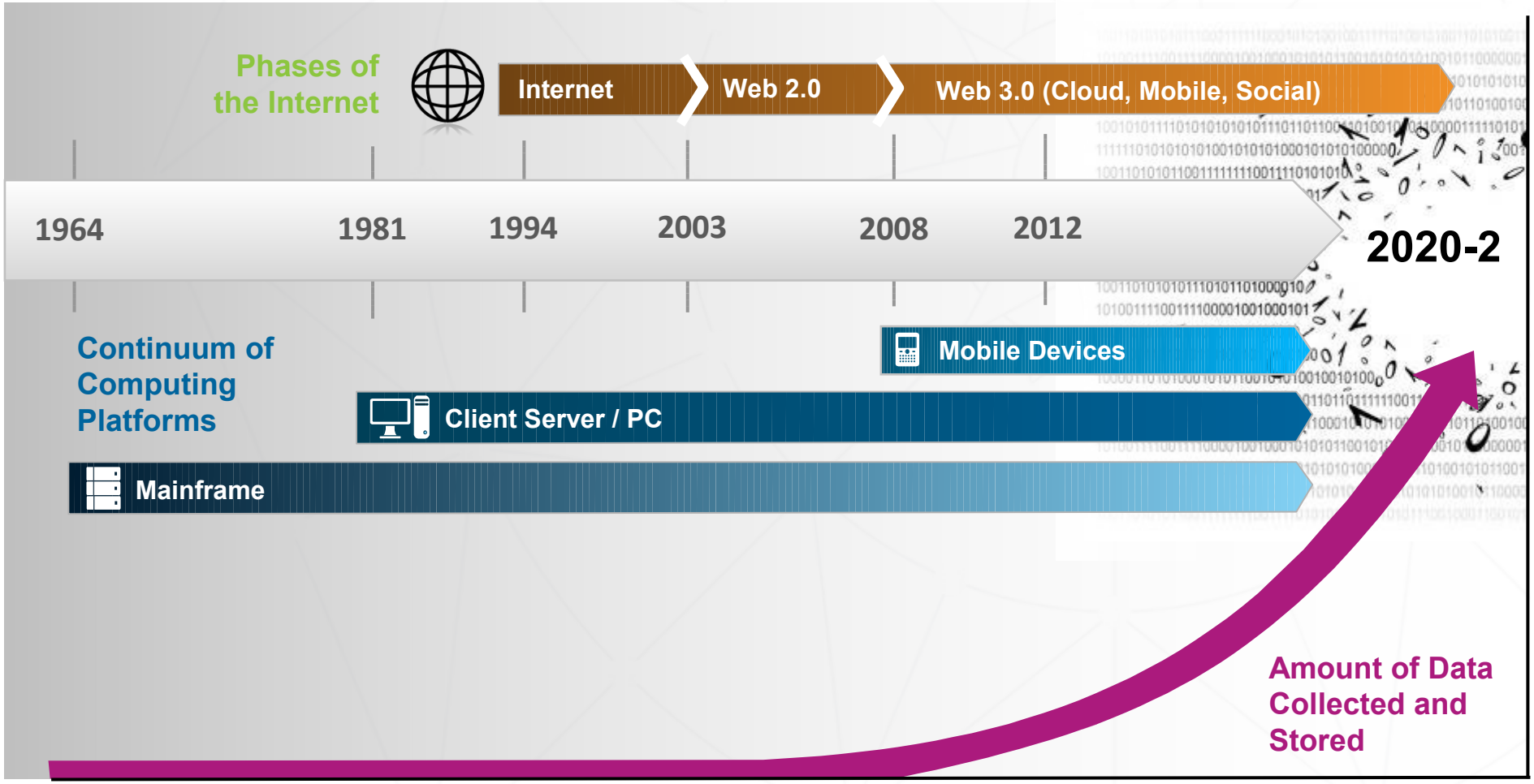
Social Business
By 2014, 20% of business users will replace email as the primary interpersonal communications with social networking

Mobile Enterprise
66% of CIOs ranked mobility as a top investment priority in 2012

Smarter Planet
Over $100 billion: Global investment in technology to support smart city development by 2020

*Source: IDC, IDC's CloudTrack 2012 Summer Survey, Part 1: Cost Savings in the Cloud, November 14, 2012

The 3rd generation of computing platform, the 3rd phase of the Internet, and the explosion of information are colliding to form a perfect storm of disruption and transformation



