Communicator 3000
MPE/iX Express 1
Based on Release 6.0

HP 3000 MPE/iX Computer Systems

Volume 10, Issue 2

HEWLETT® PACKARD

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1 Announcements

Future 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 will not be made to work with MPE/iX Release 6.5 and later releases. MPE/iX Release 6.5 is projected to begin shipping during the first half of 2000. 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 5.5 (which has a projected end-of-support date of November 1, 2000) and Release 6.0 (which has a projected end-of-support of November 1, 2001).

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 9x8 or 9x9KS HP 3000 Servers.

Discontinuance of High Availability Fiber Link Disk Drives

Hewlett-Packard Company introduced a family of High Availability Fiber Link disk drives. Fiber Link's discontinuance ends August 1, 1997. The Fiber Link disk represented HP's first RAID devices built for high availability, high performance, high capacity and distance up to 500 meters. RAID technology has continued to move forward, and CSY has embraced each new RAID technology EMC Disk arrays, High Availability Model 10 and disk arrays.

With CSY readying itself for new I/O cards, processors and I/O backplanes, MPE/iX 6.5 is the first HP 3000 O.S. to support new I/O devices and processors; therefore, CSY is not carrying Fiber Link support forward in MPE/iX 6.5. FL will be supported on MPE/iX 6.0, until its obsolescence occurs.

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 3000 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 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 3000 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 Electronic Support 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 Electronic Support Center Security-Related Services

HP Electronic Support 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 Electronic Support 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 Electronic Support Center web page at:

Table 1-1.

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 Electronic Support 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.

2 Overview—MPE/iX Release 6.0 Express 1 (C.60.01)

This *Communicator 3000* provides general and detailed information on the new and enhanced functionality for the MPE/iX 6.0 Release Express 1 (C.60.01), as well as information on release strategy and installation prerequisites.

MPE/iX 6.0 has accumulated all of the functionality previously released on MPE/iX 5.5 Express releases such as Year 2000 enhancements, ODBCLink/SE—a 32-bit driver from M.B. Foster Associates, and B-Tree functionality with IMAGE/SQL. In addition, it also offers support for user-defined job queues—for improved system management, SAMBA—for NT integration, Java, FTP enhancements, and many more enhancements.

MPE/iX 6.0 Express 1 provides the following additional enhancements: CI enhancements, PATCH/IX B.01.02, DLT4000/DLT7000 Differential Tape support, IMAGE/SQL P and Z data types, HP Driver for JDBC, HP 3000 Large Memory Subsystem, Legato Storage Node, Support for 36 Gigabyte Disks, and improvements to the JAVA developer's kit.

Communicator Summary

Following are brief descriptions of the articles and chapters.

Chapter 1 Announcements

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

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

- Discontinuance of High Availability Fiber Link Disk Drives

- MPE/iX Patches on HP Electronic Support Center

  MPE patches are now available on HP Electronic Support Center via the Internet to all customers. New access instructions are in the article, "MPE/iX Patches Now on HP Electronic Support Center," in chapter 1.

Chapter 2, Overview--Communicator Summary

This chapter provides a summary of information contained in this manual.

Chapter 3, Technical Articles

This chapter includes articles on the following features:

- CI Enhancements

  This article provides information about CI Evaluator Functions `JINFO`, `JOBCNT` and `WORDCNT`. It also provide information about CI Variables `HPDATETIME`, `HPDOY`, `HPHHMMSSMMM`, `HPLEAPYEAR` and `HPYYYYMMDD`.

- NPCONFIG Variable to NW Spooler

  This article provides information about the `NPCONFIG` variable with details on configuring the spooler.

- PATCH/iX B.01.02

  This article provides information about a new dialog box in the Patch Qualification screen and a new activities menu item '[ ] Adding Reactive Patches from Download'.

- Announcing DLT4000/7000 Differential Tape Support in MPE/iX

  This article provides information about two new stand-alone differential tape drives, the DLT4000 and the DLT7000. It provides hardware and software requirements for using the drives.

- IMAGE/SQL Enhancement: P and Z Data Types

  This article provides information about this enhancement to IMAGE/SQL which allows application programs to enter unsigned data into TurboIMAGE/XL fields with P or Z data.

- HP Driver for JDBC

  This article provides information about the JDBC driver. It provides an overview of the functionality and the requirements for using this driver.

- Java Developer's Kit for MPE/iX

  This article provides information about the new features of Java for MPE/iX, including improved performance, a just-in-time compiler, reduced resource requirements, and simplified operation.

- Legato NetWorker Storage Node for MPE/iX

  This article provides information about the Legato Storage Node and how to configure the libraries on MPE/iX.

- ALLBASE/BRW JCWs for Year 2000

  This article provides information about changes to two JCWs which support the reading and writing of two-digit years.

- HP3000 997 Large Memory Subsystem

  This article provides details about using a large memory subsystem on HP 3000 997 servers.

- Hewlett-Packard SureStore E Disk Array MC256

  This article provides a summary of site, software and hardware requirements for support of the HP SureStore E Disk Array MC256.

- DVD Support on the HP 3000

  This article provides information about replacing older CD-ROM drives with the DVD drive, and still permitting the use of CD-ROM disks.

- ALLBASE/SQL Version G3 Article Update

  This article provides changes to syntax shown in the previously published Communicator article.

- HP System Account and Directory Naming Structure

Chapter 4, Product Release History

This chapter adds product information for MPE/iX Release 6.0 and updates the termination dates in the Supported System Release Matrix table.

Chapter 5, Catalog of User Documentation

This chapter provides two types of manual listings:

- A listing of all new or updated manuals by the time of the MPE/iX 6.0 Release.

- A current listing of the MPE/iX manuals grouped by collections.

MPE/iX Patches on HP Electronic Support Center

by Patch Support Team
Commercial Systems Division

MPE/iX patches for MPE/iX Release 5.0 and beyond, are available on 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 Electronic Support Center

To serve customers the HP Electronic Support Center provides World Wide Web access for downloading patches.

Access to World Wide Web Server (www)

HP Electronic Support 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 Electronic Support Center will inform you proactively about newly developed security and GR patches. For more information, refer to the instructions on the Electronic Support Center website.

AUTOPAT Installation Document

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

To retrieve the AUTOPAT patch installation instructions:

1. Access the "HP Electronic Support Center" website using the appropriate web address for your country.

2. Enter login user ID and password.

3. In the main menu under What Would You Like to Do? select:
   Search Technical Knowledge Base.

4. In the pulldown menu, select:
   Search by Doc Id.

5. In the search field, enter AUTOPATINST. Click on the **SEARCH** button.

3 Technical Articles

- CI Enhancements
- NPCONFIG Variable to NW Spooler
- PATCH/iX Enhancements
- Announcing DLT4000/DLT7000 Differential Tape Support in MPE/iX
- IMAGE/SQL Enhancement: P and Z Data Types
- HP Driver for JBDC
- Java Developer's Kit for MPE/iX
- Legato 3000 NetWorker Storage Node for MPE/iX
- ALLBASE/BRW JCWs for Year 2000
- HP 3000 997 Large Memory Subsystem
- Hewlett-Packard SureStore E Disk Array MC256
- DVD Supported on the HP 3000
- ALLBASE/SQL Version G3 Article Update
- HP System Account and Directory Naming Structure

CI Enhancements

by Jeff Vance,
Commercial Systems Division

Enhancements Summary

MPE/iX Release 6.0 Express 1 contains the following CI enhancements:

- There are three new CI evaluator functions - `JINFO`, `JOBCNT` and `WORDCNT`.

- There are five new CI variables - `HPDATETIME`, `HPDOY`, `HPHHMMSSMMM`, `HPLEAPYEAR`, `HPYYYYMMDD`.

- The `PAUSE` command allows you to select just jobs or just sessions that match "`[jobname,]user.account`".

- The `QUOTE` function, introduced late in release 5.5, has been officially removed. It was un-documented in the 6.0 base release and the function has been deleted in 6.0 Express 1. `QUOTE` was removed because it did not provide useful functionality, and is easy to duplicate using the existing `REPL` function.

