

**Communicator e3000
MPE/iX Release 7.0
(Software Release C.70.00)**

HP e3000 MPE/iX Computer Systems

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1 Overview—MPE/iX Release 7.0 (C.70.00)

This *Communicator 3000* provides general and detailed information on the new and enhanced functionality for the MPE/iX 7.0 Release (C.70.00), as well as information on support, release strategy and installation prerequisites.

This MPE/iX 7.0 Communicator describes the following enhancements:

- MPE/iX A and N-Class Console
- PCI WAN Sync MUX (Adapter Card and Driver) for A and N-Class Servers
- Multi-function core I/O card for A and N-Class Servers
- The PCI 100Base-T Link Product for A and N-Class Servers
- PCI-SCSI Device Adapter Cards on HP e3000 N-Class and A-Class Servers
- List of topics which appeared in the 6.5 Communicator that may be of interest to customers moving from MPE/iX 6.0 to MPE/iX 7.0

Communicator Summary

Following are brief descriptions of the articles and chapters.

Chapter 1, Overview--Communicator Summary

This chapter provides a summary of information contained in this manual. It also provides information about obtaining MPE patches from the HP Electronic Support Center.

Chapter 2, Announcements

Important announcements regarding availability of products and services are included in this chapter.

- **Introducing MPE/iX 7.0 Release --** provides overview of 7.0 enhancements.
- **Removal of Support for Servers and HP-IB in MPE/iX --** details the discontinuance of support for certain older servers and the HP-IB device adapter.
- **Discontinuance of High Availability Fiber Link Disk Drives --** describes discontinuance of High Availability Fiber Link disk drives.
- **Obsoleted Products Removed from Release 6.5 --** lists the obsolete products that have been removed from the SUBSYS tape for the 6.5 release.
- **Files associated with Obsoleted Products --** Lists the files associated with these obsoleted products: Resource Sharing, CCSY Access Server, CCSY Access/SQL and Cooperative Services/XL.
- **Obtaining Software Security Patches for your HP Computer System --** Describes the process for obtaining security patches for HP systems.

Chapter 3, New Networking

This chapter contains articles about the New Networking capabilities.

Chapter 4, PCI-SCSI Device Adapter Cards

This chapter contains technical articles that provide information about new PCI-SCSI Device Adapter Cards on HP e3000 N-Class and A-Class systems for the MPE/iX 7.0 release.

Chapter 5 , How to Order

This chapter provides information on how to order MPE/iX subsystem products.

Chapter 6, Product Release History

This chapter adds product information for MPE/iX Release 7.0 and updates the termination dates in the Supported System Release Matrix table.

Chapter 7, Catalog of User Documentation

- A listing of all new or updated manuals at the time of the MPE/iX7.0 Release.

Topics in 6.5 Communicator on the Growth Solution and other Topics.

- Large Files overview -- describes the changes to the MPE/iX operating systems as a result of the introduction of Large File functionality.
- AIFs for Large Files -- describes the four modified intrinsics for handling Large Files.
- AIFs for Multiple Job Queues -- describes the enhanced functionality for obtaining queue information about multiple job queues.
- Increase in Number of TCP Connections -- describes an enhancement to allow 20000 connections.
- Dispatcher Multiple Runqueues -- describes the changes to the Dispatcher module including improved system performance.
- Increased System Limits - an overview -- provides a list of the increased system limits.
- Support for 511 Disks on MPE (A-Class and N-Class are limited to 255 until 7.0 Express 1)-- describes how to configure more than 255 disks.
- Increased Number of DSTs -- describes the increased number of data segments.
- User-defined Job Queues and ALTJOB HIPRI Enhancements -- describes the enhancement to 255 user-defined job queues possible on Release 6.5.
- NEWCI Command (CI Elimination) -- describes the functionality and implementation of the NEWCI command.
- Compatibility Considerations for COBOL and C -- describes the issues for COBOL and C as they relate to Large Files.
- C/iX Supports 64-bit Integers -- describes enhancement to C/iX compiler to provide full support for a 64-bit integer data type.
- FTP Support for Large Files
- Enterprise Management Solution -- describes a way to manage distributed IT environments using Legato Backup Solution.
- Support Tools Manager (STM) -- describes a method for handling complex data centers replacing the Sysdiag diagnostics system.
- Enhanced Message Source Template for HP 3000 Agents in ITO -- describes a new set of source templates installed on the Management Server.
- HP Secure Web Console -- describes a new HP product which provides secure console access from web browsers.
- TurboSTORE Support for DLT -- describes the capability for fast search on DLT drives.
- DLT4000/DLT7000 Differential Tape Support on MPE/iX -- describes the capabilities of the DLT4000 and DLT 7000 differential tape drives.

Communicator Summary

- DLT8000 Differential Tape Drives -- describes the capabilities of the DLT8000 differential tape drive.
- TERMDISM: User Interface Change under System Diagnostics -- describes the features of the new diagnostic interface named Support Tools Manager (STM).
- HP SureStore E Disk Array 12H on the HP 3000 -- describes the new HP disk array supported on the HP 3000.
- DVD Support on the HP 3000 -- provides information about replacing older CD-ROM drives with the DVD drive, while still permitting the use of CD-ROM disks.
- DLT 7000 and Legato Storage Node Usage--provides listing of supported Legato Storage Node and DLT Libraries.
- HP SureStore E Disk Array XP256 -- describes the high-capacity, high-speed mass storage, with continuous data availability, ease of service, scalability, and connectivity.

Internet, Interoperability and Databases (6.5 Communicator)

- Large Transactions for IMAGE Users -- describes the solutions for large transactions available for IMAGE users
- XM User Checkpoint Priority Control--describes the Transaction Manager process to write out dirty pages to reduce response time.
- Transact/iX Expanded B-Tree and File Open Enhancement--describes the enhancements to Transact/iX to support B-Trees and File Open.
- Apache for MPE/iX -- describes new server software which enables your HP 3000 to function as a full-featured web server.
- Introducing LDAP C-SDK/iX -- describes a set of client APIs in C language for MPE/iX applications to access X.500 network directories.
- MPE/iX Software Developer's Kit (SDK) for Java, Version 1.2 -- describes the enhancements to the new release of JAVA for MPE/iX.
- HP Driver for JDBC -- provides information about the Java API that enables development of Java applications and applets with a wide range of relational databases.

MPE/iX Patches on HP IT Resource Center

*by Patch Support Team
Commercial Systems Division*

MPE/iX patches for MPE/iX Releases are available on the IT Resource Center (previously the HP Electronic Support Center) to all customers.

Features and Benefits

The new patch access and delivery system benefits all MPE/iX customers with:

- Improved overall communication between HP and customers.
- Provision of useful and timely information for patch justification and decision making.
- Reduced system downtime for known problems.
- Reduction of the turnaround time for patch availability and delivery.
- Close to 24*7 access time.
- Unification of the MPE/iX and HP-UX patch delivery process.

Electronic access to patch information and delivery of patches provide three basic services:

1. Access to patch information in an automated, timely and accurate manner.
2. Electronic downloading of patch information and binaries.
3. Proactive notification of new patches via email.

Access Method to the HP IT Resource Center

To serve customers the IT Resource Center provides World Wide Web access for downloading patches.

Access to World Wide Web Server (www)

IT Resource Center is available through the World Wide Web. World Wide Web access is the easiest, fastest, and most popular method of browsing for patch information and downloading patches. It is more reliable, especially for large patches.

- **U.S. Web accessing address:**
<http://us-support.external.hp.com>
- **European Web accessing address:**
<http://europe-support.external.hp.com>

Electronic Digests

If you want to keep yourself up-to-date on the latest development of MPE/iX patches, you can sign up for the daily Security Bulletin and weekly mpeix_patch Bulletin. Once you have subscribed to these two bulletins, you will receive these digests on a periodic basis via electronic mail. HP IT Resource Center will inform you proactively about newly developed security and GR patches. For more information, refer to the instructions on the IT Resource Center website.

Patch Installation Tools

There are two tools available to install MPE/iX reactive patches, Patch/iX and AUTOPAT. HP recommends the use of Patch/iX for reactive patch installation. Patch/iX has many features and checks to ease and improve the installation process, including:

- A sophisticated patch qualification mechanism to ensure the integrity of your system.
- The ability to perform much of the patch installation process while your system is still up and available to users.
- An option to install a patch or set of patches using the HP Stage/iX Subsystem, which allows the application of a patch to be performed without tapes. For more information on Stage/iX, refer to the *System Software Maintenance Manual* for your release. Patch/iX instructions are also available on the following website:
<http://www.docs.hp.com/mpeix/>

You should use AUTOPAT only if you are familiar with its use, and have a good understanding of MPE/iX patch management.

Patch/iX Installation Document Retrieval

These are the steps for retrieving documents using Patch/iX.

1. Access the HP IT Resource Center WEB site (previously the Electronic Support Center) using the appropriate WEB address for your country.
2. Click on the link, "Individual Patches."
3. Enter: "ITRC User ID" and "password."
4. Click on the link, "MPE/iX Patches."
5. Click on the link, "MPE Patch Installation Guide."
6. Click on the link, "Use Patch/iX or AUTOPAT to install the patch."
7. Click on the link, "Patch/iX Instructions."

Patch/iX Version Identification

To ensure you have the latest version of Patch/iX, on your system do the following:

1. :HELLO MANAGER.SYS, INSTALL
2. :PATCHIX VERSION
3. Compare this version number (for example, B.01.02) with the latest version available for your release on the HP IT Resource Center Patch/iX download page. If you are

running an earlier version than is available, you should download and install the newer one from the download page.

AUTOPAT Installation Document Retrieval

AUTOPATINST is the “DOCID” of the document with instructions to assist you in installing one or more patches needed by your MPE/iX system using the AUTOPAT installation tool.

1. Access the HP IT Resource Center WEB site (previously the Electronic Support Center) using the appropriate WEB address for your country.
2. In the Main Menu, Click on the link, “Search Technical Knowledge Base.”
3. Enter: “ITRC User ID” and “password.”
4. In the Technical Knowledge Base Home page from the pull down menu, Click on “Search By DOC ID” (do not Search by Keyword).
5. In the search field, enter “AUTOPATINST.”
6. Click on the “SEARCH” button.

Create a CSLT Prior to Patch Installation

Before starting any patch application activity, you should always back up your system by creating a Custom System Load Tape and a full backup. This will allow you the flexibility of restoring your system to the previous environment. To create a CSLT, do the following:

1. Log on as `MANAGER.SYS`
2. `:SYSGEN`
3. `>TAPE`

Disclaimer

CAUTION Hewlett-Packard is not liable for errors occurring during data transmission through the Internet. HP assumes no responsibility for the use or reliability of its software on equipment that it has not furnished itself. Furthermore, for customers without a current support contract with HP, HP is not responsible for answering any questions in regard to the use of this patch delivery process.

2 Announcements

Introducing MPE/iX 7.0 Release

Welcome to the newest MPE/iX Release -- 7.0! In this release, we introduce two new server families: the HP e3000 N-Class and A-Class, based on our state of the art PA-RISC hardware and available at hardware speeds unprecedented in the HP e3000 family. Improved performance is expected across the board, but performance gains from this raw horsepower will especially be seen in single-threaded batch applications.

The HP e3000 A-Class server with relative performance levels between 2.2 and 5.4 (estimated) are the new low-end of the HP e3000 product line. The HP e3000 N-Class servers with relative performance levels between 9 and 72 (estimated) are the new mid-range and high-end of the HP e3000 product line.

This first release of N-Class and A-Class servers, in the first calendar half 2001, supports uni-processor configurations, with up to 2 Gb of main memory. Also in June or July of 2001, a 7.0-based Express release will add N-Class and A-Class support of multi-processors and large main memory configurations (up to 16 Gb for N-Class and up to 2Gb for A-Class), which will yield exemplary performance. Look for performance benchmark statistics in the near future.

MPE/iX Release 7.0 also adds support for PCI I/O devices (on N-Class and A-Class machines only). PCI I/O is robust, industry-standard, high-performing, and state-of-the-art.

N-Class and A-Class servers, in both uni-processor and multi-processor configurations, will be available for shipment in the first calendar half, 2001.

Our Next Platform ("Push") Release:

Normally, any MPE/iX release that ends with a ".0" number is a "platform" or "push" release. In the past, this implied that the release is proactively shipped to all customers with current support contracts.

However, customer feedback has indicated that nearly all customers wait for the first Express or PowerPatch release after the "push" release before updating. So, in order to save on customer & HP logistics, we've decided to "push" an early 7.0-based Express release. **This Express release will be proactively distributed to all customers with current support contract sometime in mid-2001.**

Customers purchasing new N-Class or A-Class systems before then will have to use MPE/iX Release 7.0. Release 7.0 is also supported on 9x8, 9x9, and 99x systems, and these systems will support the same capacity limits as they did on MPE/iX Release 6.5. In other words, Release 7.0 supports multi-processor configurations and large memory configurations on these current systems. Customer with these systems may order MPE/iX Release 7.0, or they may choose to wait for the proactive distribution of the early 7.0-based Express release.

Before Deciding On MPE/iX Release 7.0 -- Some Important Notes:

Due to development schedule conflicts, much of the newly introduced functionality in MPE/iX Release 6.5 Express 2 is not yet present in MPE/iX Release 7.0. This functionality will be available in an early 7.0-based Express release, which is due to ship in June or July of 2001 and which will be proactively distributed ("pushed") to all HP e3000 customers with current support contracts. For more information, please see the "Communicator HP e3000 MPE/iX Express 2 Based on Release 6.5", available at <http://docs.hp.com> Customers using any of these features should wait for the early 7.0-based Express release before updating. The specific list of functionality present in Release 6.5 Express 2 that is not in Release 7.0 is:

- QUERY/iX Enhancements
- TurboIMAGE/iX Expanded Limits
- Large Size Datasets in TurboIMAGE/iX
- AS Clause in ALLBASE/SQL
- High Availability FailOver for the SureStore E Disk Array XP256
- MPE/iX High Availability Cluster/iX

For similar reasons, Predictive Support is not available in MPE/iX Release 7.0. It will be included in MPE/iX Release 7.0 Express 1.

Older series 9x7 servers are not supported on MPE/iX Release 7.0 or later. See the article, "HP Will Retire Support of HP 3000 9x7 Servers," elsewhere in this Communicator document, for more information.

New Web-Based Resource

New Web-Based Resource Enables Customers to Look Up MPE/iX Revisions Supported by Software Vendors.

When planning an operating system upgrade, customers are interested in knowing if their third-party software vendors have certified their products on the new release.

HP has created a new web-based resource that enables customers to look up revisions of MPE/iX supported by third-party software vendors. For more information on this resource or to look up a specific partner go to the following website:

<http://www.hppartners.com/meet.php3>.

NOTE	Before undertaking an upgrade customers should check directly with their third-party software vendors to ensure that they have acquired the proper software revision levels.
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MPE/iX Release 6.0 End Of Support Extended

MPE/iX Release 6.0's End Of Support date has been extended to April 30, 2002. After that date, HP will no longer generate new Release 6.0 patches and will not accept support calls on Release 6.0 based problems. Customers should plan on updating all their HP e3000 systems to a later release before April 30, 2002. Release 6.0 first shipped in October, 1998.

This Release 6.0 End Of Support date coincides with the End Of Support date for the 9x7 series systems. See the article, "HP Will Retire Support of HP 3000 9x7 Servers," in this Communicator document for more information.

6250 bpi Tapes As A Software Distribution Media

HP is stopping the usage of 6250 bpi tapes for the distribution of HP software with the shipment of Release 7.0. Customers can no longer sign up for 6250 bpi software distribution media. Customers with existing contracts that call for 6250 bpi tapes will still receive these tapes for releases prior to 7.0, but all customers are encouraged to update their contracts to use either DDS or CDs as their software distribution media.

6250 bpi tape drives will still be supported for customer usage. HP simply has stopped distributing software using this media.

HP Will Retire Support of HP 3000 9x7 Servers

Introduced almost a decade ago, the HP 3000 9x7 Servers were once the workhorse of the HP 3000 family. In recent years, however, the 9x7's have been replaced by more powerful, affordable, smaller and efficient HP e3000 platforms.

With the increasing scarcity of repair parts, HP announced in December 2000 that support for all HP 3000 9x7 Servers will be ending on April 30, 2002. Support for some versions of the MPE/iX operating system used by 9x7 Servers also will be ending soon. Support for MPE/iX Release 5.5 ended on December 31, 2000, and support for MPE/iX Release 6.0 ends on April 30, 2002. No date has been set for the end of support for MPE/iX Release 6.5. **MPE/iX Release 7.0 will not support any HP 3000 9x7 Servers.** (This is similar to MPE/iX Release 6.5, which did not have the ability to support the 925/935/949, 920/922/932/948/958 or 950/955/960/980 families).

Protect your investment

As the end of support for the HP 3000 9x7 Servers approaches, parts will be in shorter supply and support prices are likely to rise. If you have an HP 3000 9x7 Server, you should begin planning to replace it with current HP e3000 Servers. Because of the complete backward compatibility of MPE/iX, most applications will run unaltered on newer HP e3000 machines. HP e3000 'box upgrades' typically are quick and seamless.

New replacement HP e3000 Servers currently include the HP e3000 9x8, 9x9KS, 997, A-Class and N-Class platforms. Sales of new HP e3000 9x8, 9x9KS and 997 servers are expected to be discontinued in the second half of 2001.

New options and opportunities

Upgrading to a current HP e3000 platform is an ideal opportunity to revisit how your business utilizes the HP e3000. HP and its resellers provide many attractive, seamless options for helping you move forward into newer, affordable HP e3000 technologies. Recent MPE/iX capabilities such as Internet server support, Java programming, high-availability tools, graphical user interfaces and hardware consolidation options can improve the efficiency of your HP e3000 Servers, increase productivity and provide you with greater user satisfaction.

HP and its resellers can help you move your HP 3000 9x7 applications to newer HP e3000 Servers with longer support lives. By acting now, you can minimize the challenges of such a move, reduce your ongoing operational costs, and improve the overall productivity of your HP e3000 solutions.

Please call your HP representative or local reseller for additional information on excellent replacement servers for your HP 3000 9x7 Servers, or visit us at http://mpeixservers.hp.com/news_events/discontinuances.html.

Removal of Support for Servers and HP-IB in MPE/iX

In order to streamline the development and test of future MPE/iX releases, the PBA-IB HP-IB Device Adapter (A1747A) and old CIB I/O based HP 3000 Servers does work with MPE/iX Release 6.5, 7.0, and later releases.