Adapted from HorizonWatch: Top Technology Trends To Watch In 2013

Source: Bill Chamberlin

The Mainframe is everywhere, making the world work better

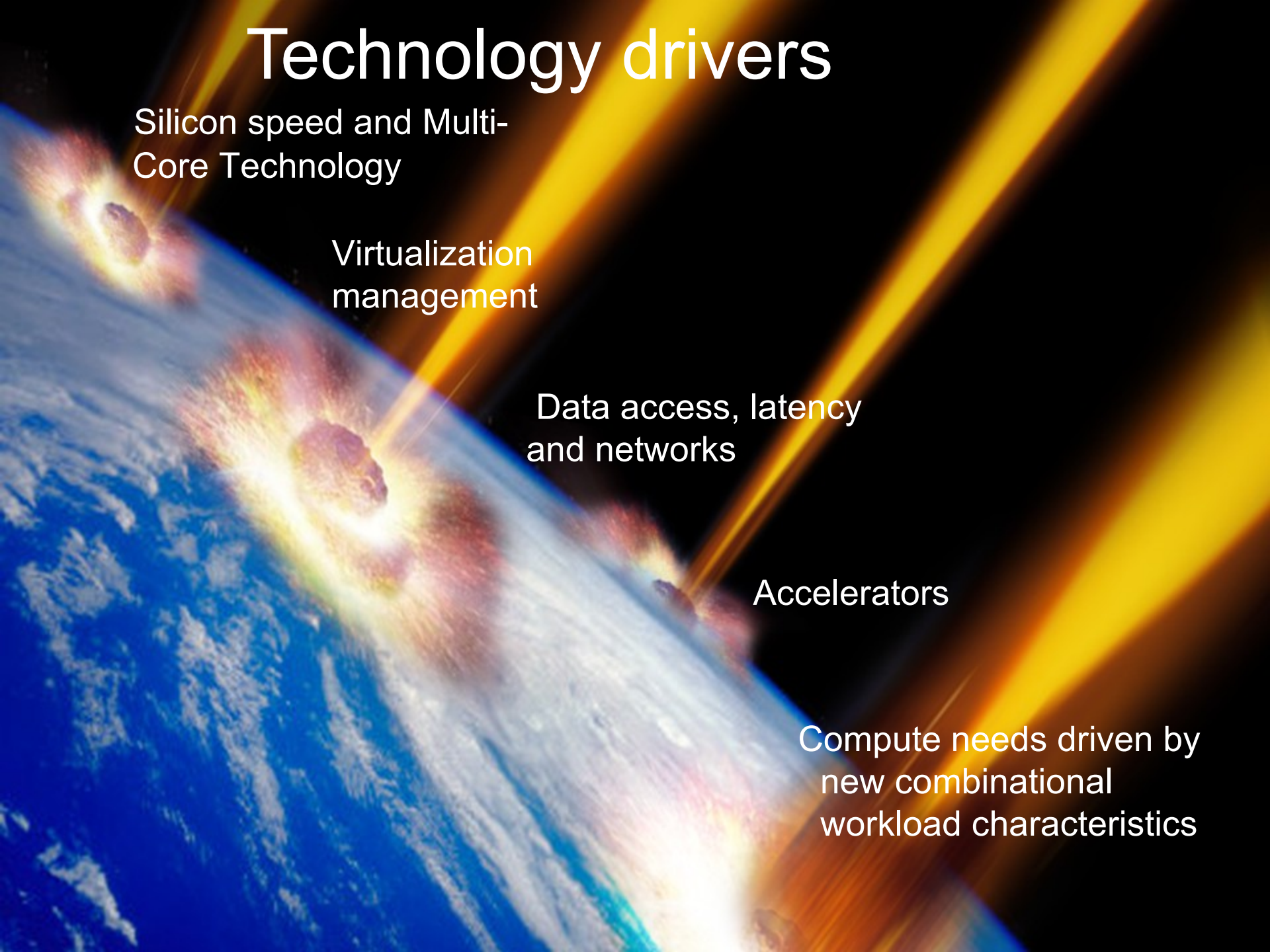
Mainframes process
30 billion business transactions per day

Mainframes enable
$6 trillion in card payments annually

80 percent of the world's corporate data originates on mainframes.

