

Hardware Management Console (HMC) – An Introduction

By John Still

This year, I had all the windows in my house replaced. The windows that were originally installed by the builder were scratched and faded, the wood frames were rotting, and the insulation factor was next to nothing. It was time for an upgrade... Time to take advantage of the newer materials, better security, and increased insulation factor found in today's windows.

The console on your AS/400, iSeries, or i5 system is the most important window in your I.T. environment. The system console can do things no other terminal connected to your system can do. Have you thought much about your console lately? Is this all-important window due for an upgrade?

The work that I do quite often requires putting the system into a restricted state. Hence, when I visit computer rooms, I am led to the system console. More often than not, this is a 10-year-old twinax terminal with the sign on screen burned into the glass and a bunch of key caps missing. The images on the screen are out of focus and the brightness knob has long ago lost its ability to shed some light on the subject. A lot of these shops have come from System/36 or System/38, to AS/400, to iSeries (with a few upgrades in between). The system console usually survives these upgrades and is just simply plugged into the new system. It is typically over looked.

It's time to take a look at what's new. With IBM's announcement of the new Power5-based eServer i5 systems came the introduction of the Hardware Management Console or HMC. But before we get into all the features that are included with this new device, let's have a brief look at its pedigree.

I'm sure many of you remember the System/38. The powerful predecessor of the AS/400 had one feature that stood out... the console and keyboard were built right into the system unit. (See **Figure 1**.)

For the System 36, IBM engineers decided to set the console free but 20 feet was the limit they put on how far it could roam from the system. Customers now had a choice of a handful of 5250 display stations to choose from. One of my favorites was the 5251 Model 011 (all 40 pounds of it!). I loved the way the keyboard would click and buzz at you. (See **Figure 2**.)

When the AS/400 was introduced in 1988, two types of consoles were offered – ASCII or Twinaxial. I never saw an AS/400 with an ASCII console... Twinax was the reigning champion. Over time, IBM would enhance their lineup of 5250 display stations to include such features as multi-session and 132 column capabilities.

As personal Computers became more popular in the workplace, IBM came out with 5250 emulation cards. By installing one of these cards in a PC, you could open 5250 sessions and also turn your PC into a system console. All you had to



Figure 2. IBM 5251



Figure 1. IBM System/38 console

do was to make sure you were connected to port 0 on the first workstation controller and that your address was set to 0.

With Client Access came PC Console and, as Client Access became iSeries Access, PC Console grew into Operations Console. Your options for system console connectivity now included:

- A direct attached PC connected from a communication card on the iSeries to a serial port on the PC. With an optional remote control panel cable, you could get a GUI version of the iSeries control panel.
- LAN Console – a PC connected to a LAN via TCP/IP. If you could PING the iSeries from your PC, you could become the system console. This required a dedicated Ethernet card in the iSeries.
- The good old twinax terminal (or a PC with a 5250 emulation card).

In my travels, twinax terminals are still the most common followed by PC Operations Console and then LAN Console. LAN Console provides the most features, most importantly is its ability to provide full console capability remotely. It can be tricky to configure and troubleshoot and a lot of shops that use LAN Console usually have a backup twinax or direct attached Operations Console.

Enough of the history already! Let's take a look at the newest addition to the console family...

The HMC is actually not a new device. It has been a part of the pSeries world since 2002. With the convergence of the pSeries and the iSeries line becoming more of a reality, it was only a matter of time before the HMC would move into the iSeries world.



Figure 3. IBM 7315-C03

Officially, it is called the IBM Hardware Management Console. It is a LINUX based PC (xSeries) appliance designed specifically for the eServer Power5. Currently, there are two models available. The 7315-C03 (Figure 3) is a desktop model and the 7315-CR2 (Figure 4) is a rack-mounted model. Both of these models come pre-loaded and are closed and dedicated... unlike earlier PC Consoles, you cannot load any other software on them. Minimum HMC configuration includes 1gb memory, 40gb Disk, DVD-RAM, 10/100/1000Mbps Ethernet port, internal modem, diskette drive etc. The rack-mounted HMC comes with two Ethernet cards, the desktop HMC comes with one. I would recommend adding a second optional Ethernet card to the desktop model (more on this later).

The i5 systems require an HMC for LPAR configuration and management as well as managing Capacity on Demand (CoD). Operations consoles or twinax consoles will not be able to handle these functions. Also, some service functions will be more easily handled through an HMC. If you disconnect the HMC from your i5 system, the i5 and any configured partitions

will continue to run as normal because the partition configuration is also stored in NVRAM on the i5, you just can't perform any LPAR or CoD functions. A second backup HMC can be installed if you want full redundancy. If you are not using LPAR or CoD, then an HMC is not needed however I would argue that the features the HMC provides would be worth considering anyway.

When you power up the HMC for the first time, it will automatically launch a guided setup wizard. This wizard will help you to configure the Ethernet ports, user IDs and passwords, service contact information, Service Agent settings, and security among other things. The IBM Information Center provides planning worksheets that you can fill out ahead of time to make this step a little easier.



Figure 4. IBM 7315-CR2

The next step is to connect the HMC to your Managed System (the i5). Connection from the HMC to the Managed System is made by means of a private network. The first Ethernet port on the HMC is connected to the HMC1 port on the i5. When the guided setup wizard was run earlier, this port would have been configured so that the HMC was flagged as a DHCP server and the i5 as a DHCP client. As soon as the i5 is plugged in to a power receptacle, the service processor begins to power up. The HMC assigns an IP address to the MS and the connection between the two is complete.

