Servers
Introducing new servers for a new world:
IBM @server Advantage
New tools to manage e-business
Application flexibility
Innovative technology

IBM @server

IBM

New Hardware for 2000

Redbooks

International Technical Support Organization

OCT2000P08V01

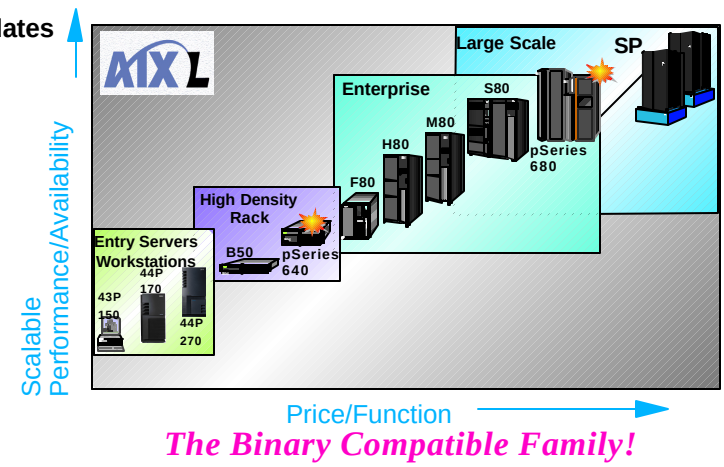
Agenda

New Workstation Features and Graphics Adapters

New Rack Mount Products

Enterprise Server Updates

Other New Features



The Binary Compatible Family!

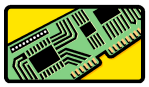
Redbooks

ibm.com/redbooks

Workstation Announcements

- Workstations
  - 44P-170 450 MHz
  - 44P-270 and 8MB L2

- Graphics Accelerators
  - GXT4000P, GXT6000P



- Memory Prices for 170 and 270 Reduced Again!
- Price Reductions
  - 43P-150, 250 MHz

- New Disk Mounting Kit for 4th 36.4 GB, 10 KB RPM for 44P-170
- New B50 Power Cord Option

Notes:

7044 MODEL 170

Now that the Power3-II 450 MHz processor with 8 MB of L2 cache is available for the RS/6000 7044 Model 170, you'll enjoy the enhanced system performance that makes the Model 170 an even better value for workstations and workgroup servers. The Model 170 system with the Power3-II 450 MHz Processor, 256 MB (minimum) memory, Ethernet, and Ultra SCSI controllers integrated on the planar, is an excellent choice for mechanical computer-aided design (MCAD) workstations as well as for workgroup servers managing e-business, e-commerce, Enterprise Resource Planning (ERP) and supply-chain applications.

7043 MODEL 270 AND 7044 MODEL 270

Similarly, RS/6000 7043 Model 270 and 7044 Model 270 system performance can now be enhanced with the 2-Way Power3-II 375 MHz Processor with 8 MB of L2 cache per processor. The 7044 Model 270 system maximum memory capacity has been increased from 8 GB to 16 GB with the optional 1024 MB (2 X 512 MB) memory DIMM. This competitively priced DIMM option provides a welcome memory solution for your workstations and entry workgroup systems.

170 MOUNTING HARDWARE

Mounting Hardware for the RS/6000 7044 Model 170 enables you to mount a fourth disk drive internally.

B50 POWER CORDS

Now, when you order a new RS/6000 7046 Model B50, you'll get a power cord that plugs into a standard wall outlet, an alternative to connecting to the rack's power distribution unit (PDU). As with the 7043 and 7044, these 10- to 14-foot cords are available in a variety of choices so they can be used in numerous countries. (Refer to the Feature Availability Matrix in the Sales Pages for a complete list of countries.)

Notes:

Commitment to value

The Model 170 extends the line of powerful,affordable IBM w rkgroup servers with a choice of state-of-the-art,64-bit copper POWER3-II micropr cess rs. The entry 333 MHz option combines 64-bit pr cessing capability with a full 1MB of L2 cache f r excellent performance at an aff rdable price.

With a higher clock speed and 8MB of L2 cache,the 450 MHz pr cess r pr vides significantly increased commercial performance.And the design of the Model 170 pr tects investments by letting c mpanies start at 333 MHz, then upgrade t 400 or 450 MHz simply by plugging in a new pr cessor card. These are among the most powerful micr pr cessors IBM has ever ffered.

With the 450 MHz pr cess r installed, the Model 170 pr vides nearly six times the floating-point perf rmance and more than three times the transaction pr cessing perf rmance of the 43P Model 150 with a 375 MHz pr cessor.

Matched t the powerful micr pr cessors is a new memory controller with a 100 MHz memory bus that further enhances perf rmance.With up t twice the memory of the Model 150 and up to 145.6GB of 10K rpm disk storage,the Model 170 can easily meet the needs of a small business or Web server. The advanced technology of the

Model 170 pr vides a number of business advantages.It offers flexibility in building business s lutions,with more than 13,000 AIX applications available in such areas as e-business,e-commerce, enterprise resource planning and supply chain management.And since the Model 170 can run 32-bit and 64-bit applications concurrently,it can help manage a company's transition t 64-bit computing. Connectivity f r the most demanding

e-business or Web applications is no problem with up to 17 10/100 Ethernet connections supported by a single system.

Notes:

Supercharged application performance

The Model 270 is designed for technical and graphics users who require high-perf rmance and SMP capability. It incorporates state-of-the-art IBM copper chip technology.The 375 MHz POWER3-II pr cess rs offer a significant performance boost,with nearly three times impr vement in floating-point performance compared to the RS/6000 43P Model 260

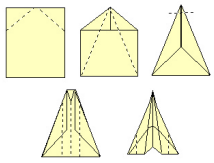
Not only are the pr cessors more powerful than the two-way Model 260,but twice as many pr cessors are available.

The Model 270 can be expanded to a two-,three-r f ur-way SMP system, and upgrades can be acc mplished simply by plugging in a new pr cess r card.Available with a one-,two-,three or four-way configuration is 4MB of Level 2 (L2)cache.A two-or f ur-way system may also be configured with 8MB of L2 cache.T assure balanced system performance,8MB and 4MB L2 cache pr cess r cards may not be mixed in a system.

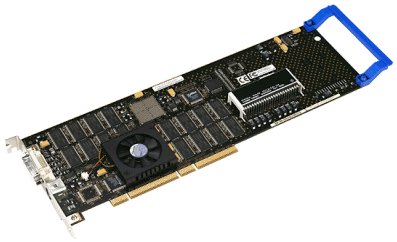
With multiple POWER3-II pr cessors, up to 8MB of L2 cache and up to 16GB of memory,the Model 270 is an excellent choice f r running MCAD design and analysis applications such as the entire CATIA suite as well as Pro/ENGINEER 2000 i and Deneb. The Model 270 brings new levels of performance to CAE applications from companies such as Ansys,HKS, MSC.S ftware,AVL,CD/adapco,Fluent, ESI,LSTC and Mecalog.In EDA,applications fr m Avant!,Cadance,FTL Systems and Synopsys take advantage of the large memory and exceptional compute power of the Model 270.

GXT4000P - Class II Graphics Accelerator

- Class II Graphics Accelerator
  - IBM Custom ASIC Chip Is Used As Rasterization Pipeline
    - Chip Design Is Based On The Unique "Oasis" Chip
      - The Oasis Chip Has Been Very Successful and Is Widely Recognized In The Industry
    - "Sandstorm" Is An Improved And Faster "Version" Of "Oasis"
  - System CPU + Software Build the Geometry Accelerator
  - CATIA Graphics Performance Will Scale With CPU
- Cost Conscious Graphics Accelerator
  - Excellent 3D Graphics Performance At A Low Price Point
    - Ideal For CATIA Model Design And Optimization
  - Outstanding 2D Graphics Performance
  - Single slot PCI card (requires one full slot)



Primitive	Times GXT2000P
Z-Buffered Fill	2.5X
Trilinear Textured Fill	4.2X
Triangle Setup	4.2X



Notes:

(#2826) - POWER GXT4000P Graphics Accelerator

IBM POWER GXT4000P -- Entry, 3D 64-bit PCI graphics accelerator
Attachment via a single 64-bit or 32-bit PCI bus slot
Performance improvements over previous IBM graphics products
Native support for OpenGL and graPHIGS 3D APIs
Advanced 3D texture mapping, Digital monitor support

The GXT4000P Graphics Accelerator is a 64-bit entry 3D PCI Graphics adapter for the RS/6000 Models 7044-170 and 7044-270 and 7043-270 upgrade. The graphics subsystems, matched to the POWER 3 II-based workstations provide excellent functionality and performance for demanding graphics applications in:
Mechanical Computer Aided Design (MCAD) and Engineering (MCAE) for automotive and aerospace
Petroleum exploration and production
Scientific Visualization
Other technical design and visualization

API support - X11, graPHIGS, OpenGL 1.2

Monitor Support
Resolutions Supported 8/24 bit (up to 1920 x 1200 @ 76Hz)
DDC2B support, ISO 9241 Compliant, Analog & Digital interfaces

Software Requirements: AIX V4.3.3

The GXT4000P is packaged on a standard single-slot PCI card. The PCI interface is 64-bit, up to 66 MHz and 3.3V. There are no options. It is supported on 7044 Models 170 and 270 (and the 7043 Model 270 upgrade).
Attributes provided: 3D Graphics
Attributes required: 1 long PCI 32 or 64-bit slot 3.3V

Notes:

This adapter has the following base features:

128MB Unified Frame Buffer
- 24 Bit Double Buffered up to 1920 x 1200
- 24-Bit Quad Buffered Stereo up to 1280 x 1024
- 24-Bit Z-Buffer
- 4/8 Bit Overlay
- 8 Bit Double Buffered Alpha
- 8 bit Stencil/Clip Planes
- 8 windows ID bits

1 Rectangular Scissor region
5 HW Rectangular Clippers
Texture Mapping
- up to 108MB Texture Memory (1280 x 1024)
- Dual Texture
- 3D texture
- Texture color table

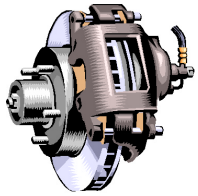
Video Support
- Bilinear Scaling
- Color Space Conversion

