



**i5/OS Console Choices (V5R3 and V5R4)**

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## i5/OS Console Choices (V5R3 and V5R4)

### Purpose:

This paper describes how a customer should make a decision on what to use for their i5/OS console as of V5R4M5. Because of the variety of ways that System i can be used, what's best for one customer may not be best for another customer. This paper will describe some of the key differences between the console choices, and what the pros and cons are for each. Then various scenarios will be described, and a console recommendation will be made for each. At times, multiple consoles will be required in order to get all needed function. The word "Console" is used generally at some times to also include control panel function. This document is only meant as an overview and for decision making. Details on how to configure and use these console types are available in Infocenter.

### Console Choices:

The types of consoles that can be used to control i5/OS are:

- 1) Twinax terminal
- 2) Operations Console direct-connect
- 3) Operations Console LAN-connect
- 4) Hardware Management Console (HMC)
- 5) Thin Console for System i
- 6) ASMI (Advanced System Management Interface)

Here is a brief description of each:

**Twinax terminal** - This was the traditional console for OS/400 and i5/OS. It requires the use of a 5250-style terminal (sometimes referred to as a "dumb terminal"), which is connected to the system via a twinax or twisted pair cable, and a twinax adapter. The terminal and twinax adapter are dedicated to the purpose of providing a 5250 interface between the system and a user. No graphical user interface is available. It is supported on all System i models ever made. When used in a multiple i5/OS partitions environment, a twinax terminal and twinax adapter are required on the System i for each i5/OS partition. Note: There are some 2 and 4 session twinax terminals available; however, all sessions connect to a single i5/OS partition. Also note that in the future, System i may not support twinax console.

If you will be using a POWER6 system you will be required to use a Hardware Management Console (HMC) and place the required I/O Processor (IOP) in an expansion unit. The first frame only supports adapters that can run without an IOP.

**Operations Console direct-connect** – This console type involves installing iSeries Access for Windows on a PC, and connecting a single async cable (provided with the system) between that PC and the system. The Operations Console component of iSeries Access for Windows is then configured for a local console directly attached, which allows the provided PC5250 emulator to be used as the system console. When used in a partitioned environment, an async-capable WAN adapter is required on the System i for each partition. In addition, a graphical view of the system control panel is available for use (requires a separately orderable parallel cable in addition to the async cable). The parallel cable is not available on POWER5 or POWER6 models, and is no longer supported in V5R4. These functions can also be made available remotely through the use of a dial-in connection between a remote PC and the PC directly connected to the system. Operations Console has been available since V4R3 of OS/400. In the future, System i may not support direct-connect Operations Console.

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If you will be using a POWER6 system and plan to use an adapter that requires an IOP, for example a 2742, you will have to place the IOP and adapter in an expansion unit and manage the system with an HMC. The use of adapters not requiring an IOP is supported in the first, or only frame.

**Operations Console LAN-connect** – This console type involves installing iSeries Access for Windows on a PC, and connecting it via a LAN adapter on the System i (an additional LAN adapter will be required for each partition. With i5/OS V5R4 the additional LAN adapters can be IOP-less Ethernet adapters). The Operations Console component of iSeries Access for Windows is then configured for LAN-connection, which allows the provided PC5250 emulator to be used as the system console. In addition, a graphical view of the system control panel is available for use. This connection type allows a single PC to be the console for multiple System i's and/or OS/400 and i5/OS partitions. It has been available since V5R1, however, V5R3 or later is recommended. Operations Console LAN-connect uses the embedded Ethernet port for the System i 520 with i5/OS V5R3 with V5R3M5 Machine Code, and with i5/OS V5R4 for the System i 515, 525, 550 and 570. The System i 595 uses an IOPless Ethernet adapter starting in i5/OS V5R4. Note that in the future System i may not support token-ring for Operations Console LAN-connect.

POWER6 systems provide a type of embedded Ethernet called Integrated Virtual Ethernet (IVE) that allows logical ports to share physical ports. This function extends to additional logical partitions although only one logical port per physical port is used in a single partition. Since this function is considered a virtual resource there is not a need for a separate network adapter. For systems not managed by an HMC this frees up a card slot.

