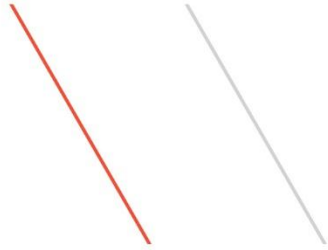


IBM z Systems

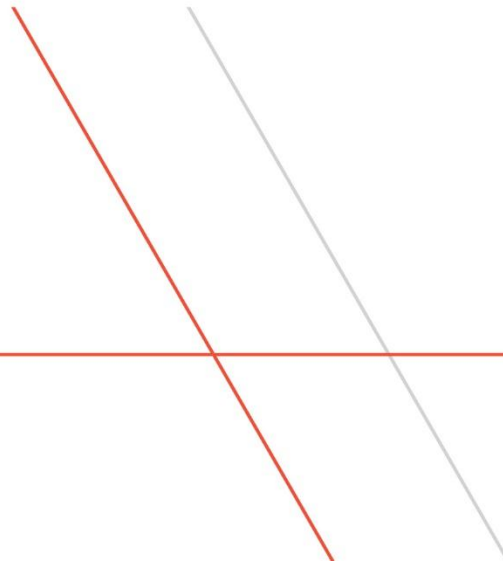


z/TPF and z13

Mark Gambino, TPF Development Lab

March 23, 2015

TPFUG – Dallas, TX



Disclaimer

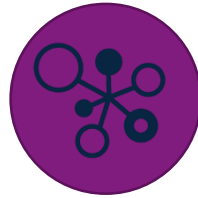
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IBM z13: The New Possible



Mobile

Deliver **up to 36%** better response time, **up to 61%** better throughput, and **up to 17%** lower cost per mobile transaction



Analytics

Deliver insights **up to 17X** faster and with **13x** better price performance than closest competitor



Cloud

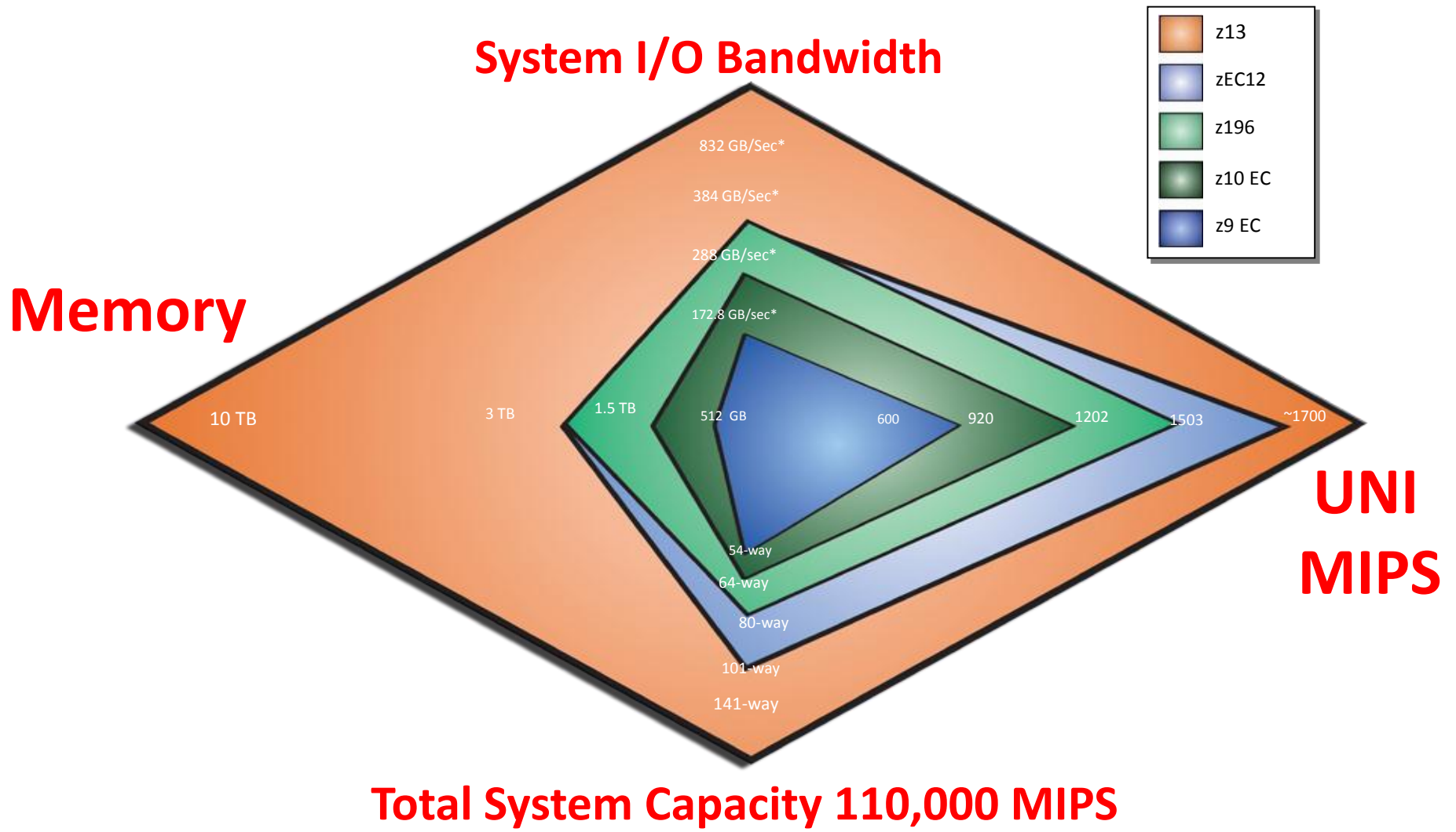
Enable superior Cloud services at **up to 32%** lower cost than x86 Cloud and **up to 60%** less than Public Cloud over three years