- The `DELIMPOS` function returns the position (index) of one or more specified delimiters. A defect in `DELIMPOS` was corrected which could impact some existing CI scripts. Prior to 6.0 express 1, `DELIMPOS` treated each space in the string as a separate delimiter -- in other words, there was no 'folding' of spaces. In 6.0 express 1, `DELIMPOS` treats multiple spaces as a single delimiter, just as the `WORD` function does. In fact, `DELIMPOS` is consistent with `WORD`'s "endvar" parameter for all cases, except when the string has no matching delimiter. In this situation `DELIMPOS` returns 0, meaning there was no match; whereas, `WORD` returns string length plus one.

JINFO

Syntax: JINFO (jobID, item [,status])

jobID   Required. String identifying the target job or session that information is being requested for. Format is "`[#]J|Snnn`", or "`0`", indicating the current job or session.

item   Required. String label specifying the information requested for the target job or session. Only one item can be requested per call to `JINFO`, although some of the items below return multiple pieces of information.

status   Optional. An unquoted CI variable name to hold the integer status value for `JINFO`. If passed, the variable named by this argument contains the status of the call to jinfo: zero indicates success, non-zero indicates a failure. When 'status' is passed and an error occurs, the CI ignores the error. Specifically, no message is written to `$STDLIST` or to `$STDERR`, and the `CIERROR` variable is not set. The `JINFO` function return is always -1 when 'status' is specified and a `JINFO` error occurs. If this argument is omitted and an error in `JINFO` occurs, a CI error message is written to

$STDLIST (within the definition of the HPMSGFENCE variable).

```
status values:
     0 - success
  3042 - no job or session matches the jobID
  4000 - invalid syntax for the jobID, expect [#]J|Snnn
  9942 - unknown JINFO item
  9945 - information for the requested item is unavailable for the
         target jobID.
  9946 - item security violation, the user needs greater
         privileges to retrieve the item
```

```
Example:      :calc JINFO('S64','IPaddr')
Result:       15.192.90.81
Example:      :calc JINFO('J144','FmtPriority',status)
Result:       DQ
Example:      setvar _state JINFO(hplastjob,'jobstate',status)
              while status = 0 and _state = 'WAIT' do
                 pause 20
                 ...
                 setvar _state JINFO(hplastjob,'jobstate',status)
              endwhile
Example:      if jobcnt('@J:@r.sys',jlist) > 0 then
                 setvar i 0
                 setvar total_cpu 0
                 while setvar(_job, word(jlist,,setvar(i,i+1))) <> '' do
                    if JINFO(_job,'exists') then
                       setvar total_cpu total_cpu + JINFO(_job,'CPUsec')
                    endif
                 endwhile
              endif
```

Restrictions

Not all items listed below are available to jobs that are waiting or scheduled. For example, JINFO is unable to return the CI PIN ('CIpin') if the job is waiting; however, some items, like the job state and job queue, are returned, regardless of the state of the target job. When a JINFO item cannot be obtained CIERR 9945 is reported. If the 'status' argument is passed, it is set to 9945 and no CI error is displayed.

No special capabilities are required to get any info about your own job/session. Users with OP or SM capability can get all items for any job/session, and may also retrieve the global items available via JINFO.

For users lacking OP or SM capability:

- To access restricted data for a job logged on in the same "user.acct", AM capability is required, unless JOBSECURITY is set to LOW. If JOBSECURITY is LOW, JINFO considers the job as if it is "you".

- To access restricted data for a job logged on in your account but as a different user, AM capability is required, independent of the JOBSECURITY setting.

Some items have additional restrictions:

- 'command', any token in the command image that could be considered a lockword is deleted.

JINFO Item Values and Descriptions

```
Label                 Type    Description
-------------------   ------  ----------------------------------------------

Account               string  account name.
CIpin                 int     * PIN number for the job's usermain process,
                                 typically the CI.
Command               string  * command most recently executed (lockwords are
                                 removed).
ConnectMin            int     number of minutes connected.
ConnectSec            int     number of seconds connected.
Copies                int     number of copies for $STDLIST output.
CPULimit              int     CPU limit in seconds, -1 is unlimited.
CPUMillisec           int     number of milliseconds of CPU.
CPUSec                int     number of seconds of CPU.
Deferred              bool    True if job's inpri is <= the jobfence.
DegradeMode           bool    ** True if system is running in degraded mode,
                                 meaning no new jobs are allowed to log on
                                 until disk space is recovered.
Exist                 bool    True if the target job exists in any state.
Exists                bool    See 'Exist'.
FmtIntroDate          string  formatted date job was introduced, eg.
                                 "WED, JUL 14, 1999".
FmtIntroTime          string  formatted time job was introduced, eg. "6:21 PM".
FmtPriority           string  current scheduling queue for the usermain (CI)
                                 process, e.g. 'BS', 'CS', 'DS', 'ES'.
FmtStreamedByDate     string  formatted date when job/session was submitted.
FmtStreamedByTime     string  formatted time when job/session was submitted.
Group                 string  logon group name.
HomeGroup             string  * home group name.
Inpri                 int     input priority.
IntIntroDate          int     date job was introduced as a YYYYMMDD integer.
IntIntroTime          int     time job was introduced as a HHMMSS integer.
IntroDate             int     See "IntIntroDate".
IntroTime             int     See "IntIntroTime".
IntStreamedByDate     int     date job/session was submitted as a YYYMMDD
                                 integer.
IntStreamedByTime     int     time job/session was submitted as a HHMMSS
                                 integer.
IPAddr                string  * IP address in dotted format (xx.xx.xx.xx),
                                 "" for jobs and local sessions.
Job User Account      string  "[jname,]user.acct" names concatenated.
Job User Account Group string "[jname,]user.acct,group" names concatenated.
JobName               string  jobname if supplied, else "".
JobNum                string  unique job identifier, "#J|Snnn".
JobQ                  string  job queue name, "" for sessions
JobSecurity           bool    ** 'LOW' or 'HIGH' depending on the JOBSECURITY
                                 setting.
JobState              string  "INTRO", "SCHED", "WAIT", "EXEC*", "EXEC", "SUSP".
JobType               string  "J" for jobs and "S" for sessions.
JobUserAccount        string  see "Job User Account"..
JobUserAccountGroup   string  see "Job User Account Group"
JSMAINPin             int     * PIN number for the job's JSMAIN process.
LdevIn                int     Input LDEV number for $STDIN.
LdevOut               int     Output LDEV number for $STDLIST, 0 for spooled
                                 jobs.
LocAttr               int     * user local attributes.
Numbered              bool    True is job file is numbered.
```

Outclass	string	Outclass name for a job's STDLIST, e.g. "LP". Empty ("") for sessions.
Outpri	int	output priority.
PassExempt	string	** The system's password exemption policy for jobs: "NONE", "USER", "XACCESS", "MAX".
Priority	int	current priority for the usermain (CI) process, e.g., 150, 200, etc.
Private	bool	* True if the job's stdlist is marked private.
Quiet	bool	True if :set msg=off is in effect.
RawIntroDate	int	date job was introduced in CALENDAR format.
RawIntroTime	int	time job was introduced in CLOCK format.
RawStreamedByDate	int	date job/session was submitted in CALENDAR format.
RawStreamedByTime	int	time job/session was submitted in CLOCK format.
Restart	bool	True if ";RESTART" specified in job "card".
State	string	see "JobState".
StdinSPID	string	"Innn" identifier for the stdin spoolfile for jobs.
StdinSPstate	string	STDIN spoolfile state: "OPEN", "ACTIVE", "READY". "" for sessions.
StdlistDelete	bool	True if SET STDLIST=delete in effect.
StdlistSPID	string	"Onnn" identifier for the stdlist spoolfile for jobs. "" for sessions.
StdlistSPstate	string	STDLIST spoolfile state: "CREATE", "DEFER", "READY","XFER", "PRINT", "PROBLM", "DELPND", "SPSAVE". Note: some of these states apply to jobs that have terminated. No JINFO information is available on jobs that have terminated.
StreamedBy	string	* full identifier of the job/session that streamed or initiated the target job. For example: "jobname,user.account (#J123)". This is the same value as seen in the HPSTREAMEDBY CI variable.
StreamedByDate	int	see "IntStreamedByDate".
StreamedByLdev	int	* Ldev of job/session that submitted the target job.
StreamedByTime	int	see "IntStreamedByTime".
User	string	user name.
User Account	string	"user.account" names concatenated.
User Account Group	string	"user.account,group" names concatenated.
UserAccount	string	See "User Account".
UserAccountGroup	string	See "User Account Group".

