Communicator e3000 MPE/iX Release 7.0 PowerPatch 3 (Software Release C.70.03)

HP e3000 MPE/iX Computer Systems

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1 Overview

This *Communicator HP e3000* provides general and detailed information on the new and enhanced functionality for the MPE/iX Release 7.0 PowerPatch 3 (C.70.03), as well as information on support, release strategy and installation prerequisites.

This *Communicator* should be used in conjunction with the *Communicators* from Releases 7.0 and 7.0 Express 1. Only new information relating to the Release 7.0 PowerPatch 3 is contained in this document. If you have additional questions beyond the scope of this document, please review the information in the two *Communicators* for Releases 7.0 and 7.0 Express 1. These documents are available online at *www.docs.hp.com*.

This MPE/iX *Communicator* describes the following enhancements:

- Announcing High Availability FailOver/iX for FC Disk Arrays
- HP SureStore Virtual Array 7110 and 7410 on the HP e3000
- Announcing Limited Support for Ultrium Tape on MPE/iX
- Predictive Changes `SYSSTART` during `UPDATE`
- TurboIMAGE B-Tree Behavior Clarification
- WebWise Replaces Apache in FOS
- Introducing Sendmail for MPE/iX

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 Release 7.0 PowerPatch 3 — provides overview of the PowerPatch enhancements.
- End of Support date for MPE/iX Releases 6.5, 7.0, and 7.5 is December 31, 2006
- Obtaining Software Security Patches for you HP Computer System

Chapter 3, Technical Articles

This chapter contains articles about the following:

- Announcing High Availability FailOver/iX for FC Disk Arrays
- HP SureStore Virtual Array 7110 and 7410 on the HP e3000
- Announcing Limited Support for Ultrium Tape on MPE/iX
- Predictive Changes `SYSSTART` during `UPDATE`
- TurboIMAGE B-Tree Behavior Clarification
- WebWise Replaces Apache in FOS
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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 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 Manua*l 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

MPE/iX Release 7.0 PowerPatch 3

MPE/iX and the e3000 have been dutifully serving HP customers for nearly 30 years. On November 14th, 2001 HP announced the end of sales for the HP e3000 and MPE/iX.

HP realizes that customers are planning their migration away from the e3000 and MPE/iX. We understand that it is very important for our customers to have additional time to develop and implement their migration strategy. Thus, HP has improved the existing functionality and integrity of MPE/iX Release 7.0 with a proactive patch-set found in MPE/iX 7.0 PowerPatch 3.

MPE/iX Release 7.0 PowerPatch 3

MPE/iX 7.0 PowerPatch 3 is a pro-active patch-set that includes defect repair which improves the capabilities and supportability of MPE/iX 7.0. This patch-set helps to ensure that customers are able to maximize the value of their current HP e3000 environment as they manage their transition off the platform.

End of Support Dates

Support for MPE/iX 6.0 release ended October 31, 2002 while MPE/iX Releases 6.5, 7.0, and 7.5 will be supported through December 31, 2006.

Customers who are planning their HP e3000 environment into the future should note that while MPE/iX 6.5 is supported through 2006, customers may find it beneficial to upgrade to MPE/iX 7.0. MPE/iX 7.0 contains many performance and capacity enhancements for high-end systems and bundled tools for using the HP e3000 with the Internet.

For a comprehensive listing of supported hardware, please go to:

http://www.hp.com/products1/mpeixservers/news_events/discont/servers/end_support.html

Making the PowerPatch Installation Easy

HP Engineering Services remains a major focal point for all your MPE/iX consulting needs. Please contact your local HP support organization for upgrades and installations.

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 H P e3000 and H P9000 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 H Pe3000 or H P9000 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 section outlines the various security related services offered by Hewlett-Packard 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.”

How to Subscribe

To subscribe to automatically receive future NEW HP Security Bulletins from the Hewlett-Packard 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 Hewlett-Packard 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 explicit 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 Technical Articles

This chapter contains the following articles:

- Announcing High Availability FailOver/iX for FC Disk Arrays
- HP SureStore Virtual Array 7110 and 7410 on the HP e3000
- Announcing Limited Support for Ultrium Tape on MPE/iX
- Predictive Changes `SYSSTART` during `UPDATE`
- TurboIMAGE B-Tree Behavior Clarification
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- Introducing Sendmail for MPE/iX

Announcing High Availability FailOver/iX for FC Disk Arrays

by Jim Hawkins, MPE/iX Lab

General Information

At no charge, High Availability FailOver/iX (HAFO or HAFO/iX) is now available for HP e3000 systems connected to many of HP's VA and XP family Fibre Channel (FC) disk array products. Support is offered for customers with HP e3000 A/N-Class systems running MPE/iX 7.5 using the A6795A 2Gbit FC-HBA and also for customers with HP e3000 S9xx systems running at least MPE/iX 7.0 using the A5814A-003 SCSI-FC Router. This greatly expands the coverage of the HAFO product which until recently supported only the SCSI XP256 (SCSI XP256 remains supported with these changes).