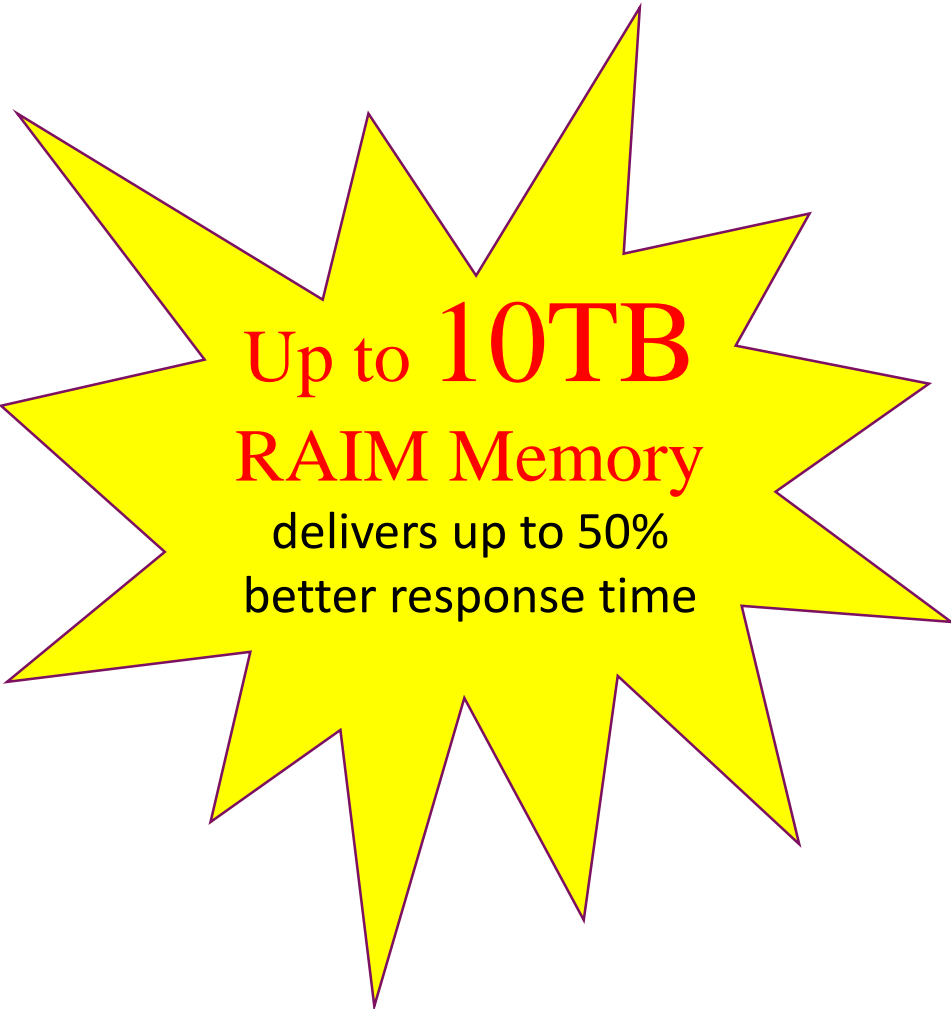
Security

Accelerate speed of encryption **up to 2X** over the zEC12 to help protect the privacy of data throughout its life cycle