The PBA-IB HP-IB Device Adapter was discontinued in May 1999 and has an end of support date of November 1, 2001. The following old CIB I/O (also known as CIO) based HP 3000 Servers will have completed their end-of-support well before November 1, 2001:

- the 925/935/949 family
- the 920/922/932/948/958
- the 950/955/960/980 family

HP-IB and the above HP 3000 Servers will continue to be supported through their end-of-support date on MPE/iX Release Release 6.0 (which has an end-of-support date of April 30, 2002).

NOTE If you are running MPE/iX on one of these older systems, or on a system with any of these older cards or peripherals, you must **not** update that system to Release 6.5 or 7.0.

Customers wishing to replace their HP-IB I/O cards and peripherals should consider SCSI or LAN connected peripherals. Customers wishing to replace the above older HP 3000 Servers, as they complete their support life, should consider the HP e3000 A-Class or N-Class Servers.

Discontinuance of High Availability Fiber Link Disk Drives

In May 1993, Hewlett-Packard Company introduced a family of High Availability Fiber Link disk arrays. Those Fiber Link (HP-FL) disk arrays were discontinued in August of 1997, along with other standalone Fiber link disk drives. The Fiber Link disk arrays were HP's first RAID devices built for high availability, high performance, high capacity and distances up to 500 meters. Since 1993, HP has embraced new disk array technologies, HP XPxxx disk arrays, High Availability Model 10 and 20 disk arrays and AutoRAID.

CSY is also moving to new processor technologies. These new computers call for new I/O cards, devices drives and I/O backplanes. MPE/iX is also changing. MPE/iX 6.5 is the first HP e3000 operating system to support some of these new I/O requirements. Therefore, MPE/iX 6.5 and later releases will not support Fiber Link disk I/O system drivers, I/O cards, and Fiber Link disks. The last release of MPE/iX to support HP-FL drivers and disk is MPE/iX 6.0.

The following is a partial list of products not carried forward in MPE/iX 6.5 and later:

Part #	Description of Obsolete Part
C2258HA	1/02 High Availability FL disk array
C2254HA	4/99 High Availability FL disk array
C2252B	4/99 High Availability FL disk array
C2258B	1/02 High Availability FL disk array
C2252HA	4/00 High Availability FL disk array
C2254B	4/99 High Availability FL disk array
C2259B	1/02 High Availability FL disk array
C2259HA	1/02 High Availability FL disk array
C2201A	8/97 FL disk
C2204A	8/97 FL disk
A1748A	PBA FL Chan-span card with HP-FL adapter
A28616A	PBA FL NIO Optic interface card
A27115A	CIO Fiber Optic interface card

Obsolete Products Removed from as of 6.5

*by Allan Hertling
CS R&D*

Numerous products that have reached their “End of Support Life” were removed from the SUBSYS tape for the 6.5 release and later.

The following obsolete products have been removed.

Product Number	Product Description
B1710A	NWOffice (FULL)
B1711A	NWOffice (DESK)
B1712A	NWOffice (ACCESS)
B1713A	NWOffice (CORE)
B1714A	NWOffice (FULL)
B1715A	NWOffice (DESK)
B1716A	NWOffice (ACCESS)
B1716B	Access Server/XL
B1717A	NWO-AccessSQL
B1717B	NWO-AccessSQL
B1718A	Resource Sharing
B3160A	CCSY Access Server
B3162A	CCSY Access SQL
32560A	PSP (FULL)
32561A	PSP (DESK)
32562A	PSP (ACCESS)
32563A	PSP (CORE)
32571A	Cooperative Services/XL
32586A	Information Access
35460A	PC Backup/XL
36561A	HPSpell (AM)
36562A	HPSpell (DUAL)
36576A	HPSlate
36930A	DSG-V
50700A	LaserRX

Product Number	Product Description
HP32020B	Netware/iX

This product removal from the SUBSYS tape will affect you if one or more of these products reside on your system.

During an FOS Update

If your system contained any of the above listed products, the associated library modules were removed from the system libraries. The product files will not be removed.

NOTE The products listed above are obsolete and no longer supported. There is no guarantee that they will continue to function correctly under Release 6.5 or future versions of the operating system.

Following an Install

None of the products listed above will reside on your system after you have completed an `INSTALL` using the Release 6.5 or later tapes. If any of the products listed above are required on the system, the product files will have to be retrieved from a previous system backup which contains the product files.

NOTE Once again, the products listed above are obsolete and no longer supported. There is no guarantee that they will continue to function correctly under Release 6.5 or future versions of the operating system.

Files Associated with Obsolete Products: Resource Sharing, CCSY Access Server, CCSY Access SQL, Cooperative Services/XL

by Sue Meloy
CS-R&D

The following products are obsolete and no longer being shipped:

- B1718A Resource Sharing
- B3160A CCSY Access Server
- B3162A CCSY Access SQL
- 32571A Coop. Services/XL

Files associated with these products may still exist on your system. The following files are installed by these products and can be removed if you wish to clean up your system. Since some of these files may be accessed by networking software, stop network services on the system before removing the files.

After removing the files, stream JCONFJOB.NET.SYS to rebuild the network services configuration files, then restart the networking software.

Files related to B1718A Resource Sharing	
CDM000.PPC.SYS	JROOTCON.PPC.SYS
CPDMG000.PPC.SYS	PDSMAST.NET.SYS
CRCDG000.PPC.SYS	PDSSERV.NET.SYS
DISCMGR.PPC.SYS	PDSFILE.NET.SYS
RESMGR.PPC.SYS	RSUDC.PPC.SYS
PDBAKUP.PPC.SYS	RSCONF.PPC.SYS
DISCSCAN.PPC.SYS	README.PPC.SYS
PDSERVER.PPC.SYS	NOTICE.PPC.SYS
PDDIAG.PPC.SYS	CLC000.PPC.SYS
ROOTCONV.PPC.SYS	NWOLC.PPC.SYS
NBMON.PPC.SYS	CPDDG000.PPC.SYS
PDXL.PPC.SYS	QDIAG000.PPC.SYS
TRACEMAP.PPC.SYS	PPCDIAG.PPC.SYS
JPDINSTL.PPC.SYS	PPCDIAGC.PPC.SYS
JDISCAN.PPC.SYS	

Also, modules HP32589_01 and NWOLC_01 in XL.PUB.SYS and segment PPCDIAG in SL.PUB.SYS are installed by this product.

Files Related to B3160A CCSY Access Server	
HDFMC000.PPC.SYS	ADMENUS.PPCUTIL.HPOFFICE
HDFHC000.PPC.SYS	DHDPGINP.PPCUTIL.HPOFFICE
ADFRM000.PPC.SYS	DHDPMODS.PPCUTIL.HPOFFICE
TRFRM000.PPC.SYS	DHDPMAP.PPCUTIL.HPOFFICE
HDSP.PPC.SYS	SSAMPL1.PPCUTIL.HPOFFICE
DICINIT.PPC.SYS	SSAMPL2.PPCUTIL.HPOFFICE
DICTCONV.PPC.SYS	SHDPDIC.PPCUTIL.HPOFFICE
HDSPNS.PPC.SYS	SHDPENV.PPCUTIL.HPOFFICE
ADMIN.PPC.SYS	SDIAGDB.PPCUTIL.HPOFFICE
TRANS.PPC.SYS	JDICTCHG.PPCUTIL.HPOFFICE
HDPBATCH.PPC.SYS	JDICTCLN.PPCUTIL.HPOFFICE
HDPUTIL.PPC.SYS	HDSPMAST.NET.SYS
HDPLOAD.PPC.SYS	HDSPFILE.NET.SYS
HDPUNLD.PPC.SYS	HDSPSERV.NET.SYS
ENVINIT.PPC.SYS	ALLDBIN.PPCUTIL.HPOFFICE
XL.PPC.SYS	SAMPL1IN.PPCUTIL.HPOFFICE
WHATSNEW.PPC.SYS	SAMPCMD.PPCUTIL.HPOFFICE
ACUDC.PPCUTIL.HPOFFICE	JINSTHDP.PPCUTIL.HPOFFICE

Files Related to B3162A CCSY Access SQL	
IASOLID.PPC.SYS	IAGRANT.PPC.SYS
IASOLIDV.PPC.SYS	IACAT000.PPC.SYS
IASOLIDC.PPC.SYS	IASQLDAD.PPC.SYS
JIASOLID.PPC.SYS	IASQLSVR.PPC.SYS
IASQLSN2.PPC.SYS	SQLFILE.NET.SYS
IASQL.PPC.SYS	SQLMAST.NET.SYS
IASQLSN1.PPC.SYS	SQLSERV.NET.SYS

Files Related to 32571A Coop. Services/XL	
HCS.PPC.SYS	HCSERVER.PPC.SYS
SHCSAMP.PPCUTIL.HPOFFICE	HCSMAST.NET.SYS
SAMPXEQ.PPCUTIL.HPOFFICE	HCSERV.NET.SYS
JHCSAMP.PPCUTIL.HPOFFICE	HCSFILE.NET.SYS

Important Predictive Support Changes in MPE/iX 6.5 and Later

by Gary Robillard
CS-R&D

Product Overview

HP Predictive Support provides proactive hardware support and helps increase the uptime of your systems by monitoring system memory and disk/tape drives.

When the HP Predictive Support software detects a potential problem, it sends a message to the HP Response Center. The Response Center portion of the system screens the data and forwards problems requiring further analysis to a Response Center Engineer. If action is needed at your site, the Response Center Engineer and the account Customer Engineer will work with you until the problem is resolved.

This proactive hardware support is provided as part of the HP Hardware and Software Support Agreement.

Predictive Support Changes as of MPE/iX Release 6.5

The Predictive Support Monitor (`PSMON.PRED.SYS`) startup model has been changed. On previous versions of MPE, `PSMON` was automatically started by the Diagnostic system monitor (`DIAGMON.DIAG.SYS`), which was part of the `sysdiag` diagnostic system. The Support Tools Manager (STM) has replaced the `sysdiag` diagnostic system on MPE iX 6.5. A new job named `JPSMON.PRED.SYS` was created to start `PSMON`.

Predictive Support relies on a `sysdiag` diagnostic library, and because of this, there is currently no way to have `PSMON` started by the STM diagnostics. `PSMON` is now launched by streaming the job `JPSMON.PRED.SYS`. If you want Predictive Support to monitor your system, `JPSMON.PRED.SYS` must always be running.

WARNING **If `JPSMON.PRED.SYS` is not running, Predictive Support will not perform its daily scheduled run to monitor your system.**

To determine if `JPSMON` is running, you can use the MPE iX `SHOWJOB` command, as follows:

```
:SHOWJOB JOB=PSMON,MANAGER.SYS
```

You should see one active job.

The installation job for Predictive Support will attempt to place a “`STREAM JPSMON.PRED.SYS`” command in the system startup file (`SYSSTART.PUB.SYS`), after the `STREAMS` command. If this fails, then you should manually add a line to `SYSSTART.PUB.SYS` to stream the `JPSMON.PRED.SYS` job.

NOTE The `sysstart` must have a creator of `MANAGER.SYS` in order to be automatically executed during system startup. Additionally, the first line of `sysstart` should be the `STARTUP` directive.

You should insure that there is a “`SPOOLER LP;OPEN`” and a “`STREAMS 10`” command before the “`STREAMJPSMON.PRED.SYS`” command in the `SYSSTART` file. Also recognize that for your system, the line printer might have a different class name than “`LP`,” and your streams device might have a logical device number other than 10.

Here is an example of what the lines in `SYSSTART.PUB.SYS` might look like:

```
Startup
Limit 20,60
Jobfence 7
Spooler lp:start
Streams 10
Continue
Stream jstrtlan.sysmaint.sys
Continue
Stream jpsmon.pred.sys
**
```

HP Predictive supports the following new peripherals:

DGHS04Y	4GB SCSI Disk Drive
ST32272WD	2GB SCSI Disk drive
ST34572N,W,WC,WD	4GB SCSI Disk Drives
ST34573N,W,WC,WD	4GB SCSI Disk Drives
DGHS09Y	9GB SCSI Disk Drive
ST39102LC	9GB SCSI Disk Drive
ST39173N,W,WC,WD	9GB SCSI Disk Drives
ST39175WC,LC,LW	9GB SCSI Disk Drive
ST118273N,W,WC,WD	18GB SCSI Disk Drives
ST318203LC	18GB SCSI Disk Drive
ST318275LC,LW,WC	18GB SCSI Disk Drives
ST136475LW,WC	36GB Disk Drives
DLT4000	SCSI Digital Linear Tape
DLT7000	SCSI Digital Linear Tape

The following peripherals are no longer supported:

Any HPIB or FLEX Interface Disk, including but not limited to:	
HPC2200A	335MB HPIB Disk
HPC2202A	670MB HPIB Disk
HPC2203A	670MB HPIB Disk
HPC2281A	335MB HPIB Disk
HPC2282A	670MB HPIB Disk
HPC2201A	670MB Flex Disk
HPC2204A	1.34GB Flex Disk

The following SCSI disks are no longer supported:

HPC2460x	420MB Disk
HPC2461x	673 MB Disk
HPC2462x	1.36GB Disk
HPC2470x	234MB disk mechanism
HPC2471x	328MB disk mechanism
HPC2472x	422MB disk UPGRADE KIT
HPC2473x	673MB Disk UPGRADE KIT
HPC2474R	1.36GM C3 UPGRADE KIT
HPC3010M1	2GB SCSI Disk (As of April 30, 2000)

Obtaining Software Security Patches for your HP Computer System

Hewlett-Packard would like to make you aware of a special free service provided for all customers of HP e3000 and HP 9000 computer systems. This service gives customers a direct route to Hewlett-Packard for obtaining information relating to the security of their Hewlett-Packard Computer System(s).

Hewlett-Packard issues information on the availability of Software security patches via Security Bulletins to subscribers of the HP Security Bulletin Digest e-mail service, a part of the IT Resource Center (formerly the HP Electronic Support Center). A Hewlett-Packard support contract is NOT required to subscribe to this service to obtain information or security patches. Any purchaser of an HP e3000 or HP 9000 Computer System can make use of the HP Security Bulletin services at no charge.

Customers may also obtain information and Security Bulletin services via the World Wide Web.

A security problem is a software defect that allows unauthorized personnel to gain access to a Computer System or to circumvent any of the mechanisms that protect the confidentiality, integrity or availability of the information stored on the system. When such problems in Hewlett-Packard software are brought to the attention of the company, their resolution is given a very high priority. This resolution is usually in the form of a Security Bulletin which may explain how to correct the problem or describe how to obtain a software security patch that will correct the problem.

Hewlett-Packard has introduced this service as the primary mechanism to alert subscribers to security problems and provide corrections. Hewlett-Packard will not analyze the relevance of any security patch to any individual customer site within the scope of the HP Security Bulletin service. The responsibility for obtaining and applying security patches resides with the customer.

The remainder of this letter outlines the various security related services offered by HP IT Resource Center and the methods for subscribing to and retrieving information from it. It also outlines how you can inform Hewlett-Packard of potential security concerns you may have with your Hewlett-Packard Computer System.

HP IT Resource Center Security-Related Services

HP IT Resource Center offers subscribers the following benefits:

- Receive Security Bulletins automatically when they are published.
- Retrieve the archive list of bulletins issued prior to subscription.
- Download security patches if the subscriber configuration supports it.

Remember, an HP support contract is not required to subscribe to HP Security Bulletin services.

Subscribing to HP IT Resource Center Security Bulletin Services

Once you have placed your name on the subscriber list for future Security Bulletins (see instructions below), you will receive them via e-mail on the day they are issued by HP.

As referenced below, you can also view a list of past Security Bulletins issued in the “HP Security Bulletins Archive.”

Instructions

To subscribe to automatically receive future NEW HP Security Bulletins from the HP Electronic Support Center via electronic mail, do the following (instructions subject to change without notice):

1. Use your browser to access the HP IT Resource Center web page at:

http://us-support.external.hp.com US, Canada, Asia-Pacific,
and Latin-America

http://europe-support.external.hp.com Europe

2. Logon with your User ID and password (or register for one). Remember to save the User ID assigned to you, and your password.
3. Once you are on the HP IT Resource Center home page, click on “Support Information Digests.” On this page, you can subscribe to many different digest services, including the Security Bulletin Digests.

To review Security Bulletins that have already been released, click on “Search Technical Knowledge Base (Security Bulletins only)” on the HP Electronic Support Center home page. Near the bottom of the next page, click on “Browse the HP Security Bulletins Archive.”

Once in the archive, click on “HP-UX Security Patch Matrix” to get a patch matrix of current HP-UX and BLS security patches. Updated daily, this matrix categorizes security patches by platform/OS release, and by Security Bulletin topic.

If You Discover a Security Problem

To report new security vulnerabilities, send e-mail to

security-alert@hp.com

Please encrypt any exploit information using the security-alert PGP key, available from your local key server, or by sending a message with a -subject- (not body) of ‘get key’ (no quotes) to security-alert@hp.com.

3 New Networking

This chapter contains the following articles about the New Networking capabilities.

- MPE/iX A and N-Class Console
- PCI WAN Sync MUX (Adapter Card and Driver) for A and N-Class Servers
- Multi-function core I/O card for A and N-Class Servers
- The PCI 100Base-T Link Product for A and N-Class Servers

MPE/iX A-Class and N-Class Console

*by John Spitzer & Jeff Bandle
Commercial Systems Division*

Introduction

The release of MPE on the PA-RISC N-Class and A-Class platforms demonstrates HP's Commercial Systems Division's commitment to supporting the new PCI based I/O architecture for HP e3000 platforms. The change to the PCI I/O architecture affects all devices that are connected to the system. Because this is a new platform for MPE, there are significant changes to the hardware and software used to access and use the system console. This article describes how the new platform affects console commands and operations. Although the hardware and software are changed, you will see minimal changes that affect how the console ports on this platform are used.

Before the MPE operating system is started, all console access is made through connections to the platform's Core I/O card. This article gives a high level overview of the functions present on the Core I/O card and detailed description of the functions used to access the console features.

Console Function Summary

The Core I/O card is a component installed in the N-Class and A-Class systems that contains all the I/O components necessary to configure a bootable system (not including disks and tapes drives and terminals). The core I/O card contains the following functions:

Guardian Service Processor

The Guardian Service Processor (GSP) provides the functionality required for basic console operations to control the hardware before the OS is booted and to provide the connectivity to manage the system. The functions supported by the GSP are similar in nature to those provided by the Access Port (AP) interface on previous platforms. For example, display selftest chassis codes, execute boot commands, determine installed hardware, etc. The GSP has significant additional functionality that significantly improves the security and accessibility of the console. By using functions built into the Core I/O card, the N-class and A-class systems can easily be fully managed from any remote location

Serial ports

The three external serial ports perform the same general purposes as on previous platforms.