Once the HAFO software is installed, the user configures each disk LDEV with a primary data path and an alternate data path. In a normal state, data is routed through the primary path while HAFO software continually monitors disk I/O reply messages for failed components. HAFO is designed to detect the following event types:

- Hung I/O
- Failed disk controller
- Failed I/O host device adapter card
- Failed connection component (cables, switches, routers)

When these events are detected the HAFO software will "failover" to the alternate data path. That is, all subsequent I/O is sent to the configured alternate data path. No application or higher level MPE/iX Operating System component should experience an abnormal event. All I/Os complete as normal using the alternate data path and alternate array controller.

In the event of a failover, the system operator is notified via an MPE/iX console message. This is a "repeater" type message. Repeater messages are repeatedly sent to the console at approximately five minute intervals until a REPLY command is used to acknowledge the message. In addition to the console message, the failover event also causes I/O type log records to be written into the MPE/iX system log file.

Upon repair of the failed component, the system operator may switch the LDEV back to the primary path to restore HAFO protection for that device.

NOTE To prevent an uncontrolled series of repeated failover events HAFO does not allow automatic "fail back" from alternate to primary path

Who Should Consider HAFO

HAFO is for customers using disk arrays who want protection against failure for the following components of the I/O subsystem:

- I/O Host Bus Adapter (HBA)
- Cabling
- FC Switches
- SCSI-FC Routers
- Disk Controllers

CAUTION Before deploying HAFO, system disk I/O performance should be analyzed. Those systems with disk I/O bottlenecks (long disk queues and/or I/O completion times greater than a few seconds) are not good HAFO candidates as false failover events may be seen.

NOTE Those customers using Cluster/iX to protect their MPE/iX disk volumes may NOT use HAFO/iX on these same volumes. Further, Cluster/iX and HAFO/iX protected volumes may not share an HBA.

Required Hardware and Software

Required Hardware

- HP e3000 (each HAFO connection requires a pair of HBAs)
  - S9xx
    - A28696A NIO F/W SCSI Card
    - A5814A SCSI-FC Router
  - A-Class, N-Class
    - A6795A 2Gbit FC HBA
- Supported FC Multi-port Disk Array Products (each HAFO connection requires a pair of ports)
  - VA7410
  - XP48 and XP512
  - XP128 and XP1024
  - (SCSI XP256 remains supported)

Minimum Required Software

MPE/iX 7.0 (for HP e3000 S9xx)

MPE/iX 7.5 (for HP e3000 A/N-Class)

The following software patches are part of C.70.03 PPT and are required for HAFO support:

MPEMXL5 (I/O Core Patch)
MPEMXG9 (HA Utilities Patch)

Additional software patches NOT in C.70.03 PPT required for HAFO support:

MPEMXK9 (HA Utilities Patch)

Hardware that is NOT supported

- Any Arrays not listed above including, but not limited to
  - VA7100, VA7110 (supported on MPE but not for HAFO)
  - FC-XP256, VA7400 (never supported on MPE)
- A5814-001 Distancing Router (direct connect to XP48/512)

Documentation

Please refer to *http://docs.hp.com/* for the new edition of the HAFO manual:

High Availability FailOver/iX Manual (MPE/iX 7.0, MPE/iX 7.5) Edition 2, date code E0803, Part Number: 32650-90911 (".pdf" only)

The previous version of the manual still applies to MPE/iX 6.5 customers with SCSI XP256: "High Availability Failover Utilities Configuration Guide" (Part No. 32650-90899)

Additional information on HAFO, HP e3000 High Availability products, disk array utilization and MPE specific FC configuration information can be found in the "High Availability" section of the CSY external web site: *http://jazz.external.hp.com/mpeha/papers/index_papers.htm*

Recommended items for customers deploying HAFO and FC disk arrays include:

Table 3-1

High Availability FailOver/iX	(Web based training slide show with audio)	http://jazz.external.hp.com/mpeha/papers/HAFO_training_session/HAFO_training_session.html
Router White Paper	(Important information for A5814A-003 SCSI-FC Router)	http://jazz.external.hp.com/mpeha/papers/router_paper01.htm
MPE Disk Performance White Paper	(General discussion of disk performance issues)	http://jazz.external.hp.com/mpeha/papers/off_white_2004.html
How-To Papers	(Other HA related subjects)	*http://jazz.external.hp.com/mpeha/howto/index_howto.html*

HP SureStore Virtual Array 7110 and 7410 on the HP e3000

by Jim Hawkins, MPE/iX Lab

The HP StorageWorks Virtual Array is a low-cost, high capacity, high performance, 2 Gb Fibre Channel virtual disk array that delivers industry leading uptime. You can mix and match drives of different size, and add capacity instantly. HP's hot swap technology and redundant components reduce planned downtime. The virtual array architecture simplifies management and administration of the array. File or LUN creation occurs quickly, without worrying about the underlying physical technology.

- The HP StorageWorks Virtual Array 7110 (va7110) supports over 6.5 TB with up to 45 disks. The va7110 has one host port per array controller to enable configurations with no single point of failure. These ports support either 1 Gb or 2 Gb Fibre Channel devices to protect your investment in connectivity infrastructure.
- The HP StorageWorks Virtual Array 7410 (va7410) supports over 15 TB with up to 105 disks. The va7410 has four host ports to enable simplified and more extensive server and storage area network (SAN) connectivity. These ports support either 1 Gb or 2 Gb Fibre Channel devices. With four back-end disk ports and faster array controllers, the va7410 is capable of up to 34,000 cached I/Os per second and up to 330 MBps sequential throughput.