* indicates you must have SM or OP capabilities, or the job must be your own job, or you must have AM capability and be logged on into the same account as the target job, or you must be logged on as the same user.account as the target job and JOBSECURITY is LOW.

** indicates you must have SM or OP capabilities.

JOBCNT

Syntax: JOBCNT (job_match [,joblist_var])

> Defn: A CI evaluator function that returns the number of jobs and/or sessions that match 'job_match'. Optionally, these matching job/session numbers are returned in the CI variable named by the 'joblist_var' parameter. All jobs/sessions matching "job_match" are counted, including: executing, waiting, suspended and scheduled jobs.

```
      Type:   Integer
```

Parms

```
Job_match:
```
Required. String identifying the target jobs and/or sessions.
Supported formats:

```
        "@"           - all jobs and sessions
        "@J"          - all jobs
        "@S"          - all sessions
        "user.acct"   - all job/sessions matching "user.acct"
        "jobname,user.acct" - all job/sessions matching
                            "jobname,user.acct"
        "@J:[jobname,]user.acct" - all jobs-only matching
                            "[jobname,]user.acct"
        "@S:[jobname,]user.acct" - all sessions -only matching
                            "[jobname,]user.acct"
```

NOTE "jobname", "user" and "acct" may be wildcarded.

",user.acct" (empty 'jobname') can be passed to specify that only jobs or sessions without job names are desired. If 'jobname' is specified then only job/sessions with job names are considered.

```
Joblist_var:
```
Optional. An unquoted name of a CI variable that holds the job/session numbers that match the 'job_match' argument. Each job/session number is separated by a single space. For example:

```
        "J2 S34 S36 J12 J31 S44"
```

NOTE It is possible that more jobs match than will fit in the CI variable. In this event, the variable is filled to capacity without reporting an error. The caller can detect this condition by comparing the number of jobs matching against the number of tokens in the 'joblist_var' variable.

```
Example:    :calc JOBCNT("@S")           # find all sessions
Result:     12
Example:    :calc JOBCNT("@J:@.sys")      # find all jobs in SYS account
Result:     4
Example:    setvar x JOBCNT('@', jlist)   # find all jobs/sessions
            if x <> wordcnt(jlist) then
              # not all matching job/sessions fit into var
              ...
Example:    :calc JOBCNT("@!hpjobtype:!hpjobname,!hpuser.!hpaccount")
Result      1                             # find all jobs or sessions logged
                                          # on exactly as "you"
```

WORDCNT

Syntax: WORDCNT (string[,delims][,start])

`Defn:`   A CI evaluator function that returns the number or words (tokens) defined by "delims" in "string", starting at "start". The default delimiters are the same as for the `WORD` and `DELIMPOS` functions: a space, a comma, a semicolon, an equals sign, left and right parentheses, left and right brackets, single quote, double quote, and tab. The default start is 1.

`Type:`   Integer

`Example:`   `:calc WORDCNT('file a=bb,old;rec=40,,f,ascii')`
`Result:`   9

New CI Variables

HPDATETIME   A CI variable containing the current date and time in a string formatted as "YearMonthDateHourMinuteSecondMillisecond". For consistency, if `HPDATETIME` is referenced more than once for a "logical" (or atomic) operation, such as extracting the date and the time, it is very important to store `HPDATETIME` into a user-defined variable and extract from that variable. For example, to accurately separate the date and time from `HPDATETIME` the code below should **NOT** be used:

```
setvar mydate lft(hpdatetime,8) /* Don't do this! */
setvar mytime rht(hpdatetime,9) /* Don't do this! */
```

The problem above is that "MYDATE" could be set a millisecond before midnight, and "MYTIME" could be set a millisecond past midnight, with the result being:

```
MYDATE = 19990314      /* Mar 14 just before midnight */
MYTIME = 000000100      /* Mar 15 just past midnight */
```

Instead, create a variable that contains `HPDATETIME` and extract from that variable. For example:

```
setvar date_time HPDATETIME      /* This is correct! */
setvar mydate lft(date_time,8)
setvar mytime rht(date_time,9)
```

NOTE   Current time resolution is only tenths-of-a-second so the last two string characters will both be "0".

```
Type:    String, read-only.
Example: if the current date and time is Feb 21, 1999 at
         14:08:15:2, HPDATETIME equals "19990221140815200"
```

HPDOY   A CI variable containing the day number in the current year, with Jan 1 being day 1.

```
Type: Integer, read-only.
Example: On Feb, 7, 1999 HPDOY equals: 38
```

HPHHMMSSMMM A CI variable containing the current time in a string formatted as "HourMinuteSecondMillisecond".

NOTE   Current resolution is only tenths-of-a-second so the last 2 string characters will both be "0".

```
Type: String, read-only.
Example: if the current time is 14:08:15:2, HPHHMMSSMMM equals
        "140815200"
```

HPLEAPYEAR   A CI variable that indicates if the current year is a leap year.

```
Type: Boolean, read-only.
Example: On Feb. 7, 1999 HPLEAPYEAR equals: FALSE
        On Jan. 1, 2000 HPLEAPYEAR equals: TRUE
```

HPYYYYMMDD   A CI variable containing the current date in a string formatted as "CenturyYear-of-centuryMonthDate".

```
Type: String, read-only.
Example: if the current date is Feb 21, 1999, HPYYYYMMDD equals
        "19990221"
```

Pause Enhancement

PAUSE   The `JOB=` parameter of the `PAUSE` command now allows users to select jobs-only or sessions-only in the target user.account(s). A new "`@J:`" or "`@S:`" prefix to the existing "[jobname,]user.account" form supports this new functionality. The complete syntax for `JOB=` is:

```
[#]J|Snnnn, where nnn is a number, or
@S|@J|@                            or
[@J|@S:][jobname,]user.acct
```

The 'jobname' value can be passed as an null value ("`,`") to indicate that only jobs or sessions without jobnames are considered. A non-null value in 'jobname' means that only jobs or session with job names are candidates for selection. If 'jobname' is not relevant to the selection then it should be omitted, and only the 'user.acct' should be specified.

To pause until all job/sessions logged on exactly as "you" (but excluding "you") terminate, enter:

```
:pause job="@!hpjobtype:!hpjobname,!hpuser.!hpaccount
```

New NPCONFIG Variable Added to NW Spooler

By G. K. Rajani
Commercial System Division

The network (NW) spooler behaves differently from serial spooler for %2nn series CCTLs. The new NPCONFIG item "serial_printer_simulation" is added to fix this problem.

Description of the New NPCONFIG Item

If you configure "serial_printer_simulation" to true, then the NW spooler behaves the same way as the serial spooler for CCTL %2xx series. That is, it sends LFs for %2nn series of CCTLs.

If you configure "serial_printer_simulation" to false, then there won't be any change in the NW spooler's behavior. That is, it sends <esc>&a#R. As a result, you find CCTL %2xx series is incompatible between the network and serial spooler. By default "serial_printer_simulation" is set to false.

Sample NPCONFIG File

```
 75      (network_address = 15.10.44.112
         # One of the NW printer's ip addresses
         serial_printer_simulation = true)
```

Patch/iX B.01.02

by Michael Dovano
Commercial Sysems Division

New enhancements were included in PATCH/iX [B.01.02] which has a few changes in the
screen as shown:

1. If a PowerPatch is involved in the installation which contains FOS Enhancement
   patches, then a dialog shown below prompts the user in the Patch Qualification screen.

```
+----------------------------------------------------------------+
| This PowerPatch tape contains FOS enhancements as well as fixes.|
| The default for Patch/iX is not to install these enhancements.  |
|                                                                |
| Would you like them to be installed (Y/N)?                     |
+----------------------------------------------------------------+
```

   Respond 'Y' to install all 'FOS Enhancements' or 'N' to not install the FOS
   Enhancements. If you wish to install only one or more specific FOS enhancement
   patches, then respond 'N' to the above prompt and force the patches manually. Note that
   you will still need to force any patches for purchasable products.