- **Local console:** This port provides a connection for a C1099A terminal. This port provides direct access to the system. The C1099A is the model of terminal that is supported on the console port of the N-Class and A-Class platforms. This terminal supports both the block mode and character mode application that are necessary to configure and manage the system. The local console port is also the default port where console messages are sent. These messages are typically the logon/logoff messages and

console requests such as tape requests and spooler status messages. This is configured as ldev 20 on the system.

- Remote console: This port provides a modem capable port for remote support access. This is the only port on the Core I/O card that supports a modem connection. It is not recommended for this port to be used for general user dial-in access. In most environments, this port is used to provide a remote connection for Predictive support. The supported modem is the Multi-Tech model MT5634ZBA (HP Part No: 0960-1074).
- UPS port: This port is used solely for support of HP Power Trust Uninterruptable Power Supplies (UPS) connected to the MPE system. These battery power devices are used to ensure a system will stay up during a power failure and that power surges won't damage or destroy the system boards.. The console driver will not allow a user to logon to this port. This behavior is the same as on previous platforms.

The GSP LAN/Console access

This port provides a 10Base-TX connection into the GSP. The system Core I/O card on the N-class and A-class systems contains an imbedded Telnet/TCP/IP networking stack in firmware. Associated with this stack is a 10BT RJ45 networking connectivity port that can be used to perform almost all console functions that are available on the local and remote console ports such as startup and shutdown of the system. There is more detail on the features of this port later in this article. When a telnet connection is established to this port and the user is logged on to the GSP, the user will see a mirrored display of all messages going to the local console port. The user can take write access and perform almost all the system management function that can be performed on the local console.

NOTE This networking port is NOT the general purpose networking port and can only be used for console access.

GSP LAN Port

This port provides an independent LAN connection to the Core I/O card. This port has its own IP node and telnet server. This port is configured with an IP address, subnet mask and gateway address. When enabled, a connection is established to the port via telnet from any telnet client. The GSP provides the user and password protected logon. *This is not a secure telnet connection.*

Once a user is logged on to the GSP, the user has the capability to perform almost all of the same console tasks that are available from the local console. This includes full startup and shutdown capability, remote power on/off control, configure and control most GSP operations. The system can be fully managed via a connection to this port. The physical LAN connection to this port is completely independent from the general system LAN and cannot be used to access other MPE functions.

GSP Features

The GSP provides the functionality to locally and remotely manage the system console functions.

Console mirroring

Users of the GSP are categorized with two sets of capabilities.

A console *Operator* can use the system's console, manage the system when a problem occurs (rebooting it, etc,...), diagnose system failures through GSP logs and allow a pre-configured remote console to connect. This is the usual set of capabilities required to operate and manage a system. A console *Administrator* has the additional abilities to set up the GSP configuration in order to allow correct system operation and management. This mainly includes configuring login/password and access control and system monitoring features. Once all the configurations are complete the system can be fully operated and managed with the *Operator* capability only.

There are a set of mirroring rules that control what each class of user can do and see while other users are connected at the same time. For example if an operator is the first to log in to the GSP and then an administrator connects, only those commands allowed the operator are available. If an administrator is the first to log on to the GSP and then an operator connects, the operator will have NO mirroring output.

NOTE If the administrator is connected at a port other than at the local console, the local console is not available. The administrator must disconnect to re-allow access to the local console. If necessary, the remotely connected administrator can be forcibly disconnected by pushing a small reset button on the rear of the system on the Core I/O card.

When enabled, and a user connects to the remote port and/or GSP LAN port, the GSP will mirror console activity to connected users. There is always only one user that has the ability to enter commands. All other connected users will see a message telling them they don't have write access. Write access can be obtained by entering the characters ^Ecf (Ctrl-E cf) within 3 seconds.

Password protected access

All access to the GSP can be protected by username and password authentication. The users can also be configured so that they are allowed only one successful logon. If so configured, when they logoff, the GSP administrator must re-enable access if they want to allow access to that user.

Session ldev

The remote serial port can create a session on a separate ldev. For example, if an ldev is configured on the proper path in Sysgen and NMMGR (typically ldev 21) and remote console access is disabled in the GSP, then a user would log on to that ldev, when they connected to the port. In this case, no GSP access is available. If remote console is enabled and the user is mirroring the console on the remote port, the GSP command 'SE' will suspend console mirroring and establish a connection to the configured ldev.

Remote power up/down

From the GSP interface, the user can power up or down the system. This feature is available unless the front panel switch is turned off. The function behaves almost like the user turned off the front panel switch.

Functionality

Local, remote, UPS ports

On the first three physical serial ports, you will see almost no difference in console functionality between the new PCI driver and the HP-PB (NIO) driver that is available on previous platforms. The driver supports the three serial ports for local console, remote modem port and the UPS port.

Unsupported functionality

There are two console features that are no longer supported on the N-class and A-class systems.

- **AutoDial:** This driver does not support outgoing AutoDial. This feature was part of the NIO card firmware and, at one time in the past, Predictive Support was the only known product using autodial to initiate calls. Predictive Support is no longer using this method to initiate calls. Instead Predictive is sending all the necessary modem commands via the normal write path.
- **Speed sense:** This was also a built-in feature of the HP-PB (NIO) card. We chose to not implement this because: a) it was difficult to do in the driver; b) there is a limited need to have this on the console.

GSP Commands

The purpose and function of many of the GSP commands are similar to the Access Port commands on previous platforms. There is extensive online help text.

Here is a GSP command summary:

```
==== GSP Help =====(Administrator)===
AC  : Alert display Configuration          PC  : Remote Power Control
AR  : Automatic System Restart config.    PG  : PaGing parameter setup
CA  : Configure Asynch/serial ports       PS  : Power management module Status
CL  : Console Log- view console history   RS  : Reset System through RST signal
CO  : COnsole- return to console mode     SDM : Set Display Mode (hex or text)
CSP : Connect to remote Service Proc.     SE  : SEssion- log into the system
DC  : Default Configuration              SL  : Show Logs (chassis code buffer)
DI  : DIscconnect remote or LAN console   SO  : Security Options & access control
EL  : Enable/disable LAN access          SS  : System Status of proc. modules
ER  : Enable/disable Remote/modem        TC  : Reset via Transfer of Control
HE  : Display HElp for menu or command    TE  : TEll- send a msg. to other users
IT  : Inactivity Timeout settings        VFP : Virtual Front Panel display
LC  : LAN Configuration                 WHO : Display connected GSP users
LS  : LAN Status                        XD  : Diagnostics and/or Reset of GSP
MR  : Modem Reset                       XU  : Upgrade the GSP Firmware
MS  : Modem Status
```

Details of selected commands:

Security Options (SO): This command is used to configure GSP users and passwords. The default configuration is no users are configured. All connections to the GSP have administrator capability.

The first user configured is created as administrator. Once created, several console mirroring rules will come into play. For example if an administrator is logged on, then an operator capable user can't log on till the administrator disconnects. If an administrator is connected via the GSP LAN port, no access (not even ^B) is allowed on the local console until the administrator disconnects.

If the administrator password is lost, then the user configuration in the GSP must be cleared via a rear panel reset button. The user configuration is cleared by pushing the reset button and then responding to a prompt on the local console within 30 seconds. If the prompt is not answered, then the user configuration is retained.

GSP users can be configured for DIAL-BACK access. This means that when that user logs on to the GSP through the remote port, the GSP will hang up and dial that user back at a configured phone number.

Power Control and Status(PC, PS) Allow the user to switch system power ON or OFF. This is almost like turning the system power off at the front panel switch. This will work as long as the real front panel switch is left in the 'ON' position.

Paging parameters (PG): This feature is able to generate a paging message based on the chassis codes that arrive in the GSP. This requires a modem to be connected to the remote port and to be properly configured. On receipt of the appropriate level of alert, the GSP will dial a configured number to send an alpha-numeric page. Part of the alpha-numeric pager message is the string configured in this command, describing the alert level that caused the page.

Upgrade the GSP Firmware (XU): The upgrade is performed using ftp over the GSP LAN. The command provides a dialog that contains a default IP address and anonymous ftp logon to a server where the upgrade files reside. The user can override this location if the files have been copied to a more local server. This command can only be run from the local console port.

Configuration

This section provides information on how to configure the console terminals and the ldevs in Sysgen and NMMGR

NMMGR Configuration

There is no change in the parameters configured in NMMGR, except that Modem Type V22.bis is not supported on the N-Class and A-Class systems

Console terminal Configuration

Some of the terminal configuration parameters are important for proper GSP operation. The C1099A terminals connected to the local and remote console ports should be configured with the following parameter settings: All other terminal parameters not mentioned should be left at the default setting. To get to the configuration menus press the

[F10] key then [F8].

```
F2 Genrl:Emulation=HPTerm
F6 Ports:
EIA Baud Rate=9600
EIA Data Forma=8/1/N
EIA Parity Check=Off
EIA Xmit=No Protocol
EIA_Recv=Xon-Xoff(XPC)
Enhanced=On
F7 Host:Comm Mode=CharacterLocal Echo=Off
F9 Emul:Terminal ID: 70096
```

NOTE The HP C1099A terminal is the model that is officially supported on the N-Class and A-Class systems. However, there have been no steps taken to preclude operation with other terminals. For example, the GSP does not check the terminal identification. Use other terminals at your own risk. The 700/9x family of terminals is known to work but have not been certified on this platform.

Sysgen Configuration

The following data shows the details of the information that needs to be added to the IO configuration in Sysgen in order to configure the core I/O serial devices. The ldev 20 configuration is shown. The configuration of the remote session and UPS devices are the same except for the PATH and LDEV paramters. Additionally, the UPS port requires the class HPUPSDEV to be assigned. Note the two new ID's 'PCI_CONSOLE' and 'C1099A' created for these entries.

```
io> lp 0/0/4/0
PATH: 0/0/4/0                LDEV:
ID:  PCI_CONSOLE            TYPE: DA
PMGR:  PCI_CONSOLE_DAM      PMGRPRI: 6
LMGR:                MAXIOS: 0
```

```
io> lp 0/0/4/0.0
PATH: 0/0/4/0.0            LDEV: 20
ID:  C1099A                TYPE: TERM
PMGR:  CDM_CONSOLE_DM      PMGRPRI: 9
LMGR:  TIO_TLDM            MAXIOS: 0
```

```
io> ld 20
LDEV: 20  DEVNAME:          OUTDEV: 20  MODE: JAID
ID: C1099A                RSIZE: 40  DEVTYPE: TERM
PATH: 0/0/4/0.0          MPETYPE: 16  MPESUBTYPE: 0
CLASS: TERM
```

I/O paths used for the core I/O serial ports.

The serial ports on the Core I/O card are configured on the following I/O paths:

```
0/0/4/0.0 - console; Ldev 20
0/0/4/0.1 - remote session
0/0/4/0.2 - UPS device
```

Modem protocols

CCITT Mode – In this protocol the driver waits for RI before raising DTR. It also requires the modem to assert DSR, RTS and DCD before a connection is established..

Bell Mode - This is sometimes called Bell simple protocol. The driver raises DTR when it can accept a connection. The connection is valid when the driver sees DCD from the modem.

The remote session path must be configured for a modem protocol. The GSP uses the 'drop of modem line' commands to the card to detect session termination.

With this new console functionality, system managers of MPE based N-Class and A-Class systems will be able to use their existing applications on the console, as well as access the console from more remote locations with minimal extra hardware setup. A few simple commands to configure the console networking and remote lan access will be enabled.

Conclusion

The new and retained features of the N-Class and A-Class console provide the ability to fully manage the HP e3000 from local and remote locations with a minimum of additional hardware and no additional software. A few simple commands are all that are required to configure and access these powerful system management capabilities. These features make it easy to manage the system in a wide variety of data center environments.

PCI WAN Sync MUX (Adapter Card and Driver)

*by Learning Products Team
Commercial Systems Division*

The new class of HP e3000 systems has PCI-bus based hardware architecture. So new drivers must be developed to support new PCI-based peripheral devices, including a new WAN Sync MUX card.

The WAN Sync MUX product is a combination of hardware, firmware protocol modules and the host driver with the following features:

- WAN connectivity solution for PCI-bus based HP e3000 systems
- IBM (SNA) connectivity solution for PCI-bus based HP e3000 systems.
- Same interface to LAN/WAN network stacks (e.g., NS TCP/IP) as exists on HP-PB systems.
- Same interface to SNA network stacks (e.g., IMF, APPC, NRJE, etc.)
- Software component bundled with FOS and SUBSYS.
- PCIWAN Sync MUX add-on adapter card must be ordered separately.
- PCI equivalent to HP_PB PSI link product (A5563A)

The PCI WAN Sync MUX requires firmware downloads and has real on-board processor and memory. The level-2 protocols (SDLC and LAPB) will be running on the card. This simplifies the driver's operations.

PCI WAN Sync MUX encompasses the new software driver and new add-on adapter card that are required to provide WAN and IBM connectivity for the new system architecture. It is a distinct and separate product from HP-PB PSI, which is incompatible with the new architecture.

From a customer perspective, there is no major difference in how the networking subsystems will operate compared to HP-PB HP e3000 systems. The change to the underlying hardware architecture will be basically transparent. Customers currently using NS, TCP/IP, and SNA products and applications will run their applications the same as they do on HP-PB (using PSI hardware) systems, only they will now run over the PCI WAN MUX LAPB and SDLC links respectively.

This approach is fundamental to the HP e3000 PCI design philosophy: the underlying hardware/architecture changes should not impact upper layer software products or customer applications, and should be essentially transparent.

NOTE Please note that, unlike PSI, Bi-Sync/RJE is not supported on Sync MUX.

The software component for the new PCI WAN Sync MUX link product will be bundled into FOS (MPE/iX 7.0 and later) and SUBSYS. The customer needs to order the hardware (Sync MUX adapter add-on card) and software (LAP-B or SDLC) separately for their system. This is the same as HP-PB PSI.

The PCI WAN Sync MUX Add-on Adapter Card has the following features.

- Multi-port card (8 ports)
- Can support multiple WAN protocols such as HDLC-NRM(SDLC), HDLC-LAPB (AND x25), HDLC-LAP-D (ISDN), Frame Relay, etc.
- “Intelligent” card with on-board memory and downloadable firmware.
- Protocols will be running on the card.
- Can support running of multiple protocols on different ports at the same time.
- Same adapter card is supported by HP-UX on their N-class servers.

The card is capable of supporting up to 2 Mbps speeds, which can be configured in NMCONFIG.

Multi-function core I/O card

*by Learning Products Team
Commercial Systems Division*

The Core I/O card is a component installed in the N-Class and A-Class systems that contains all the I/O components necessary to configure a bootable system (not including disks and tapes drives and terminals). The core I/O card contains the following functions

Guardian Service Processor

The Guardian Service Processor (GSP) provides the functionality required for basic console operations to control the hardware before the OS is booted and to provide the connectivity to manage the system. The functions supported by the GSP are similar in nature to those provided by the Access Port (AP) interface on previous platforms. For example, the functions display selftest chassis codes, execute boot commands, determine installed hardware, etc. For more information on the GSP functions see *System Startup, Configuration, and Shutdown Reference Manual* Appendix H and the article in this chapter, *MPE/iX A-Class and N-Class Console*.

Serial ports

The three external serial ports perform the same general purposes as on previous platforms.

- Local console provides direct connect for a C1099A terminal.
- Remote console port provides a modem capable port for remote support access. It is not recommended for this port to be used for general user dial-in access.
- The third serial port is intended for use to connect to a UPS. The console driver will not allow a user to logon to this port. This behavior is the same as on previous platforms.

The GSP LAN/Console Port

This port provides a 10Base-TX connection into the GSP. When a logon is established to the GSP, that logon can be used to perform almost all console functions that are available on the local and remote console ports such as startup and shutdown of the system.

SCSI Connections

The N-Class Core I/O card contains embedded versions of both an A5159A (Dual Port) and an A5149A (Single Port) cards. The A5159A portion of the Core I/O card supports the two internal system disk slots. The A5149A portion of the Core I/O card presents a single LVD/SE bus for the connection of device(s) external to the system.

The A-Class Core I/O card contains embedded versions of both the A5159A (Dual Port) and a A5150A (Dual Port) cards. The system uses one port from each card to support a single internal disk and presents the other SCSI bus to allow the connection of external SCSI peripherals. Path 0/0/1/0 (from the A5159A) is provided with a VHDCI 68-pin LVD/SE

connector. Path 0/0/2/0 (from the A5150A) is provided with a special HD 50-pin SE connector: this connector only supports an 8-bit data path so only “narrow” SCSI devices such as the DDS-3 Tapes may be connected.

See the section titled **PCI-SCSI Device Adapter Cards on HP e3000 N-Class and A-Class Systems** for details on configuring and using these SCSI ports.

10/100Base-TX LAN

The port is capable of providing full 10/100Base-TX connectivity for general system network access. **However, the 10/100Base-TX port will not be supported on this release.**

The PCI 100Base-T Link Product

*by Learning Products Team
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Introduction

The N-Class and A-Class HP e3000 systems have a PCI-bus based hardware architecture, so new drivers (link products) have been developed to support new PCI-based peripheral devices. This includes a new 100Base-T LAN adapter card. PCI 100Base-T encompasses the new software driver and new add-on adapter card that are required to provide LAN connectivity for the N-Class and A-Class servers.

Product Overview

The PCI 100Base-T Link provides the following

- The LAN connectivity solution for PCI-bus based HP e3000 systems
- The same interface to all LAN network stacks (e.g., NS TCP/IP, DTC) as exists on HP-PB (NIO) HP e3000 systems
- The PCI equivalent to HP-PB 100Base-T Fast Ethernet link product (B5427BA), which is a distinct and separate 100Base-T link product that runs only on HP-PB (NIO) HP e3000 systems.

Using PCI 100Base-T

There is no major difference in how the networking subsystems will operate compared to HP-PB (NIO) HP e3000 systems. Current network software products (such as NS TCP/IP, DTC Terminal I/O, and Streams/iX products and applications) will run their applications the same as they do on HP-PB systems, only they will now run over the PCI 100Base-T link product. This approach is fundamental to the HP e3000 PCI design philosophy: the underlying hardware/architecture changes should not impact upper layer software products or customer applications, and will be essentially transparent.

