The IBM z13 innovative architecture

- The new 14-core design delivers massive scale across all workloads and enables cost-saving consolidation opportunities.
- z/VM V6.3 has been enhanced to exploit simultaneous multithreading offered on the new processor chip.
- Support for sharing OSA-Express Port Groups across z/VM systems within a central processor complex (CPC).
- z/VM V6.3 delivers optimized OSA-Express and reduced cost of ownership for IEEE 802.3 Link aggregation networking environments.
- The new processor delivers new front panel data including a strong, fast I/O infrastructure, cache on the processor chip to bring data close to processing power, security and compression capabilities of the coprocessors and I/O devices, and the 99.999% data availability design of our coupling technologies.
- The IBM z13 intelligent design delivers new levels of performance and capacity for large-scale consolidation and growth.

The IBM z13 is designed to provide:

- Up to 40% more system capacity performance as compared to zEC12
- Up to 40% system capacity performance improvement over zEC12 101 way
- 141 cores to configure (versus 101 on zEC12)
- 231 capacity settings (versus 161 on zEC12)

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IBM zAwareTM deployed on IBM z13 builds on previous IBM zAware function with:
- Support for Linux on 2 Systems message log analysis
- Support for native or Linux on z Systems images
- The ability to process message streams with no message IDs
- New message types for coupling-device messages with similar operational characteristics for modeling and analysis.
- Recognition of dynamic activation and deactivation of a Linux image into a group, and appropriate modeling and analysis.

- Aggregated Systplex view for z/OS and system views.
- User-defined grouping. For Linux on z 2 Systems, the user can group multiple systems into a combined model: for example, one for all web servers, one for all databases, and so on; by “solution” (for instance, one model for your cloud; or by VM host).
- Heat map display which provides a consolidated/aggregated/higher level view with the ability to drill down to details.
- Improved usability and GUI enhancements addressing many customer requirements.
- Enhanced filtering and visualization, with better use of GUI real estate.
- Improved U navigation.
- Display of local time in addition to UTC time.
- Enhancements based on IBM One UI guidelines.
- Enhanced analytics.
- More robust data store.
- New facilities to support with Mozilla Firefox 31 and Internet Explorer 9, 10, and 11.

**Designed for Common Criteria EAL5+ certification for security of logical partitions.**

- This means that the IBM z13 is designed to prevent an application running on one operating system image on one LPAR from accessing application data running on a different operating system image on another LPAR on the server.

**Greater than 16 Domain support**

- Support to allow a cryptographic coprocessor to be shared across more than 16 domains, up to the maximum number of LPARs on the system.
- This support relies on enhanced firmware available with a minimum microcode level for the Crypto Express4S and Crypto ExpressSS coprocessors.
- The configuration migration tasks feature of the TKE is planned to be enhanced to also support the Crypto ExpressSS coprocessor.

**The Crypto ExpressSS Coprocessor support:** TKE 8.0 is required for managing Crypto ExpressSS cryptographic coprocessors and manages them through the same Crypto Module notebook functions as previous generations of Crypto Express coprocessors.

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**FIPS Certified Smart Card:** A FIPS certified smart card, part number 00A7107, is now included in the smart card reader and additional smart cards optional features.

**Crypto Coprocessors with more than 16 domains:** TKE 8.0 is planned to allow the management of domains beyond the current limit of 16. This will require the latest levels of code on the IBM z13 to allow more than 16 domains on the Crypto ExpressSS.

**Note:** This support is only available with z/OS.

**Full function migration wizard for EP11:** The full function migration wizard is designed to provide the ability to quickly and accurately collect and apply data to the Crypto Express features configured as EP11 coprocessors.

**This wizard previously supported CC1, however Crypto Module Group support has been removed:** Crypto Module Grouping is no longer supported on TKE 8.0. All group management must now be done from a Domain Group.

**New master key management functions:** TKE 8.0 is planned to allow support of two new master key management functions which are available when managing any type of master key.

1. Generate a set of master key parts wizard-like feature which allows you to create a new key part for each of the different types of master keys.
2. Load all new master key wizard-like feature which allows you to load a new key for each of the different types of master keys.

**Usability Enhancements:** TKE 8.0 is planned to have many usability enhancements including the ability for users to select a check box that allows them to change their passphrase on the logon screen for a passphrase profile.

**NOTE:** Users can now select multiple items in the Host container, Crypto Module Group container, or Domain Groups container of the main window of the TKE application.