Device installation and support is to be provided by HP trained personnel. For detailed information on the support and configuration of the Virtual Array products consult the hp external web site in the storage section: http://www.hp.com/storage (currently VA7110 is under “Entry-level” and VA7410 “Mid-range”). Both the VA7110 and VA7410 have “technical documentation” tabs as the primary source for information.

For HP Support engineers additional information can be found on the NSS Spock site (HP Internal only): *http://hpso.rose.hp.com/spock/index.shtml*

NOTE The Command View SDM software is required to Support the VA disk arrays. CV-SDM does NOT run on MPE/iX. In addition to your MPE system you are required to connect an appropriate host system (“windows” type or HP-UX) with CV-SDM installed for configuration, support and management of your VA

HP SureStore Command View SDM .http://www.hp.com/storage “Storage software”

Configuration Basics

- va7100 va7410 Configuration Requirements
  - — Firmware version A100 or higher
  - — Port behavior set to HPUX or MPE
  - — Port Topology should be set to Private Loop
  - — Rebuild Priority should be set to Low
  - — Logical Unit Number (LUN) (0) must be configured for Command View SDM to work properly
  - — LDEV 1 as a boot device is supported
- HP e3000 System information:
  - — S9xx (NIO based machines):

- — F/W SCSI Device Adapter HP28696A. Firmware version 3728
- — SCSI-FC Fabric Router A5814A #003. Firmware version 8.01.0A
- — HSSDC Gigabit Interface Converters (GBIC)
- — Fibre optic cable: 62- or 50-micron fibre optic cable with dual SC connector

OR

- — A/N-Class (PCI based systems):
  - — A6795A PCI- 2Gbit Card -- LC Cable interface
  - — No additional GBIC for Card, Device still requires one.
  - — LC/SC Fibre Channel Cable such as A5750A-008 or C7530A
- — HP e3000 Software Requirements
  - — MPE/iX 7.0 plus MPEMXF8 (or superceding patch or PPT)
  - — MPE/iX 7.5 plus MPEMXF8 (or superceding patch or PPT)
  - — SYSGEN product ID is `HPDARRAY`.
- — Host Diagnostic Support
  - — No host based diagnostics are supported. Diagnostic functions are accomplished via Command View SDM Product running on NT or HP-UX host.
  - — Offline Diagnostic Support. No specific support for Offline Diagnostic support. Basic functions such as "ODE Mapper" will be able to identify and the Logical Units configured on the VA7100 as SCSI Disks.

Additional MPE Specific information on disk array utilization and FC configuration information can be found in the “High Availability” section of the vCSY external web site:
http://jazz.external.hp.com/mpeha/papers/index_papers.html

Recommended items for customers deploying va family disk arrays include:

Table 3-2

High Availability FailOver/iX	(Web based training slide show with audio)	http://jazz.external.hp.com/mpeha/papers/HAFO_training_session/HAFO_training_session.html
Router White Paper	(Important information for A5814A-003 SCSI-FC Router)	http://jazz.external.hp.com/mpeha/papers/router_paper01.htm
MPE Disk Performance White Paper	(General discussion of disk performance issues)	http://jazz.external.hp.com/mpeha/papers/off_white_2004.html
How-To Papers	(Other HA related subjects)	*http://jazz.external.hp.com/mpeha/howto/index_howto.html*

Announcing Limited Support for Ultrium Tape on MPE/iX

by Jim Hawkins, MPE/iX Lab

The purpose of this article is to document the limited support offered for Ultrium Tape Devices (a.k.a. "LTO") on MPE/iX.

The primary considerations are outlined below. Items #3 and #4 are unique to Ultrium Tape Devices and represent a departure from traditional MPE/iX tape device support.

1. System and connection types: A-Class and N-Class, LVD-SCSI only.
2. O.S. software: MPE/iX 7.0 or 7.5 with appropriate version of patch MPEMXJ3.
3. Supported software: Only for use with certified 3rd party back-up solutions.
4. Diagnostic support: Very limited, requires access to Windows or HP-UX system with LVD-SCSI HBA and current version of HP Storage Works Library and Tape Tools. Some diagnostic activities may require removing the tape device from the HP e3000.

More in depth discussion of these items along with configuration details follows.

Hardware and Software Requirements

MPE/iX support of Ultrium 215 and 230 devices is limited to parallel LVD-SCSI connections only. Thus, these devices may only be connected to HP e3000 A-Class and N-Class systems running MPE/iX 7.0 or 7.5 Release. In addition, patch MPEMXJ3, version "A" for MPE/iX 7.0 or version "B" for MPE/iX 7.5, must be installed for the device to be supported. Finally, on 7.0 only, patch MPEMX74 "A" should also be installed.

Only those HP Ultrium Tape devices sold for use with HP-UX PA-RISC server systems will be supported. There are variations in firmware for the many Ultrium devices on the market; only devices with the firmware for HP-UX server systems will be supported. More on Firmware below.