If you will be using a POWER6 system and plan to use an adapter that requires an IOP, for example a 2849, you will have to place the IOP and adapter in an expansion unit and manage the system with an HMC. The use of adapters not requiring an IOP is supported in the first or only frame.

**Hardware Management Console (HMC)** – This console type was new with POWER5 models. It is a hardware appliance available from IBM that is pre-loaded with an operating system and the applications needed to control the systems. It is designed to be a closed system, and other applications cannot be added. This console type can be used to manage multiple System i and System p POWER5 and POWER6 models. However, it cannot be used to control any System i models prior to POWER5. It contains a 5250 emulator, and control panel functions are also available. In addition, remote PCs running 5250 emulation can be used as the i5/OS console by configuring the HMC to allow the console to be passed through it (Operations Console is not required on the remote PC). Note that one HMC can control multiple partitions without requiring a separate adapter for each one. This can be a significant cost savings.

**Thin Console for System i** – This console type is new for System i POWER5 520 and POWER5 550 models. It is a hardware appliance available from IBM that is pre-loaded with an operating system and a 5250 emulator. It is designed to be a closed system, and other applications cannot be added. The Thin Console can control one system and is not supported in a partitioned environment. This console type is very easy to setup and operate and provides the simplicity of a twinax console. Note that the Thin Console is only available in the United States, Canada, and Western Europe (see appendix). Support for System i 515 and 525 was added in V5R4M5.

**Advanced System Management Interface (ASMI)** – This function allows a PC running a web browser to connect to an integrated Ethernet port on a System i to make a subset of functions available on a control panel. It can be used to remotely power on and off POWER5 and POWER6 models. It can only be used with System i POWER5 and POWER6 models and has no 5250 console capability. It is designed to be complementary to other console choices, not in place of. When complementing Operations Console, its primary value is the ability to remotely power on the supported System i models.

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### Functional Comparison of the console Choices

The following chart lists key functions that are available on twinax, Operations Console and HMC. ASMI is not included since it's not intended to be a console on its own:

<b>Function</b>	<b>Twinax</b>	<b>Op Console</b> (functions apply to all models unless specified)	<b>HMC</b> (all functions are for POWER5 and POWER6 models only)	<b>Thin Console for System i</b>
Local 5250 access	Yes	Yes	Yes	Yes
Remote 5250 access	No	Yes	Yes (via passthru)	No
One console PC can manage many partitions/systems	No	Yes (LAN-only)	Yes (see scenario #8 for further discussion)	No
LPAR and CUoD managed with	No	Yes (pre-System i5 only)	Yes	No
Graphical disk management available on	No	Via iSeries Navigator	No	No
Remote Control panel functions available	No	Yes (but no remote power on capability on System i5)  Note that the Remote Control Panel support of Operations Console using a parallel port cable to the iSeries is no longer supported in V5R4.	Yes	No
Requires IOP and dedicated IOA	Yes	No – POWER5 515, 525, 520 with i5/OS V5R3 with V5R3M5 Machine Code, and POWER5 550, and POWER5 and POWER6 570 with i5/OS V5R4 use embedded Ethernet port for LAN-connect.  Yes – except POWER5 595 with i5/OS V5R4 uses IOP-less Ethernet	No	No

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		adapter for LAN.  Yes – LAN-connect in i5/OS V5R3 and earlier.  Yes - Direct-connect requires IOP and dedicated IOA when using pre V5R4M5 level code		
Supported via LAN	No	Yes	Yes	No (although an Ethernet cable is used to directly attach the Thin Console to the system)
Customer has to install software on console	No	Yes	No	No
Supports all languages supported by OS/400 and i5/OS	Yes	Yes	No (language support is limited)	No (language and country support is limited)
EZSetup function available	No	Yes for V5R3, not recommended in V5R4	No	No
Can be used for remote service	No	Yes (the remote service capability is available using the IOP-less async adapter shipped with POWER5 and POWER6 models)	Yes – New Service Focal Point function	No

### How these differences will affect customers:

Although Operations Console, HMC, and Thin Console overlap functions in a number of places, how you use these functions may help determine what is the appropriate choice. This section describes some of the differences more completely.