z Systems Enterprise Class (EC) Machine Growth



Very Large Memory



Up to **10TB**
RAIM Memory
delivers up to 50%
better response time

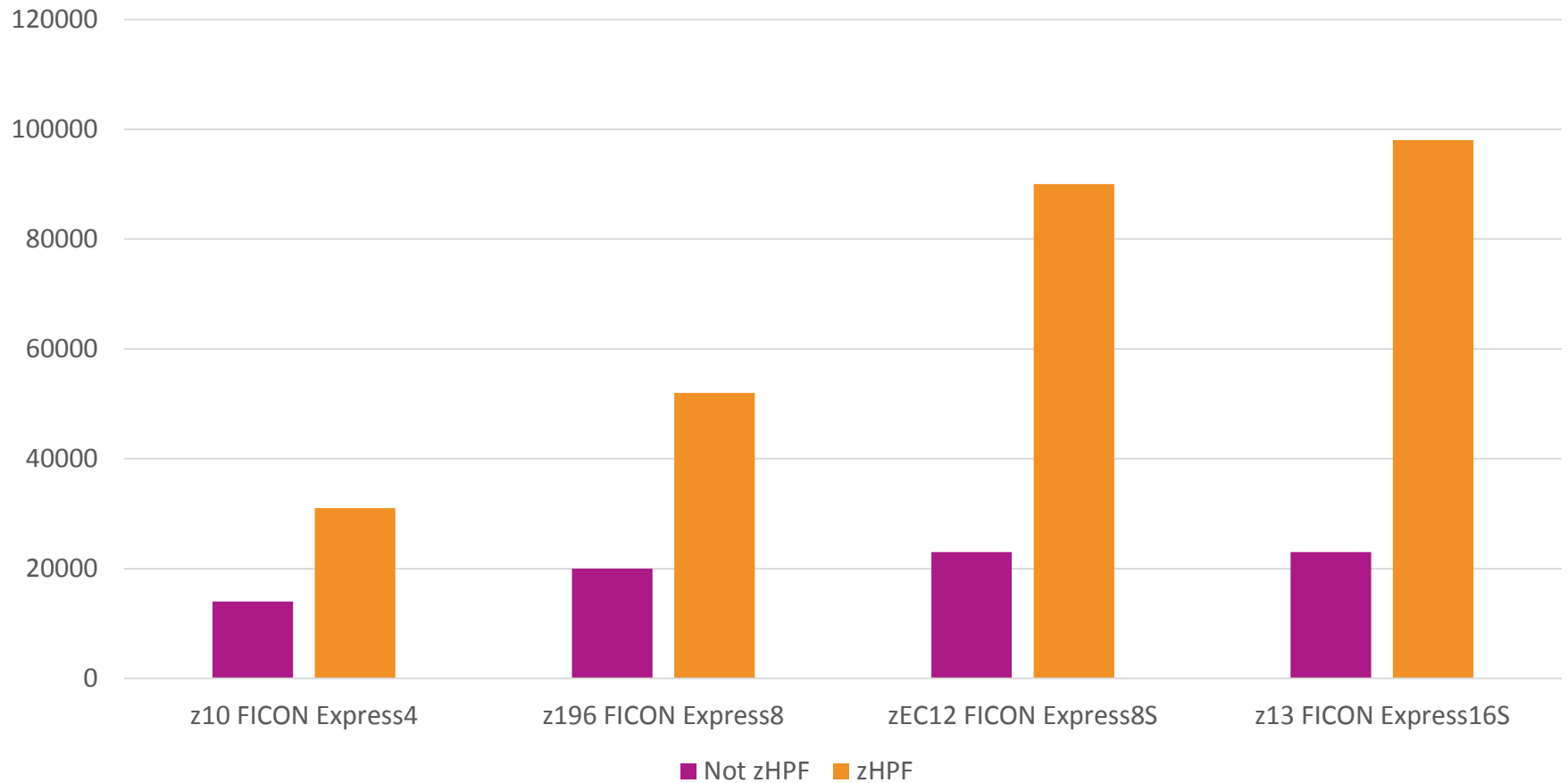
- Increase size of dump buffer area
- Increase size of VFA
- Larger user tables
- Exploit z/TPF logical record caches
- Reduces I/O
- Reduces transaction response time
- Enables new workloads
- Performance improvements
 - Memory cache size is 2x on z13
 - 2GB page support coming soon to z/TPF