4 Hardware Color Maps
Gamma corrected AA lines
HW occlusion culling

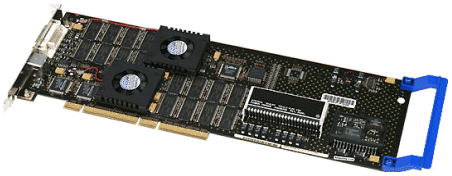
OCT2000P08V04

GXT6000P - Class III Graphics Accelerator

- Class III Graphics Accelerator
  - Sandstorm Custom ASIC Is Used As Rasterization Pipeline
    - Same Rasterization Engine As In GXT4000P
  - TwinPeaks Custom ASIC Is Used As Geometry Accelerator
    - Geometry Processing "In Hardware" On The Graphics Adapter
- Outstanding 3D Performance
  - Design Takes Advantage Of Low Cost Design Of Custom ASICs
  - Off-Loads Geometry Processing Into Graphics Hardware
    - Ideal For Large Models, Digital Mockup, Rotations, Zooming, etc.
  - Simultaneously Outstanding 2D Performance
  - Requires a single full PCI slot



Primitive	Times GXT3000P
Z-Buffered Fill	3.2X
Trilinear Textured Fill	1.7X
Triangle Setup	2.5X



Notes:

(#2827) - POWER GXT6000P Graphics Accelerator

IBM POWER GXT6000P -- Mid-range, 3D 64-bit PCI graphics accelerator
- Attachment via a single 64-bit or 32-bit PCI bus slot
- Geometry Accelerator on-board delivering highest ever IBM 3D graphics performance
- Native support for OpenGL and graPHIGS 3D APIs
- Advanced 3D texture mapping, Digital monitor support

The GXT6000P Graphics Accelerator is a 64-bit mid-range 3D PCI Graphics adapter for the RS/6000 Models 7044-170 and 7044-270 (and 7043-270 upgrade). The graphics subsystems, matched to the POWER 3 II-based workstations provide excellent functionality and performance for demanding graphics applications in:
- Mechanical Computer Aided Design (MCAD) and Engineering (MCAE) for automotive and aerospace
- Petroleum exploration and production
- Scientific Visualization
- Other technical design and visualization

API support - X11, graPHIGS, OpenGL 1.2

Monitor Support
- Resolutions Supported: 8/24 bit (up to 1920 x 1200 @ 76Hz)
- DDC2B support, ISO 9241 Compliant, Analog & Digital interfaces

Software Requirements: AIX V4.3.3
The GXT6000P is packaged on a standard single-slot PCI card. The PCI interface is 64-bit, up to 66 MHz and 3.3V. There are no options. It is supported on 7044 Model 170 and 270 (and the 7043 Model 270 upgrade).

- Attributes provided: 3D Graphics
- Attributes required: 1 long PCI 64 or 32-bit slot 3.3V

Notes:

This adapter has the following base features:

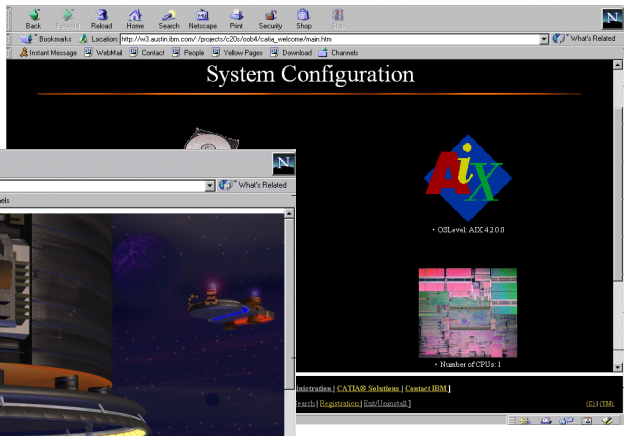
- 128MB Unified Frame Buffer
  - 24 Bit Double Buffered up to 1920 x 1200
  - 24-Bit Quad Buffered Stereo up to 1280 x 1024
  - 24-Bit Z-Buffer
  - 4/8 Bit Overlay
  - 8 Bit Double Buffered Alpha
  - 8 bit Stencil/Clip Planes
  - 8 windows ID bits
- 1 Rectangular Scissor region
- 5 HW Rectangular Clippers
- Texture Mapping
  - up to 108MB Texture Memory (1280 x 1024)
  - Dual Texture
  - 3D texture
  - Texture color table
- Video Support
  - Bilinear Scaling
  - Color Space Conversion
- 4 Hardware Color Maps
- Gamma corrected AA lines
- HW occlusion culling
- Geometry Processing

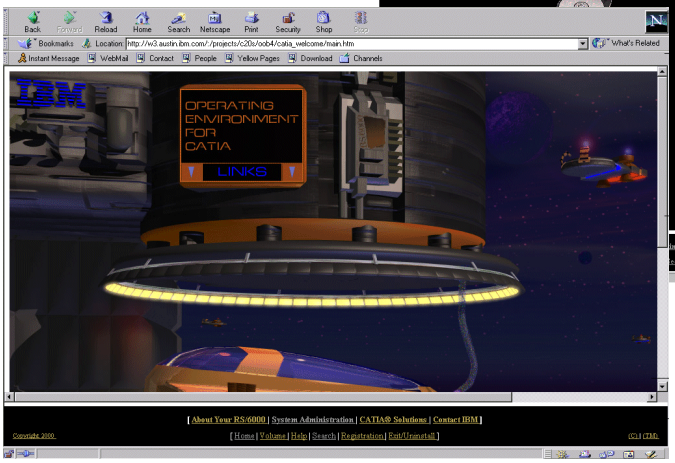
Lower Memory Prices

- FC 4121 - 2 x 512 MB DIMMs will be Reduced in Price
  - From $10/MB to now: $7.00/MB
    - FC4121 Supported on 44P-170 AND 44P-270
- FC 4120 - 2 x 256 DIMMs
  - Very Competitive Price of $7.00/MB
  - Available for 44P-170 AND 44P-270
    - Maximum of 8 GB in 44P-270 with 32 Memory Slots

Welcome Center Update

Contains updated links and machines through September 2000





OCT2000P08V07

New Rack Mount Server

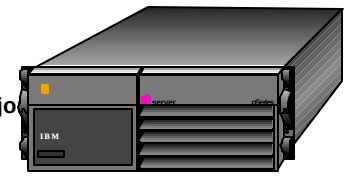
October, 2000

Redbooks ibm.com/redbooks

OCT2000P08V08

pSeries 640 Key Features

Featuring:
- 5Ux24" 19" rack drawer
- Redundant AC or DC power
- Hot-swappable disk, Hot-plug power and cooling
- Front, tool-less access to all major components and cables



Processors/Memory
- 64-bit 1-4 way SMPs
- Copper technology
- POWER3-II 375 MHz w/ 4MB L2 (8MB L2 optional)
- Up to 16GB ECC/Chip-kill Memory

AIX L

Integrated IO
- Two 10/100 Ethernet
- Two Ultra2 SCSI Controllers
- Three serial ports (RJ45 in front for PalmPilot)
- Keyboard, Mouse

PCI Expansion Slots (5)
- One 32-bit, four 64-bit slots

Storage Bays
- Four front accessible hot-swappable disk bays and additional bay for optional CD-ROM or tape

Environments
- Designed for NEBS level 3
- FCC Class A and Environmental Class C
- Acoustics General Business

Setup / Maintenance
- Customer setup
- Customer installable features

Reliable ... By Design
- Integrated service processor
- Dynamic CPU Deallocation
- Multi-bit error correcting memory
- Thermal and power management

Control Panel
- Critical indicators located on front bezel and rear chassis
- Programmable alarm beacon
- PalmPilot interface for install, application deployment and performance monitoring

Redbooks ibm.com/redbooks

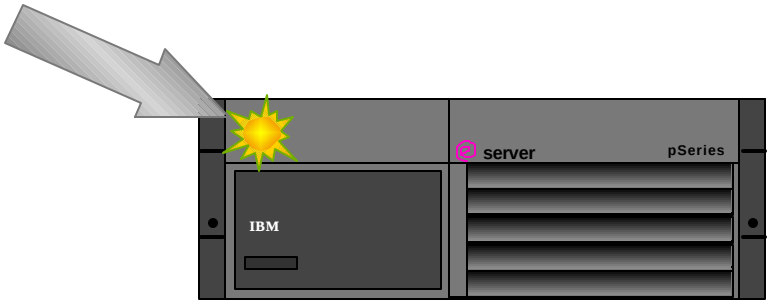
Notes:

System Features
Bus Architecture
Five PCI slots are available:
One 32-bit PCI half-size keyed slot at 33 Mhz, 5 volt
Two 64-bit PCI full-size keyed slots at 33 Mhz, 5 volt
Two 64-bit PCI full-size keyed slots at 50 Mhz, 3.3 volt
Microprocessor
Up to four 375 Mhz Power3 630+ bulk processors. Can be configured as a 1 to 4way SMP system. The microprocessors have 32 KB instruction, 64 KB data, and 4 MB L2 cache.
Memory
256 MB (minimum) to 16 GB (maximum)
Up to two memory cards with 16 memory modules each is possible (the memory modules must be installed in matched pairs)
Media Drives
Up to 4 internal hard disk drives:
9.1 GB Ultra2 7200 RPM SCSI Disk Drive (68-pin)
9.1 GB Ultra2 10K RPM SCSI Disk Drive (80-pin)
18 GB Ultra2 7200 RPM SCSI Disk Drive (68-pin)
18 GB Ultra2 10K RPM SCSI Disk Drive (80-pin)
36 GB Ultra2 10K RPM SCSI Disk Drive (80-pin)
Other Drives
The following CD-ROM and tape drive are optional:
12/24 GB 4 mm Tape Drive
40X (MAX) SCSI-2 CD-ROM drive
Power Supply
Up to two (redundant) power supplies in a system drawer is possible. Both ac and dc power supplies are available. A 540-watt, 115/230 volt ac power supply is available, or a -48 volt dc is available. Note: You cannot mix ac and dc power supplies in the same drawer.