2. A new activities menu item '[ ] Adding Reactive Patches from Download' has been
   added to allow the installation of download patches without any customization. The
   menu item is as shown:

```
     Mark        Activity
   ========================================
   [   ]        Adding a PowerPatch
   [   ]        Adding Reactive Patches from Tapes
   [   ]        Adding Reactive Patches from Download
   [   ]        Adding (SUBSYS) Products
   ========================================
```

Announcing DLT4000/DLT7000 Differential Tape Support on MPE/IX

by Larry Nichoalds, CSY Labs
  Jim Hawkins, SSD WTEC

Beginning with Release 5.5 Express 7, MPE/iX supports the following stand-alone Differential DLT Tape drives:

- DLT4000 (C3690A) - F/W SCSI interface (not a true F/W device see "Product Overview")
- DLT7000 (C6374A) - F/W SCSI interface

Software Requirements

Customers wishing to use these new DLT devices must be running on MPE/iX 5.5 or LATER version of MPE/iX. On MPE/iX 5.5 (Release C.55.00, MPE/iX 31900C.05.08) a patch provides the critical software device driver enhancements necessary for the support of these DLTs. Again, these devices are NOT supported on MPE/iX 5.0 (Release C.50.00, 31900B.79.06) and there are no plans to support these devices on 5.0 in the future.

Upon the release of Release 6.0 Express 1, there will not immediately be any patches for Predictive Support or Online Diagnostics that specifically support the new device IDs. In the short term Predictive and Diagnostic tools will likely flag these devices as "unknown" or "unsupported." However, the SCSIDLT diagnostic will function for these devices AND plans are in place to include Predictive and Diagnostics in the next open Express/PowerPatch Release for 5.5.

Hardware Requirements

 On HP3000 S900 systems F/W SCSI Device Support is typically provided via the 28696A NIO F/W SCSI Device Adapter Card. At the time this article was written, there are two other possible F/W SCSI Device Adapter Cards.

NEITHER of these connection options is actually supported:

Unsupported connection Option #1	The 9x9KS "Core I/O Card" A3453-69210 exports a F/W SCSI interface. However we do NOT, for performance reasons, support or recommend that a DLT be connected via this interface. The assumption is that this exported bus will also be shared with the system's internal disks and unpredictable and unacceptable performance may be seen when disks and DLT are accessed simultaneously (as during STORE/RESTORE). (Please read additional information in the Product Overview section for details on device performance.
Unsupported connection Option #2	The HP-HSC F/W DA A2969A is not supported on HP3000 S900 systems. This card requires the existence of "Device Adapter Software" that has yet to be written for MPE/iX.

Physical connection of these devices is accomplished via "Fast/Wide/Differential SCSI" Cables such as C2911A, C2924A, C2925A etc.

NOTE   While DLT Libraries are available for purchase, support for these devices is very limited on HP3000 S900 systems. There are currently no plans for supporting the DLT Libraries for "normal" MPE/iX operations such as BOOT, FCOPY or STORE. DLT Libraries are supported only when used in conjunction with a third party software package, Legato's "NetWorker." Inquiries about DLT Library support should be made directly to Legato.

Product Overview

Product	Standard, Non-compressed Capacity with DLT IV	Average Maximum Data Transfer Rate to Tape	Average Maximum Data Transfer Rate on SCSI Bus	Maximum of Devices per Bus
DLT4000 (SE-SCSI)	20Gbtye	~2Mbyte/sec	~4Mbyte/sec	1
DLT4000 (FW-SCSI)	20Gbtye	~2Mybte/sec	~4Mybte/sec	2
DLT7000 (FW-SCSI)	35Gbtye	~4Mbyte/sec	~9Mybte/sec	1

The performance difference between the DLT4000 and DLT7000 Differential drives is due to data transfer characteristics. Specifically the DLT7000 is a "differential-wide" device, transferring two bytes at a time during the data phase. The DLT4000 (C3690A), though it is connected via a "differential-wide" cable, is actually a "differential-narrow" device, transferring only one byte at a time. From a native (non-data compression) perspective, the DLT4000 is capable of transferring data to tape at up to 2 Mb/Sec while the DLT7000 is capable of transferring data to tape at up to 4 Mb/Sec. When making use of the compression feature (Digital Lempel-Ziv, DLZ) the amount of data sent to the device can be significantly greater than the device's ability to write to tape, depending on the compressibility of data. However, there is an upper limit on the amount of data that the device can accept and the SCSI bus can transfer. This puts an upper limit on the number of devices that can be driven at peak I/O rates on a Bus. This upper limit is the "Maximum Number of Devices Per Bus." Of course, these figures are approximate and are reached only on systems with sufficient available CPU resources AND Disk I/O bandwidth.

Both the DLT4000 and DLT7000 drives accept the new CompacTape IV cartridge. When this cartridge is used, the amount of data you can store on a tape can be up to 20.0 GB native, or an expected 40.0 GB of data using the compression mode for the DLT4000. The DLT7000 will hold 35.0 GB native, or 70.0 GB when employing data compression. The actual amount of data stored in compression mode is dependent on the nature of the data being stored. That is, text files tend to be highly compressible while code files are not. Both devices can also use the CompacTape III cartridge. The amount of data you can store on this tape cartridge can be 10.0 GB native capacity or 20.0 GB compressed.

IMPORTANT   Tapes created on a DLT4000 can always be read by the DLT7000; however, DLT4000 drives are not capable of reading tapes created on DLT7000s. Since both drives use the same physical media type, shops with a mixture of DLT types will have to manage media created on DLT7000 separately so as not to attempt to read it on a DLT4000. Typically if a DLT7000 tape is put into a DLT4000, the "Use Cleaning Tape" indicator will be illuminated. If a DLT7000 tape is to be over-written by a DLT4000, just ignore the "Use Cleaning Tape" indicator and proceed overwriting the tape (do not clean the drive). The "Use Cleaning Tape" will go off automatically when the tape is overwritten or removed from the drive.

DLT is designed as a high-volume back-up solution. The tape media can endure approximately 500,000 passes and has a shelf life of 10 years. The DLT4000 has a head life of 10,000 tape motion hours and MTBF of 80,000 based on a 100% duty cycle. The DLT7000 has a head life of 30,000 tape motion hours and MTBF of 200,000 hours with a 100% duty cycle (per Quantum's literature). Unlike DDS drives, you should only clean DLT devices when the cleaning light actually comes on. If you clean a DLT more often than is indicated, you will reduce the life of the heads.

Configuration

Here is an example of what the configuration should look like on the HP3000 for the DLT4000 and DLT7000.