#### **Only on System i POWER5 and POWER6 models**

One of the key differences in the products is that HMC is only available for use with System i POWER5 and POWER6 models, and Thin Console is only available for POWER5, while Operations Console is available for most models still in support. So if the customer wants to use a single console to control a mix of pre-System i POWER5 and System i POWER5 and POWER6 models in their environment, Operations Console would be the clear choice. However, once they start partitioning the POWER5 and POWER6 systems, the choice becomes more difficult. Partitioning can only be performed from an HMC. They could then decide to have one HMC to manage all their i5/OS partitions, and one Operations Console PC for managing their other systems. Using an HMC's 5250 console for more than a small number of systems or partitions may cause performance issues depending on the model HMC and it's resources.

Another way of doing it would be to use the HMC to do all the partitioning, but once all the partitions are allocated, use Operations Console as the 5250 interface into all the systems so they still can all be controlled by one PC. There is a maximum number of 26 active emulators allowed per PC and the size and

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resources of the PC may surface performance issues. See scenario #9 below for more information concerning a backup console configuration for a partitioned System i.

### **Control Panel functions**

Remote Control Panel (RCP) capability is more limited with Operations Console on System i POWER5 and POWER6 models. On pre-System i POWER5 systems, Operations Console RCP function could be used through a parallel port cable to the System i, and is no longer supported in V5R4. This connection went to the System i service processor, and allowed RCP to be used to remotely power on a System i. Also, on System i 270 or 8xx systems a LAN connected configuration of Operations Console, or the virtual control panel, connected to a primary partition can be configured to perform functions, including power on, to additional logical partitions as long as the primary partition remains active.

However on System i POWER5 and POWER6 models, there is no parallel port, and the service processor connection is through an embedded LAN adapter that Operations Console cannot use. What this means is that the only 2 choices for remotely powering on a System i POWER5 or POWER6 model are HMC and ASMI. Although almost all other functions of the control panel can be accessed via Operations Console RCP through a LAN connection, there is no current plan to add the remote power on capability.

### **Language support**

There are differences in the languages supported by the different console choices. Operations Console is a component of iSeries Access for Windows, which is translated into about 40 different languages, including double-byte and bi-directional languages. The HMC is more limited and at initial announcement/availability covers about 20 languages (see appendix). It does not support Korean, or any of the bi-directional languages, such as Arabic and Hebrew. Customers needing to use their console in a language not supported by the HMC have 2 choices. Either they can use Operations Console or they can use the iSeries Access for Windows PC5250 emulator passing through the HMC. In the latter, iSeries Access for Windows connects to a special port on the HMC which allows PC5250 to run as the console without using Operations Console. The steps to configure this are documented in the System i Info Center. Since the Thin Console is only supported in a set of countries (see the appendix) customers needing to use their console outside this set of countries will need to use HMC or Operations Console.

### **Graphical disk unit management**

On System i, a graphical interface to manage these units is available in iSeries Navigator. In order to access that feature, the PC must first authenticate via a service tools user ID, which then opens a connection to the service tools interface to access the service tools server. There are some features of disk unit management that are not available via a 5250 interface, so using this graphical interface is the only way of performing these functions. This disk unit management interface is not available on HMC. So regardless of what System i model needs to be managed, iSeries Access for Windows is required for doing graphical disk unit management.

### **I/O Requirements**

Operations Console direct-connect, LAN-connect (i5/OS V5R3 and earlier) and Twinax terminal require a connection to a dedicated IOA (Input/Output Adapter) that is logically under an IOP (Input/Output Processor) on the System i, while HMC and the Thin Console for System i just plug into an integrated LAN port, and Operations Console LAN-connect uses either the embedded Ethernet adapter (System i 515, 525, 520, 550, and 570) or an IOP-less Ethernet adapter (System i 595). On the new System i POWER5 and POWER6 models, there are fewer slots available in the main tower than there are on previous models. So depending on what other I/O is required on the system, there may not be slots available to plug in the required IOP and IOA. On some System i POWER5 models, there is not a slot available off the primary IOP for a twinax console. In those cases, an additional IOP must be purchased (in addition to the IOA), therefore consuming 2 slots, and leaving little or no room for any additional I/O. This is not a concern for LAN-connected Operations Console on the System i 515, 525, 520, 550, and 570 which connects to the embedded Ethernet adapter. POWER6 models using LAN-connected Operations Console would most likely use the new HEA. If LAN-connect Operations Console doesn't meet the customer's needs, HMC or Thin Console are the likely options.