**ENC-Zero Verification Pattern for 24-byte DES Operational Keys:** TKE 8.0 is planned to support an ENC-Zero verification pattern that is computed and displayed with 24-byte DES operational keys.

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**FICON Express16S - a new generation for FICON, zHPF, and FCP**

IBM is releasing a new I/O infrastructure that will strengthen the synergy between DS8870 and IBM z Systems, delivering improved a new I/O infrastructure that will strengthen the synergy between DS8870 and IBM z Systems, delivering improved, repeatable performance, and enhanced reliability for mission-critical environments.

- With the introduction of the FICON Express16S on the IBM z13, you now have additional growth opportunities for your Storage Area Network (SAN).
- FICON Express16S supports a link data rate of 16 gigabits per second (Gbps) and auto negotiation to 4 or 8 Gbps for synergy with existing switches, directors, and FICON products.
- With support for native FICON, High Performance FICON for 2 Systems (zHPF), and Fibre Channel Protocol (FCP), the IBM z13 server enables you to position your SAN for even higher performance – helping you to prepare for an end-to-end 16 Gbps infrastructure to meet the lower System z demand and bandwidth demands of your applications.

**FICON Dynamic Routing**

With the IBM z13 server, FICON channels are no longer restricted to the use of static Storage Area Network (SAN) routing policies for Inter Switch Links (ISLs) as they can support dynamic routing in the Storage Area Network (SAN) called FICON Dynamic Routing (FDR). This feature provides the dynamic policies previously available only to FICON Director manufacturers, for example, Brocade's Exchange Based Routing (EBR) and Cisco's Open Exchange ID Routing (OXID).

**Improved High Performance FICON for z Systems (zHPF) I/O Execution at Distance**

- FICON Express16S in an IBM z13 server has been enhanced to support over 40% more bandwidth than FICON Express8S running over 8 Gbps at distances up to 1 km to be executed in a single round trip to the control unit thereby not allowing the I/O service time for these write operations at extended distances.
- With the introduction of FICON Express16S in an IBM z13, administrators can now configure the channel subsystem (CSS) scalability with support for more logical channel subsystems (LCSBs) which are required to support the fifty LPARs for IBM z13, four subchannel sets (to support more devices per logical channel subsystem), and 32K devices per FICON channel up from 24K channels in the previous generation.

**Improved Channel Subsystem (CSS) Scalability**

- Support for a mix of physical and logical channel subsystems (CSS) is provided by enabling the elimination of single points of failure for storage after a disk failure by simplifying the exploitation of IBM's DS8870 Multi-target Metro Mirror replication with GTPS and TFC-R-HyperSwap.

**z/VMM Support for the IBM z13 (z13)**

- With the PTF for APAR VI96557, z/VMM provides support that will enable guests to exploit zEC12 function supported by z/VMM on the IBM z13 (z13), z/VMM support for IBM z13 includes support for:
  - New I/O related architectures: Support is provided for new I/O related architectures and features including IFL 2019 including:
    - PCI RIO (real-time I/O)
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**z/VMM Scalability**

- Support for APAR VI96556, z/VMM provides host exploitation support for z/VMM on IBM z13, which will enable z/VMM to dispatch work on up to two threads (logical CPUs) of an IFL processor core. z/VMM simultaneous multithreading support is available for only one processor core on Linux in the IBM z13, but not on the IBM z13.

**TKE 8.0 includes support for managing Cipher Express5S cryptographic modules:** The configuration migration tasks feature of the TKE is planned to have many usability enhancements including the ability for users to quickly and accurately collect and apply data to the Crypto Express features configured as EP11 coprocessors.

- With the PTF for APAR VI96556, z/VMM will support up to 64 cores with multithreading disabled.
- With the PTF for APAR VI96556, z/VMM will support up to 128 cores with 2 physical threads per core.
- With the PTF for APAR VI96556, z/VMM will support up to 32 logical processors on prior machines.

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**Up to 141 ICF engines can be ordered on a single server across multiple Coupling Facility LPARs. This helps limit the number of LPARs on the system.**

> **IBM Integrated Coupling Adapter (I CA Sh)**

- The IBM Integrated Coupling Adapter (ICA Sh), introduced on the IBM z11 platform, is a two-port, short distance adapter for applications requiring high utilization of coupling channel links.

**IBM z13**

- IBM z13 will support up to 256 Coupling CHPIDs, twice the 128 coupling CHPIDs supported on zEC12. This provides enhanced connectivity with a growing number of coupling channel types and facilitates consolidation of multiple Systplexes into the same set of physical servers. Note that each CF image will continue to support a maximum of 128 coupling CHPIDs.