91 percent of CIOs said new customer-facing apps are accessing the mainframe

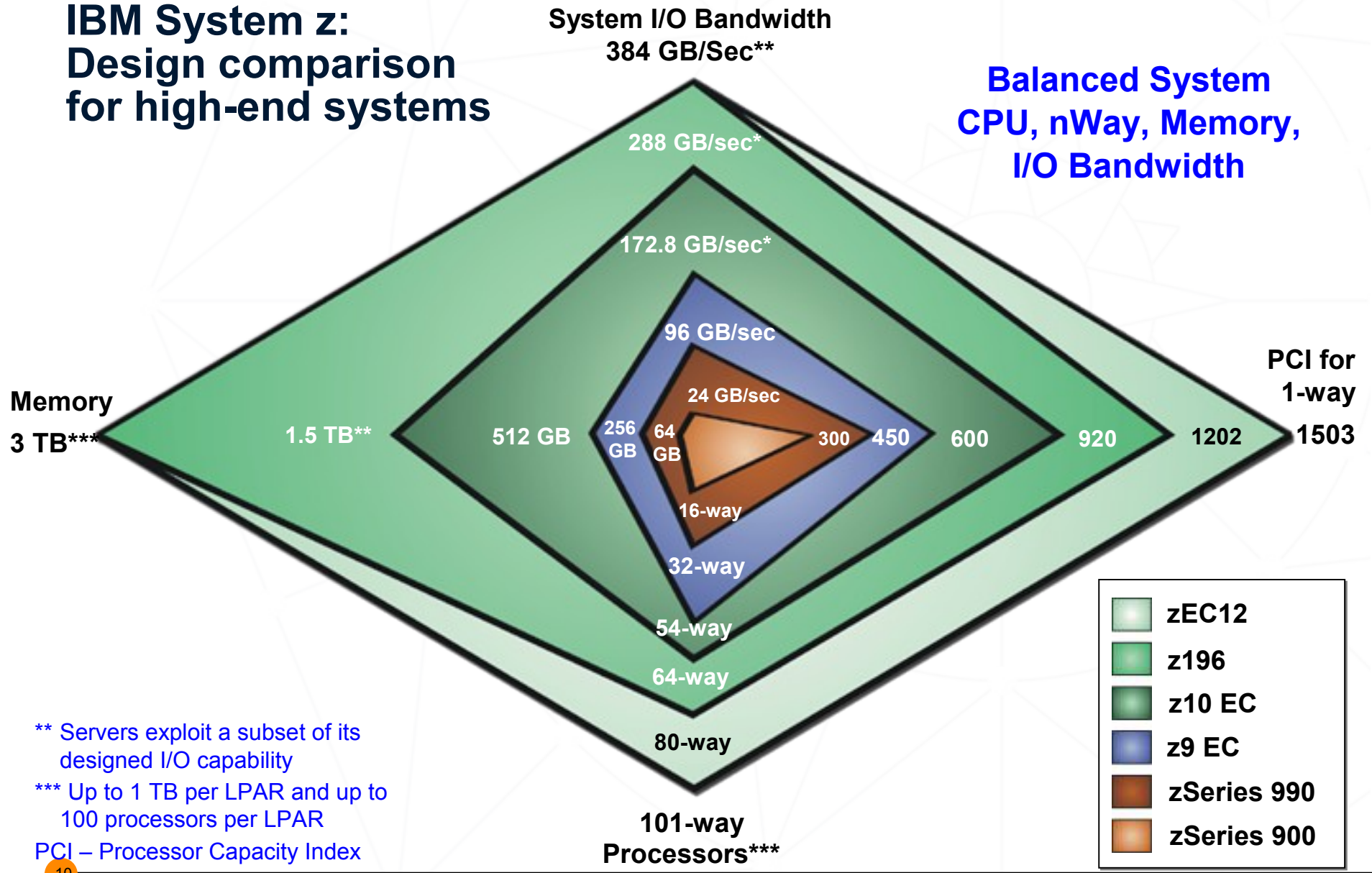
Technology drivers



Industry Outlook / Roadmap

- **Real per-thread performance growth slowing**
  - Limited by physical constraints including power density
  - Substantial innovation required to maintain current thread performance
- **Chip performance growth driven by multi-core designs**
  - Relies on software to exploit many more cores, threads
- **Optimization for chip/package performance, not core performance**
  - Non-linear relationship between core power, performance
- **Processor designers continue to pursue thread performance growth**
  - Very challenging, especially across broad range of workloads
  - Some approaches focus on increasing *apparent* thread speed
    - Hardware / software co-design
    - More efficient software
    - Accelerators for specific tasks
    - Innovative uses of multiple processors and threads

IBM System z: Design comparison for high-end systems

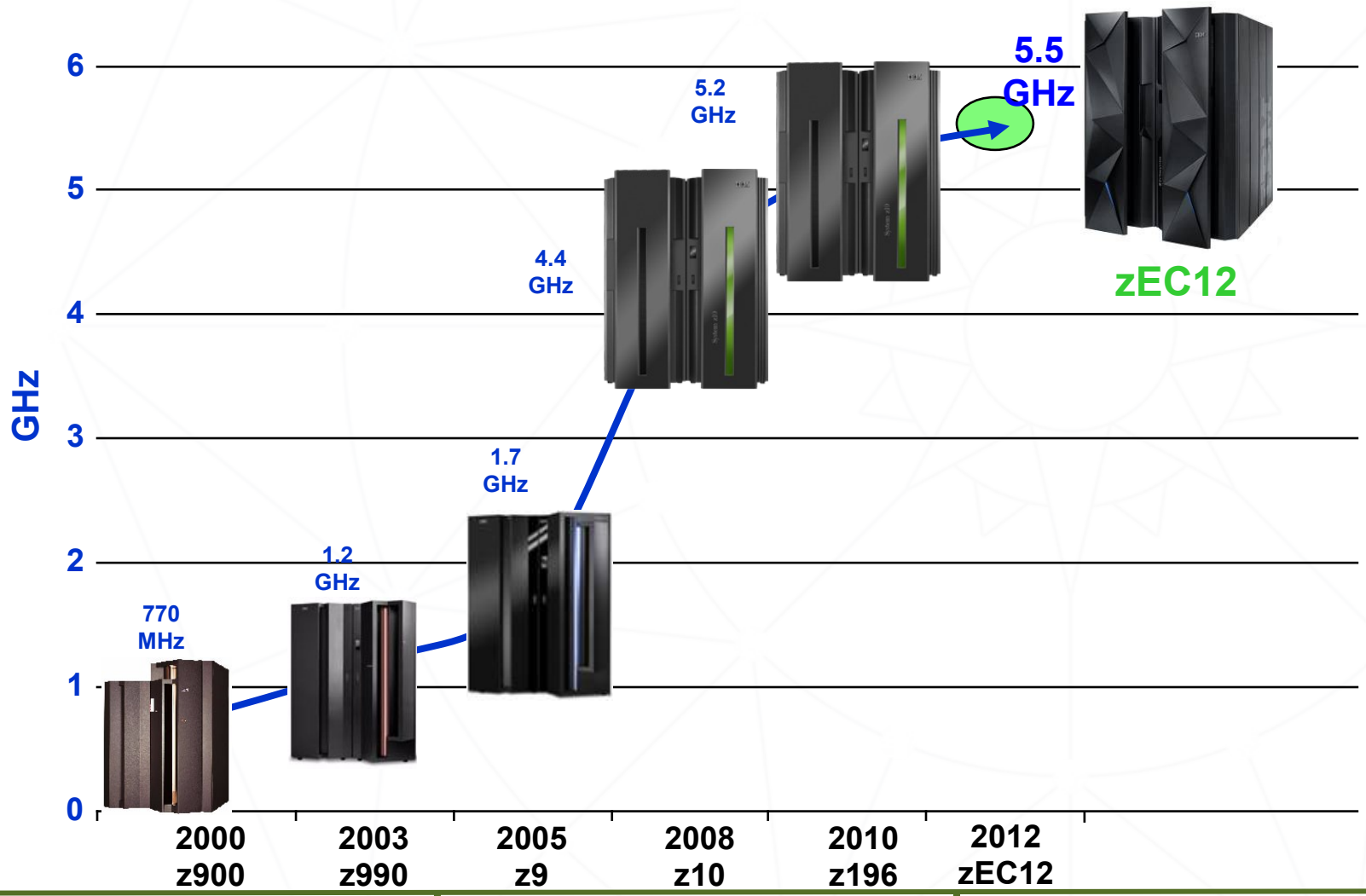


** Servers exploit a subset of its designed I/O capability

*** Up to 1 TB per LPAR and up to 100 processors per LPAR

PCI – Processor Capacity Index

zEC12 continues System z industry leadership in frequency



- **z900** – Full 64-bit z/Architecture®
- **z990** – Superscalar CISC pipeline
- **z9®** – System level scaling