Unlike the HP-PB 100Base-T Fast Ethernet link product, the software component for the new PCI 100Base-T link product will be bundled into FOS (MPE/iX 7.0 and later). This means that no additional software must be ordered or installed in order to run PCI 100Base-T on MPE/iX 7.0 and later. The PCI 100Base-T adapter add-on card (A5230A) must be ordered and installed separately.

NOTE	The PCI 100Base-T adapter card is a single-port, add-on card. This card does not require firmware downloads and has no on-board memory. The card is capable of supporting both 10-Mbps and 100-Mbps speeds, and is configured in NMCONFIG.
-------------	--

Configuring PCI 100Base-T links

As with HP-PB (NIO) 100Base-T Fast Ethernet, the 100Base-T links are configured in NMCONFIG using NMMGR. The NMMGR link configuration screen is for a generic 100Base-T link and can be used to configure 100Base-T on either HP-PB or PCI platforms. When the 100Base-T link is started via another network subsystem (e.g., :NETCONTROL START; NET=SYSLAN1), the network will automatically detect whether the underlying LAN link hardware is HP-PB or PCI, and will invoke the appropriate software driver.

NOTE There have been some minor changes regarding network configuration and NMMGR screens on MPE/iX 7.0. These changes are reflected in the *HP e3000/iX Network Planning and Configuration Guide* and *NS 3000/iX NMMGR Screens Reference Manual*, updated for MPE/iX 7.0

Conclusion

With the PCI 100Base-T link product and add-on adapter card, the N-class and A-class servers can support the same 100Base-T LAN connections and applications as HP-PB (NIO) HP e3000 systems.

4 PCI-SCSI Device Adapter Cards

This chapter contains technical articles that provide information about new PCI-SCSI Device Adapter Cards on HP e3000 N-Class and A-Class systems for the MPE/iX 7.0 release. The following articles are included in this chapter:

- PCI-SCSI Device Adapter Cards on HP e3000 N-Class and A-Class Systems
- SCSI Device Configuration Examples for N-Class and A-Class HP e3000 Systems
- SCSI Interface and Device Support for N-Class and A-Class HP e3000

PCI-SCSI Device Adapter Cards on HP e3000 N-Class and A-Class Systems.

by Jim Hawkins

Commercial Systems Division

With the introduction of N-Class and A-Class Systems, new device adapter cards are required for the support of SCSI peripherals. These new cards also require new software and new SYSGEN configuration values. The purpose of this article is to provide an external "System Administrator" view of these changes in MPE/iX. The opening section of the article describes the new device Adapter cards. A small section on Card Performance and Device Connection limits is then provided for reference. Finally the closing section of this article is a review of SCSI Terminology (which you may want to read first if all of this is new to you). Note: Installation of HP e3000 Device adapter cards is to be performed by licensed HP Hardware personal only. All documents referred to in this article are available <http://docs.hp.com>. The configuration of these cards and attached SCSI devices using SYSGEN is covered in a separate article in this Communicator.

New Device Adapter Cards for N-Class and A-Class Systems

There are four new Device Adapter Cards available for the N-Class Systems: A4800A, A5149A, A5150A and, A5159A. A-Class Systems support two of these four cards: the A4800A and A5149A. Each of these cards can be plugged into one of the system PCI Buses and will present one or two SCSI Bus port(s) to the outside world. In addition, the N-Class and A-Class Systems each have a "Core I/O" card which includes modules that provide SCSI peripheral support. These Core I/O SCSI Buses are implemented using the same chip set(s) as the new Device Adapter cards and so can be treated as an embedded version of these new cards.

A4800A - Single Port FWD SCSI-2 (PCI bus) Adapter Card. This card plugs into a PCI Bus on the system and presents a single SCSI bus to the outside world. This SCSI bus allows connections to High Voltage Differential (HVD) SCSI peripherals only. Historically on the HP e3000, HVD SCSI devices have been called "Fast/Wide" devices. This bus must be terminated using an HVD terminator; typically this is a High Density (HD) 68-pin HVD Terminator such as the C2905A. (Special Note: This card is not auto-terminating; it requires an additional physical terminator such as A4700-67098 (1252-6520) be installed on the card for proper bus operation. This terminator should be included with the card but can easily be lost if you are not careful.) For details see "A4800A PCI Ultra SCSI Host Bus Adapter Service and User Guide."

A5159A - Dual Port FWD SCSI-2 (PCI Bus) Adapter Card. (N-Class Only) This card plugs into a PCI Bus on the system and presents two (2) independent SCSI buses to the outside world. These SCSI Buses allow connections to High Voltage Differential (HVD) SCSI peripherals only. (Historically on the HP e3000, HVD SCSI devices have been called "Fast/Wide" devices.) Each of these buses must be terminated using an HVD terminator; typically this is a High Density (HD) 68-pin HVD Terminator such as the C2905A. For details see "HP A5159A Dual Port PCI to Differential Ultra SCSI Host Bus Adapter Service and User Guide."

A5149A - Single Port Ultra 2 SCSI (PCI bus) Adapter Card. This card plugs into a PCI Bus on the system and presents a single SCSI Bus to the outside world. This SCSI Bus is capable of operating in either LVD or SE Mode. This determination is made automatically by the card based upon the devices and termination present on the Bus; there is no software control for this feature. This bus must be terminated. Depending upon the cables/connectors being used, this would typically be either a High Density (HD) 68-pin LVD/SE terminator such as C2364A or, for Very High Density (VHDCI) 68-pin LVD/SE cables, a C2370A. For details see “HP A5149A PCI to Ultra2 SCSI Host Bus Adapter Service and User Guide.”

A5150 - Dual Port Ultra 2 SCSI (PCI bus) Adapter Card. (N-Class Only) This card plugs into a PCI Bus on the system and presents two (2) independent SCSI Buses to the outside world. These SCSI Buses are capable of operating in either LVD or SE Mode. This determination is made automatically by the card based upon the devices and termination present on the Bus; there is no software control for this feature. Each SCSI bus must be independently terminated. Depending upon the cables/connectors being used this would typically be either a High Density (HD) 68-pin LVD/SE terminator such as C2364A or, for Very High Density (VHDCI) 68-pin LVD/SE cables, a C2370A. For details see “HP A5150A Dual Channel PCI to Ultra2 SCSI Host Bus Adapter Service and User Guide.”

N-Class Core I/O Card. This card contains embedded versions of both an A5159A (Dual Port) and an A5149A (Single Port). The A5159A portion of the Core I/O card supports the two internal system disk slots - neither of these SCSI Buses are exported to the outside (i.e. there is no way to connect external peripherals to these buses). The A5149A portion of the Core I/O card presents a single LVD/SE bus for the connection of device(s) external to the system (VHDCI 68-pin LVD/SE connector).

A-Class Core I/O Card. This card contains embedded versions of both the A5159A (Dual Port) and a A5150A (Dual Port). The system uses one port from each card to support a single internal disk and presents the other SCSI bus to allow the connection of external SCSI peripherals. Path 0/0/1/0 (from the A5159A) is provided with a VHDCI 68-pin LVD/SE connector. Path 0/0/2/0 (from the A5150A) is provided with a special HD 50-pin SE connector; this connector only supports an 8-bit data path so only “narrow” SCSI devices such as the DDS-3 Tapes may be connected.

SCSI Card Performance Limits and Device Connection Limits

(Primary source “A5149A PCI to Ultra2 SCSI Host Bus Adapter Service and User Guide”)

Table 4-1. SCSI Bus Widths and Speeds

SCSI Classification	HP Card Id (signal type)	SCSI Bus Width (Bits)	Maximum Data Rate (MegaBytes/Sec)
SCSI-1	HP28642A (SE)	8	5
Fast SCSI	HP28696A (HVD)	8	10
Fast Wide SCSI	“	16	20
Ultra SCSI	A4800A, A5159A (HVD)	8	20
Wide Ultra SCSI	“ “	16	40

Table 4-1. SCSI Bus Widths and Speeds

SCSI Classification	HP Card Id (signal type)	SCSI Bus Width (Bits)	Maximum Data Rate (MegaBytes/Sec)
Ultra2 SCSI	A5149A, A5150A (LVD/SE)	8	40
Wide Ultra2 SCSI	“ “	16	80

The above “Maximum Data Rate” values are maximums that these cards can achieve. Actual Maximum Data Transfer Rates are dependent upon a number of factors including the type of peripheral, the storage enclosures that these peripherals are placed within and the cables used to connect them. For example:

- SCSI-1 Devices were only certified to operate on the HP e3000 at SCSI-1 speeds. While it is possible that newer SE-SCSI disks are capable of working at higher speeds they are not certified to do so.
- HP6000 Series Mass Storage products (a.k.a. “Cars” boxes) and High Availability Storage enclosures (A3311A, A3312A, a.k.a. “Jamaica”) will not support transfers at higher than “Fast” speeds (e.g. Ultra or Ultra2).
- A5616A “SureStore E Disk System HVD10” uses HVD signaling and LVD Disk modules but internal components are SE-SCSI based. Since SE-SCSI signaling is not defined at “Ultra2” speeds (see Table 4-2) this cabinet is limited to Ultra speeds.

The PCSCSI DAM software will, by default, limit the bus operating speed based upon the detected bus type according to the following rules:

1. If there is one or more SCSI-1 devices on a bus then the card will operate at “SCSI-1” speed.
2. Except where rule #1 applies the software will set the bus speed to “Fast.”

CAUTION Overriding software defaults to operate devices at faster than certified speeds can cause erratic system behavior, hangs and even data corruption.

Table 4-2. SCSI Bus Length vs. Number of Devices by Bus Type

SCSI Classification	SE (Meters)	HVD (Meters)	LVD (Meters)	Maximum Allowed Devices (Note 2)
SCSI-1	6	25	12.5	8
Fast SCSI	3	25	12.5	8
Fast Wide SCSI	3	25	12.5	16
Ultra SCSI	1.5	25	12.5	8
Ultra SCSI	3	--	--	4
Wide Ultra SCSI	--	25	12.5	16

Table 4-2. SCSI Bus Length vs. Number of Devices by Bus Type

SCSI Classification	SE (Meters)	HVD (Meters)	LVD (Meters)	Maximum Allowed Devices (Note 2)
Wide Ultra SCSI	1.5	--	--	8
Wide Ultra SCSI	3	--	--	4
Ultra2 SCSI	Note 1	Note 1	12.5	8
Wide Ultra2 SCSI	Note 1	Note 1	12.5	16

CAUTION Exceeding cable length maximums may cause erratic system behavior, hangs and/or data corruption

NOTE Single-Ended and High-Voltage Differential protocols are not supported/defined at Ultra2 Speeds.

NOTE This limit is based upon SCSI bus electrical and timing characteristics only. MPE/iX may further limit the number of devices allowed per bus based upon performance characteristics. Please see the "N-Class Supported Peripherals" Article in this Communicator for additional details.

SCSI Terminology Primer

The SCSI Standard documents both the physical and electrical connection between devices. There are a large number of options and terms used to define the type of SCSI bus or device that one is using. Luckily, on the HP e3000 only a certain subset of these options have been supported. The most important characteristic to understand is the type of electrical signaling the device is capable of using. A secondary consideration is the type of connectors a device uses, which will influence your cabling options. We'll cover both of these items below.

SCSI Electrical Signaling Types:

At this time there are three different electrical signaling types: Single-Ended (SE), High Voltage Differential (HVD) and Low Voltage Differential (LVD). The original set of SCSI devices available on the HP e3000 are known as Single-Ended SCSI devices. These devices were typically connected via a 50 pin cable with 8 data bits (1 byte) and use +5 Volt signals to communicate at a peak rate of 5Mbytes per second. These devices are also referred to as a SCSI-1, Single-Ended Narrow or simply SE-SCSI. Examples of these devices include DDS Tapes like the HPC1530B or Disks such as the ST34573N which are typically connected to the HP28642A Device Adapter Card. On the N-Class and A-Class systems SE-SCSI devices are supported via connection to A5149A and A5150A PCI-SCSI Device Adapter Cards.

A second type of SCSI device was introduced in the MPE/iX 5.0 release and is typically

referred to as “Fast/Wide SCSI” or F/W SCSI. These devices are connected via a 68 pin cable with 16 data bits (2 bytes) and use a +-5 volt differential signal to communicate at up to 20 Mbytes per second. The term “Fast-Wide SCSI” is actually incomplete in defining the type of device being used; a more proper term would be High Voltage Differential SCSI (HVD) using Fast Wide signaling. Examples of these HVD devices include the DLT7000 Tape drive, numerous “Fast-Wide” Disks such as the HPC2490WD or ST39173WD, all of which are typically connected to the HP28696A Fast/Wide SCSI Adapter Card. On the N-Class and A-Class systems, HVD devices are supported via connection to A4800A and A5159A PCI-SCSI Device Adapter Cards.

With the introduction of the N-Class and A-Class Systems, there is a new type of SCSI device available known as Low Voltage Differential (LVD) Devices. These devices are connected via a 68 pin cable with 16 data bits (2 bytes) and use a +-3.3 volt differential signal to communicate at up to 80Mbytes per second. As of the time that this article is written there are no fully LVD devices being supported on the HP e3000. The SCSI standard states that all LVD devices should have the capability of operating in SE-SCSI mode. Thus, the LVD Device Adapters that HP supports have the capability to support both Single-Ended and LVD devices. This means that it is possible for older SE-SCSI devices to be used with an LVD Device Adapter (though they will transfer data at the lower SE-SCSI rate). On the N-Class and A-Class systems, LVD devices would be supported via connection to A5149A and A5150A PCI-SCSI Device Adapter Cards.

Physical Connectors and Cables

With these different electrical characteristics, there are also different physical connectors. At this time HP supports devices that use four different types of physical connectors: Low Density (LD) 50-Pin (example DDS-2 C1530B), High Density 50-Pin (HP28642A Device Adapter Card), High Density (HD) 68-Pin (HP28696A Fast/Wide SCSI Adapter Card) and Very High Density (VHDCI) 68-pin (A5149A, Single Port Ultra 2 SCSI (PCI bus) Adapter Card). This means there are a large number of cable types in varying lengths, some with different connectors on each end (LD50 -> HD50 or HD50 -> HD68 or HD68 -> VHDCI68, etc.) When ordering cables pay particular attention to the type of connectors present on each device you are connecting.

The type of physical connector does not explicitly dictate the type of electrical signals that can be used. For instance SE, HVD and LVD signals can all be transmitted through a 68-pin cable with High Density connectors, but NOT at the same time! Hooking up SE devices to HVD devices (or vice versa) can actually damage the devices; so be cautious. Just because you can physically connect doesn't mean that you should. (The complexity of this issue is one reason that we recommend that all peripheral installation be done by HP Technicians.)

SCSI Device Configuration Examples for N-Class and A-Class HP e3000 Systems

by *Jim Hawkins*
Commercial Systems Division

Device configuration for N-Class and A-Class systems is accomplished using the same tools (SYSGEN, IOCONFIG) as existing HP e3000 Systems. Your MPE/iX 7.0 Release software will include four new default configuration groups:

CONFNCL1 – N-Class booting from internal disk drive
CONFNCL2 – N-Class booting from external disk drive
CONFACL1 – A-Class booting from internal disk drive
CONFACL2 – A-Class booting from external disk drive

These configuration files provide the minimum set of devices necessary to boot the system and start the installation process. You will need to modify your configuration file to connect additional SCSI devices to your system.

This article will provide a step by step description of configuring both SCSI Device Adapter cards and attached SCSI peripherals on an N-Class System. This article will not provide a complete listing of other possible hardware types. The A-Class's interface will be similar enough to allow a System Manager experienced in configuring hardware to apply this N-Class example to an A-Class system. This article will not cover configuration of the system Console nor the configuration of Data Communications/Networking Devices.

NOTE The installation of Device Adapter Cards is a complex operation requiring partial disassembly of your system and is best left to your HP Hardware Support Technician.

Determining the type of cards that are in your system

The following operations are accomplished while the system is "down," e.g. not running MPE/iX. Start by entering a Control-B at the system console. You may be prompted for a logon id and password, each of which currently defaults to a single Carriage Return. At the GSP> prompt enter an RS or TC command, confirm it and acknowledge any prompts that are presented. You should soon find yourself at the main Boot Command Handler (BCH) menu (If you have problems please refer to the MPE/iX System Software Maintenance Manual for this Release which should include a more complete description of rebooting your system):

Console Display #1

```
Main Menu: Enter command or menu > di
```

```
---- Main Menu  
-----
```

Command	Description
-----	-----
BOot [PRI ALT <path>]	Boot from specified path
PAth [PRI ALT] [<path>]	Display or modify a path
SEARch [DIsplay IPL] [<path>]	Search for boot devices
COntfiguration menu	Displays or sets boot values
INformation menu	Displays hardware information
SERvice menu	Displays service commands
DIisplay	Redisplay the current menu
HElp [<menu> <command>]	Display help for menu or command
RESET	Restart the system

Proceed to the Information menu:

Console Display #2

Main Menu: Enter command or menu > in

----- Information Menu

Command	Description
-----	-----
ALL	Display all system information
BootINfo	Display boot-related information
CAche	Display cache information
ChipRevisions	Display revisions of major VLSI
COprocessor	Display coprocessor information
FRU	Display FRU information
FwrVersion	Display firmware version
IO	Display I/O interface information
LanAddress	Display Core LAN station address
MEemory	Display memory information
PRocessor	Display processor information
WARnings	Display selftest warning messages

```

B0ot [PRI|ALT|<path>]      Boot from specified path
Display                    Redisplay the current menu
HElp [<command>]          Display help for specified command
RESET                     Restart the system
MAin                      Return to Main Menu

```

For the purposes of this article we are only interested in the I/O information for this system. The “IO” function will provide two sets of information in two sections. The first section is the listing of the System and Local Bus Adapters; the Local Bus Adapters with slot numbers 1-12 are potential Device Adapter locations. The second section is the listing of PCI Device Adapters that are actually present on the system. These controllers are either Device Adapter Cards or the embedded functions of the Core I/O Card.