Notes:

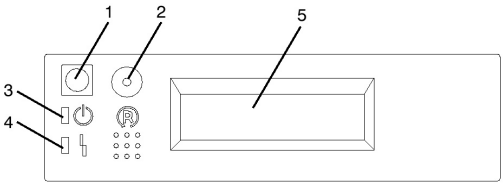
Keyboard
Standard: 101-key Enhanced Keyboard
Optional: 101/102 or 106-key Enhanced Keyboard
Mouse
3-button
Operator Panel
32-character LCD diagnostics display
Power and Reset buttons
Input/Output Ports
25-pin Parallel
9-pin Serial (3)
RJ-45 Serial (1) System Drawer Front
Keyboard
Mouse
Ultra2 SCSI LVD
10/100BaseTX Ethernet (2)
Microphone
Headphone
Security Features
General-access password
Privileged-access password

Programmable Alarm Beacon



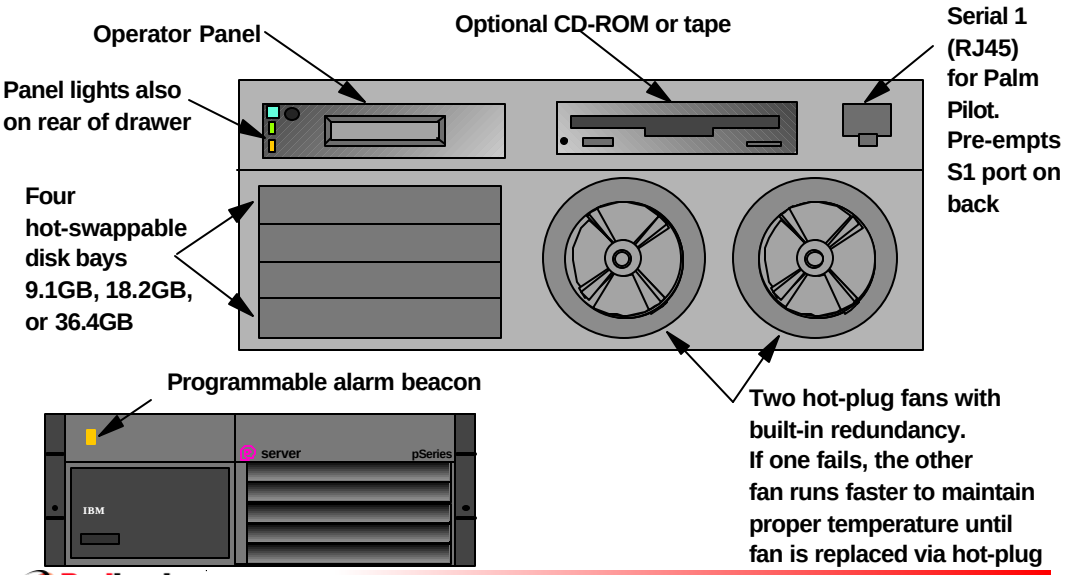
- Steady or blinking amber color through front bezel
- Quickly identifies the server needing attention
- Programmable interface for applications to set blinking light
- Identifies a system error with a steady light

Notes:

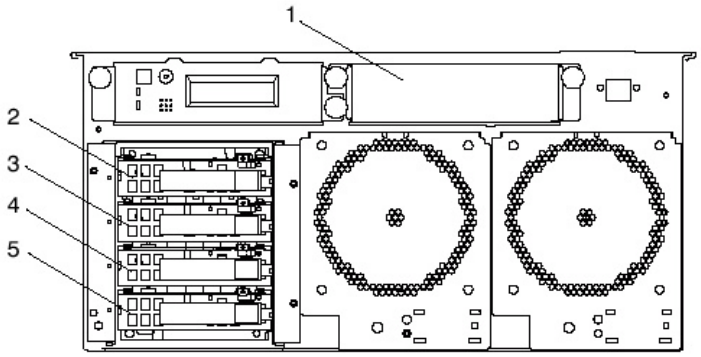


Number	Component Name	Component Description
1	Power-On Switch	Turns the system drawer's power on and off.
2	Reset Switch	Function depends upon the operating system.
3	Power-On LED	Glows green when the system is powered on and blinks slowly when the system is in standby mode.
4	System Attention LED (System Fault/System Identify Indicator)	Glows amber when the system is in the following states: • **Normal State** - LED is off • **Fault State** - LED is on solid • **Identify State** - LED is blinking
5	Operator Panel Display	Displays current status of system drawer startup, or diagnostic information in the event of a hardware problem.

Behind the Front Panel

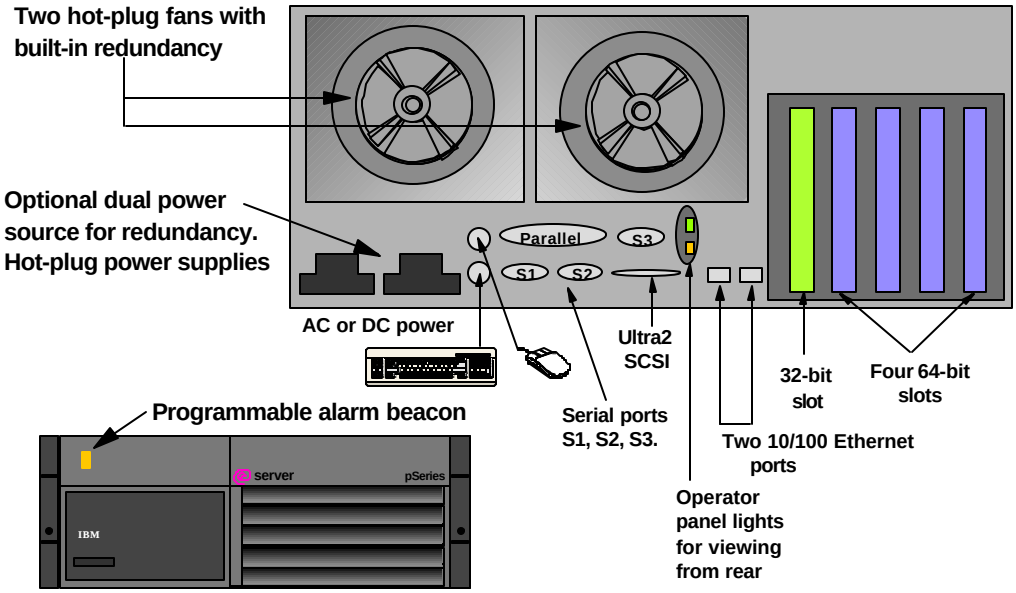


Notes:



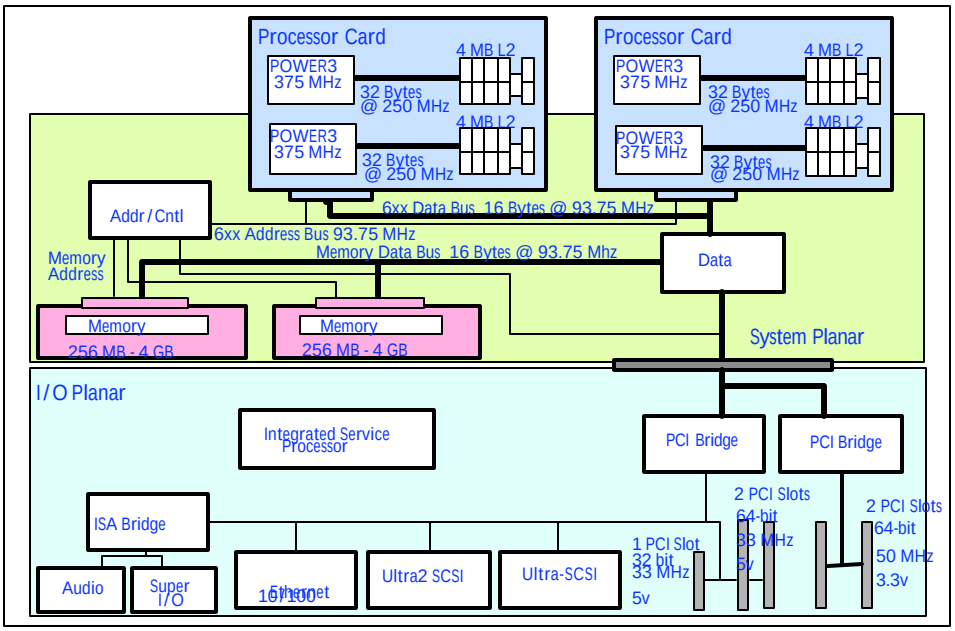
1	Media Bay - SCSI ID=0
2	Disk Drive - SCSI ID=8
3	Disk Drive - SCSI ID=9
4	Disk Drive - SCSI ID=10
5	Disk Drive - SCSI ID=11

Processor Drawer from the Rear



Notes:

pSeriers 640 Architecture



Sun Can't Stack Up to pSeries 640

pSeries 640

E420R

Up to 23% more SPECint95 performance

27% lower Web list price

Superior RAS

- Hot-plug fans and power, Dynamic CPU Deallocation, service processor

More expandability

- 4x more memory and internal storage

Top-rated UNIX OS and HA solutions

Source: www.sun.com and www.ibm.com/servers/eserver/pseries as of 10/3/00

pSeries 640 Price Comparison

pSeries 640

Base 1-way 256MB, 9.1GB	$16,995
Upgrade to 1GB memory	4,608
Upgrade to 18.2 GB 10K rpm disk	590
CD-ROM	375
Total U.S. list price	22,568
ShopIBM special price	**$18,054**

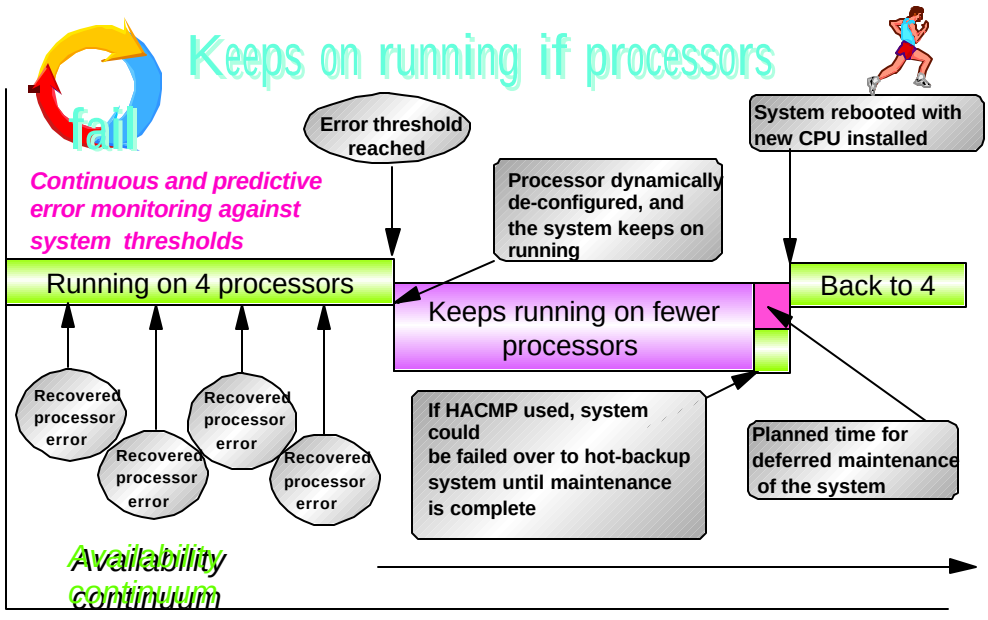
Sun E420R

$25,034

~27% lower price

Notes: Prices are comparisons between SunStore (www.sun.com) and ShopIBM (www.ibm.com/shopibm) as of 10/3/00; Prices are subject to change without notice, dealer prices may vary; Configuration is 1GB memory, 18.2GB 10000 rpm disk file, DVD or CD-ROM and unlimited user UNIX license.