Ultrium Tape Usage Requirements

Ultrium devices will only be supported for access/usage by certified 3rd party supplied back-up products; certified products are currently limited to:

- BACKUP+/iX (ORBiT Software Inc., *http://www.orbitsw.com/*)
- HiBack® (Mount10 Group, *http://www.mount10.com/*).

Ultrium Tape devices are NOT supported for any other traditional MPE/iX tape functions including, but not limited to: System boot, SYSGEN, HP Store/Restore, HP TurboStore, general file system access, user logging, FCOPY, Sherlock diagnostics, etc. These restriction are in place due to incompatibilities between MPE/iX tape usage patterns and Ultrium implementation assumptions which can lead to unacceptably poor performance. In most of these cases, there are no actual blocks in place to prevent using Ultrium; nevertheless, such usage is NOT supported.

There is one small exception: The program `devtool.pub.sys` and the command file `devctrl.mpexl.telesup` may be used to load/unload media but it will NOT support turning compression on/off for Ultrium. HP Ultrium incorporates "intelligent" compression that prevents attempts to compress data that is already compressed so there is no need to explicitly turn device level (hardware) compression on or off.

Error Reporting, Diagnostics and Firmware Updates

MPE/iX logs all Ultrium Tape device errors and checks conditions to the system log files as with other SCSI tapes. System Log files can then be examined with LOGTOOL or cstm's logtool utility. Similarly, all standard tape console messages such as AVR tape mount or cleaning cartridge prompts can be seen. However, MPE/iX cstm (a.k.a. MESA) diagnostics, (like HP-UX cstm) do NOT allow Ultrium access to functions such as "expert tools" or "firmware update."

Most diagnostic support for Ultrium drives comes from HP Storage Works Library and Tape Tools (a.k.a. LTT). LTT does not run on MPE/iX; therefore in some diagnostic scenarios the Ultrium may have to be removed from the HP e3000 and connected to a host running LTT. For details on LTT, please reference the HP corporate web site *www.hp.com*. Currently "HP StorageWorks Library and Tape Tools" web page may be found at:

http://h18006.www1.hp.com/products/storageworks/ltt/index.html

Firmware update can be accomplished through Firmware Upgrade Tape (FUP). The Firmware Upgrade Tape (FUP) creator is part of the HP Storage Works Library and Tape Tools. The FUP creator must be run on Windows, HP-UX or Linux. Once a FUP is created it can be used to update Ultrium devices connected to the HP e3000. More information can be found at the following web sites:

HP External: "HP Ultrium - Firmware Upgrade Instructions for HP Standalone External, Internal and M-drive Ultrium Tape Drives"

http://h20000.www2.hp.com/bizsupport/TechSupport/Document.jsp/objectID=lpg50219

HP Internal: NSS Nearline storage "HP StorageWorks Library and Tape Tools - Firmware"

http://hpcrlib1.gr.hp.com/customercare/Technicalsupport/diagnostics/LTT_firmware.htm

Ultrium device firmware should selected for devices to be compatible with HP-UX Server Systems. Current firmware levels are:

- Ultrium 215, firmware revision N26D
- Ultrium 230, firmware revision E32D

Configuration Limits and Examples for Ultrium Devices on MPE/iX

Physical connections are to be made only to LVD-SCSI Host Bus Adaptors. LVD-SCSI terminators must be used for devices to function at rated speeds. HP recommends only ONE Ultrium Tape device per SCSI bus for maximum performance. No more than TWO Ultrium Tape devices per SCSI bus will be supported. An Ultrium device must never share a SCSI bus with any other SCSI peripheral type.

You may configure an Ultrium tape LDEV via SYSGEN or IOCONFIG as you would any other SCSI tape device. On 7.0 with MPEMX74 you should use device ID=DLT. On 7.5 you may use device ID=LTO or ID=DLT. (Using device ID of LTO or DLT assigns the scsi_tape2_dm driver to the device. This driver supports Ultrium, DLT and other, "non-DDS" tapes. The driver, completed by MPEMXJ3, will detect Ultrium devices and automatically make the appropriate SCSI mode page settings.)

Ultrium devices are configured as standard SCSI type devices and so require a "pseudo" device to be configured as do all other SCSI devices on MPE/iX

Configuration Example:

Given the following output from "ISL> ODE RUN MAPPER2"

```
0/6         Elroy PCI Bridge                    DH    782H  AH    0     0

0/6/2/0     Symbios SCSI Controller

0/6/2/0.3.0  Ultrium (LTO) 1-SCSI Tape drive   -     -     -     -  E32D
```

The following SYSGEN (IOCONFIG) commands would be used:

```
sysgen> ap 0/6       pat_pci_bc
sysgen> ap 0/6/2     pci_device
sysgen> ap 0/6/2/0   A5149A
sysgen> ap 0/6/2/0.3 PSEUDO
sysgen> ad 19 0/6/2/0.3.0 LTO
                          |||
```

(ID of DLT may be used on 7.0)