Console Display #3

Information Menu: Enter command > io

I/O MODULE INFORMATION

Type	Path (dec)	Slot Number	HVERSION	SVERSION	IODC Vers
----	-----	-----	-----	-----	----
System bus adapter	0		0x8030	0xc10	0x0
Local bus adapter	0/0	Built_In	0x7820	0xa00	0x0
Local bus adapter	0/1	Built_In	0x7820	0xa00	0x0
Local bus adapter	0/2	6	0x7820	0xa00	0x0
Local bus adapter	0/4	2	0x7820	0xa00	0x0
Local bus adapter	0/5	1	0x7820	0xa00	0x0
Local bus adapter	0/8	4	0x7820	0xa00	0x0
Local bus adapter	0/10	5	0x7820	0xa00	0x0
Local bus adapter	0/12	3	0x7820	0xa00	0x0
System bus adapter	1		0x8030	0xc10	0x0
Local bus adapter	1/0	12	0x7820	0xa00	0x0
Local bus adapter	1/2	10	0x7820	0xa00	0x0
Local bus adapter	1/4	9	0x7820	0xa00	0x0
Local bus adapter	1/8	11	0x7820	0xa00	0x0
Local bus adapter	1/10	8	0x7820	0xa00	0x0

```
Local bus adapter      1/12  7          0x7820   0xa00   0x0
```

PCI DEVICE INFORMATION

Description	Path (dec)	Vendor Id	Device Id	Bus #	Slot #
Ethernet cntlr	0/0/0/0	0x1011	0x19	0	Built_In
SCSI bus cntlr	0/0/1/0	0x1000	0xc	0	Built_In
SCSI bus cntlr	0/0/2/0	0x1000	0xf	0	Built_In
SCSI bus cntlr	0/0/2/1	0x1000	0xf	0	Built_In
Comp. ser cntlr	0/0/4/0	0x103c	0x1048	0	Built_In
Comp. ser cntlr	0/0/5/0	0x103c	0x1048	0	Built_In
Fibre channel	0/1/0/0	0x103c	0x1028	8	Built_In
SCSI bus cntlr	0/5/0/0	0x1000	0xc	40	1
Ethernet cntlr	0/10/0/0	0x1011	0x19	80	5
SCSI bus cntlr	0/12/0/0	0x1000	0xf	96	3
SCSI bus cntlr	0/12/0/1	0x1000	0xf	96	3
SCSI bus cntlr	1/0/0/0	0x1000	0xb	128	12
SCSI bus cntlr	1/0/0/1	0x1000	0xb	128	12
SCSI bus cntlr	1/10/0/0	0x1000	0xf	208	8
SCSI bus cntlr	1/12/0/0	0x1000	0xc	224	7

Information Menu: Enter command >

The hardware path can loosely be interpreted as:

System Bus Location / Local Bus Number / PCI Device / PCI Device Function

One potential point of confusion is that, unlike existing HP e3000 systems, there is no formula to correlate Slot #, physical location in the system, with Bus # and Path. Notice from the above that the System has enough information to identify “SCSI bus cntlr” or “Ethernet cntlr.” Each path marked “SCSI bus cntlr” represents a separate SCSI Bus. The Vendor Id, Device Id, Path and Bus/Slot information may be used to uniquely identify each PCI-SCSI Device Adapter Card type.

Table 4-3. Card Type with Vendor Id. and Device Id.

Card Type	Vendor Id	Device Id
A4800A (SP HVD)	0x1000	0xf (same as A5159A)
A5159A (DP HVD)*	0x1000	0xf (same as A4800A)
A5149A (SP LVD/SE)	0x1000	0xc
A5150A (DP LVD/SE)*	0x1000	0xb

* Dual Port Cards, presenting two independent SCSI Buses, will have a pair of paths, one for each SCSI Bus. Each such path pair will have the same leading three values, one member of the pair ending in zero (0) and the other in a one (1). (In PCI Bus Architecture terminology, these cards are “multi-function” devices.) As a final check, this pair must be on the same bus/slot number pair. From the information previously gathered from the Information Menu, IO Function, we can see that the system has the following cards connected:

Example #1: Correlating Path and Card Type.

Using the information in Table #1 with the output from console display #3 command we can derive the following:

Path	Device Id.	Card Type
0/0/1/0	0xc	Core I/O Embedded A5149A (SP LVD/SE)
0/0/2/0, 0/0/2/1 (pair on same bus)	0xf,0xf	Core I/O Embedded A5159A (DP HVD)
0/12/0/0, 0/12/0/1 (“ “ “ “)	0xf,0xf	A5159A (DP HVD)
1/0/0/0, 1/0/0/1 (“ “ “ “)	0xb,0xb	A5150A (DP LVD/SE)
1/10/0/0	0xf	A4800A (SP HVD)
1/12/0/0	0xc	A5149A (SP LVD/SE)

Determining the Devices connected to the system

The N-Class system has a built in function that will search for devices attached to the system. This function is available on the Main Menu as the Search command.

Console Display #4

Main Menu: Enter command or menu > sea

Searching for potential boot device(s)

This may take several minutes.

To discontinue search, press any key (termination may not be immediate).

Path#	Device Path (dec)	Device Path (mnem)	Device Type
P0	0/0/1/0.2	extscsi.2	Sequential access media
P1	0/0/2/0.6	intscsia.6	Random access media
P2	0/0/2/1.6	intscsib.6	Random access media
P3	0/1/0/0.8		Random access media
P4	0/12/0/0.3		Random access media
P5	1/10/0/0.4		Random access media
P6	1/12/0/0.0		Random access media

This provides us with an idea of types of devices (Sequential ~ Tape, Random ~ Disk) connected to our system. This information, combined with the card types, gives us the basic information needed to configure the system. Note that these devices are not SCSI Multi-LUN devices; therefore, this output does not show the implied LUN value of ZERO for each of these devices. The MPE/iX configuration addresses of these devices would have “.0” appended to them.

One piece of configuration data that is missing is the actual hardware device Ids. At this time the only source for this information is the ISL utility, ODE MAPPER2. MAPPER2 is the 64-bit version of the MAPPER program used for previous HP e3000 platforms. For more complete information on ODE MAPPER2, please see the MPE/iX System Software Maintenance Manual for this Release. It is highly recommended that your configured device Ids match the actual device Ids returned by ODE MAPPER2. For the purposes of this article we’ll assume some arbitrary but legal device Ids.

The next part of your configuration must be done while the system is “up” and running MPE/iX.

New Boot Messages for N-Class (and A-Class):

Early in the system boot code, MPE/iX will scan possible hardware locations to determine what I/O adapter cards are present in the system. The code will indicate the presence of I/O adapter cards using “+” or “*”. The “+” indicates the presence of a PCI Device with a single PCI function; the “*” indicates the presence of a PCI Device with multiple functions:

```
ISL> start norecovery
MPE/iX launch facility

Scanning PCI BUS 0   ++*...++.....
Scanning PCI BUS 8   .....
Scanning PCI BUS 10  .....
Scanning PCI BUS 20  .....
Scanning PCI BUS 28  +.....
Scanning PCI BUS 40  .....
```



```

Scanning PCI BUS 50  +.....
Scanning PCI BUS 60  *.....
Scanning PCI BUS 80  *.....
Scanning PCI BUS 90  .....
Scanning PCI BUS A0  .....
Scanning PCI BUS C0  .....
Scanning PCI BUS D0  +.....
Scanning PCI BUS E0  +.....

Initialize_genesis - Ver bld1: <<pci 2.1601>>
WED, OCT 25, 2000, 2:59:03 PM (y/n)?

```

The messages seen when booting an A-Class system will be an abbreviated form of the above as the A-Class systems have fewer PCI Buses. The remainder of the system boot messages will be the same as seen on existing platforms on current MPE/iX Releases.

Configuring SCSI Devices using SYSGEN on N-Class Systems

The process followed to configure SCSI Devices on these new Device Adapter Cards is the same as the process configuring of SCSI Devices on existing HP e3000 9XX Systems. The main difference is that various path elements represent different hardware components than on existing HP e3000 9XX systems; these new hardware devices require different software drivers.

For the following examples we will assume that we are using the same system information presented in the preceding examples. These examples will show the configuration of an internal disk drive (as LDEV 1), an external tape drive (as LDEV 7) and cover the special cases of the System Spooled Printer (LDEV 6) and System Streams Devices (LDEV 10). The configuration of LDEV 20, the System Console, and other Data Communications/Networking hardware devices, will be covered in separate articles in this Communicator.

We'll start by configuring LDEV 1 on the internal system disk at path address 0/0/2/0.6.0. Recall from our previous explorations that this path represents a "random access media," e.g. a disk, and that it is on the Core I/O Embedded A5159A (DP HVD). We'll choose the disk Id of HPC2490WD as this is a supported "Fast/Wide SCSI" (HVD) disk (you may use this Id too, though it is recommended that you use the Id obtained from ODE MAPPER2).

As with existing HP e3000 systems, you must build up a set of paths by configuring each path element separately starting with the left-most element. To review the hardware path "0/0/2/0.6.0" can be interpreted as:

System Bus Location / Local Bus Number / PCI Device / PCI Device Function . SCSI Target
. SCSI LUN

We start by configuring System Bus Location equal to zero ("0"). We then configure Local Bus Number equal to zero ("0"), PCI Device equal to two ("2"), and PCI Function equal to zero ("0"). The System Bus entry, Local Bus entry and PCI Device entry all have new and unique configuration identifiers. The configuration of SCSI devices is accomplished with the same exact steps as are followed in MPE/iX 6.5 on existing HP e3000 systems.

If you were to build a new configuration file for an N-Class system and wanted the device 0/0/2/0.6.0 to be our LDEV #1 (system/boot disk), you would issue the following commands in SYSGEN.

```
io> ap 0 id=pat_ioa_bc
io> ap 0/0 id=pat_pci_bc
io> ap 0/0/2 id=pci_device
io> ap 0/0/2/0 id=A5159A << This is the Device Adapter Card (ID from Example #1)
io> ap 0/0/2/0.6 id=pseudo          ___/ pair of entries per stand alone device
io> ad 1 path=0/0/2/0.6.0 id=hpc2490wd  \ pair of entries per stand alone device
    or (if LDEV #1 previously existed)
io> md 1 path=0/0/2/0.6.0 id=hpc2490wd
```

Checking that the Device Adapter Card is properly configured:

```
io> lp 0/0/2/0
PATH: 0/0/2/0          LDEV:
    ID: A5159A          TYPE: DA
PMGR: PCI_SCSI_DAM     PMGRPRI: 6
LMGR:                  MAXIOS: 0
```

If you were to build a new configuration file for an N-Class system, the next step would be to configure LDEV 7. In our previous examples we found a “sequential access media,” e.g. “tape” at path address 0/0/1/0.2.0. Recall from our previous explorations that this device is on the Core I/O external SCSI Bus, A5149A (SP LVD/SE). We’ve chosen to use HPC1553A as this is a supported SE-SCSI DDS-3 Tape drive; you should use the value that matches your Boot Tape device.

(Paths “0” and “0/0” were added in previous example for LDEV #1)

```
io> ap 0/0/1 id=pci_device
io> ap 0/0/1/0 id=A5149A          << This is the Device Adapter Card
io> ap 0/0/1/0.2 id=pseudo       ___/ pair of entries per stand alone device
io> ad 7 path=0/0/1/0.2.0 id=hpc1553B  \ pair of entries per stand alone device
    or (if LDEV #7 previously existed)
io> mp 7 path=0/0/1/0.2.0 id=hpc1553B
```

Checking that the Device Adapter Card is properly configured:

```
io> lp 0/0/1/0
PATH: 0/0/1/0          LDEV:
    ID: A5149A          TYPE: DA
PMGR: PCI_SCSI_DAM     PMGRPRI: 6
LMGR:                  MAXIOS: 0
```

As in the previous example, PMGR is set to “PCI_SCSI_DAM,” which is the correct value.

This is how LDEV 7 is configured in CONFNCL1:

```
LDEV:      7  DEVNAME:
           ID: HPC1553A
           PATH: 0/0/1/0.6.0
CLASS: TAPE    TAPE2    DDUMP    TAPE1
           OUTDEV:      0  MODE:
           RSIZE:      128  DEVTYPE: TAPE
           MPETYPE:    24  MPESUBTYPE: 7
```

This covers the basics of configuring a single Disk and single Tape; now, on to the special cases.

The MPE/iX Operating System requires several logical devices to be present in order to function properly. LDEV 1, LDEV 7 and LDEV 20 are the basic hardware devices that must be present. In addition MPE/iX requires that LDEV 10 be configured as the “Streams” device and that a spooled printer be configured, usually LDEV 6 with Class LP or PP, in order for Jobs to Logon. Neither of these devices has to be physically present but they must be configured. If your system has been factory preloaded, these devices should already be present in configuration files found in the group CONFIG.SYS. Alternately, they should be found in the groups CONFNCL1, CONFNCL2 (N-Class), CONFACL1, and CONFACL2 (A-Class).

In order to configure these “virtual” LDEVs you must use a real hardware path up to the Device Adapter, but you do NOT have to have actual LDEV6 and LDEV10 devices physically present. We recommend that these devices be configured with the special Target Ids 16 (sixteen) and 17 (seventeen) so as to not artificially limit the number of devices allowed on a SCSI Bus (the PCI SCSI DAM software will allow these normally illegal values for “virtual” LDEVs). New Device IDs have been added to IODFAULT.PUB.SYS to ensure proper configuration of these special devices:

LP_PP_ID: use for the System Printer

JOBTAPE_ID: use for the Streams device

Assuming that LDEV 7 was previously configured at path 0/0/1/0.2.0 as in the previous examples the actual SYSGEN commands to add LDEV 6 and LDEV 10 would be:

```
io> ap 0/0/1/0.16 id=pseudo
io> ad 6 path=0/0/1/0.16.0 id=lp_pp_id
   or (if ldev 6 already defined but not valid or being used)
io> md 6 path=0/0/1/0.16.0 id=lp_pp_id
```

The streams device (LDEV10) must have OUTDEV parameter set to an existing spooled device class. In this case LP-PP-ID has a default class of PP, so that is the value we use for OUTDEV

```
io> ap 0/0/1/0.17 id=pseudo
io> ad 10 path=0/0/1/0.17.0 id=jobtape_id outdev=pp
   or (if ldev 10 already defined but not valid or being used)
io> md 10 path=0/0/1/0.17.0 id=jobtape_id outdev=pp
```

From the CONFNCL1 file:

```
LDEV:      6  DEVNAME:
           ID: LP_PP_ID
           PATH: 0/0/1/0.16.0
           OUTDEV:      0  MODE:
           RSIZE:      66  DEVTYPE: PP
           MPETYPE:    32  MPESUBTYPE: 6
```

```
CLASS: LP          PP
```

```
LDEV:    10  DEVNAME:                OUTDEV:    LP  MODE:    JA
      ID: JOBTAPE_ID                RSIZE:    128  DEVTYPE: TAPE
      PATH: 0/0/1/0.17.0            MPETYPE:   24  MPESUBTYPE: 2
```

```
CLASS: JOB        JOBTAPE
```

From the screen output shown in “Console Display #4” it can be seen that we have another disk drive at path “1/10/0/0.4”. The MPE/iX SCSI configuration address of this device must include a SCSI LUN which is implied to be zero since it is not shown. So our configuration path will be “1/10/0/0.4.0”. In Sysgen you would enter the following commands:

```
io> ap 1 id=pat_ioa_bc
io> ap 1/10 id=pat_pci_bc
io> ap 1/10/0 id=pci_device
io> ap 1/10/0/0 id=A4800A << This is the Device Adapter Card (ID from Example #1)
io> ap 1/10/0/0.4 id=pseudo          ___/ pair of entries per stand alone device
io> ad 100 path=1/10/0/0.4.0 id=hpc2490wd \ pair of entries per stand alone device
```

SCSI Interface and Device Support for N-Class and A-Class HP e3000

*by Jim Hawkins
Commercial Systems Division*

Our basic goal is to have a useful set of SCSI peripherals available for use with N-Class and A-Class Systems, (Interfaces such as HP-IB and HP-FL are not supported). As always, we have a strong desire to protect our customers' existing hardware investment. The set of SCSI devices supported for N-Class and A-Class HP e3000 Systems with the 7.0 Release is based upon those SCSI devices supported in the 6.5 Release. However there are a large number of devices that are "supported" in MPE/iX Release 6.5 but actually obsolete and/or nearly obsolete. Therefore we've made our strongest efforts to actually test and support those SCSI devices that are currently (or recently) shipping from HP. Where possible, we've also sampled from older families of devices in order to allow continuing usage of these devices.

N-Class and A-Class Supported Devices Rules of Thumb:

1. HP e3000 Supported SCSI devices shipping as of January 2001 will be supported.
Exception: Devices specifically listed as NOT supported.
2. SCSI Devices obsolete or removed from HP Price List before January 2001 will NOT be supported.
Exception: Devices specifically listed as supported.

NOTE Devices listed as "unsupported" on N-Class or A-Class systems will still be found in the MPE/iX 7.0 and later copies of IODFAULT.PUB.SYS and will continue to be supported on OTHER HP e3000 Systems (e.g. 99x, 9x9, and 9x8).

Table 4-4. Interface Cards:

Product Number	Interface Description(s)	SCSI Chip Set
N-Class Core I/O	VHDCI 68-pin LVD/SE SCSI 2x Internal LVD.SE SCSI*	SYM53C895 SYM53C876
A-Class Core I/O	VHDCI 68-pin LVD/SE SCSI Internal LVD.SE SCSI* HD 50-pin SE-SCSI ** Internal LVD.SE SCSI*	SYM53C896 SYM53C876
A5149A	VHDCI 68-pin LVD/SE SCSI	SYM53C895
A4800A	HD 68-pin HVD SCSI	SYM53C875
A5150A***	2x VHDCI 68-pin LVD/SE SCSI	SYM53C896
A5159A***	2x HD 68-pin HVD SCSI	SYM53C876

* These Core I/O SCSI Buses are internal to the System. Each supports connection of a single LVD disk.

** This connection exclusively supports 8-bit wide SCSI transfers. Therefore only DDS3 and 7980 Tape Devices are supported; other devices will not function or will loose data.