- **z10™** – Deep Pipeline, Arch. extensions
- **z196** – Out-Of-Order (OOO), Additional Architectural Extensions

- **zEC12** – OOO+, Architectural Extensions, Enablement for new Software Paradigms

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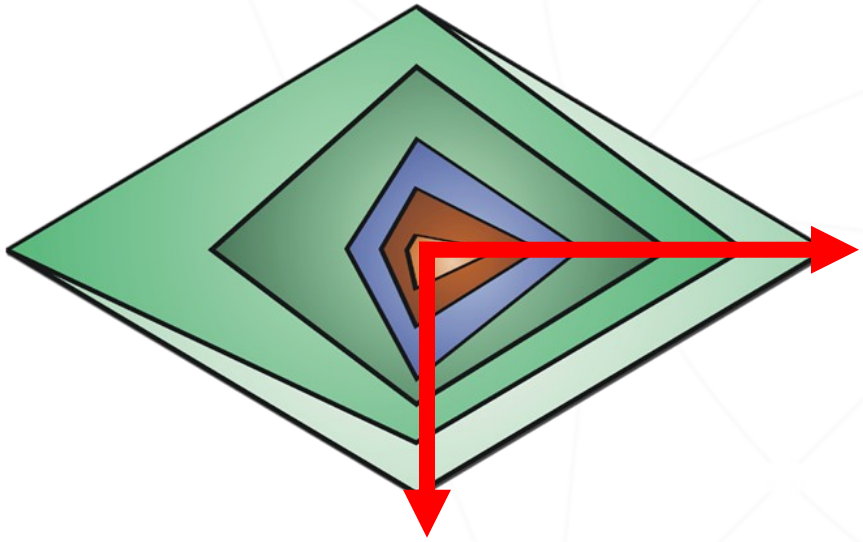
Compute Capability Trends: System z

- **Technology Trends**
  - Transistor density continues to grow
  - Transistor speedup has significantly moderated
  - Per-thread performance growth rate slowed
- **Faster growth of SMP (n-Way) needed to sustain box growth**
  - Hardware innovations to enable consistent performance on large SMP
  - Focus on constraint relief across software stack
    - PR/SM™, z/OS®, DB2®, IMS™, CICS®, WAS, …



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Compute Capability Trends: System z*

- Future growth coming from dimensions **other** than hardware thread speed:
  - **Software** efficiency – extract full performance value from System z hardware
    - Compiler technology, dynamic optimization
    - Exploit new architectural facilities
  - **Core** density – multi-core processor chips
    - More efficient use of space, less complex packaging
  - **Cache** density – leveraging leadership eDRAM technology
    - Larger caches closer to more cores
  - **Thread** density – software scaling efficiently to many more active threads
- **Combined result: continued growth in system capacity each generation; plus:**
  - **Sysplex** scale – more systems sharing data and workloads
  - **Workload optimization** via specialized capabilities

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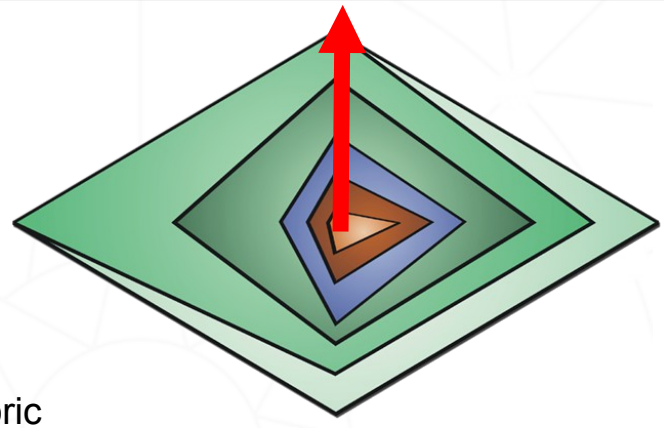
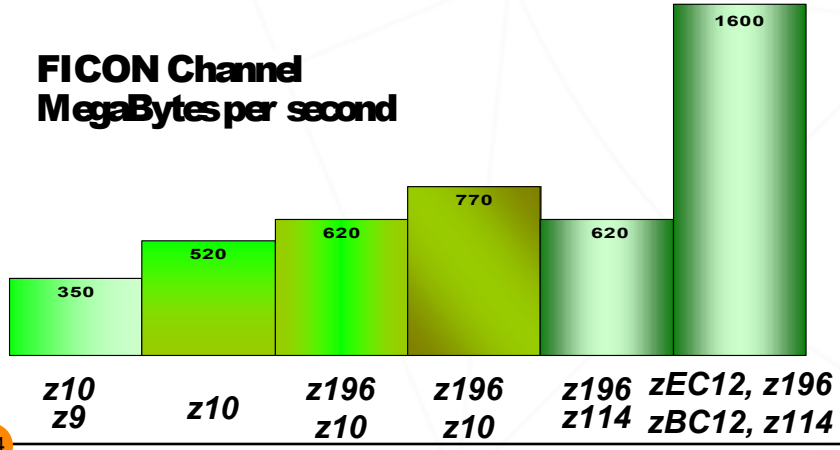
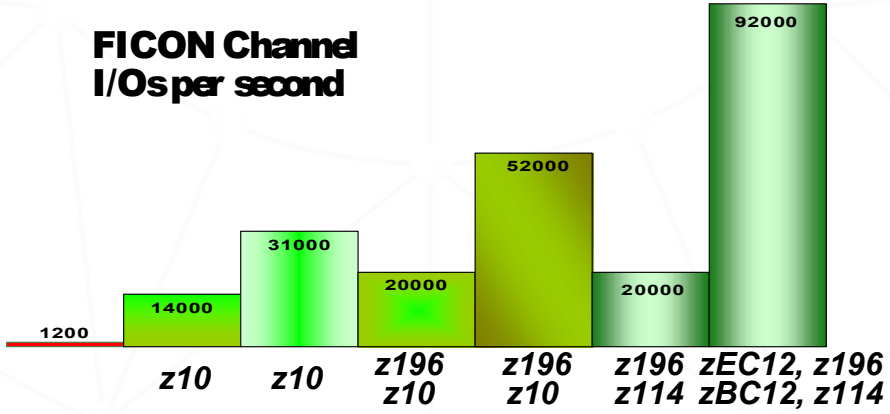
System z I/O & Storage Outlook*