To confirm, use the "list path" command. The last three entries should show:

```
sysgen> LP
. . .
PATH:  0/6/2/0                              LDEV:
  ID:  A5149A                               TYPE: DA
PMGR:  PCI_SCSI_DAM                      PMGRPRI:     6
LMGR:                                     MAXIOS:     0


PATH:  0/6/2/0.3                            LDEV:
  ID:  PSEUDO                               TYPE: DA
PMGR:  TRANSPARENT_MGR                   PMGRPRI:     6
LMGR:                                     MAXIOS:     0


PATH:  0/6/2/0.3.0                          LDEV:   19
  ID:  LTO                                  TYPE: TAPE
PMGR:  SCSI_TAPE2_DM                     PMGRPRI:    10
LMGR:  LOGICAL_DEVICE_MANAGER             MAXIOS:     0
```

Predictive Changes SYSSTART during UPDATE

by Gary Robillard, Predictive Support

Due to some customer sites having multiple startup directives in SYSSTART.PUB.SYS, the job that installs Predictive has been modified to recognize this. Previously, this Predictive job would just add the "STREAM JPSMON.PRED.SYS" line to the end of SYSSTART. Now, the job modifies the SYSSTART file as follows:

1. Gather STREAMs device and printer queue for STREAMs and OPENQ commands if needed.
2. If SYSSTART.PUB.SYS does not exist, a new SYSSTART file is created on ldev 1 with the following contents:

```
STARTUP
**
WARMSTART
OPENQ LP
STREAMS 10
STREAM JPSMON.PRED.SYS
**
COOLSTART
OPENQ LP
STREAMS 10
STREAM JPSMON.PRED.SYS
****
```

3. If a WARMSTART, COOLSTART, RELOAD or UPDATE section exists and has commands, AND there are no other STREAM commands AND there are no STARTSESS to OPERATOR.SYS commands, then do not modify the SYSSTART file.
4. If there are STARTSESS commands but no STARTSESS to OPERATOR.SYS, then do not modify the SYSSTART file.
5. The command STREAM JPSMON.PRED.SYS is removed from the STARTUP section and added to the WARMSTART and COOLSTART sections. If no WARMSTART and COOLSTART sections exist, they are created and contain these commands:

```
**
WARMSTART
OPENQ LP
STREAMS 10
STREAM JPSMON.PRED.SYS
**
COOLSTART
OPENQ LP
STREAMS 10
STREAM JPSMON.PRED.SYS
****
```

If the file NOSYSST.PRED.SYS exists, it prevents the Predictive job from doing any SYSSTART file processing during installation. Therefore, if you do NOT want the "STREAM JPSMON.PRED.SYS" command added to your SYSSTART file, create the NOSYSST.PRED.SYS file with a build command.

```
BUILD NOSYSST.PRED.SYS;DISC=1
```

TurboIMAGE B-Tree Behavior Clarification

by Tien You Chen, MPE/iX Lab

Possible Confusing Behavior

TurboIMAGE has supported B-Tree indices since C.07.00. Even though a user can create a B-Tree index only on the master data set's key item, s/he can perform index searches using all of its corresponding detail data set search items as well. Users can now call DBFIND to perform a generic key search on a master data set, then chained DBGETs to return all the qualified records. Confusion arises when a user calls DBFIND on a master data set but, before or between the chained DBGETs of those qualified records, s/he calls another DBFIND on a detail data set using a search item linked to the master currently being accessed chained. This DBFIND will reposition the chain pointer on the master. As a result the user may get an 'end of chain' status for the next DBGET to the master data set. Since these two DBFINDs are finding against two different data sets, the user is amazed at the interference between these two.

What to Expect and How to Solve

Because only one KSAM/iX file is attached to each master data set, all B-Tree access for related detail data sets also goes, via the master data set, to the same KSAM file. Since there is only one logical record pointer in the KSAM file, a new DBFIND, which positions the logical record pointer, affects the current reading. In addition, the internal runtime data structure, though allocated one per data set, is still affected. Therefore, even if the second DBFIND on the detail data set is not a B-Tree DBFIND, many flags in the runtime data structure are reset. The next DBGET to the master data set acts as though there was no previous B-tree DBFIND to the master.

This combination of access methods, mixing DBFIND/chain DBGET to a master with DBFIND/chain DBGET to a detail using a path to that same master, is not common. We suggest the user call a second DBOPEN to handle the second DBFIND. However, please remember the second DBOPEN is needed only when calling DBFIND on a detail chain while still performing chained DBGETs on the related master data set.

WebWise Replaces Apache in FOS

By Mark Bixby, Commercial Systems Division

The HP WebWise MPE/iX Secure Web Server version A.01.00 was first introduced as a separately purchasable add-on product for MPE/iX 6.5 or greater. But as of MPE/iX 7.5, the WebWise web server has been updated to version A.03.00 and replaces Apache in FOS as a no-extra-cost bundled product. Patch WBWGDT7A brings this same functionality to MPE/iX 7.0.

This is the second release of the HP WebWise MPE/iX Secure Web Server. It was labeled version A.03.00 because it is replacing the A.02.00 version of Apache. There was no A.02.00 version of WebWise.