DLT4000 Example

```
io> ld 90
   LDEV: 90  DEVNAME:           OUTDEV:  0        MODE:
     ID: DLT4000               RSIZE:   128     DEVTYPE: TAPE
   PATH: 4/4.2.0              MPETYPE:   24      MPESUBTYPE: 8
  CLASS: TAPE      DLTTAPE DDUMP

io>  lp 4/4.2.0
PATH:   4/4.2.0                            LDEV: 90
ID: DLT4000                               TYPE: TAPE
PMGR: SCSI_TAPE2_DM                       PMGRPRI: 10 LMGR:
LOGICAL_DEVICE_MANAGER                     MAXIOS: 0

io> lp 4/4.2
PATH: 4/4.2                               LDEV:
ID: PSEUDO                                TYPE: DA
PMGR: TRANSPARENT_MGR                     PMGRPRI: 6
LMGR:                                     MAXIOS: 0

io> lp 4/4
PATH: 4/4                                 LDEV:
ID: HP28696A                              TYPE: DA
PMGR: SCSI_DAM                            PMGRPRI: 6
LMGR:                                     MAXIOS:
```

DLT7000 Example

```
io> ld 91
LDEV: 91   DEVNAME:           OUTDEV:  0        MODE:
ID: DLT7000                   RSIZE:   128     DEVTYPE: TAPE
PATH: 4/4.3.0                MPETYPE:   24      MPESUBTYPE: 8
CLASS: TAPE       DLTTAPE DDUMP

io> lp 4/4.3.0
PATH: 4/4.3.0                             LDEV: 90
ID: DLT7000                               TYPE: TAPE
PMGR: SCSI_TAPE2_DM                       PMGRPRI: 10
LMGR: LOGICAL_DEVICE_MANAGER              MAXIOS: 0

io> lp 4/4.3
PATH: 4/4.3                               LDEV:
ID: PSEUDO                                TYPE: DA
PMGR: TRANSPARENT_MGR                     PMGRPRI: 6
LMGR:                                     MAXIOS: 0

io> lp 4/3
PATH: 4/3                                 LDEV:
ID: HP28696A                              TYPE: DA
PMGR: SCSI_DAM                            PMGRPRI: 6
LMGR:                                     MAXIOS: 0
```

IMAGE/SQL Enhancement: P and Z Data Types

by Dolly Hu
Commercial System Division

This IMAGE/SQL enhancement allows application programs using Image/SQL to enter unsigned data into TurboIMAGE/XL fields with P or Z data type.

Prior to this enhancement, Zoned Decimal and Packed fields, when written from an application using IMAGE/SQL, were always populated with signed numbers. This created a problem for some application programs reading the data. For example, a COBOL program with a data item defined as Z4 in TURBO IMAGE, and 9(4) in the COBOL program (note the absence of the "S"), a number of 942 gets stored as "094B" (signed), and to the COBOL program, it is an invalid numeric.

IMAGE/SQL `SPLIT` command and `UPDATE TYPE` command have been enhanced to allow `SIGNED` or `UNSIGNED` mapped type if the mapped type is `DECIMAL`. If `UNSIGNED` keyword is specified, then all positive values written from an application using IMAGE/SQL are unsigned. The default is `SIGNED`. If `SIGNED/UNSIGNED` key word is used with any mapped type other than `DECIMAL`, then "Syntax Error" is returned by IMAGE/SQL.

SP[LIT]

Divides a large mapped column into two or more smaller columns.

SYNTAX

```
SP[LIT] MappedTable.MappedColumn INTO

  NewMappedColumn:SourceType[:MappedType [SIGNED  ]] [,...]

                                    [UNSIGNED]
```

EXAMPLE

```
(i)  SPLIT TABLE1.COLUMN5 INTO NEWCOLUMN1:I4:CHAR(8),&

                              NEWCOLUMN2:X20,&

                              NEWCOLUMN3:K3:DECIMAL(15,0)

(ii) SPLIT TABLE2.COLUMN3 INTO NEWCOL1:I4:CHAR(8),&

                              NEWCOL2:X20,&

                              NEWCOL3:Z4:DECIMAL(4,0) UNSIGNED
```

UP[DATE] TYPE

Updates data type mapping information for a specified TurboIMAGE/iX data type or a specified Mapped Column.

SYNTAX

```
U[PDATE] TYPE {SourceType IN {       *       }}
              {                 { MappedTable}}
              {IN MappedTable.MappedColumn }
     [TO NewMappedType [SIGNED  ]]
                       [UNSIGNED]
```

EXAMPLES

(i) UPDATE TYPE I4 IN COMPOSER

(ii) UPDATE TYPE IN COMPOSER.BIRTHDATE TO CHAR(18)

(iii) UPDATE TYPE IN TABLE1.UNSIGNEDZ4 TO DECIMAL(4,0) UNSIGNED

HP Driver for JDBC

Shu-Feng Wei
Commercial Systems Division

Java Database Connectivity (JDBC) is a Java API that enables development of Java applications and applets with a wide range of relational databases. It consists of a set of classes and interfaces written in Java. JDBC allows developers to write database applications using a standard, pure Java API.

A typical JDBC Java application consists of a Java application or applet, the JDBC Driver Manager, a vendor specific JDBC driver, and a database. The JDBC Driver Manager is provided with the Java SDK and its primary function is to load and register the vendor-specific JDBC driver with the Java applications and then get out of the way. The following diagram shows the various components of a client-server JDBC application.

Figure 3-1. JDBC Client-Server Application
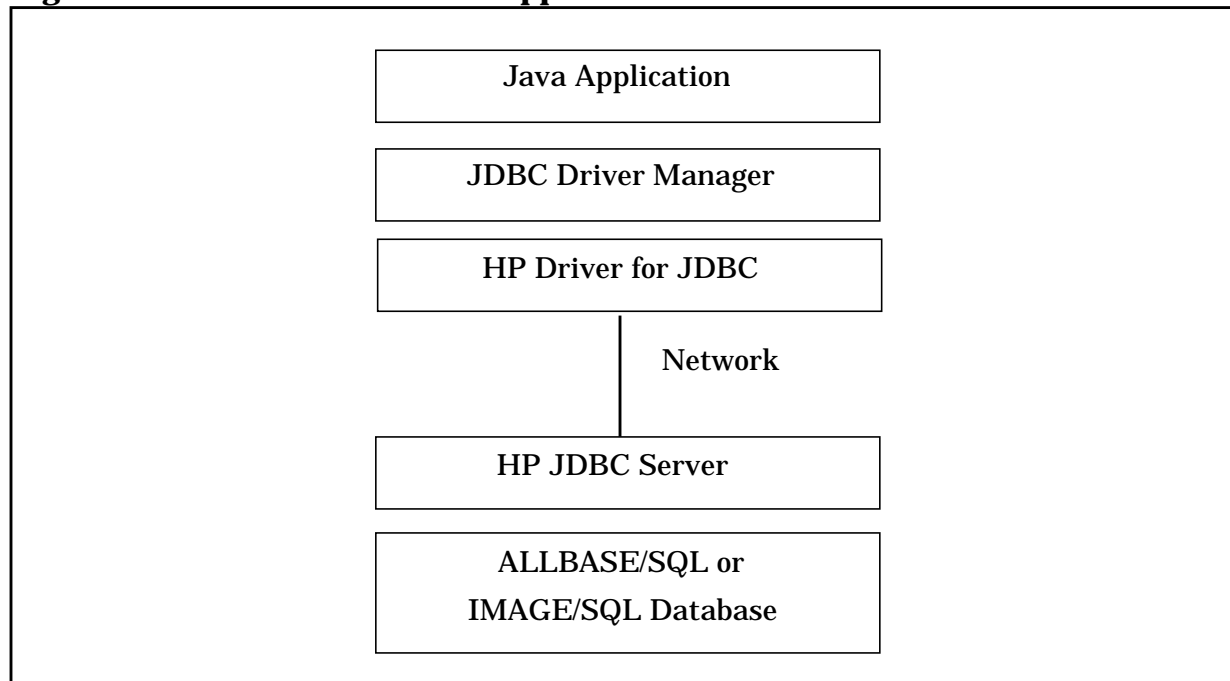
The HP Driver for JDBC is a vendor specific JDBC Driver that allows Java applications to connect to ALLBASE/SQL or IMAGE/SQL databases on MPE/iX or ALLBASE/SQL on HP-UX. The HP Driver for JDBC is a Type 3 (Network-Protocol) driver, meaning the driver translates the JDBC API into a DBMS-independent protocol on the client-side, and then translates to the ALLBASE/SQL protocol on the server. The driver components on the client-side are written in 100% Pure Java, which provides the complete compatibility with all Java Virtual Machines on all platforms.

HP JDBC Components

There are three components supplied with the HP JDBC product, the JDBC Driver, the JDBC Monitor, and the JDBC Server. The user is responsible for writing a Java application or applet that uses JDBC on the client, as well as providing the ALLBASE/SQL or IMAGE/SQL database on the server.