- **Leverage industry standard technology**
  - Enable faster exploitation of advances across industry
  - Enhance interoperability across platforms
  - Increase configuration flexibility
  - Reduce cost of data center infrastructure
  - Enable **options** to leverage standards-based Converged Fabric
- **Optimize for enterprise-scale data**
  - Leverage storage technologies for efficient management
  - Enable access to enterprise data from multiple platforms and devices
- **Maintain and extend System z values**
  - Extreme scale in connectivity, bandwidth, IOPS
  - Co-optimization with System z software stack
  - Leadership reliability, availability, security, manageability





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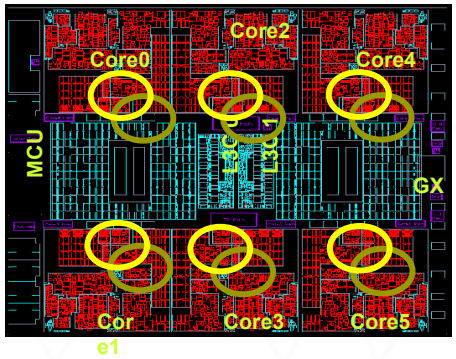
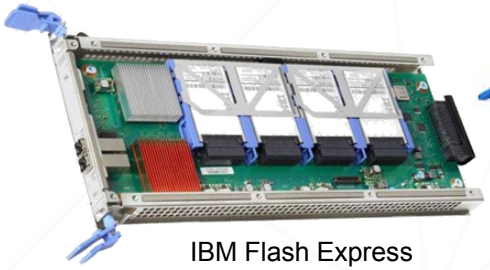
Acceleration & Optimization Outlook*

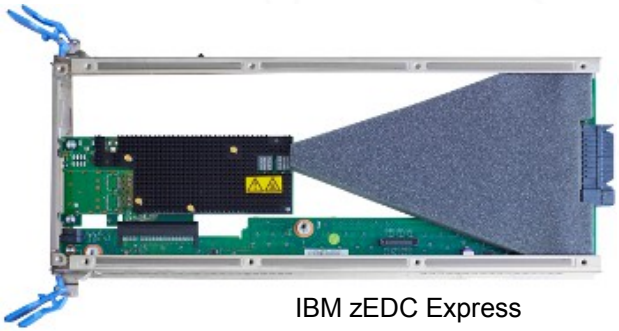


- **Processor accelerators**
- **Integrated firmware functions**
- **PCIe-attached accelerators**
  - Use industry-standard interface and form factor
  - Leverage flexibility of ASICs and FPGAs for special functions
  - In-line processing of data entering or leaving System z
  - Off-load processing from System z processors

IBM Crypto Express 4S



IBM Flash Express



IBM zEDC Express

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zEnterprise Data Compression (zEDC) - can help to reduce CPU and storage

Every day 2.5 quintillion bytes of data are created

Compress your data

*4X**

(efficient system data compression)

*Up to 118X reduction in CPU and up to 24X throughput improvement when zlib uses zEDC ***

Data Ready

Efficiently compress active data by providing a low CPU, high performance, dedicated compression accelerator

Industry standard compression for cross platform data distribution **

Typical Client Use Cases:

Significant disk savings with trivial CPU cost for large BSAM/QSAM sequential files ***

More efficiently store audit data in application logs

Reduce the amount of data needed for data migration and backup/restore **

Transparent acceleration of Java compressed applications **

NEW **zEDC Express**

NEW **z/VM 6.3 support for guests*****

NEW **z/OS V2.1 zEDC**

* The amount of data sent to an SMF logstream can be reduced by up to 75% using zEDC compression – reducing logger overhead

** These results are based on projections and measurements completed in a controlled environment. Results may vary by customer based on individual workload, configuration and software levels

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zEnterprise:

Integrated IT Infrastructure for Optimized Service Delivery

zEnterprise Unified Resource Manager

- Integrated, dynamic, intelligent resource management
- Workload-Aware Resource Optimization
- Enabled for Infrastructure as a Service

IBM zEnterprise™ EC12 (zEC12)

- Optimized to host large scale database, transaction, and mission critical applications
- The Most efficient platform for Large-scale Linux consolidation

IBM DB2 Analytics Accelerator (IDAA)

- Unprecedented response times to enable 'train of thought' analyses
- Deep transparent integration with DB2
- Queries are executed in the most efficient location

zEnterprise BladeCenter Extension (zBX)

- Selected IBM POWER7™ blades and IBM System x® Blades* for AIX® , Linux, and Windows applications
- High performance optimizers and appliances to accelerate time to insight and reduce cost
- Integrated high performance private network