Dynamic CPU Deallocation



Notes:

http://www.rs6000.ibm.com/doc_link/en_US/a_doc_lib/aixbman/admnconc/adm_guide.htm#B1132000bkm

System Management Concepts: Operating System and Devices

Enabling Dynamic Processor Deallocation

Starting with machine type 7044 model 270, the hardware of all systems with more than two processors will be able to detect correctable errors, which are gathered by the
firmware. These errors are not fatal and, as long as they remain rare occurrences, can be safely ignored. However, when a pattern of failures seems to be developing on a specific
processor, this pattern may indicate that this component is likely to exhibit a fatal failure in the near future. This prediction is made by the firmware based-on-failure rates and
threshold analysis.

AIX, on these systems, implements continuous hardware surveillance and regularly polls the firmware for hardware errors. When the number of processor errors hits a threshold
and the firmware recognizes that there is a distinct probability that this system component will fail, the firmware returns an error report to AIX. In all cases, AIX logs the error in the
system error log. In addition, on multiprocessor systems, depending on the type of failure, AIX attempts to stop using the untrustworthy processor and deallocate it. This feature is
called Dynamic Processor Deallocation.

Notes:

At this point, the processor is also flagged by the firmware for persistent deallocation for subsequent reboots, until maintenance personnel replaces the processor.

Potential Impact to Applications

This processor decallocation is transparent for the vast majority of applications, including drivers and kernel extensions. However, you can use AIX published interfaces to determine whether an application or kernel extension is running on a multiprocessor machine, find out how many processors there are, and bind threads to specific processors.

The interface for binding processes or threads to processors uses logical CPU numbers. The logical CPU numbers are in the range [0..N-1] where N is the total number of CPUs.
To avoid breaking applications or kernel extensions that assume no "holes" in the CPU numbering, AIX always makes it appear for applications as if it is the "last" (highest numbered) logical CPU to be deallocated. For instance, on an 8-way SMP, the logical CPU numbers are [0..7]. If one processor is deallocated, the total number of available CPUs becomes 7, and they are numbered [0..6]. Externally, it looks like CPU 7 has disappeared, regardless of which physical processor failed. In the rest of this description, the
term CPU is used for the logical entity and the term processor for the physical entity.

Applications or kernel extensions using processes/threads binding could potentially be broken if AIX silently terminated their bound threads or forcefully moved them to another CPU when one of the processors needs to be deallocated. Dynamic Processor Deallocation provides programming interfaces so that those applications and kernel extensions can be notified that a processor deallocation is about to happen. When these applications and kernel extensions get this notification, they are responsible for moving their bound threads and associated resources (such as timer request blocks) away form the last logical CPU and adapt themselves to the new CPU configuration.

Notes:

If, after notification of applications and kernel extensions, some of the threads are still bound to the last logical CPU, the deallocation is aborted. In this case AIX logs the fact that the deallocation has been aborted in the error log and continues using the ailing processor. When the processor ultimately fails, it creates a total system failure. Thus, it is important for applications or kernel extensions binding threads to CPUs to get the notification of an impending processor deallocation, and act on this notice.

Even in the rare cases where the deallocation cannot go through, Dynamic Processor Deallocation still gives advanced warning to system administrators. By recording the error in the error log, it gives them a chance to schedule a maintenance operation on the system to replace the ailing component before a global system failure occurs.

Processor Deallocation:

The typical flow of events for processor deallocation is as follows:

1.The firmware detects that a recoverable error threshold has been reached by one of the processors.
2.AIX logs the firmware error report in the system error log, and, when executing on a machine supporting processor deallocation, start the deallocation process.
3.AIX notifies non-kernel processes and threads bound to the last logical CPU.
4.AIX waits for all the bound threads to move away from the last logical CPU. If threads remain bound, AIX eventually times out (after ten minutes)and aborts the deallocation
5.Otherwise, AIX invokes the previously registered High Availability Event Handlers (HAEHs). An HAEH may return an error that will abort the deallocation.
6.Otherwise, AIX goes on with the deallocation process and ultimately stops the failing processor.

Notes:

Probable Causes
CPU FAILURE

Failure Causes
CPU FAILURE

Recommended Actions
ENSURE CPU GARD MODE IS ENABLED
RUN SYSTEM DIAGNOSTICS.

Detail Data
PROBLEM DATA
0144 1000 0000 003A 8E00 9100 1842 1100 1999 0930 4019
0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000 4942 4D00 5531
2E31 2D50 312D 4332 0000
0002 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000 0000 0000 0000 0000
... ...

CPU_DEALLOC_SUCCESS

Error Description: A processor has been successfully deallocated upon detection of a predictive processor failure.
This message is logged by AIX when processor deallocation is enabled, and when the CPU has been successfully deallocated.
DETAIL DATA: Logical CPU number of deallocated processor.

Notes:

CPU_FAIL_PREDICTED

Error description: Predictive Processor Failure

This error indicates that the hardware detected that a processor has a high probability to fail in a near future. It is always logged whether or not processor deallocation
is enabled.

DETAIL DATA: Physical processor number, location

Example: error log entry - long form

```
LABEL:              CPU_FAIL_PREDICTED
IDENTIFIER:         1655419A

Date/Time:          Thu Sep 30 13:42:11
Sequence Number:    53
Machine Id:         00002F0E4C00
Node Id:            auntbea
Class:              H
Type:               PEND
Resource Name:      proc25
Resource Class:     processor
Resource Type:      proc_rspc
Location:           00-25

Description
CPU FAILURE PREDICTED
```


Notes:

The syntax for this command is:
ha_star -C
where -C is for a CPU predictive failure event.

Error Log Entries

Following are examples wth descriptions of error logentries:

errpt short format - summary
Three different error log messages are associated with CPU deallocation. Following is an example of entries displayed by the errpt command (without options):

```
# errpt
IDENTIFIER   TIMESTAMP    T  C  RESOURCE_NAME   DESCRIPTION
804E987A     1008161399   I  O  proc4           CPU DEALLOCATED
8470267F     1008161299   T  S  proc4           CPU DEALLOCATION ABORTED
1B963892     1008160299   P  H  proc4           CPU FAILURE PREDICTED
#
```

If processor deallocation is enabled, a CPU FAILURE PREDICTED message is always followed by either a CPU DEALLOCATED message or a CPU DEALLOCATION
ABORTED message.
If processor deallocation is not enabled, only the CPU FAILURE PREDICTED message is logged. Enabling processor deallocation any time after one or more CPU FAILURE PREDICTED messages have been logged initiates the deallocation process and results in a success or failure error log entry, as described above, for each processor reported failing.
errpt long format - detailed description

Notes:

Following is the form of output obtained with errpt -a:
Processor proc4 gets a predictive failure and gets deallocated by AIX:

```
# lsattr -EH -l proc4
attribute       value               description          user_settable

state           disable             Processor state      False
type            PowerPC_RS64-III    Processor type       False
      #
```

At the next system boot, processor proc4 is reported by firmware as defective and not available to AIX:

```
# lsattr -EH -l proc4
attribute       value               description          user_settable

state           faulty              Processor state      False
type            PowerPC_RS64-III    Processor type       False
      #
```

But in all three cases, the status of processor proc4 is Available:

```
# lsdev -CH -l proc4
name            status              location             description

proc4           Available           00-04                Processor
#
```


Notes:

Processor State Considerations

Physical processors are represented in the ODM data base by objects named procn where n is the physical processor number (n is a decimal number). Like any other "device"
represented in the ODM database, processor objects have a state (Defined/Available) and attributes.

The state of a proc object is always Available as long as the corresponding processor is present, regardless of whether it is usable by AIX. The state attribute of a proc object
indicates if the processor is used by AIX and, if not, the reason. This attribute can have three values:

enable
    The processor is used by AIX.
disable
    The processor has been dynamically deallocated by AIX.
faulty
    The processor was declared defective by the firmware at boot time.

In the case of CPU errors, if a processor for which the firmware reports a predictive failure is successfully deallocated by AIX, its state goes from enable to disable. Independently
of AIX, this processor is also flagged as defective in the firmware. Upon reboot, it will not be available to AIX and will have its state set to faulty. But the ODM proc object is still
marked Available. Only if the defective CPU was physically removed from the system board or CPU board (if it were at all possible) would the proc object change to Defined.

Example:
Processor proc4 is working correctly and used by AIX:

Notes:

In case of failure at any point of the deallocation, AIX logs the failure with the reason why the deallocation was aborted. The system administrator can look at the error log, take corrective action (when possible) and restart the deallocation. For instance, if the deallocation was aborted because at least one application did not unbind its bound threads, the system administrator could stop the application(s), restart the deallocation (which should go through this time) and restart the application.

System Administration

Turning Processor Deallocation On and Off

Dynamic Processor Deallocation can be enabled or disabled by changing the value of the cpuguard attribute of the ODM object sys0. The possible values for the attribute are enable and disable.

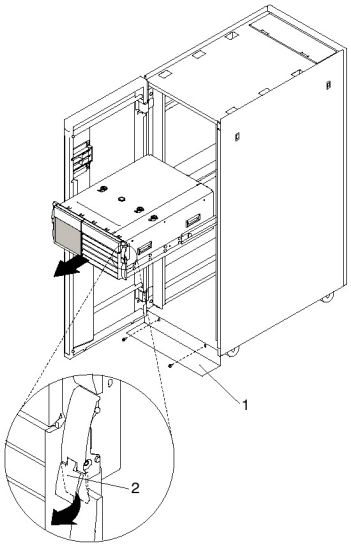
The default, in this version of AIX, is that the dynamic processor deallocation is disabled (the attribute cpuguard has a value of disable). System administrators who want to take advantage of this feature must enable it using either the Web-based System Manager system menus, the SMIT System Environments menu, or the chdev command.