HP WebWise MPE/iX Secure Web Server version A.03.00 is based on Apache 1.3.22 and adds mod_ssl 2.8.5 to provide Secure Sockets Layer (SSL) encryption and X.509 authentication using digital certificates.

Product Overview and Feature Set

HP WebWise MPE/iX Secure Web Server offers secure encrypted communications between browser and server via the SSL and TLS protocols, as well as strong authentication of both the server and the browsers via X.509 digital certificates. The current release of the HP WebWise MPE/iX Secure Web Server is A.03.00 and is composed of:

- Apache 1.3.22
- Mod_ssl 2.8.5 SSL security add-ons for Apache
- MM 1.1.3 shared memory library
- Openssl 0.9.6b cryptographic/SSL library
- RSA BSAFE Crypto-C 5.2 cryptographic library (for the RC2, RC4, RC5, and RSA algorithms)

HP WebWise MPE/iX Secure Web Server is NOT:

- a substitute for a firewall (explicitly allow acceptable connections, etc.)
- a substitute for good host security practices (change default passwords, keep the OS up-to-date, etc.)
- a substitute for good application security practices (use appropriate file and user security, carefully validate all input data, etc.)
- a substitute for good human security practices (communicate the importance of protecting sensitive or proprietary data, no password sharing, etc.)

WebWise is just one component in a secure environment and by itself does nothing to prevent the number one cause of web server break-in events -- poorly written CGI applications. Well-written CGI applications must rigorously validate every byte of data sent by a browser, and must refuse to process any input data containing unexpected characters.

System Requirements and Patches

- MPE/iX 7.0
- HP highly recommends installing the latest NSTxxxxx network transport patch.

Support

HP WebWise MPE/iX Secure Web Server A.03.00 is supported through the HP Response Center as part of MPE/iX FOS support.

New Apache Functionality since 1.3.14

Most of the Apache Software Foundation development work since 1.3.14 consists of portability enhancements and bug fixes for various problems including security issues. Some minor new functionality has also been added, as partially listed below:

- A new LogFormat directive of %c to display the connection status when each request is completed.
- mod_auth has been enhanced to allow access to a document to be controlled based on the owner of the file being served. Require file-owner will only allow files to be served where the authenticated username matches the user that owns the document. Require file-group works in a similar way checking that the group matches.
- The rotatelogs utility was enhanced to allow the logfile name to include customizable date stamps (using the standard strftime syntax) as well as the ability to specify the time offset from UTC.
- The Apache manual web pages can now be installed to a location other than the htdocs DocumentRoot, and so starting with WebWise A.03.00 these pages have been relocated to the `/APACHE/CURRENT/htmanual` directory tree. The WebWise A.03.00 installation process replaces the old `/APACHE/PUB/htdocs/manual` directory with a symbolic link pointing to `/APACHE/CURRENT/htmanual`.

SSLv2.0, SSLv3.0, and TLSv1.0 Protocols

These protocols lie between the HTTP and TCP/IP protocol layers and provide secure, authenticated, encrypted communications between the HP WebWise MPE/iX Secure Web Server and web browser clients.

X.509 Digital Certificates

Signed by external trusted Certificate Authorities, X.509 certificates provide authentication for both the HP WebWise MPE/iX Secure Web Server and web browser clients.

Flexible Encryption Cipher Configuration

HP WebWise MPE/iX Secure Web Server permits you to configure a wide variety of encryption ciphers, ranging from high-grade domestic-only algorithms to algorithms suitable for export.

Additional Log Files

Two new log files, ssl_engine_log and ssl_request_log, allow you to log various events associated with secure web requests.

Migrating from Previous Versions of Apache

The `/APACHE/PUB/JHTTPD` job stream file from previous versions of Apache is not compatible with HP WebWise MPE/iX Secure Web Server. You must manually create a new `JHTTPD` job stream file by using the WebWise `/APACHE/PUB/JHTTPD`.sample template.

The /APACHE/PUB/conf/httpd.conf configuration file from previous versions of Apache may or may not be compatible with WebWise depending on the previous Apache version:

- 1.3.4 – NOT compatible; you MUST use `/APACHE/PUB/conf/httpd.conf.sample` as a template to create a new httpd.conf file.
- 1.3.9 – compatible, but SSL functionality will not be enabled. To enable SSL functionality, you MUST use `/APACHE/PUB/conf/httpd.conf.sample` as a template to create a new httpd.conf file.
- 1.3.14 – compatible, but SSL functionality will not be enabled. To enable SSL functionality, you MUST use `/APACHE/PUB/conf/httpd.conf.sample` as a template to create a new httpd.conf file.

In addition to updating /APACHE/PUB/conf/httpd.conf, it is strongly recommended to update all of the other configuration files in the same directory by using the corresponding *.sample files.

Several new configuration subdirectories have been created to contain additional configuration files required by the SSL functionality. For complete details about configuring the SSL functionality, please see the Configuring & Managing MPE/iX Internet Services manual.

Migrating from WebWise A.01.00

HP WebWise MPE/iX Secure Web Server version A.03.00 was designed to be a drop-in replacement for Apache, and does not attempt to upgrade or migrate any files from the WebWise A.01.00 /APACHE/SECURE directory tree.