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Superior Economics
Protect and extend your z/OS Investments

60% longer service and support period for z/OS Version 2 over z/OS Version 1

Service & Support:

With z/OS V2, IBM plans to provide **5** years of z/OS support, with **3** years of optional fee-based extended service

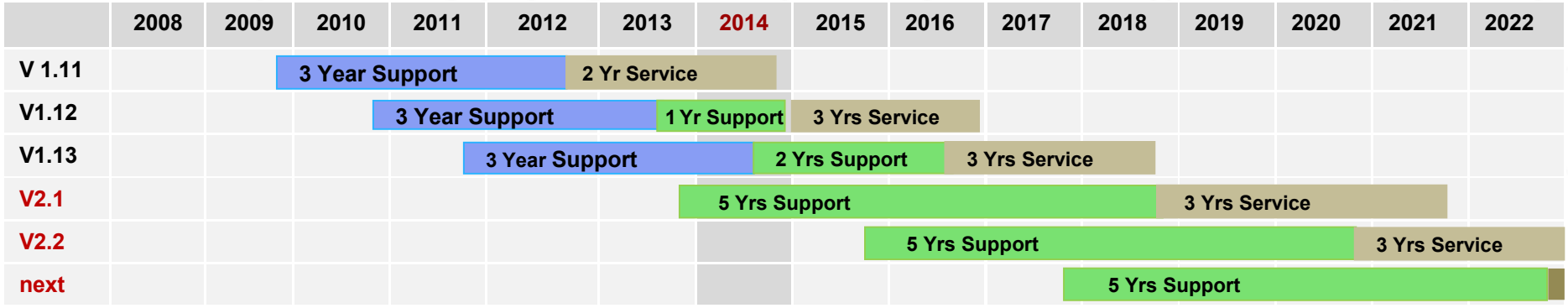
z/OS V1policy is **3** years of support with a **2** year optional fee-based extended service

Support:

z/OS V2.1 is supported through 9/2018 to allow customers time to deploy new functions

As of R12 End of Support (September 2014) PTFs remain available (no longer “cancelled”)

Continue delivering key new functions, non disruptively SPE (small program enhancements) via service



Migrate to z/OS V2 and gain back CPU

z/OSV2.1 performance tests show up to a 2% CPU reduction when migrating to z/OSV2.1 from z/OS V1.13 so you can drive more work on your mainframe.

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z/OS Management Facility Version 2.1

Improved visualization transforms typical tasks

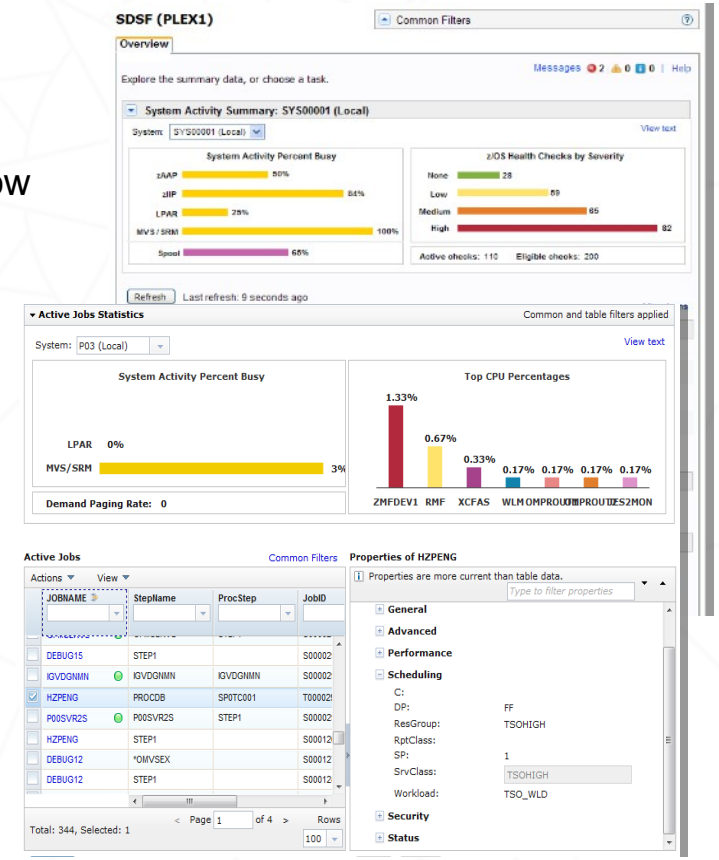
New! 1Q14 enhancements

- **Improve productivity with z/OSMF-based SDSF support**
  - New SDSF functions of ISPF and TSO/E are supported with a simplified GUI for a rich user experience
  - Provide workflow usability — including automating workflow steps

Directions:

- "Off Cycle" new functions via SPE in z/OS 2.2
- Embed z/OSMF in z/OS 2.2, "always on" in 2017
  - Services "always available"
- Leverage UI's across other z/OS components
- Leverage workflows (ex. Migration)

Simplify z/OS administration –
•Enables user friendly UI,
•Enables integration of tasks
•Simplification of tasks via work flows