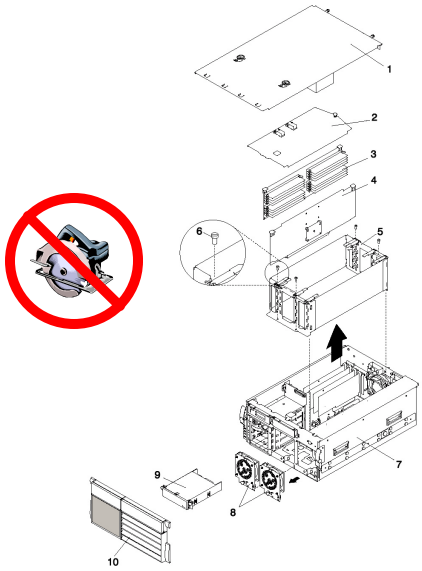
Note: If processor deallocation is turned off, AIX still reports the errors in the error log and you will see the error indicating that AIX was notified of the problem with
a CPU (CPU_FAILURE_PREDICTED, see the following format).

Restarting an Aborted Processor Deallocation

Sometimes the processor deallocation fails because, for example, an application did not move its bound threads away from the last logical CPU. Once this problem has been fixed, by either unbinding (when it is safe to do so) or stopping the application, the system administrator can restart the processor deallocation process using the ha_star command.

Tool-Less Front Service





1 Stabilizing Bar
2 Release Latch in the Release Position

Notes:

1 Main Chassis Cover
2 CEC Box Cover
3 System Memory Card
4 System Processor Card
5 CEC Box
6 CEC Box Retaining Screw (quantity 4)
7 System Drawer
8 Front Fans
9 Media Device or Tray (configuration-dependent)
10 Front Bezel

H50 to H80 Model Coversion

Conversion allows upgrade path for companies who wish to maintain serial numbers for investment protection

- The first processor card can be converted
- This conversion is an entire CEC replacement
- The H50 memory, internal media devices, certain SCSI IPL disks, and most PCI adapter cards carry forward to the upgraded H80 system
- H50s with many disks may require an external storage enclosure to accomodate all the disk, or a disk migration to higher-storage drives

Notes:

Available Feature Conversions

4311 - PowerPC 604e, 1-Way, 332 MHz 5202 - RS64 III, 2-way, 450 MHz
4311 - PowerPC 604e, 1-Way, 332 MHz 5204 - RS64 III, 4-way, 450 MHz
4311 - PowerPC 604e, 1-Way, 332 MHz 5206 - RS64 III, 6-way, 500 MHz

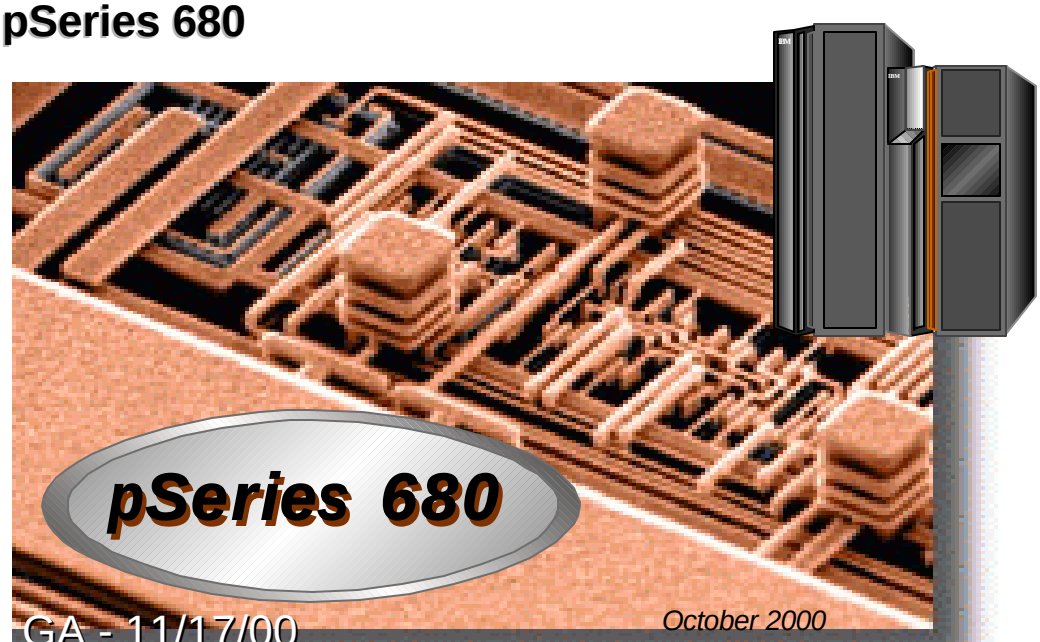
9306 - PowerPC 604e, 1-Way, 332 MHz 5202 - RS64 III, 2-way, 450 MHz
9306 - PowerPC 604e, 1-Way, 332 MHz 5204 - RS64 III, 4-way, 450 MHz
9306 - PowerPC 604e, 1-Way, 332 MHz 5206 - RS64 III, 6-way, 500 MHz

4320 - PowerPC 604e, 2-Way, 332 MHz 5202 - RS64 III, 2-way, 450 MHz
4320 - PowerPC 604e, 2-Way, 332 MHz 5204 - RS64 III, 4-way, 450 MHz
4320 - PowerPC 604e, 2-Way, 332 MHz 5206 - RS64 III, 6-way, 500 MHz

4338 - PowerPC 604e, 2-Way, 332 MHz 5202 - RS64 III, 2-way, 450 MHz
4338 - PowerPC 604e, 2-Way, 332 MHz 5204 - RS64 III, 4-way, 450 MHz
4338 - PowerPC 604e, 2-Way, 332 MHz 5206 - RS64 III, 6-way, 500 MHz

OCT2000P08V18

pSeries 680



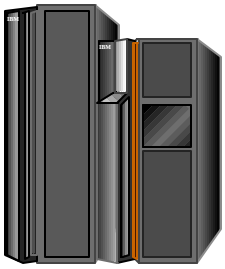
GA - 11/17/00 *October 2000*

Vertical Capacity Upgrade on Demand - 1/19/01

OCT2000P08V19

pSeries 680 and S80 Offerings

- *All pSeries 680 orders*



6 to 24-way 600 MHz SMPs
4GB to 96GB memory

Requires AIX 4.3.3
11/2000 Update CD

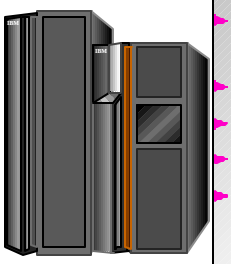
- New S80 orders remain available at 450 MHz
- S80 upgrades available for:

Redbooks ibm.com/redbooks

OCT2000P08V20

pSeries 680 Specifications

- **RS64 IV 600 MHz**
  - Copper and SOI technology
- **6, 12, 18, 24-way processors**
- **128KB/128KB L1 cache / CPU**
- **16MB L2 cache / CPU**
  - On-chip L2 cache controller
- **4GB - 96GB memory**
- **SMPs and I/O : 24GB/sec**
  - Dual buses (processors & I/O)
  - 2.4GB/sec/bus
- **Memory bus: 19.2GB/sec**
  - 4x 64-byte wide memory paths
  - 4.8GB/sec/bus
- **43.2 GB/sec total aggregate data switch bandwidth**



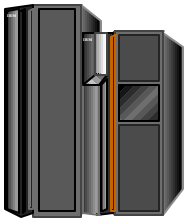
- **14-56 PCI slots**
- **Ultra SCSI 6-packs**
- **Max disk bays : 48**
- **Max I/O drawer disks: 873.6GB**
- **Max media bays : 8**
- **AIX 4.3.3 required**
- **ROLTP - 716**
- **High Availability Solutions HACMP/HAGEO and GeoRM**
- **Dynamic CPU Deallocation keeps server running with failing processors**
- **Capacity Upgrade on Demand**

Redbooks ibm.com/redbooks

OCT2000P08V21

Performance at Your Fingertips

Vertical Capacity Upgrade on Demand for pSeries 680

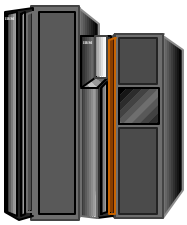


- Delivers more hardware capacity than is initially enabled and provides a quick means for enabling additional capacity at a later date
- Provides quick performance upgrades for customers where system demand is difficult to predict
- Provides greater granularity for more affordable system growth

OCT2000P08V22

Performance at Your Fingertips

Vertical Capacity Upgrade on Demand for pSeries 680 (also on S80)

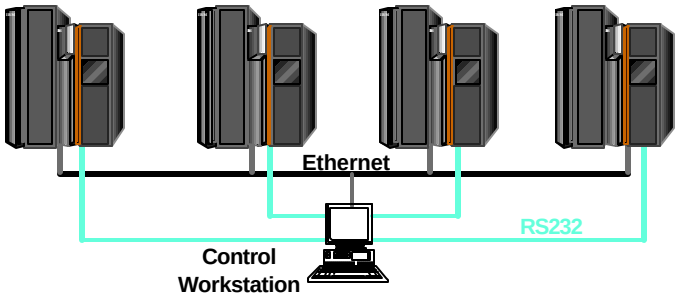


- Initial 6-way book required
- Customer may purchase one, two, or three additional 6-way books
- Processor activations are in increments of two (0, 2, 4, 6)
- Unactivated processors can be used as spares in event of processor failure
- Changes are initiated by customer without IBM intervention

OCT2000P08V23

Clustered Enterprise Servers

Manage multiple systems from a single workstation



pSeries 680 Cluster

- Functionally equivalent to SP managed nodes
- Non-switched attachment
- Up to 16 may be attached
- Requires PSSP 3.2