*** Dual Port Cards are not supported on A-Class systems.

Table 4-5. SCSI Storage Enclosures:

Description	SCSI Interface(s)	HP Product Number
HP High Availability Storage Solution (HP HASS)	SE, HVD	A3312A, A3311A
HP SMART Family of Data Storage Products	SE, HVD	C4317A, C4318A
SureStore E Disk System HVD10	HVD	A5616A/AZ

Table 4-6. N-Class and A-Class System Internal Disk Modules:

HP Product	SCSI Interface	Disk Size (in Gigabytes)	Example Product ID
A5505A (N-Class)	(LVD)	9 GB	ST39102LC
A5531A (N-Class)	(LVD)	18 GB	ST318203LC
A6089A (N-Class)	(LVD)	36 GB	ST336706LC
A5573A (A-Class)	(LVD)	9 GB	ST39102LC
A5574A (A-Class)	(LVD)	18 GB	ST318203LC
A6154A (A-Class)	(LVD)	36 GB	ST336706LC

Table 4-7. HP HASS Disks Modules:

HP Product	SCSI Interface	Disk Size (in Gigabytes)	Example Product ID
A3517A	SE	2 GB	ST32550N
A3646A	SE	4 GB	ST15150N
A3628A	SE	9 GB	ST39173N
A3518A	HVD	2 GB	ST32550W
A3547A	HVD	4 GB	ST15150W
A5285A	HVD	9 GB	ST19173LC
A5286A	HVD	18 GB	ST318275LC

Table 4-8. HP SMART Stand Alone and Rack Mount Disks:

HP Product	SCSI Interface	Disk Size (in Gigabytes)	Example Product ID
C6388A/C6389A	SE	4 GB	ST34373W
C6392A/C6393A	SE	9 GB	ST19171N
C6394A/C6395A	SE	9 GB	ST39173W
C6398A/C6399A	SE	18 GB	ST318404W
C6390A/C6391A	HVD	4 GB	ST34373W
C6396A/C6397A	HVD	9 GB	ST39173WD
C6400A/C6401A	HVD	18 GB	ST318404WD

Table 4-9. SureStore E Disk System HVD10 Disk Modules:

HP Product	SCSI Interface	Disk Size (in Gigabytes)	Example Product ID
A5276A	HVD	9 GB	ST39204LC
A5282A	HVD	18 GB	ST318203LC
A5595A	HVD	36 GB	ST136403LC
A5622A	HVD	72 GB	ST173404LC

Table 4-10. Supported Disk Array Products:

Description	SCSI Interface	Internal Disk Capacity	HP Product Number
Nike Model 10	HVD	2 GB, 4GB, 9GB	A3539A
Nike Model 20	HVD	2 GB, 4GB, 9GB, 18GB	A3549A
AutoRaid 12H	HVD	9 GB, 18 GB	A3700
EMC	HVD		(non-HP product)
XP256	HVD		A57xx

Table 4-11. Read Only Disks:

Description	SCSI Interface	HP Product Number
HP DVD-ROM	SE	C4314A

Table 4-12. Tape Devices:

Description	SCSI Interface	HP Product Number
HP DDS-3	SE	HPC1553A

Table 4-12. Tape Devices:

Description	SCSI Interface	HP Product Number
HP DDS-3 6 Tape Changer	SE	A3716A
1/2" Reel Tape	SE	HP7980S
1/2" Reel Tape	SE	HP7980SX
DLT7000	HVD	C6531A
DLT8000	HVD	C6378A

Table 4-13. Tape Libraries:

Description	SCSI Interface	HP Product Number
15 Slot 2 Drive Library (DLT 7000)	HVD	A4851A
30 Slot 3 Drive Library (DLT 7000)	HVD	A4853A
28 Slot 2 Drive Library (DLT 7000)	HVD	A4850A
40 Slot 6 Drive Library (DLT 7000)	HVD	A4846A
588 Slot 10 Drive Library (DLT 7000)	HVD	A4845A
SureStore E 1/20 Library (DLT 8000)	HVD	C7200
SureStore E 2/20 Library (DLT 8000)	HVD	C7202
SureStore E 2/40 Library (DLT 8000)	HVD	C7210
SureStore E 4/40 Library (DLT 8000)	HVD	C7214
SureStore E 2/60 Library (DLT 8000)	HVD	C7222
SureStore E 4/60 Library (DLT 8000)	HVD	C7226
SureStore E 6/60 Library (DLT 8000)	HVD	C7230
SureStore E 20/700 Library (DLT 8000)	HVD	C5599

Table 4-14. Printers:

Description	Speed	SCSI Interface	HP Product Number
HP5000 F100	100PPM	SE	C2753A
HP5000 F100T	100PPM	SE	C2753B
HP5000 F135	135PPM	SE	C2776A
HP5000 F100XP	154PPM	SE	C2772A
HP5000 F135XP	210PPM	SE	C2755B

Misc. SCSI Hardware and Software:

A5814A - SCSI-FIBRE CHANNEL ROUTER/EXTENDER (HVD)

HP Mirrored Disk/iX Software (SE or HVD disks)

SCSI Devices that will NOT be supported on N-Class and A-Class HP e3000.

Unsupported Disks Devices:

All Magneto-Optical (MO) Discs

All CDROM

SE EMC

SE/HVD Disks Less Than 2 GB

SE/HVD SCSI "Cascade" Arrays

XP512 Disk Array

Unsupported Tape Devices:

DDS-1 (and auto-changers based upon DDS-1)

DDS-2 (and auto-changers based upon DDS-2)

DLT 4000 (SE and HVD)

3480/3490 Devices

SE Tape Libraries

IEM 8MM Devices

Unsupported Printers:

Printers other than HP5000 Fxx

Unsupported Enclosures:

SureStore E SC10 LVD/SE Disk Enclosure

Other Unsupported SCSI Products:

SCSI Switch Boxes

SE SCSI Extender (28643-60001)

5 Technical Articles

The following articles are about upgrades of various applications for MPE/iX 7.0

- Future Support For Greater Than 8190 Concurrent Processes.
- PCS/iX (SCOPE) Enhanced with Expanded Limits
- QUERY/iX Enhancements Respond to User Requests
- New HP e3000 A-Class and N-Class Servers
- New Release of Hardware Diagnostics (STM) for MPE/iX 7.0

Future Support For Greater Than 8190 Concurrent Processes.

By *Scott J. McClellan*
MPE/iX System Architect
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INTRODUCTION

The maximum number of concurrent processes (sometimes referred to as MAXPIN) is a key constraint limiting MPE/iX in high-growth, high-end customer environments. Removing this constraint is one of the key ingredients in Hewlett-Packard's continuing strategy to evolve MPE/iX -- providing growth for our high-end customers.

The maximum number of concurrent processes supported by MPE/iX is 8190. This limit has not been changed in the last several MPE/iX Releases, and is not changed in Release 7.0. However, MPE/iX Release 7.0 contains many of the changes necessary to support greater than 8190 concurrent processes in a future release of MPE/iX. By incorporating these changes into Release 7.0, Hewlett-Packard has ensured that Release 7.0 has an adequate foundation to allow MPE/iX to support greater than 8190 concurrent processes in a 7.0-based Express Release.

WHO SHOULD READ THIS ARTICLE?

- High-end customers
- System Administrators for high-end systems
- Third-party software developer (or customers) with privileged applications and/or applications that explicitly use Process Identification Numbers.

This article contains:

- A very brief overview of internal changes to MPE/iX (and the relevant potential external impact).
- Discussion of the BIGPIN feature
- Description of new/enhanced "Program File Event" logging feature, which logs potential issues on a customer system.
- Description of the new MAXPIN Scaling algorithm.
- Discussion of 5-digit PIN numbers (and changes to :SHOWQ and :SHOWPROC commands).

OVERVIEW OF INTERNAL OS CHANGES

The MPE/iX concurrent process limit has historically been limited by one of Process Management data structures called the Process Control Block (PCB). The PCB data structure predates MPE/iX as the key process management data structure on older MPE/V-based operating systems. The PCB was ported to MPE/iX and has existed as a

Compatibility Mode data structure. The PCB is very heavily referenced by various components of the Compatibility Mode Operating System.

Over the years, there have been many changes to the PCB data structure that have expanded its capacity. The current MAXPIN limit is a function of PCB capacity, and is limited by 16-bit CM addressing restrictions. In Release 7.0, the PCB has been rearchitected as Native Mode data structure.

The PCB changes have been designed for maximal backward compatibility. As a result, existing CM or NM code which accesses the PCB should function correctly, (without modification) provided there are less than 8190 processes on the system.

BIGPIN Concept

Release 7.0 introduces the concept of "BIGPIN." The term BIGPIN refers to a system's ability to support greater than 8190 concurrent processes. In Release 7.0, the CORE OS is BIGPIN capable; but the BIGPIN feature (which is Configurable) will not be enabled. In a future release of MPE/iX, customers will be notified how to turn on the BIGPIN feature.

EVENT LOGGING

MPE/iX has been enhanced to log, at runtime, certain events where programs execute operations that will not function correctly if the BIGPIN feature is enabled. Customers are encouraged to make sure that this event logging facility is enabled (which it should be by default) when they upgrade to Release 7.0. In particular, high-end customers who are potential candidates for turning on the BIGPIN feature (in a future release of MPE/iX) are encouraged to examine their system log files -- looking specifically for the new BIGPIN related events (described below).

If any BIGPIN events are logged on a customer's system, the customer will need to contact the company responsible for the software in question. Hewlett-Packard will be making changes to some additional software products in future release of MPE/iX. There should be no BIGPIN related events logged by the MPE/iX operating system. If there are any events logged by MPE, please contact your HP support representative with all the details.

For software supported by third-party software vendors, contact the vendor directly. Hewlett-Packard will be working with our software vendors to ensure they can make any necessary changes to support greater than 8190 concurrent processes.

NOTE The event logging facility is designed to catch specific runtime events that will cause a problem ON SYSTEMS WITH GREATER THAN 8190 PROCESSES. None of these events represents issues on systems with less than or equal to 8190 processes. Furthermore, these events are expected to be relatively rare. For the most part, the kinds of operations that can potentially cause problems are fairly obscure. It is not "common" for third-party or customer software to reference the PCB (or other OS internal data structures) directly. Such references are limited to lower-level privileged mode applications. This is not expected to be a significant issue for customers as we move forward with a plan to support greater than 8190 processes. The event-logging facility should be viewed as a "safety net," designed to give HP and our customer's "piece of mind" as we make this transition.

HOW TO MAKE SURE PROGRAM EVENT FILE LOGGING IS ENABLED

The "SYSGEN>log/show slog" command can be used to display the current setting for various system logging events. The "status" corresponding to the "Program File Event" (event number 116) must be "ON."

Example 5-1. SYSGEN>log/show slog

```
:sysgen
[snip ...]
sysgen> log
[snip ...]
log>show slog
```

system log events	event #	status
-----	-----	-----
System Logging	100	ON
System Up	101	ON
Program File Event	116	ON
Native Mode Spooling	120	OFF

```
[snip...]
[snip...]
```

DISPLAYING PROGRAM FILE EVENTS

To display all "Program File Event" log records, use the "LOGTOOL>list" command. The list command allows the user to explicitly specify the logging event number in the "type=" parameter. To see only Program File Events, specify "type=116."

NOTE On MPE/iX Release 7.0, the LOGTOOL program can be found in PUB.SYS. On some older versions of MPE/iX, LOGTOOL was in DIAG.SYS.

LOGTOOL will format Program File Events as shown in the example below. There are two important fields in this log record:

- **EVENT TYPE.** The "event type" field is used to distinguish different Program File Events. Event types -101, -102, and -103 indicate that a program performed an action that will not work properly with greater than 8190 process (BIGPIN=true). These events are described in detail below.
- **PROGRAM FILE NAME.** This field contains the name of the program file corresponding to the program that has the issue. See "When/How Are Events Logged" below.

Example 5-2. LOGTOOL

LOGTOOL>list log=587 type=116

```

                                SYSTEM ERROR LOG REPORT
                                =====
Report Date/Time:  THU, DEC  7, 2000 -  6:47 PM
=====
THU, DEC  7, 2000   6:45 PM           LOG0587.PUB.SYS           #S3 (PIN 74)
PROGRAM FILE EVENT
EVENT TYPE: BIGPIN: Get 'My'PCB'Offset      DELTA P:           $0
STATUS:           $0                       PROGRAM FILE NAME:
PPINTEST.TESTPINS.SYS
NM OFFSET:        $0                       USER:             MANAGER
GROUP:            TESTPINS                  ACCOUNT:          SYS
JSNAME:           USER:                     MANAGER
GROUP:            TESTPINS                  ACCOUNT:          SYS
JSNAME:
=====
THU, DEC  7, 2000   6:45 PM           LOG0587.PUB.SYS           #S3 (PIN 74)
PROGRAM FILE EVENT
EVENT TYPE: BIGPIN:SST 3                    DELTA P:           $0
STATUS:           $0                       PROGRAM FILE NAME:
PPINTEST.TESTPINS.SYS
NM OFFSET:        $0                       USER:             MANAGER
GROUP:            TESTPINS                  ACCOUNT:          SYS
JSNAME:           USER:                     MANAGER
GROUP:            TESTPINS                  ACCOUNT:          SYS
JSNAME:
=====
THU, DEC  7, 2000   6:45 PM           LOG0587.PUB.SYS           #S3 (PIN 74)
PROGRAM FILE EVENT
EVENT TYPE: BIGPIN: LST 3                    DELTA P:           $0
STATUS:           $0                       PROGRAM FILE NAME:
PPINTEST.TESTPINS.SYS
NM OFFSET:        $0                       USER:             MANAGER
GROUP:            TESTPINS                  ACCOUNT:          SYS
JSNAME:           USER:                     MANAGER

```

```

GROUP:                TESTPINS                ACCOUNT:                SYS
JSNAME:

=====
TYPE      DESCRIPTION      COUNT
=====  =====
   116    PROGRAM FILE EVENT      3
=====  =====

Total records checked = 117.  Records selected = 3.

*****

[Report Completed]
    
```

WHEN/HOW ARE EVENTS LOGGED?

At runtime, if a program executes an operation that is not BIGPIN compatible, MPE/iX will set a flag indicating that "event" occurred. When a process terminates, MPE/iX checks to see if any such flags are set; and, if so, it invokes the system logging facility to log the actual events (as Program File Event - type 116 – log records).

Any given event will only be logged once for any given process (after that process terminates). It does not matter how many times a given process performs a given operation, the event will only be logged once.

SPECIFIC BIGPIN EVENTS

The table below lists all of the "Program File Events" that can potentially be logged. The "text" field refers to the "text" displayed (by LOGTOOL) in the "Event Type" field (see example above). The "Number" field is the actual numeric value associated with that Event Type.

EVENT TYPE		Description
Text	Number	
cm_tos_reg_fixup	-1	Not a BIGPIN related event. The CM instruction emulator has taken an action on behalf of the user to fix-up a correctable addressing problem. No action is required if this event is logged.
BIGPIN:LST 3	-101	Program executed a CM "LST 3" instruction.
BIGPIN:SST 3	-102	Program executed a CM "SST 3" instruction.
BIGPIN:Get'My'PCB'Offset	-103	Program called Get'My'PCB'Offset
BIGPIN:AWAKE	-201	Program called AWAKE
BIGPIN:UNIMPEDE	-202	Program called UNIMPED
BIGPIN:LABEL'IS'SL'SEG	-203	Program called LABEL'IS'SL'SEG
BIGPIN:MARKER'IS'SL'SEG	-204	Program called MARKER'IS'SL'SEG

EVENT TYPE		Description
Text	Number	
BIGPIN:FREEZE	-205	Program called FREEZE
BIGPIN:UNFREEZE	-206	Program called UNFREEZE
BIGPIN:LOCKSEG	-207	Program called LOCKSEG
BIGPIN:UNLOCKSEG	-208	Program called UNLOCKSEG
BIGPIN:LOGICALCST'	-209	Program called LOGICALCST'
BIGPIN:SEG'FROM'RTMSL	-210	Program called SEG'FROM'RTMSL
BIGPIN:TIMEREQ	-211	Program called TIMEREQ

For Event Types -101 through -211, the program will NOT function correctly with the BIGPIN feature enabled. You will need to resolve this issue with the appropriate "owner" before your system can have greater than 8190 processes executing concurrently.

NOTE These programs should work properly as long as the BIGPIN feature is not turned on. The BIGPIN feature cannot be enabled on Release 7.0, but will be available in a future Release of MPE/iX.

You will need to determine the correct "owner" for each program that logs a BIGPIN event. You can find the name of the program that triggered the Event by looking at "Program File" field in the log record (using LOGTOOL - see above). Based on the name of the program, try to determine the correct "owner."

Program "owner"	Action
Third-party software vendor.	Contact that vendor for more information.
In-house written program.	Contact HP Support to get information on how to modify the program so that it will work correctly with BIGPIN enabled.
Unsure?	Contact your Hewlett-Packard support representative for help.
Hewlett-Packard	Report this to your Hewlett-Packard support representative. Currently there are no pieces of software where this is "expected."

MAXPIN SCALING CHANGES

MPE/iX is a "one size fits all" operating system. The same version of MPE/iX runs on a broad range of systems - ranging from very low-end systems to very high-end (Enterprise Class) systems.

MPE/iX has a feature known as "MAXPIN scaling." The purpose of MAXPIN scaling is to limit the MAXPIN value on low-end machines to a more appropriate number, and to scale the size of various OS data structures accordingly. The MAXPIN scaling algorithm

improves resource utilization on low-end system (especially with respect to resident memory usage).

The MAXPIN scaling algorithm has been around for several MPE/iX releases (originally introduced when MAXPIN was increased from 1559 to 3119 – Release 2.0 timeframe). When this algorithm was originally introduced, we supported several systems with VERY small minimum memory requirements. Many of these systems are now obsolete. The original algorithm was not updated to reflect changes in the HP e3000 product line.

In Release 7.0, we have a new MAXPIN scaling algorithm that is much more appropriate, given today's low-end systems, and takes into account future enhancements to MPE/iX. These improvements will continue to increase the maximum MAXPIN value for future high-end systems.

The original MAXPIN-scaling adjusted MAXPIN based on the amount of physical memory on a system. This will continue to be the case for Release 7.0. However, the algorithm uses a different physical memory values and different MAXPIN values. In the future, additional criteria may be added to the algorithm. In particular, in a future release of MPE/iX, support for greater than 8190 processes will require > 2 GB of memory AND the BIGPIN feature will need to be enabled.

Below is a table that compares the MAXPIN scaling values for Release 6.5 (and before) and to Release 7.0 scaling values.