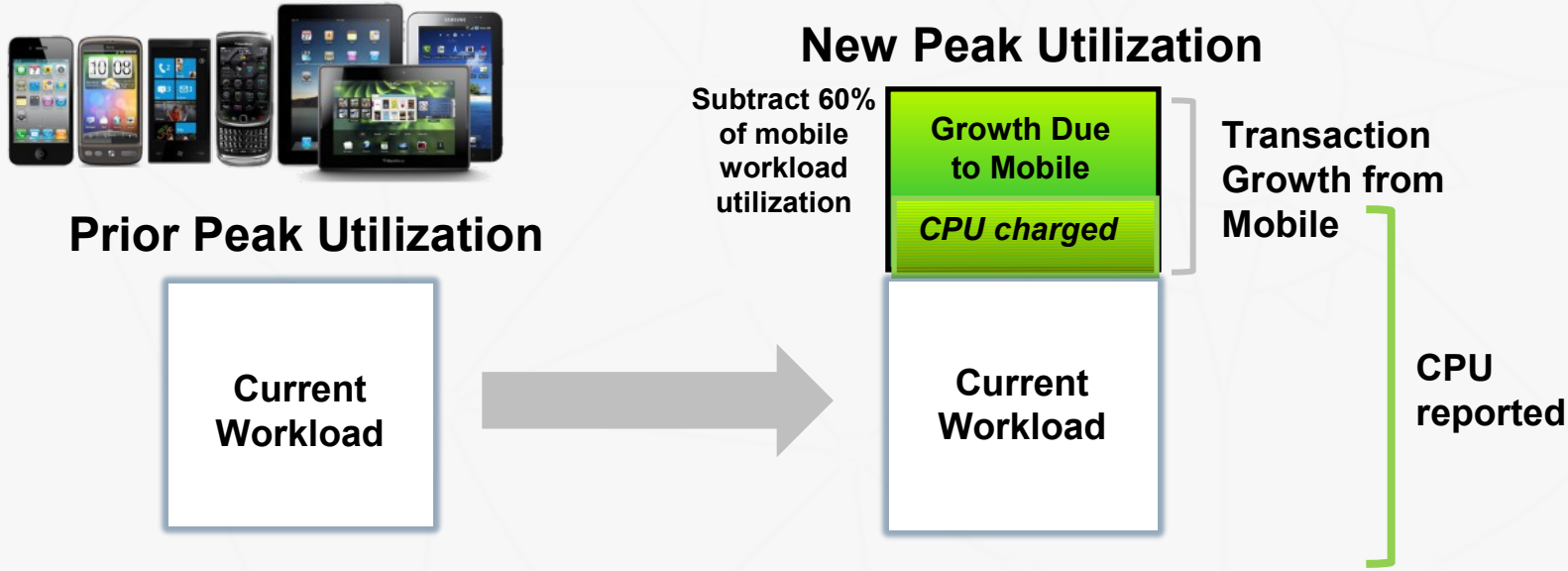
Shows jobs that are the largest consumers of CPU, as well as CPU busy

Mobile Workload Pricing Enhancements

Mobile pricing lets your IT investments cost effectively scale

- Mobile can generate significant growth in transactions
- Leverage existing System z data and transaction processing for mobile
- Scale easily with new pricing option

70% of mobile transactions touch the mainframe



- *Applicable to workloads running on zEC12 and zBC12 …*
- ***Up to a 60% reduction** in reported CPU utilization for Mobile transactions*
- *No changes to infrastructure- just use Standard SCRT plus new Mobile Workload Pricing tool to adjust for Mobile workload impact*

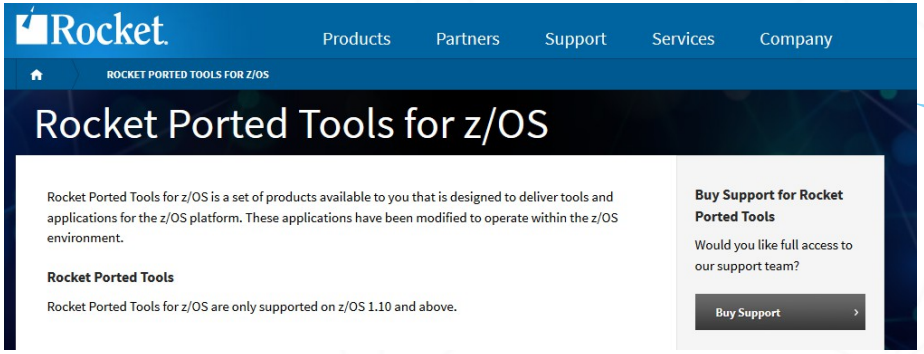
See announcement letter for details
www.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/9/649/ENUSA14-0429/index.html&lang=en&request_locale=en

Open Source Tools

- Historically limited opensource in z/OS -- selectively changing that
  - Industry Standards (tools and interfaces)
  - Speed our ability to deliver capabilities
  - Example - z/OS 2.1 zLib for zEDC (compression)

- Statement of Direction that z/OS 2.1 is the last release to support the DominoGo webserver -> moving to Apache in z/OS 2.2
- Working Plans to update OpenSSH & embed as part of z/OS

- Also announced withdraw from marketing for several features of Ported Tools (they are still supported on z/OS 2.1)
  - Building ecosystem with our Partner and ISV community.



Tuesday 11:15
z/OS 2.1 Unix System Services Latest Status and Features
Janet Sun, Rocket Software

Incorporation of SHARE Requirements

SHARE User group with conferences held twice a year continually shapes our direction
SHARE actively focuses on requirements:

Participants created initially hundreds of requirements
The SHARE MVSE helps prioritize hundreds of requirements

- 33% of Top 39 Requirements by z/OS V2.1.
- Goal for 20% of top 50-75 for z/OS 2.2
- We keep focusing on these!!
- www.share.org