You must manually use the A.03.00 *.sample files in the /APACHE/PUB/conf directory tree to create new standard configuration files, and then propagate any local customizations that you made in the A.01.00 /APACHE/SECURE/conf directory tree.

You will need to copy your server key and certificate from the old A.01.00 locations of /APACHE/SECURE/conf/ssl.key/server.key and /APACHE/SECURE/conf/ssl.crt/server.crt to the new A.03.00 locations of /APACHE/PUB/conf/ssl.key/server.key and /APACHE/PUB/conf/ssl.crt/server.crt.

Any A.01.00 CGI applications in /APACHE/SECURE/cgi-bin or any data content in /APACHE/SECURE/htdocs can either be moved to the corresponding A.03.00 directories in /APACHE/PUB, or left in place after adjusting the new A.03.00 configuration files to refer to the old A.01.00 locations.

WebWise A.01.00 accessed the web page content as the user SECURE.APACHE, but WebWise A.03.00 accesses web page content as the user WWW.APACHE. This is the same user as used by Apache A.02.00.

For Further Information

- *http://yourserver.yourdomain.com/manual/* (online documentation included with WebWise)
- *Configuring and Managing MPE/iX Internet Services Manual*
- *http://jazz.external.hp.com/src/webwise/* (HP WebWise)
- *http://www.apache.org/* (Apache opensource project)
- *http://www.modssl.org/* (Mod_ssl opensource project)
- *http://www.engelschall.com/sw/mm/* (a library of shared memory functions)
- *http://www.openssl.org/* (OpenSSL opensource project)
- *http://www.rsasecurity.com/products/bsafe/cryptoc.html* (RSA BSAFE Crypto-C commercial product)
- The HP3000-L mailing list where you can talk with other users of WebWise on MPE/iX:
  - The official HP3000-L web site of *http://raven.utc.edu/Archives/hp3000-l.html*
  - The gatewayed Usenet newsgroup of *comp.sys.hp.mpe*

Introducing Sendmail for MPE/iX

by Mark Bixby, Commercial Systems Division

Previously available as unsupported freeware, Sendmail is now available for MPE/iX 7.0 via patch SMLGDT8A as a fully supported product which allows you to send and receive SMTP-based e-mail. The initial A.01.00 release of Sendmail for MPE/iX is based on the 8.12.1 Internet open source version from sendmail.org.

System Requirements and Patches

Sendmail has the following prerequisites:

- MPE/iX 7.0
- HP highly recommends installing the latest NSTxxxxx network transport patch.
- Syslog/iX configured and running so that Sendmail can log warnings, errors, and message traffic data. Syslog/iX is documented in the *Configuring and Managing MPE/iX Internet Services* manual.
- Your e3000 must be configured to use one or more DNS servers, and must have the correct entries in the DNS database corresponding to the configured hostname in `:NMMGR`. See “DNS Issues” below for more detail.
- Any network firewalls, routers, or switches that your e3000 communicates with must be configured to allow your e3000 to send and receive packets on port 25 (SMTP) and port 53 (DNS). See “Firewall Issues” below for more detail.

Support

Sendmail 8.12.1 for MPE/iX is supported through the HP Response Center as part of MPE/iX FOS support.

Product Overview and Feature Set

The feature set of Sendmail for MPE/iX is quite extensive; the following is only a partial list:

- Send and receive SMTP-based e-mail from sessions and/or batch jobs
- Deliver local e-mail to mailboxes, files, or programs
- A vast selection of tunable performance parameters
- Highly flexible and extremely powerful configuration language
- Access control for accepting or rejecting incoming e-mail
- Message header rewriting capabilities
- Modular feature set allows you to configure exactly the functionality you want; the following optional features have been configured by default in this distribution:
  - access_db
  - domaintable
  - genericstable
  - mailertable
  - virtusertable

- Open-source robustness and reliability
- Compatibility with the HP-UX Sendmail file layout

DNS Issues

The number one cause of Sendmail installation problems is due to improper system naming and/or a lack of DNS entries describing your e3000. Please verify the following before you attempt to run Sendmail for the first time:

- `/bin/uname -n` should report your e3000 hostname as a single token, i.e. "JAZZ" instead of "`JAZZ.EXTERNAL.HP.COM`". If you do not see a single token hostname, you must configure a proper hostname by using `:NMMGR`.
- `/SYS/NET/RESLVCNF` must contain a single "domain" statement that defines the domain part of your e3000's fully qualified hostname. For example, /bin/uname –n should display "JAZZ" and `/SYS/NET/RESLVCNF` should contain a "`domain external.hp.com`" statement.
- `/SYS/NET/RESLVCNF` must contain one or more "nameserver" statements which specify one or more DNS server IP addresses that your e3000 will be querying to resolve host names. It is not necessary to run a DNS server such as BIND on your e3000 itself.
- Your e3000 must be defined within the DNS nameserver databases as having a valid "A" record that maps the e3000's hostname to an IP address.
- Your e3000 must be defined within the DNS nameserver databases as having a valid "PTR" record that maps the e3000's IP address to a hostname.

