

General information on the HMC prior to the z196 Unified Resource Manager

- The **Hardware Management Console (HMC)** communicates with each Central Processor Complex (CPC) through the CPC's **Support Element (SE)**; see **diagram A**.
- A **support element** is a dedicated workstation used for monitoring and operating a system.
- > It is attached to the central processor complex (CPC) of a system; see **diagram B**.

The SE is an **integrated support element**, that is, the support element is located inside the same frame that the central processor complex (CPC) is located.

An **alternate support element** is also provided to give you the option to switch from your **primary support element** to your **alternate support element** if hardware problems occur.

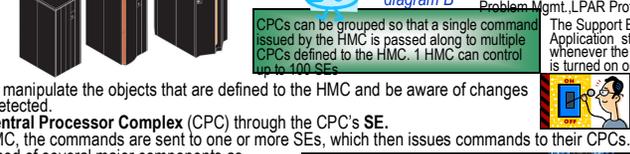


- A **HMC** is a console that you can use to **manage and monitor hardware**.
- The HMC has a **user interface** that provides the functions you need through an object-oriented design.
- Through this design, you can directly manipulate the objects that are defined to the HMC and be aware of changes to the hardware status as they are detected.

- The **HMC** communicates with each **Central Processor Complex (CPC)** through the CPC's **SE**.
- When tasks are performed at the HMC, the commands are sent to one or more SEs, which then issues commands to their CPCs.
- The **tree style user interface** is comprised of several major components as shown on right: the banner, the task bar, the navigation pane, the work pane, and the status bar.

HMC provides:

- An expert system that performs **analysis of system-level failures** besides server level failures; determines the root cause, and automatically notifies the customer and IBM Service provider of the problem, the impact of the problem, the fix, and the impact of the fix.
- Automatic **backup and restore of configuration and customization data** for the system's hardware components.
- Automatic and automatic **firmware change management** for the servers, which includes automatic monitoring of firmware levels, updates, backups, retrieval and concurrent application of updates without any customer effort or involvement.
- A highly **reliable call home server** with automatic failover.
- Weekly information about the performance and **use of systems in the field**; this data is used to support On-Demand software billing.



Unified Resource Manager

- With **zEnterprise hybrid extensions** to existing HMC management capabilities is provided by the **Unified Resource Manager (a.k.a. zManager)**.
- NOTE:** A **zManager (zMG)** is not a replacement for z/OS' Console, but it's a means of making enhanced hardware management smarter.
- These extensions provide System z qualities of service to application-specific **optimizers** and to general-purpose IBM Blades.
- Integrate optimizers and IBM blades into the System z ecosystem (IBM Smart Analytics Optimizer and Power 7 Blades)
- Support is for standard 19" U42 optional z Blade Extension (zBX) housing racks for Blade Centers

Hardware Management Console (HMC) extended to provide System z values to zBX componentry:

- Secure SSL based remote access (optional)
- Full complement of certificate management capabilities
- Complete user management suite
- Full function user definition
- Full access controls for tasks and resources allowed for each user (i.e., User Roles provided)

The HMC provides for **advanced virtualization management** that controls 4 hypervisors **each logically federated as a pool of clustered resources** using a **single point of control**:

- [PR/SM, z/VM, xHYP (x86 Blades), pHYP (Power Blades)]
- Based on a strategic hypervisor for the next generation of modular systems
- Hypervisors for the Blades** will be treated as **System z firmware**; **no customer requirements** to obtain these hypervisors, **no installation, no need to service** (shipped with System z)
- System z **boot up** will take hypervisors off the SE hard drive and deployed onto the Blades which will be **configured and serviced automatically** by System z firmware

SE appliance functionality keeps track of the firmware inventory, entitlements, orchestrates capacity upgrade on demand, backup, LPAR configuration, and virtualization integration with Blades (i.e. if a blade or adapter on a blade fails (zBX elements) the same process will be used for zBX to **call IBM RETAIN** to be recorded and service dispatched as used by System z today), inclusive of (firmware) switches.

HMC is will begin to provide a more steady state operational capabilities of the system and will eventually be able to plugin to other external management interfacing products such as Tivoli, IBM System's Director and even customer based interfaces

Consider the Blades being new specialty engines added to System z managed by the zManager.

Workload manager performance capability can influence the workload balancing used by **Data Power** using the zManager

zMG is a set of management capabilities for hardware & platform mgmt up through the hypervisors **NOTE:** This is NOT taking over the management of the guests, OS, middleware or subsystems.

Management Enablement Levels are delivered in suites at different management levels and are always present



Unified Resource Management Power System x1 IBM Appliances

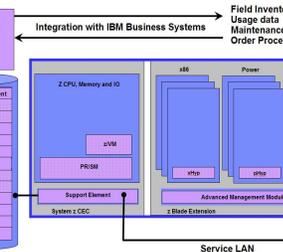
Cheat Sheet #65 zTidBits Unified Resource Manager (zManager)

The SE is usually used by service personnel to perform maintenance operations on the system (i.e. tuning on or off components, HW monitoring, Problem Mgmt, LPAR Profiles).

The Support Element Console Application starts automatically whenever the support element is turned on or rebooted.

Only the HMC can be used for monitoring and operating multiple systems; using it is more efficient than using each SE console individually.

The ensemble starts with a pair of HMCs being designated as the Ensemble Management HMCs and assigned an ensemble identity. z196 CPCs are then added to the ensemble through an explicit action at the ensemble HMC.



Total systems management of heterogeneous resources

Up to four hypervisors that are shipped, serviced, and deployed as System z LIC; Booted automatically at power-on reset and isolated on the internal platform management network

† VPD - provides an accurate hardware product and component tracking process for service to debug the right level of hardware and for upgrades to hardware to be handled automatically.