Physical Memory (m)	<= Release 6.5	Release 7.0
m < 32 MB	200	400 [2]
32 MB <= m < 48 MB	400	400 [2]
48 MB <= m < 64 MB	3000	400 [2]
m = 64 MB	5460	400 [2]
m > 64 MB	8190	400 [2]
m <= 64 MB	n/a [3]	400
64 MB < m <= 256 MB	8190 [4]	1000
256 MB < m <= 512 MB	8190 [4]	2000
512 MB < m <= 1 GB	8190 [4]	4000
1 GB < m <= 2 GB	8190 [4]	8190
m > 2 GB	8190 [4]	8190 [1]

1. For Release 7.0, the maximum MAXPIN value is still limited to 8190. In a future (7.0-based) release of MPE/iX, this value will be increased. Greater than 8190 processes will require > 2GB of memory AND will also require that the system is booted with the BIGPIN feature enabled.
2. All of these cases fall into the "m <= 64 MB" case on 7.0.
3. The "m <= 64 MB" case was broken down into finer granularity for MPE/iX releases prior to 7.0.
4. On MPE/iX 6.5 (and earlier), any system with greater than 64 MB of memory was allowed MAXPIN equal to the maximum MAXPIN value for that release. On 6.5,

maximum MAXPIN was 8190.

HPMAXPIN VARIABLE

A new system variable, HPMAXPIN, has been defined in Release 7.0. HPMAXPIN will return the maximum number of concurrent processes supported on any given system. HPMAXPIN is a standard, pre-defined integer, read-only CI variable.

Example 5-3. HPMAXPIN VARIABLE

```
:help hpmaxpin
HPMAXPIN      The maximum number of concurrent processes supported on this
system.
               Type= Read-only, Integer
:showvar hpmaxpin
HPMAXPIN = 1000
```

FIVE DIGIT PIN NUMBERS

Starting with MPE/iX Release 7.0, developers should ensure that their software is capable of handling PIN numbers greater than 8190. Once we support greater than 8190 processes, we will also be supporting > 9999. This means that PINs will require more than 4 ASCII digits to be represented in decimal. Third-party software developers and customers are encouraged to examine their software to ensure it is capable of handling 5-digit PIN numbers.

There are a variety of ways that code can be affected by the change from 4- to 5-digit PINs. An obvious example is code that displays PIN number, but does not reserve enough room for 5-digits. A subtler example is code that uses the PIN to construct a unique temporary file name. If that code appends a 5-digit PIN to a "prefix" that is 4 digits, the size of the file name will overflow the 8 character limit (for MPE filenames).

There are two MPE/iX CI commands that assume 4-digit PIN numbers in their command output. The two commands are :SHOWQ and :SHOWPROC. The MPE/iX development team worked with a set of key third-party software developers to determine the "best" way to change :SHOWQ and :SHOWPROC to accommodate 5-digit PIN numbers. In deciding the "best" approach, we had to evaluate two (somewhat) mutually exclusive objectives:

- Backward compatibility. Minimal (or ideally zero) impact to existing programs and scripts that may parse output from :SHOWQ and/or :SHOWPROC.
- Human readability. Making the output as easy to read as possible, on a terminal, by an end-user.

In the end we weighted the backward compatibility constraint higher, and selected the approach that minimized the risk of introducing compatibility issues. This resulted in slightly different approaches for the :SHOWQ command as opposed to the :SHOWPROC command.

:SHOWQ

The :SHOWQ command is a much older MPE command - existing long before MPE/iX. The output of :SHOWQ is also much more "column oriented" (compared to :SHOWPROC). In general, users are discouraged from making assumptions regarding specific column numbers in command output. Various CI functions have been added in MPE/iX to assist users in parsing output without relying on column (e.g. the "word" function). However, given the fact that :SHOWQ has been around for a very long time, its columnar output, and given older scripts (etc.) tend to make more assumptions about column, we opted not to change the columns for :SHOWQ output. As a result, 5-digit PIN numbers will "run together" with the field that follows the PIN in :SHOWQ output. Fortunately, the field following PIN in :SHOWQ is a Job/Session number. Job/Session numbers are displayed as #Jxxxxx or #Sxxxxx. As a result, the output from :SHOWQ is still fairly "readable" even if a 5-digit PIN runs together with a Job/Session number.

Example 5-4. :SHOWQ OUTPUT

```

DORMANT                                RUNNING
Q  PIN  JOBNUM                            Q  PIN  JOBNUM

A   1
B   2
B   3
A   4

[output snipped for brevity]
C  M59  #S81
C  M60  #S49
D  U10951#J60
    
```

```

-----QUANTUM-----
QUEUE  BASE  LIMIT  MIN    MAX    ACTUAL  BOOST  TIMESLICE
-----  ----  -----  ---    ---    -
CQ     152    200    1      2000   4       DECAFY  200
DQ     202    238    2000   2000   2000    DECAFY  200
EQ     240    253    2000   2000   2000    DECAFY  200
    
```

Example 5-5. COLUMN NUMBERS FOR :SHOWQ

```

----- Column Numbers -----
1           2           3           4           5           6           7
12345678901234567890123456789012345678901234567890123456789012345689

DORMANT                                RUNNING
    
```

```
Q PIN JOBNUM
L Ldddd#Ldddd
```

```
Q PIN JOBNUM
L Ldddd#Ldddd
```

Key:

L = Letter

d = Digit (decimal)

= # character

:SHOWPROC

The :SHOWPROC command is a fairly new MPE/iX command. In addition, the output from :SHOWPROC is not columnar by nature. In particular, for the :SHOWPROC ;TREE command, it would be very difficult to parse the output using column numbers. Given all these reasons, we decided to change :SHOWPROC output to display PIN numbers in a field wide enough for 5-digits followed by a space (separating the PIN number from the next field on the output line). On Release 7.0, PIN numbers are left justified within the 5-digit field (they are left justified today in a 4-digit field).

The :SHOWPROC command can be used in (essentially) three different ways:

- show invoking process only (default);
- show all process in a given job (using the ;JOB= keyword)
- show all processes in a given tree (using the ;TREE option).

Example 5-6. :SHOWPROC OUTPUT

```
:SHOWPROC (default)
```

```
----- Column Numbers -----
1           2           3           4           5           6           7
123456789012345678901234567890123456789012345678901234567890123456789
```

```
:showproc
```

```
QPRI CPUTIME STATE JOBNUM PIN (PROGRAM) STEP
```

```
C152 0:02.377 READY S9 xxxxxx :SHOWPROC
```

```
SHOWPROC ;JOB=
```

```
----- Column Numbers -----
1           2           3           4           5           6           7
123456789012345678901234567890123456789012345678901234567890123456789
```

```
:showproc ;job=#j10
```

Future Support For Greater Than 8190 Concurrent Processes.

```

QPRI  CPUTIME  STATE  JOBNUM  PIN   (PROGRAM)  STEP
D202  0:00.232  WAIT   J10     xxxxxx  :RUN SPFLSTNR.LASER
D202  00:13:46  WAIT   J10     xxxxxx  (SPFLSTNR.LASER.LARC)

```

```

-----
SHOWPROC ;TREE
----- Column Numbers -----
1         2         3         4         5         6         7
123456789012345678901234567890123456789012345678901234567890123456789

```

```

:showproc 46;system;tree
QPRI  CPUTIME  STATE  JOBNUM  PIN   (PROGRAM)  STEP

B100* 0:28.653  WAIT           46   (JOB.PUB.SYS)
B152  0:00.224  WAIT   J3     xxxxxx  (JSMAIN.PUB.SYS)
D202  0:00.252  WAIT   J3     xxxxxx  :RUN control.trnspool
D202  00:11:11  WAIT   J3     xxxxxx  (CONTROL.TRNSPOOL.NSD)
D205  00:36:16  WAIT   J3     xxxxxx  (TSENDMXL.TRNSPOOL.NSD)
D202  0:27.548  WAIT   J3     xxxxxx  (THREADM.TRNSPOOL.NSD)

[snip]

```

NOTE Column numbers are shown above for informational purposes only.
Users are encouraged NOT to use column numbers to parse command output.
Column numbers are subject to change in future releases of MPE/iX.

PCS/iX (SCOPE) Enhanced with Expanded Limits

By *James Overman*
Computer Systems Division

The Performance Collection Software (PCS/iX) product (also known as SCOPE/iX) HP B1794B for MPE/iX has been enhanced to support larger numbers of disks, CPU's, and other system resources with the version B.13.52 shipped in MPE/iX 7.0. This PCS version produces modified format Raw Logfiles (version D of LOGGLOB.SCOPE.SYS, etc.) and also modifies the format of Extracted RX Logfiles that are analyzed by the PerfView products. HP Perfview and Measureware products are now known as HP Vantage Point Performance Manager and Agent, respectively.

This new version of PCS/iX supports the increased HP e3000 MPE/iX limits of 511 disks, 15 processors, and 16Gbyte memory sizes. Also, the data fields have been tweaked to correctly process the much larger possible sizes of disk storage, number of pins, and other system resources that have grown along with the more powerful HP e3000s. The expanded and modified data items required the update of the MeasureWare Agent portion of the HP PerfView software [HP Vantage Point Performance AGENT]. Older versions of HP MeasureWare and the obsolete HP LaserRX software will not process the new Extracted RX logfiles.

New releases of HP MeasureWare Agent that understand the new MPE/iX 7.0 Extracted RX logfiles are available. Those releases should be acquired by customers through the usual HP Support Channels. Generally, a Patch for your platform may be requested from HP in the normal manner (download from the IT Resource Center, or request from the Response Center).

Immediately after updating or installing PCS/iX B.13.52.03, it will be necessary to use the UTILITY.SCOPE.SYS program to CONVERT the previous Raw Logfile formats (B or C) to the new D version, if not previously converted. This one-time conversion should require less than five minutes for even the largest Raw Logfiles. This conversion step must be performed prior to attempting to restart the SCOPEJOB that collects the PCS data.

The Extracted RX logfiles will be automatically created and modified when they are referenced by the EXTRACT.SCOPE.SYS program. If any problems are experienced with appending to previous RX logfiles, the RX output file may be purged and re-extracted in its entirety. Note that when extracting a period file (month, week, year), the previous period file is examined and updated if needed, before the current period file is addressed

QUERY/iX Enhancements Respond to User Requests

By James Overman

Enterprise Support Services Organization R&D

The newest release of QUERY/iX HP32216D.03.17 (and later) contains enhancements that were requested by customers through the SIGIMAGE User's Group. These enhancements are the support of the Expanded TurboIMAGE Limits and the Find-by-Record-Number option.

In addition, QUERY/iX has been changed to allow the runtime PARM=%777 option that invokes Business Basic Floating Decimal datatype on the Native Mode version of QUERY.

TurboIMAGE Expanded Limits

The support of the TurboIMAGE Limit Expansion allows for the increased number of datasets from 199 to 240, the increased number of data items from 1023 to 1200, and the increase in paths into a master dataset from 16 to 64. QUERY/iX will utilize the new limits on systems with the TurboIMAGE version HP30391C.09.00 and later. If the new DBUTIL option flag of OLDINFOLIMITS is enabled for a database, QUERY/iX will function normally as it uses the new DBCONTROL Mode 20 to inform TurboIMAGE that QUERY code supports the new expanded limits.

FIND by Record Number

The long requested Find-by-Record-Number enhancement has been implemented. This new format of the FIND command permits the retrieval of a specific record in a dataset. The form of the new feature is:

```
FIND [DATA BASE NAME:] DATA SET NAME.#RECORD NUMBER
```

The record number is preceded by a "#" and is the record offset into the dataset that is to be retrieved. The record number may be a decimal number (the default) or an octal value indicated by a "%" after the "#", or a hexadecimal value indicated by a "\$".

For example, to read the fifteenth record in the dataset INVOICES, one could use any of the following commands:

```
FIND INVOICES.#15
```

```
FIND INVOICES.##17
```

```
FIND INVOICES.##f
```

After a record is retrieved, all of the usual QUERY commands may be used on the record. If the record number requested does not exist, QUERY will return a "NO ENTRY" or "DIRECTED END OF FILE" followed by "0 ENTRIES QUALIFIED."

Floating Decimal Option with Native Mode QUERY

The PARM=%777 option is now available with the Native Mode version of QUERY. It was previously only available with the Compatibility Mode version of QUERY.

The availability of this feature on Native Mode QUERY will allow the Compatibility Mode version of QUERY to be discontinued in a future release. With this change, Native Mode Query (QUERY.PUB.SYS and QUERYNM.PUB.SYS) now provides a superset of the Compatibility Mode QUERY. All use of QUERYCM should now be transferable to QUERY.PUB.SYS. Thus, QUERYCM.PUB.SYS may no longer be updated and will be replaced on a future release with a SYMLINK to QUERY.PUB.SYS.

Service Request Fixes

Two Service Requests were fixed in this release of QUERY/iX.

SR 1653-268235 Superdex Indexes were being reported twice on FORM commands.

SR 8606-108307 Find on Z-type items sometimes gave a Scratch File Read Error 0.

New HP e3000 N-Class and A-Class Servers

By Dave Snow

With MPE/iX Release 7.0, HP is introducing new HP e3000 A- and N-Class Servers which in new sales situations will replace the HP e3000 9x8, 9x9KS and 997 Servers. The HP e3000 9x8, 9x9KS and 997 Servers will continue to be sold on a limited basis into the 2CH2001 with add-on processors being sold into C2002.

The HP e3000 N-Class Servers are the new mid-range and high-end HP e3000 Servers replacing the 9x9KS and 997 servers with relative performance between 9 and 72. These servers come in 1 to 4-way multi-processing configurations using 220, 330, 440 and 550 MHz PA-8500 and PA-8600 processors.

Server	Product Number	Description	Relative Perf.	SW Tier
N4000-100-220	A6449B	N4000 1-way server using a 220 MHz processor	9	4 (330)
N4000-100-330	A6450B	N4000 1-way server using a 330 MHz processor	13	4 (330)
N4000-100-440	A6451B	N4000 1-way server using a 440 MHz processor	18	4 (330)
N4000-200-440	A6451B plus A6176A proc	N4000 2-way server using 440 MHz processors	33*	4(330)
N4000-300-440	A6452B plus	N4000 3-way server using 440 MHz processors	46*	6 (340)
N4000-400-440	A6452B plus A6176A proc.	N4000 4-way server using 440 MHz processors	57*	6 (340)
N4000-100-220	A6449B	N4000 1-way server using a 220 MHz processor	9	4 (330)
N4000-400-550	A6453B plus A6177A proc.	N4000 4-way server using 550 MHz processors	72*	6 (340)
* estimated as of January 2001				

HP e3000 220 and 330 MHz N-Class Servers support only 1 processor, 440 MHz N-Class Servers support 1 to 4 processors, and 550 MHz Servers support only 3 and 4 processors. Multi-processor support will be in place with MPE/iX Release 7.0 Express 1 expecting to ship in June/July 2001.

The HP e3000 N-Class Servers support ten Twin Turbo 4x PCI I/O slots with 480-530 Mbytes/sec of I/O bandwidth each. They also support two Turbo 2x PCI I/O slots with 240-266 Mbytes/sec of I/O bandwidth each. Each HP e3000 N-Class Server comes with a core I/O card that has one Ultra2 SCSI LVD/SE connection for external peripherals; two Ultra2 SCSI busses for integrated disks; three RS-232 ports for console, remote access and

uninterruptible power supply (UPS) control; and one 10/100BaseT LAN connection (not activated until MPE/iX Express 1). Until MPE/iX Express 1 begins shipping in the June/July 2001 timeframe, all HP e3000 Servers have bundled in a 10/100BaseT LAN card (which will use one of the I/O slots). HP e3000 N-Class Servers can also support one or two internal disk drives of 9, 18 or 36 Gbytes in size.

HP e3000 N-Class Servers support up to 2 Gbytes of main memory with Release 7.0 and up to 16 Gbytes of main memory with MPE/iX Release 7.0 Express 1 shipping in the June/July 2001 timeframe. In addition, all HP e3000 N-Class Servers come standard with an HP Secure Web Console bundled in.

The HP e3000 A-Class Servers are the new entry level HP e3000 Servers replacing the 9x8 and most 9x7 servers with relative performance between 2.2 and 5.4. These servers come in 1 to 2-way multi-processing configurations using 110 and 140 PA-8500 processors.

Server	Product Number	Description	Relative Perf.	SW Tier
A400-100-110	A6398B	A400 1-way server using a 110 MHz processor	2.2	1 (310)
A500-100-140	A6399B	A500 1-way server using a 140 MHz processor	3.2	1 (310)
A500-200-140	A6399B plus A6394A proc.	A500 2-way server using a 140 MHz processor	5.4*	1 (310)
* estimated as of January 2001				

The HP e3000 A400 Server supports only one 110 MHz processor. The HP e3000 A500 Server supports one or two 140 MHz processors. Multi-processor support will be in place with MPE/iX Release 7.0 Express 1 expecting to ship in June/July 2001.

The HP e3000 A400 Servers support two Twin Turbo 4x PCI I/O slots with 500 Mbytes/sec of I/O bandwidth each. The HP e3000 A500 Servers support two Twin Turbo 4x PCI I/O slots with 500 Mbytes/sec of I/O bandwidth each and two Twin Turbo 4x PCI I/O slots that share 500 Mbytes/sec of I/O bandwidth. Each HP e3000 A-Class Server comes with a core I/O card that has one Ultra2 SCSI LVD/SE connection for external peripherals; one SE SCSI connection for external peripherals, two Ultra2 SCSI busses for integrated disks; three RS-232 ports for console, remote access and uninterruptible power supply (UPS) control; and one 10/100BaseT LAN connection (not activated until MPE/iX Express 1). Until MPE/iX Express 1 begins shipping in the June/July 2001 timeframe, all HP e3000 Servers have bundled in a 10/100BaseT LAN card (which will use one of the 2 or 4 I/O slots). HP e3000 A-Class Servers can also support one or two internal disk drives of 9, 18 or 36 Gbytes in size.

HP e3000 A-Class Servers support up to 2 Gbytes of main memory with Release 7.0 and with the A500 supporting up to 8 Gbytes of main memory with MPE/iX Release 7.0 Express 1 shipping in the June/July 2001 timeframe. In addition, all HP e3000 N-Class Servers can be ordered with an HP Secure Web Console that will use a PCI I/O slot.

All HP e3000 A-Class and N-Class Servers come standard with an unlimited user license and with Image/SQL bundled into the server. Customers who wish to buy the Allbase/SQL database can purchase the Allbase/SQL product (30368B) and specify an appropriate SW

Tier option.

HPCPUNAME Model Strings Supported With MPE/iX Release 7.0 and Possible Bootup Failures

By Dave Snow

With the MPE/iX Release 7.0, a number of new model strings will now be returned by the MPE/iX function HPCPUNAME. Following is a list of the new approved ASCII model strings for HP e3000 Servers supported with MPE/iX Release 7.0.