- The **HP Driver for JDBC** is a set of Java classes that implement the `java.sql.*` interfaces and provide an implementation of a JDBC driver that can communicate with an ALLBASE/SQL or IMAGE/SQL database. The HP Driver for JDBC typically will reside on the client side of the user application. It provides the translation from the Java language and the JDBC API to the HP proprietary network protocol.

- The **JDBC Monitor** is a component that is installed on the JDBC server host that manages all client JDBC Driver connections to the server host. It is typically started as a daemon when the server machine is booted. All JDBC client connections are made through the JDBC Monitor. The monitor performs validation of the userid and password that are passed in the client connection request and spawns JDBC Server processes to serve each of the client connections. Once the server process is spawned, the monitor returns to wait for the next client connection.

- The **JDBC Server** is the server process that is spawned by the JDBC Monitor to service a client connection. It handles the translation from the HP proprietary network protocol to the ALLBASE/SQL calls. There is at least one JDBC Server process for each client connection to the server host. More than one JDBC Server process may be used to handle multiple client statements using the same connection. This component also handles the translation from JDBC SQL to ALLBASE SQL and conversion of the database data from ALLBASE/SQL format to JDBC format.

Both the JDBC Monitor and the JDBC Server must be installed on the same host where the ALLBASE/SQL or IMAGE/SQL databases reside.

Requirements

Java Requirements

The HP JDBC Client components (the JDBC driver itself) require a Sun-compliant JDK version 1.1 and above, which includes a JDBC version 1.2. Install the JDK from Sun or from your platform vendor. Individual platform vendors may have their own requirements for the platform host. For example, Java only runs on HP-UX 10.20 and MPE/iX 6.0 and above, HP-UX 9.x and MPE/iX 5.5 is not supported.

Java and JDK components only need to be installed on the client platform. The JDBC server platforms use native components and must be installed on the same host where the ALLBASE/SQL or IMAGE/SQL databases reside.

HP-UX Server Requirements

The HP JDBC Server components require HP-UX version 10.20 or greater. HP-UX components are only required if your JDBC Server platform is the HP-UX operating system.

MPE/iX Server Requirements

The HP JDBC Server components require MPE/iX version 6.0 or greater. MPE/iX components are only required if your JDBC Server platform is the MPE/iX operating system.

ALLBASE/SQL or IMAGE/SQL Requirements

The HP JDBC Server components require an ALLBASE/SQL G3.01 or IMAGE/SQL G3.00 or greater.

Installation

HP-UX Server Components

The installation of the JDBC Server components must be done by a system administrator who has "root" capability on the server host where the database resides. A temporary directory, `/tmp/jdbc`, is used to stage the user manual, installation scripts, and product tar file.

The server components are distributed as a UNIX tape archive (TAR) file, `hpjdbc_XXX.tar`, where `XXX` represents the release number of the product.

Once the tar file is copied into a staging directory, `/tmp/jdbc`, extract the installation shell script from the tar file:

```
$ tar xf hpjdbc_XX.tar install.sh
```

MPE/iX Server Components

The installation of the HP JDBC product must be done by a system administrator on the server host where the database resides.

The components of HP JDBC are distributed as an archive file, `HFSFILES.JDBC.SYS`. Stream the JDBC installation job `I00IJDBC`, to perform the actual installation:

```
:stream I00IJDBC.JDBC.SYS
```

The installation script will extract the server files and client archive files and set up the JDBC monitor startup scripts.

Java Client Components

The HP JDBC product must first be installed on the server host before the client can be installed. This is because the client files are bundled with the server product.

The HP Driver for JDBC components consist of the Driver Java class files and a sample JDBC client source file. These are the only components required on the client-side. The driver components are packaged in three formats (the same files contents are in each package), UNIX tape archive (TAR), Java archive (JAR), and Windows ZIP (ZIP).

Setting up HP Driver for JDBC client involves:

- Downloading the appropriate HP JDBC archive file to a temporary directory.

- Extracting the HP JDBC archive file onto your client platform.

Extracting the HP Driver for JDBC Class Files The HP Driver for JDBC class files must be installed in your Java class path so that the Java compiler and the Java class loader can find them.

Example on the Win32 Platform

```
CLASSPATH=C:\JDK1.1.4\LIB;.
```

You would then install the HP Driver for JDBC class files in the directory:

```
C:\JDK1.1.4\LIB\
```

Example on HP 3000

```
CLASSPATH=/usr/local/java/latest/lib:.
```

In order to use the HP Driver for JDBC client on the MPE/iX system, you need to have the JAVA/iX installed. JAVA/iX is shipped with MPE/iX starting in Release 6.0.

The following sub-directories for the Driver class files should be automatically created:

```
com/hp/jdbc/allbase
```

```
com/hp/jdbc/allbase/samples
```

Configuring HP JDBC Server

The HP JDBC Server components behave the same on both the HP-UX and MPE/iX platforms. Thus both the configuration file and log file are the same (except for filenames).

The following example shows the standard HP JDBC default server configuration file, `servcfg`. This is a text file that resides on the server host in the same directory as the HP JDBC Server executable files and can be used to alter some of the server's behavior.

```
LOGFILE /opt/allbase/jdbc/logs/servlog
TIMEOUT 7200


#LOGGING ERROR
#LOGGING CONNECTION
#LOGGING INFO
#LOGGING WARNING
#LOGGING FATAL
#LOGGING IN
#LOGGING OUT
#LOGGING INHEX
#LOGGING OUTHEX
#LOGGING DEBUG
#LOGGING TIMESTAMP
LOGGING NONE
# If LOGGING NONE is not commented out, it must be the
# last line for it to have the desired effect.
```

The first configuration option `LOGFILE` refers to the path and filename for the HP JDBC Server log file. On HP-UX this is normally set to `/opt/allbase/jdbc/logs/servlog`. On MPE/iX this is normally set to `SERVLOG.JDBC.SYS`.

The second configuration option `TIMEOUT` specifies the number of seconds that the HP JDBC Server can remain idle before terminating.

The next set of lines are the LOGGING levels used to determine the type of information to be logged to the server log file. The meanings of the various logging levels are discussed in the Troubleshooting Section, under "Server Logging" of the *HP Driver for JDBC User's Manual*.

The server configuration file is read in each time a new server process is started. Thus once the file is edited and saved, the changes will take place beginning with the next server process.

If logging is turned on in this file, it will be in effect for all subsequent server processes.

Starting and Stopping HP JDBC Monitor

HP JDBC Monitor is the server-side counterpart of HP Driver for JDBC, present on the client-side. For a JDBC application to connect to a database, the JDBC Monitor must be running on the database server. JDBC Monitor can be started manually or automatically at system startup by including the JDBC Monitor start commands in the system startup scripts.

HP-UX Monitor Startup and Shutdown The startup and shutdown of the HP-UX JDBC Monitor is normally controlled by the system startup and shutdown scripts. Thus as long as the machine is up and running, the JDBC Monitor will also be up.

The only time the Monitor should ever be brought down is to install a newer version. In this case, use the monctrl command to kill the Monitor process. Do not use the UNIX kill command, as this could render the server unable to start a new Monitor process. The monctrl command to shut down the monitor is:

monctrl kill [*portnumber*]

The *portnumber* parameter is necessary only if the monitor you wish to shut down is not running on the default port number 31700.

To restart the monitor after it has been accidentally terminated or was shut down, use the monctrl command to start it up:

monctrl start [*portnumber*]

Again, the *portnumber* parameter is necessary only if you wish to start the monitor on a port number other than the default port number 31700.

You cannot start a monitor on the same port number as a currently running monitor. You also can not restart a monitor on its original port number until all child processes that were spawned by the previous monitor process are terminated, and the port released. If the monitor is intentionally terminated or accidentally terminates, all of its child processes must be terminated before it can be restarted. For this reason, the monitor *must not* be terminated by using the UNIX kill command. Always use the monctrl tool to kill the monitor. The tool will search out all the child processes and kill them first, before killing the monitor.