PSSP support consistent with SP managed nodes

- Perspectives, monitoring, system management

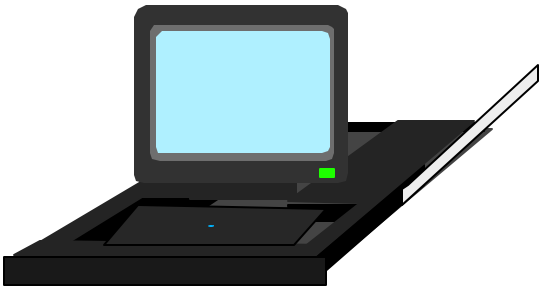
Redbooks ibm.com/redbooks

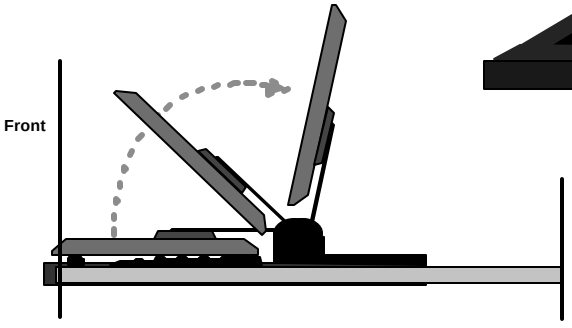
OCT2000P08V24

pSeries 7316-TF1 Flat Panel Console

Planned for November 2000

- Place your console into a 19-inch rack
- Rack Flat Panel Console Solution
- Rack Keyboard Tray
- Flat Panel Monitor Rack Mount Kit
- IBM Space Saver Keyboard
- Just 3U height in 19-inch rack



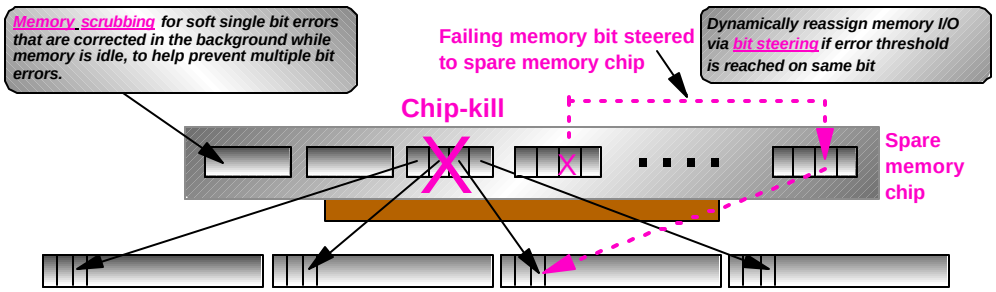


- Supported on: pSeries 640
  pSeries 680
  RS/6000 S80
  RS/6000 M80
  RS/6000 H80
  RS/6000 H70
  RS/6000 B50

Redbooks ibm.com/redbooks

OCT2000P08V25

pSeries 680 ECC Memory Data



Scatter memory chip bits across four separate ECC words for chip-kill recovery

- Bit scattering allows normal single bit ECC error processing, thereby keeping the system running with a chip-kill failure.
- Bit steering allows memory lines from a spare memory chip to be dynamically reassigned to a faulty line in a memory module to keep the system running.
- If all bits are used up on the spare memory chips, and the threshold is reached, the Service Processor will be invoked to request deferred maintenance at the customer's convenience

(Also on S80, F80, M80, and H80)

OCT2000P08V26

10,000 RPM Disk Drives

36.4 GB 10,000 RPM Ultra SCSI Disk Drive

- 7043 260 and 270 - 7044 170 and 270
- Feature Code 3119

36.4 GB 10,000 RPM Ultra SCSI 16-bit Enhanced Disk Drive

- 7043 260 and 270 - 7044 270
- Feature Code 3128

10,000 RPM Ultra3 16-bit Enhanced Disk Drives

- 7025-F80, 7026-B80, 7046-B50
- Feature Code 3129, 3152 and 3153 for 36.4, 9.1, and 18.2 sizes
- Major Features
  - With Ultra3 adapter, provides under the covers Ultra3 in F80
  - Interface speeds of Ultra SCSI (40 MBps) or Ultra3 (160 MBps)
  - 1-inch high form factor

Notes:

New IBM 36.4GB 10,000 RPM Ultra SCSI Disk Drives for RS/6000 Give you Exceptional Performance and Storage

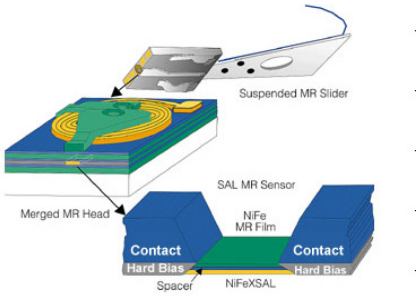
OVERVIEW

These RS/6000 36.4GB 10,000 RPM SCSI Disk Drives are state-of-the-art hard disk drives that give you exceptional performance and storage. These drives support Ultra SCSI interface speeds of 40 MBps. They also support the slower Fast/Wide SCSI speed of 20 MBps. The higher SCSI bus date rate along with 10,000 rpm faster spinning speed of the disk platters can greatly improve a system's overall data throughput. These disk drives are a 3.5 inch, 1-inch (25-mm) high form factor that allow them to be placed in dense system configurations.

KEY PREREQUISITES

These new disk drives require:

- o A supported RS/6000 model with:
  - One disk bay
  - One SCSI internal 16-bit address
- o One of the following supported operating systems:
  - AIX Version 4.2.1 or 4.3.2, or later (Refer to the Sales Manual pages for specific support.)



Notes:

(#3119) - 36.4GB 10,000 RPM Ultra SCSI Disk Drive

The 36.4GB 10,000 RPM Ultra SCSI Disk Drive provides 36.4GB of storage capacity and supports the industry standard Ultra SCSI interface speed of 40 MBps.

Characteristics:

Form Factor: 3.5-inch, 1-inch (25 mm) high
Cable included: No
External Interface: Ultra SCSI (16-bit, Single Ended)
Attachment Industry Spec: SCSI-3 fast 20, ANSI Spec X3T10/1071D
Average Seek Time: 6.02 ms (based on four(4) READS to one(1) WRITE)
Average Latency: 2.99 ms
Rotational Speed: 10,000 RPM
Maximum Data Transfer Rate: 44.3 MBps

Note: Ultra SCSI disk drives require attachment to a supported Ultra SCSI adapter in order for the drive to run at 40 MBps.

Attributes provided: 36.4GB of disk storage
Attributes required: One disk drive bay.

Notes:

(#3128) - 36.4GB 10,000 RPM Ultra SCSI 16-bit Enhanced Disk Drive

The 36.4GB 10,000 RPM Ultra SCSI 16-bit Enhanced Disk Drive provides 36.4GB of storage capacity and supports the industry standard Ultra SCSI interface speed of 40 MBps.

Characteristics:

Form Factor: 3.5-inch, 1-inch (25 mm) high
Cable included: No
External Interface: Ultra SCSI (16-bit, Single Ended)
Attachment Industry Spec: SCSI-3 fast 20, ANSI Spec X3T10/1071D
Average Seek Time: 6.02 ms (based on four(4) READS to one(1) WRITE)
Average Latency: 2.99 ms
Rotational Speed: 10,000 RPM
Maximum Data Transfer Rate: 44.3 MBps

Note: Ultra SCSI disk drives require attachment to a supported Ultra SCSI adapter in order for the drive to run at 40 MBps.

Attributes provided: 36.4GB of disk storage mounted in a carrier.
Attributes required: One disk drive bay.

OCT2000P08V27

Additional 10,000 RPM Disk Drives

9.1 GB 10,000 RPM Disk Drive

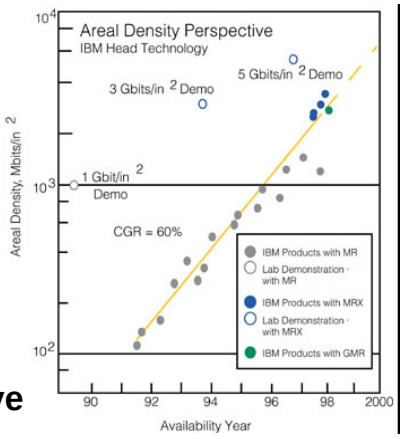
- Extended to additional Models
- Featue Code 3027
- Available now on H80, M80, and 150
- Was already available on 170, 270, and 260

18.1 GB 10,000 RPM Disk Drive

- Extended to additional Models
- Feature Code 3102
- Available now on H80. M80, and 150
- Was already available on 170, 270, and 260

18.1 GB 10,000 RPM Hot-Swap Disk Drive

- Feature Code 3117
- Available on 7017-S80 and 7017 S85
- New Drive of similar design to feature code 3119



Notes:

(#3027) - 9.1GB 10,000 RPM Ultra-SCSI Disk Drive

The 9.1GB 10,000 RPM Ultra SCSI Disk Drive provides 9.1GB of storage capacity and supports the industry standard Ultra SCSI interface speed of 40 MBps.

Characteristics:

Form Factor: 3.5-inch, 1-inch (25 mm) high
Cable included: No
External Interface: Ultra SCSI (16-bit, Single Ended)
Attachment Industry Spec: SCSI-3 fast 20, ANSI Spec X3T10/1071D
Average Seek Time: 6.02 milliseconds
Average Latency: 2.99 milliseconds
Rotational Speed: 10,000 RPM
Maximum Data Transfer Rate: 30.5 MBps

Note: Ultra SCSI disk drives require attachment to a supported Ultra SCSI adapter in order for the drive to run at 40 MBps.

Attributes provided: 9.1 GB storage capacity
Attributes required: One disk drive bay.

Notes:

(#3102) - 18.2 GB 10,000 RPM Ultra SCSI Disk Drive

The 18.2GB 10,000 RPM Ultra SCSI Disk Drive provides 18.2GB of storage capacity and supports the industry standard Ultra SCSI interface speed of 40 MBps.

Characteristics:

Form Factor: 3.5-inch, 1-inch (25 mm) high
Cable included: No
External Interface: Ultra SCSI (16-bit, Single Ended)
Attachment Industry Spec: SCSI-3 fast 20, ANSI Spec X3T10/1071D
Average Seek Time: 6.02 milliseconds
Average Latency: 2.99 milliseconds
Rotational Speed: 10,000 RPM
Maximum Data Transfer Rate: 44.3 MBps

Note: Ultra SCSI disk drives require attachment to a supported Ultra SCSI adapter in order for the drive to run at 40 MBps.

Attributes provided: 18.2 GB storage capacity
Attributes required: One disk drive bay.

Notes:

(#3117) - 18.2GB 10,000 RPM Ultra SCSI Hot Swap Disk Drive

The 18.2GB 10,000 RPM Ultra SCSI 16-bit Disk Drive provides 18.2GB of storage capacity and supports the industry standard Ultra SCSI interface speed of 40 MBps.