**Integrated Facility for Managing Crypto Express4S and Crypto ExpressSS**

- TKE 8.0 supports the Facility for Managing Crypto Express4S and Crypto ExpressSS.

**Performance**

- Enhanced analytics • More robust data store • New facilities to support with Mozilla Firefox 31 and Internet Explorer 9, 10, and 11.
Hardware Management Console (HMC)

Alternative to USB Flash Memory Drive:
- With the Hardware Management Console 2.13.0, the USB Flash Memory Drive will continue to be supported.
- The Hardware Management Console 2.13.0 will also provide alternative options for each task that currently has an option to utilize a USB Flash Memory Drive, and this will allow customers to eliminate the requirement for USB Flash Memory Drive.
- These alternatives such as FTP Servers and Remote Browser from workstation will be documented in IBM Knowledge Center. If you prefer no USB Flash Memory Drive usage, select the Feature Code 0845.

Discontinuance of System Activity Display:
- With the Hardware Management Console 2.13.0, the System Activity Display task is no longer supported for the IBM z13 systems.
- The System Activity display functionality is available for legacy systems (zEC12 or earlier) which are managed by the Hardware Management Console 2.13.0.

Hardware Management Console Data Replication Versioning:
- The Hardware Management Console 2.13.0 Data Replication task has added versioning support, and this requires all Hardware Management Consoles to update to the 2.13.0 level in order to support Data Replication to update the Hardware Management Consoles.
- Any Hardware Management Console at 2.12.1 level or earlier will not be able to perform the data replication with a Hardware Management Console 2.13.0.

Hardware Management Console Time Source Change:
- The Hardware Management Console 2.13.0 will no longer define its time source using the Add Object Definition.
- The time source is now defined on the Customize Console Date/Time task.
- This will provide a clearer identification of all defined time sources including validation of Server Time Protocol (STP) Coordinated Timing Network IDs (CTN IDs).

User Management Dashboard:
- This User Management Dashboard task provides additional functionality such as more granular user management controls and inheritance controls to objects added to groups. It is recommended to look at the Hardware Management Console What's New section in the online help or IBM Knowledge Center to view detailed descriptions for this new task including getting started tutorials for different usage scenarios.

Enhancements to Advanced Workload License Charges:
- Technology Update Pricing for the IBM z13 extends software price-performance provided by AWLC for z13 servers.
- New and revised Transition Charges for Syplexes programs provide a transition to Technology Update Pricing for the IBM z13 for syplex customers who have not yet migrated to z13 servers.
- This ensures that usage benefits are maintained and alleviates the benefits of Technology Update Pricing for the IBM z13 pricing at all customers migrate.

Note: When a z13 server is in an actively coupled Parallel Sysplex or a Loosely Coupled Complex, you may choose either aggregated AWLC pricing or aggregated Parallel Sysplex License Charges (PSLC) pricing subject to all applicable terms and conditions. For additional information about software pricing for the z13 server, refer to Software Announcement 215-001, dated January 14, 2015, Technology Transition Offerings for the IBM z13 which extends software price-performance advantages.

The CPC drawer is divided in to two nodes:
- Each node contains the following components:
  - Three eight-core processor unit (PU) SCMs, with six, seven, or eight active cores, depending on the machine model.
  - One storage controller (SC) SCM, with a 480 MB L4 cache.
  - Five DDR3 DIMM slots per memory controller, for a total of 15 per node.
  - Each CPC drawer contains two nodes, which altogether consist of the following components:
    - Six- to eight-core PU SCMs, with 90 or 92 active processor units (PUs), depending on the model.
    - Two Storage Controller SCs, with 960 MB L4 cache total.
    - Dual inline memory modules (DIMMs) plugged in to 20 or 25 DIMM slots of the total of 30 DIMM slots available, providing 320-3200 GB of physical memory and 256-2550 GB of addressable (customer available) memory.
    - Ten PCIe Generation 3 (PCIe Gen3) slots for PCIe I/O drawer fanouts or PCIe coupling links fanouts.
    - Four G4x slots for PIB fanouts or InfiniBand coupling fanouts.
    - Two flexible service processor (FSP) cards for system control.
    - Four DC Converter Assemblies (DCAs) that provide power to the CPC drawer. Loss of one DCA will not cause enough power to trip the drawer's power requirements (n+1 redundancy).
    - The DCAs can be concurrently removed and replaced (one at a time).
    - Water-cooling manifold for PU ships.

The z13 can be delivered as an air-cooled system or as a water-cooled system.