Sendmail for MPE/iX is distributed with a convenient script that you can run to check all of the above DNS configuration issues and more:

```
:HELLO SERVER.SENDMAIL
:XEQ SH.HPBIN.SYS -L
shell/iX> /SENDMAIL/CURRENT/bin/dnscheck
```

The dnscheck script will instruct you how to fix any problems that it detects. After making each fix, keep rerunning the script until no more problems are found.

Firewall Issues

The number two cause of Sendmail installation problems is due to a firewall or other network security device blocking your e3000 from being able to send and receive packets on port 53 (DNS) and port 25 (SMTP).Sendmailn

Sendmail uses port 53 (DNS) to resolve hostnames into IP addresses and IP addresses into hostnames. Sendmail may do multiple DNS resolutions for every e-mail message sent or received, and if a firewall is blocking these DNS packets, Sendmail may experience long delays and/or generate various error messages logged to syslog.

Sendmail may need to contact external DNS servers if you are attempting to exchange e-mail with the Internet. Some intranet environments may require you to reference a "forwarding DNS server" (which can traverse your border firewall to talk to the Internet) via a nameserver statement in /SYS/NET/RESLVCNF. Consult your local network administrator for advice on how to choose a proper DNS server.

Port 25 (SMTP) is used to connect to remote mail servers to deliver outgoing e-mail, and is also used on the e3000 to listen for incoming e-mail. If a firewall is blocking outbound port 25 packets, Sendmail may experience long delays and generate various error messages logged to syslog as well as bounce messages returned to the e-mail originator. If a firewall is blocking inbound port 25 packets, Sendmail will not be able to receive any incoming e-mail, and there will be no extra syslog messages.

Migration from SendMail 8.9.1

Many e3000 machines have been running the unsupported freeware version of Sendmail 8.9.1 available from *http://www.bixby.org/mark/sendmailix.html*. The following considerations apply if you are migrating from 8.9.1 to 8.12.1:

- The 8.9.1 daemon job stream file `/SENDMAIL/PUB/JDAEMON` is not modified by the 8.12.1 installation process, and it is not compatible with the 8.12.1 distribution. You must use `/SENDMAIL/CURRENT/JDAEMON`.sample as a template for manually creating an 8.12.1-compatible `/SENDMAIL/PUB/JDAEMON` job stream file.
- The 8.9.1 `/SENDMAIL/PUB/SENDMAIL` program file is renamed to `SENDMAIL.bak` and replaced by a symbolic link that points to the 8.12.1 `/SENDMAIL/CURRENT/SENDMAIL` program file. Any existing applications that refer to `/SENDMAIL/PUB/SENDMAIL` should continue to work properly without modification.
- All 8.12.1 distribution files live in different HFS directories than the 8.9.1 distribution files. Once you are satisfied that 8.12.1 is working properly, you should purge the old 8.9.1 files to conserve disk space and avoid confusion.
- All 8.12.1 configuration files reside in the /etc/mail directory instead of the old 8.9.1 location of `/SENDMAIL/PUB/etc`. The 8.9.1 sendmail.cf file is not compatible with 8.12.1, and so you will either have to use the default `8.12.1 /etc/mail/sendmail.cf` file or create your own customized configuration file from the 8.12.1 configuration macros in `/SENDMAIL/CURRENT/cf/cf`.
- All 8.9.1 database maps including the aliases file should be rebuilt using the 8.12.1 makemap or newaliases utilities.
- Any undelivered messages still on the 8.9.1 queue will not be delivered by 8.12.1 which now has two separate queues residing at /var/spool/clientmqueue and /var/spool/mqueue instead of the previous single 8.9.1 queue location `/SENDMAIL/PUB/mqueue`.
- The implementation of local message submission has changed with 8.12.1. Previously with 8.9.1, the `/SENDMAIL/PUB/SENDMAIL` program file would copy new messages from stdin directly into a queue disk file. With 8.12.1, the SENDMAIL program file will copy new messages from stdin and then contact the local e3000's port 25 to queue the messages using standard SMTP protocol.
- 8.12.1 does not include the Majordomo mailing list software that was bundled with 8.9.1.

For Further Information

- Configuring & Managing MPE/iX Internet Services manual.
- The HP CSY Sendmail web page of *http://jazz.external.hp.com/src/sendmail/*.
- The official Sendmail web site of *http://www.sendmail.org/*.
- Information about unsupported freeware versions of Sendmail for MPE/iX can be found at *http://www.bixby.org/mark/sendmailix.html*.
- Documentation files installed on your local machine with this distribution:
  - `/SENDMAIL/CURRENT/doc/op/op.ps` - Sendmail Installation and Operation Guide
  - `/SENDMAIL/CURRENT/cf/README` - Sendmail Configuration Files
  - `/SENDMAIL/CURRENT/man` - directory tree containing man page documentation, i.e.:
    ```
    export MANPATH=/SENDMAIL/CURRENT/man:$MANPATH
    man sendmail
    ```
- The HP3000-L mailing list where you can talk with other users of Sendmail on MPE/iX:

— The official HP3000-L web site of *http://raven.utc.edu/Archives/hp3000-l.html*

— The gatewayed Usenet newsgroup of comp.sys.hp.mpe