Characteristics:

Form Factor: 3.5-inch
Requires Two (2) 1-inch high disk drive bays
Cable included: No
External Interface: Ultra SCSI (16-bit, Single Ended)
Attachment Industry Spec: SCSI-3 fast 20, ANSI Spec X3T10/1071D
Average Seek Time: 6.02 ms (based on four(4) READS to one(1) WRITE)
Average Latency: 2.99 ms
Rotational Speed: 10,000 RPM
Maximum Data Transfer Rate: 44.3 MBps

Note: Ultra SCSI disk drives require attachment to a supported Ultra SCSI adapter in order for the drive to run at 40 MBps.

Attributes provided: 18.2GB of disk storage mounted in a carrier.
Attributes required: Two (2) 1-inch high disk drive bays in a six-pack backplane.

PCI 4-Channel ULTRA3 SCSI RAID #2498

PCI 4-Channel (6-port) Ultra3 SCSI RAID Adapter

- Long form factor RAID level 5E (active hot spare) support
- Supports 32-bit or 64-bit slots
- Supports 3.3 Volt or 5 Volt slots
- Up to 160 MB/sec of I/O bandwidth
- Integrated 128 MB Fast-Write Cache Controller
- Fast-Write cache module is movable to a new adapter (battery backed)
- Two internal ports and four external ports (VHDCI)
  - The internal ports are shared with the external ports
- Does not support the 7131-105 external SCSI enclosure
- For Models F50, F80, H70, H80, M80, B50, B80, 150, 170, 260, 270 - check availability for withdrawn models.
- Support through SMIT - PCI SCSI Disk Array Manager
- AIX 4.3.3 requires 4.3S update
- lslpp -l devices.pci.14102e00.rte to check VRMF 4.3.3.25 or higher

Replaces #2494

Notes:

(#2498) - PCI 4-Channel Ultra3 SCSI RAID Adapter

The RS/6000 PCI 4-Channel Ultra3 SCSI RAID Adapter(#2498) is a non-bootable high performance Ultra3 SCSI RAID Adapter providing RAID 0,1,1E, 5, or 5E capability and can address up to sixty 16-bit SCSI physical disk drives on four independent SCSI buses.

To increase the data writing performance, a 128 MByte fast-write cache is provided as a resident part of this adapter. The 128 MByte fast-write cache is a resident feature of the PCI 4-Channel Ultra3 SCSI RAID Adapter that utilizes non-volatile RAM. During the unlikely event of an PCI 4-Channel Ultra3 SCSI RAID Adapter failure, a replacement PCI 4-Channel Ultra3 SCSI RAID Adapter can be installed and the fast-write cache can be removed from the failing adapter and installed in the new adapter insuring data integrity. The 128 MByte fast-write cache can provide an significant improvement in data throughput and response time during certain sequence write operations compared to SCSI RAID adapters without the fast-write cache. The response time and data transfer improvement will vary depending upon the data block sizes, the percentage of sequential writes, machine type/model, and application parameters.

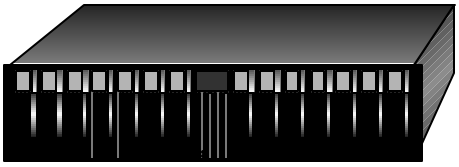
The PCI 4-Channel Ultra3 SCSI RAID Adapter has four independent Ultra3 SCSI buses. There are two internal ports and four external ports. The two internal ports are shared with two of the external ports. Two of the four busses can drive either an internal port or an external port. The other two busses only drive external ports. The internal ports can be used to provide an internal RAID soluti on on supporting RS/6000 systems. Systems with one or two internal 6-pack disks can attach to a PCI 4-Channel Ultra3 SCSI RAID Adapter. The four external ports provide connectivity to an IBM 2104-DU3 Expandable Storage Plus Drawer or 2104-TU3 Expandable Storage Plus Tower at up to 160 MB/s SCSI bus data rate. The four external ports also provide connectivity to an IBM 2104-DL1 Expandable Storage Plus Drawer or 2104-TL1 Expandable Storage Plus Tower at up to 80 MB/s SCSI bus data rate.

Limitations: The four external ports do not support the connection to the IBM 7131-105 external Fast/Wide SCSI disk enclosure. Even though the PCI 4-Channel Ultra3 SCSI RAID Adapter has ports that run at Ultra3 SCSI speeds (up to 160 MBytes/s) and Ultra2 SCSI speeds (up to 80MBytes/s), the internally attached disk drives will run at a maximum SCSI bus data rate specified by that supporting system backplane.

In order for full support and to take full advantage of the Ultra3 (up to 160 MBytes/s) speed of this adapter, the proper AIX level also needs to be considered. AIX 4.3.3 with appropriate APAR updates or later AIX versions support the full range of SCSI bus data rates (including Ultra3 SCSI up to 160 MByte/s). Check the AIX level your system has or is able to support.

IBM 2104 Expandable Storage Plus (EXP) Disk Enclosure Model DU3

- *Compact Size*
  - Supports 1" 10k rpm HDDs
  - Only 3U (EIA) high drawer
  - Low cost, high capacity
  - Ultra3 SCSI
  - 160 MB/s throughput
  - Splitable Bus (optional)
  - 14 disks may be split between
  - two processors - 7 to one
  - processor and 7 to another



- *Configurations*
  - Up to 14 disk drives (509.6GB)
  - 9.1GB,18.2GB or 36.4GB Ultra3 SCSI (LVD) 10k rpm disk drives
  - Hot-swappable with redundant power and cooling
  - Ultra3 SCSI RAID 4-port adapter available

IBM 10/100/1000 Base-T Ethernet #2975
IBM Turboways 622 Mbps MMF ATM #2946

Unshielded Twisted Pair Ethernet adapter (short card)

- # 2969 is a Multimode Fibre adapter
- Auto-negotiates 10 Mbps, 100 Mbps and 1000 Mbps
- NIM boot is supported
- All four pairs of CAT-5 wiring are required for 1000 Mbps
- 32/64-bit slot compatibility, 3.3 or 5V operation

Turboways 622 PCI MMF ATM adapter (short card)

- 32/64-bit slot compatibility, 3.3 or 5V operation
- Universal PCI 2.1 compliance
- Next generation ASIC
- 622 Mbps on 62.5 micron MMF
- Dedicated 16 MB SDRAM cache
- Supports IP over ATM, MPOA, and LAN emulation

Notes:

(#2975) - 10/100/1000 Base-T Ethernet PCI Adapter

10/100/1000 Base-T Ethernet PCI Adapter is a Full Duplex Gigabit Ethernet adapter designed with highly integrated components to optimize cost and performance. The adapter interfaces to the system via the PCI bus and connects to the network using a 4-pair CAT-5 Unshielded Twisted Pair (UTP) cable for distances of up to 100m. The 10/100/1000 Base-T Ethernet PCI Adapter supports jumbo frames for full duplex Fast & Gigabit Ethernet.

Note: For optimum performance, adapter should be placed in a 64 bit PCI card slot.

Limitation: AIX's Network Install Manager (NIM) boot is not supported with this adapter. The 1000 Mbps speed is not supported in Half Duplex (HDX) mode.

Attributes provided: One full-duplex 1000Base-T UTP connection to a Gigabit Ethernet LAN.
Attributes required: One available PCI card slot

(#2946) - Turboways 622 Mbps PCI MMF ATM Adapter

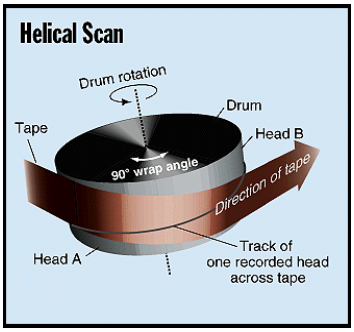
The IBM Turboways 622 Mbps PCI MMF ATM Adapter is a 64-bit, Universal PCI Adapter. This adapter provides direct access to the ATM network at a dedicated 622 Mbps full-duplex connection. The Turboways 622 Mbps PCI MMF ATM Adapter is a short form-factor adapter that interfaces to the system via the PCI bus and connects to the 622 Mbps ATM network via dual-SC type, multi-mode fiber cables. The Turboways 622 Mbps PCI MMF ATM Adapter utilizes 16MB of SDRAM for control and 16MB of SDRAM for packet memory. This ATM adapter also provides a hardware assist for TCP checksum which can provide a performance improvement by minimizing the host CPU cycles .

Attributes provided: One full-duplex connection to 622 ATM network
Attributes required: One available PCI card slot

#6158 20/40 GB 4mm Internal Tape Drive

Available over the entire RS/6000 product range

- 20/40 GB data storage capacity
- 4 MBps (with compression) data transfer rate
- Reads/Writes IBM 4-mm DDS-4 Data Cartridges in capacities of 20 GB in native mode, or 40 GB in compressed mode
- Reads/Writes IBM 4-mm DDS-3 Tape Cartridges
- AIX Version 4.3.3 or later
- Compatibility:
  - 4 GB mode (Read Only),
  - 8 GB compression (Read Only)
  - 12 GB mode(Read/Write),
  - 24 GB compression (Read/Write),
  - 20 GB mode (Read/Write),
  - 40 GB compression (Read/Write)



Notes:

(#6158) - 20/40GB 4mm Internal Tape Drive

The 20/40 GB 4-mm Internal Tape Drive is a 5.25-inch, half-high, single-ended 16-bit tape drive, which provides a high capacity for save/restore and achieve functions. This tape drive uses IBM 4-mm data cartridges and is compression capable, providing a capacity of up to 40 GB - a significant increase in capacity over the previous 12/24 4-mm internal tape drives (when using DDS-4 media).

Characteristics

Capacity: 20 GB native mode, 40 GB (typical) compression mode
Form Factor: 5.25-inch half high
Media: IBM 4-mm DDS-4 data cartridge
Technology: Helical scan, rotating head
Operation: Streaming
Data Transfer Rate: 3MBps native mode, 6MBps (typical) compression
Interface: SCSI-2 (single ended) asynchronous/synchronous
Compatability: 4 GB mode (Read Only), 8 GB compression (Read Only); 12 GB mode(Read/Write), 24 GB compression (Read/Write), 20 GB mode (Read/Write), 40 GB compression (Read/Write).

NOTE: MES orders are shipped with both a black and a white bezel.