- Virtual server lifecycle management, enabling directed and dynamic virtual server resource provisioning on all hypervisors and integrated storage, network, and ensemble configuration
- Maximum potential power, enabling power redistribution

Automate

- Workloads defined as representations of physical and virtual resources in the context of named business processes, providing insight into workload relationships and dependencies
- Performance service-level policy definition and performance monitoring, reporting, and resource optimization aligned with customer-defined workload service levels, allowing virtual CPU capacity to be adjusted across a hypervisor
- Static power savings and energy management, **enabling cost savings**

Operational Controls are management functions that deal with the fundamental hardware components.

Change Management has been extended to deal with blade and BladeCenter firmware, enabling current levels to be displayed, new levels to be retrieved from IBM and applied under customer control.

- Configuration data is **backed up and restored** as necessary to ensure the continuity of the configuration across blade replacements.
- Problem Management** is extended to the blades to enable **automatic logging of error and first-failure data capture (FFDC)** information.

Blade-related problems are analyzed to determine their severity and are reported to IBM through the **call-home** mechanism for potential service action.

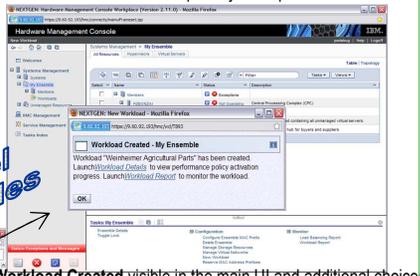
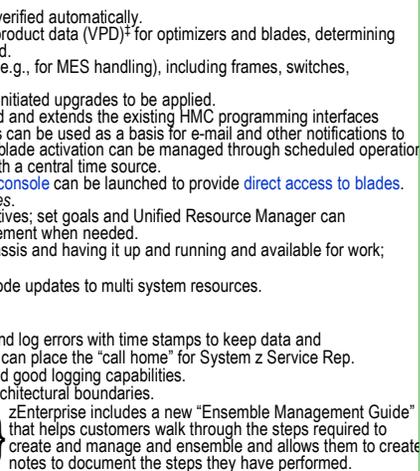
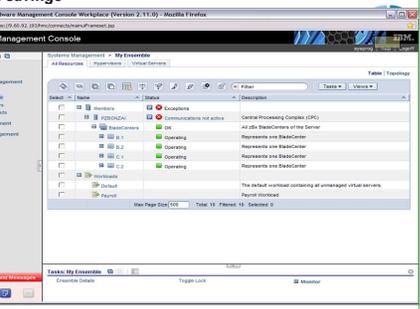
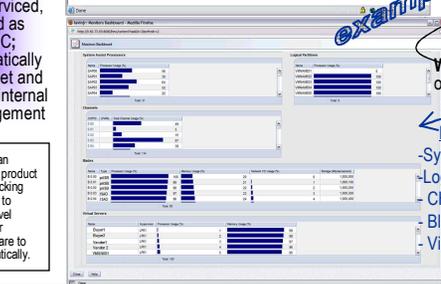
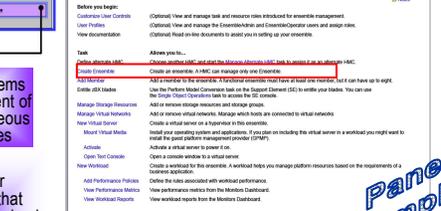
- Problems that are system-detected can be managed through these mechanisms, as can customer initiated problems.
- When a service action is required, repair activities are guided by the HMC and the effectiveness of the repair is verified automatically.

Configuration Management has been extended to handle vital product data (VPD)† for optimizers and blades, determining what zBX resources are entitled to be powered on and managed.

- The layout of the zBX frame can be displayed and managed (e.g., for MES handling), including frames, switches, and BladeCenters.
- Capacity on Demand** support enables permanent customer-initiated upgrades to be applied.
- Operations Management** allows blade power to be controlled and extends the existing HMC programming interfaces to include operations on zBX resources. Blade-related events can be used as a basis for e-mail and other notifications to support personnel. Functions such as firmware updates and blade activation can be managed through scheduled operation and a time server enables blade resources to synchronize with a central time source.
- Settings for the operational network can also be managed; a console can be launched to provide **direct access to blades**.
- Total systems management across heterogeneous resources.**

- > Manage resources to user specified service level objectives; set goals and Unified Resource Manager can monitor the resources and perform dynamic CPU movement when needed.
- > Simplify the steps between putting the blade in the chassis and having it up and running and available for work; plus simplifies day-to-day operations management.
- > Discover, load and configure and seamlessly deploy code updates to multi system resources.
- > Establish provide secure service and data networks.
- > Simplify the service management of blades.
- > The virtual machines and Blades monitor themselves and log errors with time stamps to keep data and transaction integrity; can notify the operations and they can place the "call home" for System z Service Rep.
- > Problem determination is easier with **less resources** and good logging capabilities.
- > Monitor and manage energy saving activities across architectural boundaries.

zEnterprise includes a new "Ensemble Management Guide" that helps customers walk through the steps required to create and manage an ensemble and allows them to create notes to document the steps they have performed.



Workload Created visible in the main UI and additional choice of where to go next are suggested in the confirmation dialog.

- Monitor Dash Board**
- System Assist Processors (processor usage)
- Logical Partitions (processor usage)
- CHPIDs & Channel Usage
- Blades (processor usage, memory usage, network, I/O, storage)
- Virtual Servers (name, hypervisor, processor & memory usage)