I/O Improvements

- Up to 320 Separate Channels of Dedicated I/O
 - FICON Express16S channels (16 Gb/sec channels) are new
- 2x increase in I/O bandwidth to drive growth in data and transactions throughput
- Forward Error Correction (FEC)
 - Supported by FICON Express16S channels
 - Enables higher speeds over longer distances with reduced power and higher throughput, while retaining reliability
 - No changes required to z/TPF SW to exploit benefits of this

Use High Performance FICON (zHPF)

IOPS, 4K Block Size



Data Security

Cryptographic Hardware

providing dedicated cryptographic processing for security of transactions and data, up to 2x faster

- Central Processor Assist for Cryptographic Function (CPACF)
 - Bulk data encryption
 - DES, AES, SHA
 - One CPACF per core
- Crypto Express5S (CEX5S) Accelerator
 - New for z13
 - Public key cryptography
 - RSA
 - z/TPF APAR PJ42625
 - Up to 16 CEX5S features
- Protecting data at rest
- Protecting data in flight

z13 Microprocessor Improvements

- 8-core chip, 5 GHz performance
- Wider pipeline
 - Decode multiple instructions at a time
 - Allows out of order (OOO) execution
 - Execute multiple instructions per cycle
- Industry-leading branch prediction
- Single-instruction, multiple-data (SIMD)
 - Accelerated analytics for numeric-intensive workloads
- Simultaneous Multi-Threading (SMT) for specialty engines

Other z13 Goodies

- Server Consolidation and Expansion
 - Up to 141 cores
 - 40% increase in number of cores, only 5% increase in power consumption at maximum configuration
 - Up to 85 client usable LPARs
 - Up to 8,000 enterprise-grade Linux virtual servers
- 30% better performance for Linux and JAVA
- Statement of direction for Kernel-based Virtual Machine (KVM) support

Types of Engines (Cores) on z Systems Hardware

- **GP** – General Purpose (GP) processor
 - z/TPF terminology also refers to this as an I-stream
 - Processes traditional workloads on z/OS, z/TPF, z/VM. and VSE operating systems
- **zIIP** - IBM z Systems Integrated Information Processor (zIIP)
 - Speciality engine that can be used by z/OS to process certain workloads at a reduced price point
- **zAAP** - IBM z Systems Application Assist Processor (zAAP)
 - Speciality engine for z/OS that no longer exists as of z13
 - All workloads that were zAAP-eligible are now run on zIIP engines on z13
- **IFL** - Integrated Facility for Linux (*IFL*)
 - Specialty engine dedicated for running zLinux (native or under z/VM)
- **ICF** - Internal Coupling Facility (ICF) processor
 - Specialty engine dedicated for running Coupling Facility

z/TPF Transformation Engines (TE) Offering

- Introduced to encourage z/TPF modernization, application extension, and integration with other IBM products
- TE's are allowed to run designated new workloads
- TE's are GP engines at a reduced price
- TE's are not dispatched engines like IBM's specialty engines
- Usage of GP's and TE's will be measured using the new release of SCRT in March 2015

Sounds Great. How do I Get TE's?

- Contact Connie Walberg (cwalberg@us.ibm.com) for more information

Summary

- z13 shows IBM's continuing investment in the platform
- Industry leading innovation created superior technology
- Powers systems of record and systems of engagement
- Good for z/TPF, Linux on z, and z/OS
- Allows you to extend Enterprise applications to mobile users
- Better integration with real-time analytics
- Lowest cost, open cloud architecture
- Secure

Questions?

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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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