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### **Other considerations**

Operations Console can install on most Windows PCs, whereas HMC and Thin Console for System i exist only on a pre-loaded box available only from IBM. Due to the well-known security issues that Windows has been prone to over the past several years, there are patches and service packs needed to keep a Windows PC safely running in an enterprise. Any one of these changes to the operating system has the potential to cause a problem with Operations Console. Although there is a cost benefit to being able to install Operations Console on almost any PC, there is the underlying stability of the Windows operating system that tends to be a negative at times. The HMC and the Thin Console for System i on the other hand are pre-loaded with a specific OS level that should remain relatively unchanged. In addition, some scenarios for Operations Console require the purchase of an additional IOA and IOP, which would raise the cost of that solution also. So take this into consideration when deciding on a console choice. Also, since the HMC represents a new, improved approach to partitioning, you may want to take advantage of IBM education or services to get off to a faster implementation.

## Example Scenarios:

### **Scenario #1: System i 520 with i5/OS V5R3 and V5R3M5 Machine Code**

Operations Console LAN-connect uses the embedded Ethernet adapter for this system model and it is the recommended console choice for this system. On the Operations Console PC, configure a new LAN connection to the System i and connect.

### **Scenario #2: Single partition System i 550 with i5/OS V5R4**

Since the system is not partitioned and since Operations Console LAN-connect will not require additional system hardware (LAN-connect uses the embedded Ethernet adapter for this System i model), Operations Console LAN-connect is a good choice for this system. On the Operations Console PC, configure a new LAN connection to the System i, and connect.

### **Scenario #3: Adding a System I POWER5 or POWER6 model to an environment with System i 830 and 840 systems (non-partitioned)**

In this scenario, the System i 830 and 840 are being controlled by a single LAN-connected Operations Console. When the new System i is added to the network, the customer would like to manage it from the same console that is being used for the others. A System i 515, 525, 520, 550, and 570 will use the embedded Ethernet adapter, and a System i 595 will use an IOP-less Ethernet adapter for the LAN connected Operations Console. On the Operations Console PC, configure a new LAN connection to the new System i, and connect.

### **Scenario #4: System i 520 with i5/OS V5R4**

Customer is purchasing a new System i 520 and prefers the simplicity of a twinax console. The Thin Console is a good choice for this system because of its low cost and ease of setup.

### **Scenario #5: Partitioned System i using Turkish language**

Since this system is partitioned, an HMC must be purchased in order to create the partitions and make any changes to partition sizes. However, the administrator speaks only Turkish, and the HMC does not support that language. In order to control the i5/OS partition, V5R4 iSeries Access for Windows is installed on the administrator's PC. The PC5250 component of iSeries Access is configured to connect to a port on the HMC. The HMC is configured to allow remote PC telnet sessions to connect for console use. When the PC connects to the HMC, the administrator will be prompted for the HMC's userid and password. Then the console session will be connected, and the administrator will sign into the i5/OS partition. One

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drawback of this: the person configuring HMC to allow this pass through support will need to be able to read a language that the HMC supports.

### **Scenario #6: Using disk management on System i**

The graphical interface for disk unit management is available only on iSeries Access for Windows (which includes the Operations Console and iSeries Navigator components). Unlike the 5250 function, there is no option to be able to connect through the HMC. Therefore a System i 515, 525, 520, 550, and 570 will use the embedded Ethernet adapter, and a System i 595 uses an IOP-less Ethernet adapter to make a console connection for iSeries Navigator. For the 5250 console, the administrator can choose to use Operations Console on the same PC. If the system is being partitioned, then an HMC will need to be added for that, and the administrator will need to use two different consoles to manage the system (a Windows PC for disk management and the system console, and the HMC to manage the system's hardware resources).