MPE/iX Monitor Startup and Shutdown The startup and shutdown of the MPE/iX HP JDBC Monitor is normally done by the startup and shutdown stream jobs, JSTRTMON and JSTOPMON, which are normally included in MPE/iX system startup and shutdown scripts. Thus as long as the machine is up and running, the JDBC Monitor will also be up.

The only time the monitor should ever be brought down is to install a newer version. In this case, use the `JSTOPMON` stream job or `ABORTJOB` command to kill the monitor process. The `ABORTJOB` command to shut down the monitor is:

```
: ABORTJOB #JXX
```

where XX is the job number.

To restart the monitor after it was shut down or accidentally terminated, use the `JSTRTMON` stream job to start it up.

```
: STREAM JSTRTMON.JDBC.SYS
```

On the MPE/iX platform, each client connection is serviced by a separate process that is in the same session as the monitor. Thus, if the monitor is terminated or dies, the existing server process already serving the client requests will also die. This could result in client applications experiencing dropped connections.

Using the HP Driver for JDBC

Java Class Path

Before the HP Driver for JDBC can be used, the Java class path must be set to include the HP Driver for JDBC class files. Without this setting, both the Java compiler and the Java Run Time Environment will not be able to locate the HP Driver for JDBC. Please refer to your *JDK* documentation for more explicit details as to how to set the Java class path. In general, the Java class path must include the directory in which the HP Driver for JDBC class files have been installed.

If the HP Driver for JDBC class files are installed in:

```
/opt/java/lib/com/hp/jdbc/allbase
```

then the Java class path must include the directory:

```
/opt/java/lib
```

In most cases, this would mean that the `CLASSPATH` environment variable must be set to something resembling:

Example on the HP 9000
```
CLASSPATH=/opt/java/lib:.
```

Sample JDBC Client

The HP Driver for JDBC comes with the source code to two JDBC applications, a sample client and a simple client. Both can be used to test the installation of JDBC components on the client and server.

The simple client is called `SimpleClient` and is a bare-bones text-based application that makes a connection to an ALLBASE/SQL or IMAGE/SQL database, and allows the user to send SQL statements and retrieve the results. There are no frills in the application, to make the code as simple as possible. This client should mainly be used for educational purposes. The rest of this discussion will focus on the more robust application.

The sample client is called `SampleClient` and is a more robust version of the simple client.

It shows how to use a dialog box to obtain user input, and also formats the result set output a lot better.

The first step to using the sample client is to build it by compiling the Java source code. Normally, you would do this by using the Java compiler command (the command you use may be different, depending on your JDK):

NOTE   If you are using JDK1.2.1 or later, add the following line in SampleClient.java before the call to class.forName:
`DriveManager.setLogStream(System.Out);`

```
javac SampleClient.java
```

To run the sample client, follow the instructions provided with your Java SDK for your client platform. Make sure that your Java CLASSPATH includes the directory in which the HP Driver for JDBC class files have been installed, so that the Java Virtual Machine is able to load them. For most platforms, the command to run the sample client is:

```
java SampleClient [-w] [-t]
```

Follow the prompts given by the application to connect to your database and to execute SQL statements.

The sample client can be used as a starting point for developing your own applications or for troubleshooting connection problems with the database.

Loading the HP Driver for JDBC

The Java method that is used to load all JDBC drives is the `class.forName` method. To load the HP Driver for JDBC, the code is:

```
class.forName("com.hp.jdbc.allbase.JdbcDriver");
```

This loads the HP Driver for JDBC and registers it with the JDBC Driver Manager. Once a driver has been loaded and registered with the Driver Manager, it is ready to be used to connect to a database.

URL Syntax (Including User Name and Password)

The first connection method specifies all connection parameters, including the user name and password, in an URL string.

```
java.sql.DriverManager.getConnection(url)
```

where:

```
String url =

    "jdbc:allbase://host[:port]/database?UID=uid&PWD=pwd"

    "[&TRACE=trace]";
```

host   Name or IP address of the sever host.

port   Optional port number on which the JDBC Monitor is listening. If not specified, the default part number 31700 is used.

database   ALLBASE/SQL or IMAGE/SQL database name.

---

uid	Server host userid that is authorized to access the database.
pwd	Server host password that matches the user id provided above.
trace	Optional trace values separated by the vertical bar "|" character. For more information on tracing, see the Troubleshooting section.

NOTE   This connection method may result in the user name and password being logged in various places, as URLs are commonly logged on various web servers and proxy servers. The URL is also logged if tracing is turned on. For this reason, the second connection method is preferred.

URL Syntax (Without User Name and Password)

The second connection method specifies the user id and password as method arguments, so this information is not present in the URL.

```
java.sql.DriverManager.getConnection(url, uid, pwd)
```

where:

```
String url =
```

      "jdbc:allbase://*host*[:*port*]/*database*[?TRACE=*trace*]";

```
String uid = "uid";
```

```
String pwd = "pwd";
```

host	Name or IP address of the sever host
port	Optional port number on which the JDBC Monitor is listening. If not specified, the default part number 31700 is used.
database	ALLBASE/SQL or IMAGE/SQL database name.
uid	Server host userid that is authorized to access the database.
pwd	Server host password that matches the user id provided above.
trace	Optional trace values separated by the vertical bar "|" character. For more information on tracing, see the Troubleshooting section.

ALLBASE/SQL Specifics

ALLBASE/SQL to JDBC Data Type Mapping

Table 3-1. shows what the HP Driver for JDBC will report as the JDBC data type for each ALLBASE/SQL data type. These are the `java.sql.Types` values that will be returned from the `java.sql.ResultSetMetaData.getColumnType` method. An "X" in the column

indicates the data type mapping.

Table 3-1. Data Type Mapping

JDBC DATA TYPES (vertical) / ALLBASE/SQL DATA TYPES (horizontal)	TINYINT	SMALLINT	INTEGER	BIGINT	REAL	FLOAT	DOUBLE	DECIMAL	NUMERIC	BIT	CHAR	VARCHAR	LONGVARCHAR	BINARY	VARBINARY	LONGVARBINARY	DATE	TIME	TIMESTAMP
SMALLINT (16-bits)		X																	
INTEGER (32-bits)			X																
REAL					X														
FLOAT(1...24)					X														
FLOAT(25...53)							X												
DOUBLE PRECISION							X												
DECIMAL								X											
NUMERIC									X										
CHAR											X								
VARCHAR												X							
DATE																	X		
TIME																		X	
DATETIME																			X
INTERVAL											X								

ALLBASE/SQL to JDBC Data Type Conversions

Table 3-2. shows the supported data type conversions between ALLBASE/SQL and JDBC. For conversions from JDBC to Java, please refer to a JDBC book or the Java JDBC documentation. Those conversions are generic to all JDBC Drivers.

Suggested conversions are denoted by a capital letter "X" in the conversion grid. Conversions which are supported, but which may result in a loss of precision, overflow, or

rounding, are denoted by a lowercase letter "x" in the conversion grid.

Table 3-2. Data Type Conversions

JDBC DATA TYPES (vertical) / ALLBASE/SQL DATA TYPES (horizontal)	TINYINT	SMALLINT	INTEGER	BIGINT	REAL	FLOAT	DOUBLE	DECIMAL	NUMERIC	BIT	CHAR	VARCHAR	LONGVARCHAR	BINARY	VARBINARY	LONGVARBINARY	DATE	TIME	TIMESTAMP
SMALLINT (16-bits)	x	X	X	X	X	X	X	X	X	x	X	X	X	x	x	x			
INTEGER (32-bits)	x	x	X	X	x	x	x	X	X	x	X	X	X	x	x	x			
REAL	x	x	x	x	X	X	X	X	X	x	X	X	X	x	x	x			
FLOAT(1...24)	x	x	x	x	x	x	X	X	X	x	X	X	X	x	x	x			
FLOAT(25...53)	x	x	x	x	x	x	X	X	X	X	x	x	x	x	x	x			
DOUBLE PRECISION	x	x	x	x	x	x	X	X	X	x	X	X	X	x	x	x			
DECIMAL	x	x	x	x	x	x	x	X	X	x	X	X	X	x	x	x			
NUMERIC	x	x	x	x	x	x	x	X	X	x	X	X	X	x	x	x			
CHAR	x	x	x	x	x	x	x	x	x	x	X	X	X	x	x	x			
VARCHAR	x	x	x	x	x	x	x	x	x	x	X	X	X	x	x	x			
DATE											X	X	X	x	x	x	X		x
TIME											X	X	X	x	x	x		X	x
DATETIME											X	X	X	x	x	x	x	x	X
INTERVAL											X	X	X	x	x	x			

The conversion of any ALLBASE/SQL data type to the `java.sql.Types.BIT` data type is such that only the value of zero, in either numeric or character format, will be converted to the `java.sql.Types.BIT` value of 0. All other values will be converted to the `java.sql.Types.BIT` value of 1. Thus only the integer value 0, the floating-point value 0.0, the decimal value 0 (not 0.0), and the character string "0" will be converted to a bit value of 0. Everything else is converted to a bit value of 1.