Optionally, the second Ethernet port on the HMC can be configured for open network connection. This provides VPN connection to IBM for service functions and also gives you the ability for remote console capability using WebSM from a web browser or by TELNET into the HMC. You can use a secure shell (SSH) connection directly to the HMC as well. When you log in, you are given a restricted shell. Most partition management commands can be executed using this restricted shell command line. So if you're inclined to type commands like `lshwres - m "managed system" -r proc -- level sys` rather than use the HMC application GUI, you can.

The HMC has its own firewall that can be used in conjunction with your own network firewall. In addition, System Manager Security is an application on the HMC that can be used to set up SSL between the HMC and its clients and to also generate keys and certificates. (See Figure 5.)

When the HMC is powered up, you are presented with the HMC application GUI. (See Figure 6.) The navigation pane on the left provides a view of the Managed Environment and the applications available to you. The applications can be expanded

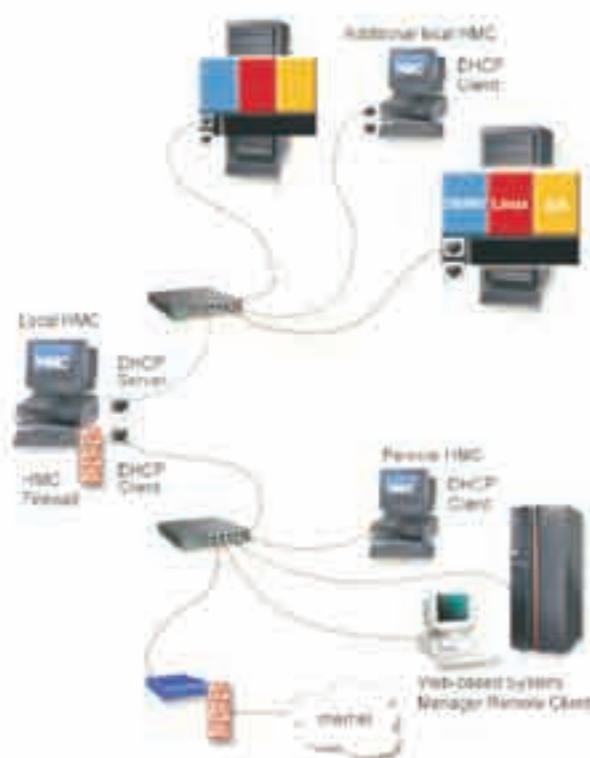


Figure 5. HMC Firewall and SSL

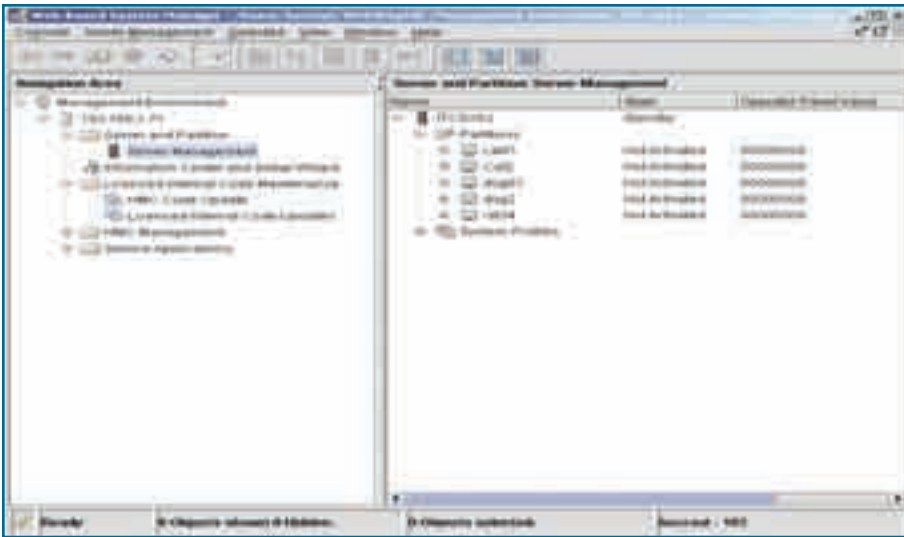


Figure 6. HMC application GUI

or contracted depending on the detail required. The content window on the right will display the specific application that is selected from the navigation pane. Across the top, the menu bar lists options such as Console, Host, Selected, View, Window, and Help. Depending on the application selected in the navigation pane, the menu bar will present options specific to that application. There is a status bar with five segments across the bottom of the HMC interface. The first segment contains an open or closed lock, which indicates whether the systems management security has been configured on the HMC. The second segment contains the state of the HMC, the third and fourth segments contain information on what is being viewed, and the last segment shows the account you used to log in to the HMC.


From the application GUI, you can start and stop the i5, create and manage partitions, start 5250 console sessions, work with CoD, download fixes, install new versions of HMC code, perform service functions, and much more.

The HMC can be backed up directly to its DVD drive or the backup can be sent by FTP to another server. Backups can also be scheduled. Typically, you would want to back up the HMC before updating its code level. Anytime you make configuration changes to the HMC, it's always a good idea to run a backup as well.

For those of you that have recently installed an HMC or if any of you are looking at upgrading to an i5 system, IBM has provided an excellent on-line course entitled "How to Use the Hardware Management Console for

POWER5 Systems". Go to the following URL and log in with your IBM user ID and password. If you do not already have an IBM user ID, you can register at this site as well:

<http://www-1.ibm.com/servers/resourcelink/svc03100.nsf?OpenDatabase>

The HMC and the i5 are a great fit. If an i5 is on the horizon for you and you plan to use LPAR and/or CoD, the HMC is going to provide all the tools you need to manage these environments and more. If LPAR and CoD were not part of your i5 plans, I would still consider putting the old twinax console away and making the HMC your console of choice. 

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