Attributes provided: 4mm tape capability
Attributes required: One 1.6-inch (41mm) half-high media bay and one SCSI-2 internal SE 16-bit address

OCT2000P08V32

New Security for RS/6000 4758-023

(#4958) - PCI Cryptographic Coprocessor

- www.ibm.com/security/cryptocards
- Federal Information Processing Standard (FIPS) 140-1 Level 3 validated device
- IBM offers software to enable your use of the Coprocessors. Two different approaches to cryptographic functions are offered for download from the http://www.ibm.com/security/cryptocards website:
  - PKCS #11 Version 2.01, an implementation of the industry-standard API
  - IBM Common Cryptographic Architecture (CCA), featuring support of special interest to the finance industry.
- Tamper-proof enclosure
- No IA-64 support at this time

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4758 Support Distribution

Device driver devices.pci.14109f00.rte shipped on Base AIX CD

- Updates via the Internet (www.ibm.com/security/cryptocards)
- Devices are defined as /dev/cryptX (where X = 0 through 3)

Firmware package to be distributed via web site (www.ibm.com/security/cryptocards)

- Firmware package is broken into 3 file sets
  - Utilities and common firmware (CLU) files
  - PKCS#11 Firmware
  - CCA Firmware

There is NO Smit or WebSM configuration for the adapter. Firmware is loaded via a command line utility. CCA has a JAVA management application.

PKCS#11 tokens are configured via SMIT. (WebSM to follow).

4758 Environments

Where can you expect to see this

The 4758 Coprocessor can be applied in:

1. Web Serving Environments - With the PKCS#11 firmware load Netscape Enterprise Server 4.0 SP 4 and higher can take advantage for SSL offload
2. Banking Environments - CCA
3. Custom Developed Applications
   - Electronic Stamp/Ticketing applications

Notes:

PKCS#11 v2.01

- RSA Labs standard for interfacing to cryptographic tokens (AKA - Cryptoki)
- Used by Netscape server products to take advantage of hardware offload for SSL and other crypto operations.
- We have implemented what is commonly referred to as the "Netscape subset".
- Implemented as a shared object (.so) which is loaded by applications and can be extended to present multiple tokens (devices) of different types.
- Each 4758 is an individual device. PKCS#11 on the 4758 takes advantage of the security features of the device. It is intended for high security, not high performance, do NOT call it an accelerator.
- Fileset is bos.pkcs11. Configuration information resides in the directory /etc/pkcs11, the shared object is /usr/lib/pkcs11/PKCS11_API.so and PKCS#11 configuration utilities reside in /usr/lib/pkcs11/methods.
- Will support additional hardware devices in the future.

Notes:

(#4958) - PCI Cryptographic Coprocessor

The IBM PCI Cryptographic Coprocessor is a 2/3 length PCI adapter combining hardware and software to provide high performance secure hardware engines for secure internet transactions such as secure data exchange, verifying electronic signatures, bulk data encryption and decryption. Cyrptographic processes are performed within a tamper proof enclosure on the adapter that is designed to meet FIPS PUB 140-1 standard for commercial cryptographic devices at Level 3.

Security functions supported by the adapter includes:

Data Encryption Standard (DES) (56 and 40 bit keys) encryption and decryption, with pre- and post-padding; the coprocessor uses both electronic and codebook (ECB) and cipher block chain (CBC) modes of encryption.
Message Authentication (MAC) and financial PIN processing - Triple DES encryption and decryption of general data
Secure RSA key-pair generation - RSA signature generation and signature verification
Secure Hashing Algorithm (SHA-1) in hardware - Hardware random number generation
Secure data storage and retrieval
Other non-cryptographic security utilities can be carried out using the onboard processor

IBM offers software to enable your use of the Coprocessors. Two different approaches to cryptographic functions are offered for download from the http://www.ibm.com/security/cryptocards website:

PKCS #11 Version 2.01, an implementation of the industry-standard API
IBM Common Cryptographic Architecture (CCA), featuring support of special interest to the finance industry.

Under custom contract, IBM also offers toolkits that you can employ to develop extensions to the CCA offering and to develop your own application to exploit the secure computing environment and cryptographic hardware. For more information on custom contracts, refer to web site http://www.ibm.com/security/cryptocards.

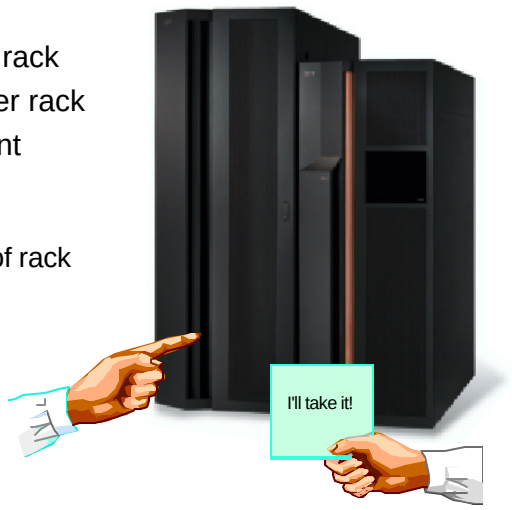
Limitations: The IBM PCI Cryptographic Coprocessor Adapter is a field only installed device in order to meet restrictive shipping requirements. Attributes provided: Data encryption via PCI bus to host Attributes required: 1 PCI slot

New Front Door

Be the first on your block to update your old machine with the new *e*server look.

- Feature code 6089 for 2-meter rack
- Feature code 6088 for 1.8-meter rack
- Black doors with sculpted accent
- Heavy perforation that
  - provides ventalation
  - allows some visibility to inside of rack
- For 7017-S85 (aka 680)

Introducing . . .
IBM @server



Major Withdrawals

The following machines have withdrawal announcements planned:

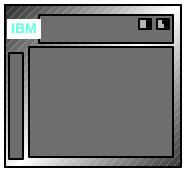
- 7043-140
- 7017-S7A
- 7026-H50
- 7043-260

Cleanup of Old Hardware

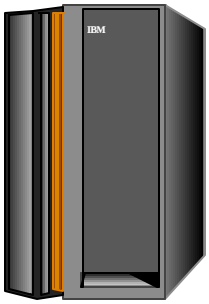
pSeries 680 Future Enhancements

- Processor Features
  - Two POWER4 processors per chip
  - Includes L1, L2, and L3 directory
  - Four chips per MCM (8 cpus per MCM)
  - Dual-ring intercommunication
- System Planar
  - Four MCMs per planar (32-way)
  - Memory books install on front
  - I/O interfaces install on back
- Packaging
  - CEC is rack-mountable (24")
  - New 24" I/O drawer
  - Two 4-packs of disk per drawer
- Scalable system bus
  - runs at 50% processor speed
- NUMA-enabled

CEC



I/O Drawer



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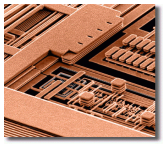
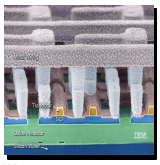
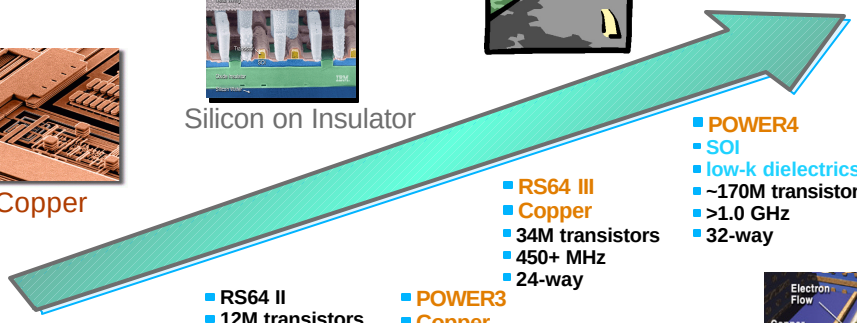
64-Bit Processor Roadmap



Copper



Silicon on Insulator



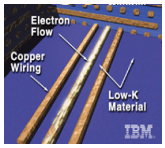
- RS64 I
- 7.5M transistors
- 125 MHz
- 12-way

- RS64 II
- 12M transistors
- 262/340 MHz
- 12-way

- POWER3
- Copper
- 23M transistors
- 375+ MHz
- 16-way

- RS64 III
- Copper
- 34M transistors
- 450+ MHz
- 24-way

- POWER4
- SOI
- low-k dielectrics (future)
- ~170M transistors
- >1.0 GHz
- 32-way



low-k dielectric

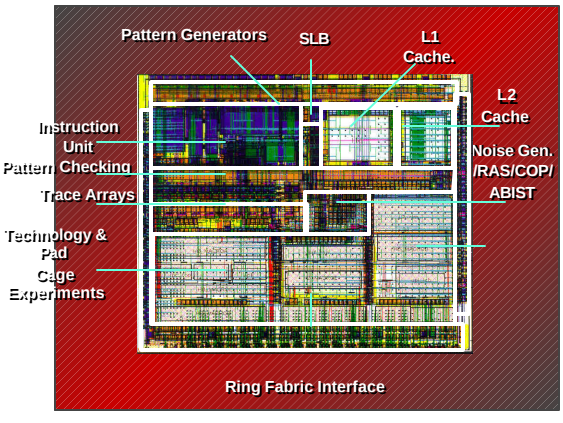
1997 1998 1999 2000/2001 2001/2002

OCT2000P08V39

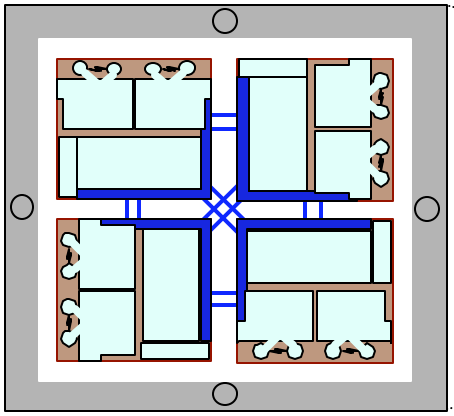
POWER4 Processor Technology

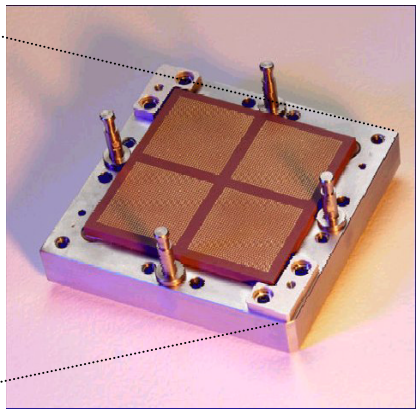
- Technology
  - Copper, SOI, 0.18 u
- Statistics
  - 35 Million Transistors
  - 2100 signal I/O
  - >5000 pins
- Operating >1Ghz

POWER ON 4Q/98 !



Multi-Chip Module





8-processor Multi-Chip Module

- Chips rotated to allow interconnection

4.5" square, glass-ceramic construct

- 8-way SMP in 20 sq.ins!