Model Description	Model String Returned by HPCPUNAME*
HP e3000 A400 1-way 110 MHz Servers	SERIES e3000/A400-100-11
HP e3000 A500 1-way 140 MHz Servers	SERIES e3000/A500-100-14
HP e3000 A500 2-way 140 MHz Servers	SERIES e3000/A500-200-14
HP e3000 N4000 1-way 220 MHz Servers	SERIES e3000/N4000-100-22
HP e3000 N4000 1-way 330 MHz Servers	SERIES e3000/N4000-100-33
HP e3000 N4000 1-way 440 MHz Servers	SERIES e3000/N4000-100-44
HP e3000 N4000 2-way 440 MHz Servers	SERIES e3000/N4000-200-44
HP e3000 N4000 3-way 440 MHz Servers	SERIES e3000/N4000-300-44
HP e3000 N4000 4-way 440 MHz Servers	SERIES e3000/N4000-400-44
HP e3000 N4000 3-way 550 MHz Servers	SERIES e3000/N4000-300-55
HP e3000 N4000 4-way 550 MHz Servers	SERIES e3000/N4000-400-55
* All A-Class and N-Class Servers only use two characters in the last term to show frequency	

For HP e3000 A- and N-Class Servers, the following definitions apply to model strings:

- First term = SERIES e3000
- Second term = family and model, may be variable length
- Third term = number of processors authorized, may be variable length
- Fourth term = frequency of authorized processors, will only be two characters

Model strings for newly shipped servers are always properly set by the HP factory or by the US Distributor, Client Systems. Whenever an HP e3000 Server is upgraded through a chassis upgrade or by the addition of a processor, the model strings will be properly set by the HP field CE doing the installation. Before completing an installation, HP field CEs should boot the HP e3000 Server to demonstrate proper setting of model string values.

Model strings cannot be set by customers or by resellers.

Mismatches between HP e3000 A- and N-Class Server model strings and the actual

processors installed in the server may result in the server not successfully booting until an HP field CE properly sets the model strings. Mismatches related to processor module frequencies or mismatches from attempting to boot MPE/iX on an HP 9000 A- or N-Class Server will be the most frequent reason for "model string failure to boot" error messages.

If the actual number of processors in an HP e3000 A- or N-Class Server is greater than the number specified in the model string, the number of processors configured at bootup time will be limited to the number authorized in the model string and a warning will be issued to the user.

These bootup failures and warnings are most likely to occur if someone attempts to move processor modules between servers or if someone attempts to convert an HP 9000 Server to be an HP e3000 Server. HP field CEs have been instructed to only reset model string values when repairing failing equipment or installing properly purchased HP e3000 field upgrade kits or additional processor modules--never to reset the model strings when someone has improperly added processor modules to an HP e3000 A- or N-Class Server.

For other HP e3000 Servers supported by MPE/iX Release 7.0, these bootup checks are not made at this time but may be added in future releases.

The following table shows the model strings for all other HP e3000 Servers supported by MPE/iX Release 7.0

Model Description	Model String Returned by HPCPUNAME
HP e3000 9x8 Family:	
HP e3000 918LX Servers	SERIES 918LX
HP e3000 918RX Servers	SERIES 918RX
HP e3000 928LX Servers	SERIES 928LX
HP e3000 928RX Servers	SERIES 928RX
HP e3000 968LX Servers	SERIES 968LX
HP e3000 968RX Servers	SERIES 968RX
HP e3000 978LX Servers	SERIES 978LX
HP e3000 978RX Servers	SERIES 978RX
HP e3000 988LX Servers	SERIES 988LX
HP e3000 988RX Servers	SERIES 988RX
HP e3000 9x9KS Family:	
HP e3000 929KS/020 Servers	SERIES 929-020
HP e3000 929KS/030 Servers	SERIES 929-030
HP e3000 939KS Servers	SERIES 939
HP e3000 939KS/020 Servers	SERIES 939-020
HP e3000 939KS/030 Servers	SERIES 939-030

HPCPUNAME Model Strings Supported With MPE/iX Release 7.0 and Possible Bootup Failures

Model Description	Model String Returned by HPCPUNAME
HP e3000 959KS/100 Servers	SERIES 959-100
HP e3000 959KS/200 Servers	SERIES 959-200
HP e3000 959KS/300 Servers	SERIES 959-300
HP e3000 959KS/400 Servers	SERIES 959-400
HP e3000 969KS/100 Servers	SERIES 969-100
HP e3000 969KS/200 Servers	SERIES 969-200
HP e3000 969KS/300 Servers	SERIES 969-300
HP e3000 969KS/400 Servers	SERIES 969-400
HP e3000 969KS/120 Servers	SERIES 969-120
HP e3000 969KS/220 Servers	SERIES 969-220
HP e3000 969KS/320 Servers	SERIES 969-320
HP e3000 969KS/420 Servers	SERIES 969-420
HP e3000 979KS/100 Servers	SERIES 979-100
HP e3000 979KS/200 Servers	SERIES 979-200
HP e3000 979KS/300 Servers	SERIES 979-300
HP e3000 979KS/400 Servers	SERIES 979-400
HP e3000 989KS/100 Servers	SERIES 989-100
HP e3000 989KS/200 Servers	SERIES 989-200
HP e3000 989KS/300 Servers	SERIES 989-300
HP e3000 989KS/400 Servers	SERIES 989-400
HP e3000 989KS/500 Servers	SERIES 989-500
HP e3000 989KS/600 Servers	SERIES 989-600
HP e3000 989KS/150 Servers	SERIES 989-150
HP e3000 989KS/250 Servers	SERIES 989-250
HP e3000 989KS/350 Servers	SERIES 989-350
HP e3000 989KS/450 Servers	SERIES 989-450
HP e3000 989KS/550 Servers	SERIES 989-550
HP e3000 989KS/650 Servers	SERIES 989-650
HP e3000 99x Family:	
HP e3000 990 Servers	SERIES 990

Model Description	Model String Returned by HPCPUNAME
HP e3000 991 Servers	SERIES 991
HP e3000 992/100 Servers	SERIES 992-100
HP e3000 992/200 Servers	SERIES 992-200
HP e3000 992/300 Servers	SERIES 992-300
HP e3000 992/400 Servers	SERIES 992-400
HP e3000 995/100 Servers	SERIES 995-100
HP e3000 995/200 Servers	SERIES 995-200
HP e3000 995/300 Servers	SERIES 995-300
HP e3000 995/400 Servers	SERIES 995-400
HP e3000 995/500 Servers	SERIES 995-500
HP e3000 995/600 Servers	SERIES 995-600
HP e3000 995/700 Servers	SERIES 995-700
HP e3000 995/800 Servers	SERIES 995-800
HP e3000 996/80 Servers	SERIES 996-80
HP e3000 996/100 Servers	SERIES 996-100
HP e3000 996/200 Servers	SERIES 996-200
HP e3000 996/300 Servers	SERIES 996-300
HP e3000 996/400 Servers	SERIES 996-400
HP e3000 996/500 Servers	SERIES 996-500
HP e3000 996/600 Servers	SERIES 996-600
HP e3000 996/700 Servers	SERIES 996-700
HP e3000 996/800 Servers	SERIES 996-800
HP e3000 997/100 Servers	SERIES 997-100
HP e3000 997/200 Servers	SERIES 997-200
HP e3000 997/300 Servers	SERIES 997-300
HP e3000 997/400 Servers	SERIES 997-400
HP e3000 997/500 Servers	SERIES 997-500
HP e3000 997/600 Servers	SERIES 997-600
HP e3000 997/700 Servers	Never supported by HP.
HP e3000 997/800 Servers	SERIES 997-800

HPCPUNAME Model Strings Supported With MPE/iX Release 7.0 and Possible Bootup Failures

Model Description	Model String Returned by HPCPUNAME
HP e3000 997/900 Servers	Never supported by HP.
HP e3000 997/1000 Servers	SERIES 997-1000
HP e3000 997/1100 Servers	Never supported by HP.
HP e3000 997/1200 Servers	SERIES 997-1200

New Release of Hardware Diagnostics (STM) for MPE/iX 7.0

MPE/iX 7.0 contains an updated version of the STM online diagnostics that were introduced in MPE/iX 6.5. Changes for this release include:

- More recent code ported from HP-UX version of STM (Mar 00 release).
- Support for N-Class and A-Class computers.
- System Info tool
- Identify tools for PCI cards, so that PCI cards are properly labelled on the system map.
- All previously released patches for STM on MPE/iX 6.5.

The version number for STM on MPE/iX Release 7.0 is A.20.00.

History

With MPE/iX 6.5, the Support Tools Manager (STM) replaced the SYSDIAG online diagnostic system on HP e3000 computer systems. SYSDIAG had been the online diagnostic system for HP e3000 systems for more than 13 years.

STM is distributed on the Fundamental Operating System (FOS) tape on MPE/iX 6.5 and subsequent releases. When MPE/iX is installed, the SYSDIAG diagnostic system will be removed and STM will be installed.

STM is fully enabled after the system is updated with the Customized System Load Tape (CSLT) and networking is configured and enabled for remote access. It is wise to verify STM after installation by typing `cstm` at the OS prompt.

Known Problem

There is a known problem that exists both on the MPE/iX 7.0 and 6.5 versions of STM. You must shut down the STM daemons before executing the "RESTORE @.@@" command using a backup tape with STM files. Otherwise, the STM files may be corrupted and STM may have to be reinstalled. To shut down STM, enter the `daemonshutdown (dsd)` command at the `cstm` prompt. After the RESTORE command has finished executing, restart the daemons with the `daemonstartup (dsu)` command at the `cstm` prompt.

More Information

For the most recent information on STM for MPE/iX, go to the Diagnostics web page at <http://docs.hp.com/hpux/diag/index.html> and scroll down to the section on MPE/iX diagnostics.

6 Product Release History

This chapter contains tables that provide information on the currently supported Commercial Systems MPE/iX releases and products, and the systems supported for the 7.0 Release..

Product Changes by Releases

The following table provides information on the currently supported Commercial Systems MPE/iX releases and products. Included are the MPE/iX release or SUBSYS VUF and a list of products introduced. It also provides information on significant changes made to a release.

Table 6-1. MPE/iX Product Releases

Release	SUBSYS	Date Code	Product(s) Introduced/Added
C.60.00	C.60.00	R3812	MPE/iX Release 6.0 (Platform Release) User-defined job Queue FTP enhancements Java for MPE/iX Samba/iX Performance enhancements System limit enhancements DNS BIND/iX
C.60.01	C.60.01	R3926	PowerPatch 1 based on Release 6.0 CI Enhancements NPCONFIG Variable on NW Spooler PATCH/iX Enhancements DLT4000/DLT7000 Differential Tape Drives IMAGE/SQL Enhancement: P and Z Data Types HP Driver FOR JDBC Java Developer's Kit Version 1.1.7B Legato NetWorker Storage Node for MPE/iX HP 3000 997 Large Memory Subsystem Support for 36 Gigabyte Disks

Table 6-1. MPE/iX Product Releases

Release	SUBSYS	Date Code	Product(s) Introduced/Added
C.65.00	C.65.00		MPE/iX Release 6.5 (Platform Release) Support for large files Increased TCP connections Support for 511 Disks Support Tools Manager (STM) Enterprise Management Solution HP Secure Web Console Apache for MPE/iX LDAP C-SDK/iX NEWCI Command
C.65.02	C.65.02	R4046	Express 2 based on Release 6.5 High Availability FailOver/iX High Availability Cluster/iX Dataset >80 GB in TurboIMAGE/iX Increase Limits in TurboIMAGE/iX IMAGE/SQL supports increased limits in TurboIMAGE/iX Business BASIC supports increased limits in TurboIMAGE/iX ANSI AS clause in ALLBASE/SQL QUERY/iX enhancements
C.70.00	C.70.00		MPE/iX Release 7.0 N-Class systems A-Class systems Guardian Service Processor (GSP) PCI-SCSI Device Adapter Cards PCI WAN Sync MUX PCI 100Base-T Link Product

Supported Releases

Table 6-2. Supported System Release Matrix

Supported Releases	Supported Systems	Support Termination Date
Release 6.0 (60.xx)	920*, 922*, 932*, 948*, 955**, 958*, 960**, 980/100, 980/200, 980/300, 980/400, 9x7, 9x7LX, 9x7RX, 9x7SX, 9x8LX, 9x8RX, 939KS, 939KS/020, 959KS/100, 959KS/200, 959KS/300, 959KS/400, 969KS/100, 969KS/200, 969KS/300, 969KS/400, 969KS/120, 969KS/220, 969KS/320, 969KS/420, 979KS/100, 979KS/200, 979KS/300, 979KS/400, 989/100, 989/200, 989/400, 989/600, 989/150, 989/250, 989/300, 989/350, 989/450, 989/500, 989/550, 990CX 992/100CX, 992/200CX, 992/300CX, 992/400CX, 990DX, 992/100DX, 992/200DX, 992/300DX, 992/400DX, 991CX, 995/100CX, 995/200CX, 995/300CX, 995/400CX, 995/500CX, 995/600CX, 995/700CX, 995/800CX, 991DX, 995/100DX, 995/200DX, 995/300DX, 995/400DX, 995/500DX, 995/600DX, 995/700DX, 995/800DX, 996/80, 996/100, 996/200, 996/300, 996/400, 996/500, 996/600, 996/700, 996/800, 996/900, 996/1000, 996/1200, 997/100, 997/200, 997/300, 997/400, 997/500, 997/600, 997/800	April 30, 2002
* Support life ended as of 1/00 ** Support life ended as of 8/00		

Table 6-2. Supported System Release Matrix

Supported Releases	Supported Systems	Support Termination Date
Release 6.5 (65.xx)	9x7, 9x7LX, 9x7RX, 9x7SX, 9x8LX, 9x8RX, 939KS, 939KS/020, 959KS/100, 959KS/200, 959KS/300, 959KS/400, 969KS/100, 969KS/200, 969KS/300, 969KS/400, 969KS/120, 969KS/220, 969KS/320, 969KS/420, 979KS/100, 979KS/200, 979KS/300, 979KS/400, 989/100, 989/200, 989/400, 989/600, 989/150, 989/250, 989/350, 989/300, 989/350, 989/500, 989/550, 989/650 990CX 992/100CX, 992/200CX, 992/300CX, 992/400CX, 990DX, 992/100DX, 992/200DX, 992/300DX, 992/400DX, 991CX, 995/100CX, 995/200CX, 995/300CX, 995/400CX, 995/500CX, 995/600CX, 995/700CX, 995/800CX, 991DX, 995/100DX, 995/200DX, 995/300DX, 995/400DX, 995/500DX, 995/600DX, 995/700DX, 995/800DX, 996/80, 996/100, 996/200, 996/300, 996/400, 996/500, 996/600, 996/700, 996/800, 996/900, 996/1000, 996/1200, 997/100, 997/200, 997/300, 997/400, 997/500, 997/600, 997/800, 997/1000, 997/1200	6 months following next Mainline release after 7.0

Table 6-2. Supported System Release Matrix

Supported Releases	Supported Systems	Support Termination Date
Release 7.0 (70.00)	<p>A400-100-110, A500-100-140 A500-200-140*</p> <p>N4000-100-220, N4000-100-330, N4000-100-440 N4000-200-440*, N4000-300-440*, N4000-400-440*, N4000-300-550*, N4000-400-550*</p> <p>9x8LX, 9x8RX,</p> <p>939KS, 939KS/020,959KS/100, 959KS/200, 959KS/300, 959KS/400,969KS/100, 969KS/200, 969KS/300, 969KS/400, 969KS/120, 969KS/220, 969KS/320, 969KS/420,979KS/100, 979KS/200, 979KS/300, 979KS/400,989/100, 989/200, 989/400, 989/600,989/150, 989/250, 989/350, 989/300, 989/350, 989/500, 989/550, 989/650</p> <p>990CX992/100CX, 992/200CX, 992/300CX, 992/400CX,990DX, 992/100DX, 992/200DX, 992/300DX, 992/400DX,991CX, 995/100CX, 995/200CX, 995/300CX995/400CX, 995/500CX, 995/600CX, 995/700CX, 995/800CX,991DX,995/100DX, 995/200DX, 995/300DX, 995/400DX, 995/500DX, 995/600DX, 995/700DX, 995/800DX,996/80, 996/100, 996/200, 996/300, 996/400, 996/500, 996/600, 996/700, 996/800, 996/900, 996/1000, 996/1200,997/100, 997/200, 997/300, 997/400, 997/500, 997/600, 997/800, 997/1000, 997/1200</p>	6 months following 2nd Mainline release after 7.0

*(Supported with 7.0 Express 1)

7 Catalog of User Documentation

This chapter provides a listing of customer manuals for the HP e3000 computer system that have been introduced or changed since the MPE/iX 6.5 Release.

With this release, you will receive two CD-ROM documentation CDs: an HP Instant Information CD and a MPE/iX Documentation Collection PDF Format CD. Using the PDF Format CD-ROM requires that you have Adobe Acrobat Reader installed on your computer. If you do not have Acrobat Reader, you can download the latest version, free of charge, from the Adobe website at <http://www.adobe.com>. The pdf files are viewable and printable using Adobe Acrobat Reader 3.0 or later. Acrobat Reader also allows you to perform keyword searches on the entire CD-ROM contents.

You can also view MPE/iX document files on an external website, <http://www.docs.hp.com>. The files on this website are presented in a html format which is searchable and printable from the website.

Customers who want to have hardcopy documentation for their HP e3000 can order the MPE/iX Hardcopy Documentation set. Contact your local sales office and order B9412AA with option 260 (MPE/iX 6.0 documentation), option 265 (MPE/iX 6.5 documentation), or option 270 (MPE/iX 7.0 documentation).

MPE/iX 7.0 New or Updated Manuals

This section lists customer manuals introduced or updated for MPE/iX 7.0.

Table 7-1. MPE/iX 7.0 New or Updated Manuals

Manual Title	Part No.	Latest Edition
Communicator 3000 MPE/iX Release 7.0	30216-90312	2/01
HP e3000 MPE/iX System Software Maintenance Manual	30216-90317	2/01
HP e3000/iX Network Planning and Configuration Guide	36922-90941	2/01
NS 3000/iX NMMGR Screens Reference Manual	36922-90040	2/01
8-port Serial PCI ACC Multiplexer Install & Users Guide	30291-90508	2/01
ODBCLink Reference Manual	36217-90410	2/01
PCI 100Base-T Network Adapter Installation & Service Guide	32650-90900	2/01
System Debug Reference Manual	32650-90901	2/01
System Startup, Configuration, and Shutdown Reference Manual	32650-90892	2/01

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