### **Scenario #7: Multiple System i solutions using English language that are being partitioned**

In this scenario, a customer with no previous System i models purchases multiple System i platforms. The administrator can read English, would like to control all i5/OS partitions from a single console, and does not need to use any of the graphical disk management features. This is definitely the perfect environment for using HMC. No Operations Console should be needed.

### **Scenario #8: Partition a System i into more partitions than can be handled via HMCs**

This is the same as Scenario #5, except that 64 partitions of i5/OS are needed on a System i. The Administrator wants a console running concurrently at all times on all partitions. Since the service processor component cannot handle the amount of network traffic this would require, some percentage of the consoles could not be run on the HMC. Instead, some of the partitions would need to use Operations Console. Each partition will need its own dedicated LAN card on the System i, but each Operations Console PC can control multiple partitions. An Operations Console PC can control up to 26 partitions/sessions but depending on the PC hardware resources a realistic limit is to have an Operations Console PC control 15 partitions/sessions.

### **Scenario #9: Highly Redundant Console Support for System i partitions**

In this scenario, the system is a partitioned System i POWER5 or POWER6 platform and the customer requires a highly redundant configuration for the system console that also provides for a backup console. For this setup, since the System i is partitioned, an HMC will be needed, and a backup/redundant HMC is highly recommended. Operations Console LAN-connected will be used for each partition and will require a dedicated IOP-less Ethernet adapter per partition. Multiple PCs will be used to provide the Operations Console support, with each PC providing the console for a subset of the partitions. To provide for a backup console the user will need to configure each PC so that it can provide console support for all partitions, and each partition must be configured for "Allow console recovery and console can be taken over by another console".

With this setup the user will be able to quickly switch from an Operations Console LAN-connected PC to a backup Operations Console LAN-connected PC or an HMC as the console as necessary without an IPL or interruption of system console activity.

### **Scenario #10: Replacing a partitioned System i 840 with a System i POWER5 or POWER6 570**

In this scenario, a customer starts with a System i 840 that has 5 partitions, all managed by Operations Console LAN-Connect. They are upgrading to a System i 570, and will continue to need 5 partitions. An HMC will definitely be needed for this. If the customer is using an HMC-supported language, such as English, and does not need to do i5/OS disk management, then no Operations Console should be needed. A

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big advantage will be that the HMC only needs to connect into a single integrated ethernet port. Operations Console requires a separate LAN IOA be dedicated for each partition being managed.

### **Scenario #11: System i 830 with twinax console being replaced with a System i POWER5 model**

Customer is using twinax console because they had always used twinax consoles. They want to continue using it when the System i 830 is replaced with the System i POWER5 or POWER5+ model. Since a twinax adapter requires an IOP the eServer Hardware Information Center needs to be consulted to determine the IOP and IOA requirements for the twinax console. Look in the article “Setting up a twinaxial console” and follow the link to “Cabling your system”. From there information can be selected by System i model number.

### **Scenario #12: System i 830 with twinax console being replaced with a System i POWER6 model**

Customer is using twinax console because they had always used twinax consoles. They want to continue using it when the System i 830 is replaced with the System i POWER6 model. Since a twinax adapter requires an IOP the eServer Hardware Information Center needs to be consulted to determine the IOP and IOA requirements for the twinax console. Look in the article “Setting up a twinaxial console” and follow the link to “Cabling your system”. From there information can be selected by System i model number .

In this case you will also have to provide an expansion unit for the IOP and IOA in addition to an HMC so the twinax adapter can be selected for use as the console.

## Appendix:

### **Languages supported by 5250 emulator in HMC.**

- US English
- UK English
- Belgian Dutch MNCS
- Belgian French MNCS
- Brazilian Portuguese
- Canadian French MNCS
- French
- French MNCS
- German
- German MNCS
- Italian
- Spanish
- Spanish Latin America
- Czech
- Hungarian
- Slovakian
- Russian
- Japanese (Katakana)
- Japanese DBCS
- Chinese
- Taiwanese

### **Countries supporting Thin Console**

- United States

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United Kingdom  
Canada  
Austria  
Belgium  
Denmark  
Finland  
France  
Germany  
Italy  
Ireland  
Netherlands  
Norway  
Portugal  
Spain  
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