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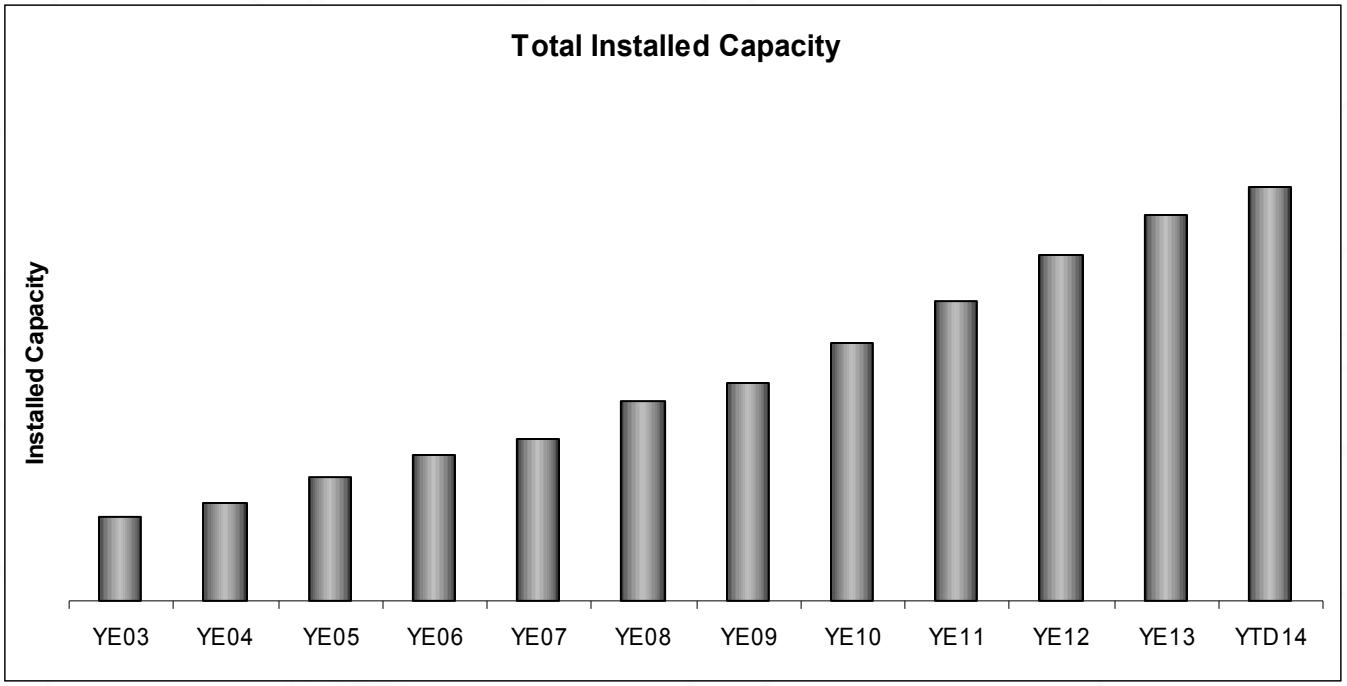
IBM zEnterprise System Momentum



270+ new accounts since 3Q10 zEnterprise launch, with 40% in growth markets

320+ hybrid computing units shipped since 3Q10

6% growth in installed IFL MIPS

68,000+ Students worldwide have participated in the Master the Mainframe for IBM System z® since 2005

7,600+ ISV apps run on IBM System z; 90 new ISVs added in 3Q13

(As of 1Q14)

[IFL = Linux-on-z Only Engine]

धन्यवाद
Hindi

多謝
Traditional Chinese

ขอบคุณ
Thai

Спасибо
Russian

Bedankt
Nederlands

Thank You
English

شكراً
Arabic

Merci
French

Obrigado
Brazilian Portuguese

Gracias!
Spanish

多谢
Simplified Chinese

Danke
German

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다

For more information…

z/OS Main Page	z/OS Home page	www.ibm.com/systems/z/os/zos/
z/OSMF home page	z/OSMF Home Page	www.ibm.com/systems/z/os/zos/features/zosmf/
IBM V2 Education Assistance	*Education*	www.redbooks.ibm.com/redbooks.nsf/pages/IBMIEAV21avail?Open
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Web

- System z official Twitter handle:
  - **@ibm_system_z**
- Top Facebook pages related to System z:
  - **Systemz Mainframe**
  - **IBM System z on Campus**
  - **IBM Mainframe Professionals**
  - **Millennial Mainframer**
- Top LinkedIn Groups related to System z:
  - **Mainframe Experts Network**
  - **Mainframe**
  - **IBM Mainframe**
  - **System z Advocates**
  - **Cloud Mainframe Computing**
- YouTube
  - **IBM System z**
- List Servers
  - **IBM-MAIN**
  - **MVS-OE**
  - **RACF-L**
  - **IBMTCP-L**
  - **ISPF-L**
  - **LINUX-390**
  - **TSO-REXX (and TSOREXX**
  - **VMESA-L**
  - **VSE-L**

System z External Resources:
- System z Homepage
- System z Software Homepage
- PartnerWorld Homepage
- zEnterprise Announcement Landing Page
- System z YouTube Channel
- zEnterprise BC12 Product Page
- zEnterprise EC12 Product Page
- System z Solutions Home Page
- Cloud Computing on System z
- Data Analytics on System z
- Linux Consolidation on System z
- Security on System z
- SAP Consolidation on System z
- Enterprise Modernization

Demos:
- IBM® zEnterprise™ BC12 virtual tour
- IBM® zEnterprise™ EC12 virtual tour
- IBM® zEnterprise™ BladeCenter Extension virtual tour

Smarter Computing Resources:
- System z on Smarter Computing Blog
- Smarter Computing Workload Simulator
- Accelerating Smarter Computing with IBM zEnterprise Video

Leading Blogs related to System z:
- **Evangelizing Mainframe (Destination z blog)**
- **Mainframe Performance Topics**
- **Common Sense**
- **Enterprise Class Innovation: System z perspectives**
- **Mainframe**
- **MainframeZone**
- **Smarter Computing Blog**
- **Millennial Mainframer**
- **SHARE.org**