The conversion of an ALLBASE/SQL data type to a JDBC data type that has a smaller degree of precision (such as conversion from ALLBASE/SQL `INTEGER` to `java.sql.Types.SMALLINT`) will follow the Java VM rules of casting one data type to another. This may result in different values on different Java platforms. There is also no warning generated when this occurs. It is up to the application developer to choose the appropriate JDBC data type.

The conversion of an ALLBASE/SQL character data type to a JDBC numeric data type uses the Java numeric conversion routines and any necessary numeric casting. Thus this

could result in a `java.lang.NumberFormatException` being shown when the conversion is performed. Again, the application developer should take the necessary precautions.

Unsupported ALLBASE/SQL Data Types

The ALLBASE `LONG BINARY`, and `LONG VARBINARY` data types are currently not supported by the HP Driver for JDBC.

Acceptable SQL Syntax

The HP JDBC Server will accept either ODBC SQL statement syntax or ALLBASE/SQL statement syntax. All SQL statements are first parsed for ODBC 2.0 SQL syntax. If the statement conforms to the ODBC 2.0 SQL syntax, it is translated to ALLBASE/SQL before being passed to the ALLBASE/SQL DBMS. If the statement does not conform to the ODBC 2.0 SQL syntax rules, it is assumed to be an ALLBASE/SQL statement, and is passed without modification to the ALLBASE/SQL SQL DBMS.

Unsupported ALLBASE/SQL SQL Statements

Table 3-3. shows a list of unsupported ALLBASE/SQL statement types in HP JDBC. Note that in many cases, JDBC provides a standardized method of performing the same action. For example, the ALLBASE/SQL "`COMMIT WORK`" statement is not supported, since the user should be using the `java.sql.Connection.commit` method.

Table 3-3. Unsupported Statements

ADVANCE	BEGIN DECLARE SECTION	BEGIN WORK
CLOSE	COMMIT WORK	CONNECT
DECLARE CURSOR	DELETE WHERE CURRENT	DESCRIBE
DISCONNECT	END DECLARE SECTION	EXECUTE
EXTRACT	FETCH	INCLUDE
OPEN	PREPARE	RELEASE
ROLLBACK WORK	SET CONNECTION	SET SESSION
SET TRANSACTION	SETOPT	START DBE
STOP DBE	SQLEXPLAIN	UPDATE WHERE CURRENT
TERMINATE USER	WHENEVER	

Dynamic/Parameterized SQL Statements

The HP Driver for JDBC supports the use of parameterized SQL statements through the `java.sql.PreparedStatement` interface. The SQL statements must use a question mark (?) as the marker character for passing the parameters.

For example, a `SELECT` statement with parameters in the where clause would look like:

`SELECT NAME, ADDRESS FROM ADDRBOOK WHERE NAME=?`

Another example is an `INSERT` statement:

`INSERT INTO ADDRBOOK(NAME, ADDRESS) VALUES (?,?)`

Stored Procedures

The HP Driver for JDBC supports the following types of ALLBASE/SQL stored procedures through the `java.sql.CallableStatement` interface:

1. Procedures that return one or more result sets.

2. Procedures that take one or more input arguments.

3. Procedures that return one or more output arguments.

4. Procedures that have a return status value.

Troubleshooting

Client Tracing

Tracing of the HP Driver for JDBC client class files is invoked by adding tracing commands to the connection URL. The connection URL can be altered to both invoke tracing and to control the type of information that is traced. The tracing information is sent to a Java stream, which must be specified by the application using the `java.sql.DriverManager.setLogStream` method.

Both the tracing level and tracing output must be specified before any tracing can be done.

Note that the use of tracing will impact performance of the application. The greater the detail in the tracing, the slower the performance of the application.

The URL syntax to invoke tracing is:

`"jdbc:allbase://server[:port]/database?TRACE=trace"`

where *trace* is any vertical bar (|) separated combination of the values:

ARGUMENTS	Trace HP Driver for JDBC class method arguments. Input arguments and return values are all traced. Only the methods called by the application are traced.
ARGUMENTS_ALL	Trace all HP Driver for JDBC class methods that are called by both the application and the driver itself.
TIME	Include the time in HHMMSSFFF format on all tracing output lines where HH is the hour from 00 to 23, MM is the minute from 00 to 59, SS is the second from 00 to 59, and FFF is the millisecond from 000 to 999. The information appears in the third column of the tracing output.
DATE	Include the date in YYYYMMDD format on all tracing output lines where YYYY is the year from 0000 to 9999, MM is the month from 01 to 12, DD is the day of the month from 00 to 31. This information appears in the second column of the tracing output.
TIMESTAMP	Include both the date and the time on all tracing output lines. This is just a combination of the DATE and TIME tracing values.

OBJECT	Include the object hash code in the format `HHHHHHHH` on all tracing output lines where `HHHHHHHH` is the eight digit hexadecimal value of the hash code. This information appears in the first column of the tracing output.
THREAD	Include the executing thread name on all tracing output lines. This information appears as the fourth column of the tracing output.
DEBUG	Trace debugging statements from the driver. This will produce a large amount of output, so it should be used sparingly.
CONNECTION	Trace driver connection information.
NETWORK	Trace driver network information.
ERROR	Trace driver errors.
WARNING	Trace driver warnings.
SQL	Trace SQL statements that are passed to the driver.
ALL	Trace everything.

For example, the URL to turn on tracing of all connections with time stamp information would be:

```
"jdbc:allbase://server/database?TRACE=CONNECTION|TIMESTAMP"
```

Do not user any space characters between tracing levels and the vertical bar separator as some browsers and web servers do not allow space characters in a URL.

NOTE   Remember that the application must also set the tracing stream using the `java.sql.DriverManager.setLogStream` method.

Server Logging

The server configuration file controls logging of the JDBC Server. The following is a list of the various logging levels that can be set in the server configuration file.

NONE	Turns off all preceding logging levels.
CONNECTION	Turns on logging of connection information such as the time of the connection, the client IP address, and the name of the database.
IN	Turns on logging of input information coming from the client.
INHEX	Turns on logging of the hexadecimal dump of the input information coming from the client.
OUT	Turns on logging of output information being sent back to the client.
OUTHEX	Turns on logging of the hexadecimal dump of the output information being sent back to the client.
INFO	Turns on logging of miscellaneous information about the processing of the server. This has the potential to log a fair amount of data, which may

	affect performance.
TIMESTAMP	This causes each log entry to be prefaced by a timestamp of the form `HH:MM:SS.mmm`.
WARNING	Turns on logging of warning messages generated by the Server.
ERROR	Turns on logging of error messages generated by the Server.
FATAL	This is the same as specifying `INFO`, `WARNING`, and `ERROR`.
DEBUG	Turns on logging of a lot of debugging messages. This should only be done at the request of support personnel. This generates a large amount of logging information and can severely affect performance.

Java Developers Kit for MPE/iX Version 1.1.7B Release Notes

by Gavin Scott
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This release of the Java Developer's Kit (JDK) for MPE/iX includes support for the 1.1.7B version of Sun's JDK, along with significant improvements to the MPE/iX implementation.

Highlights of this release relative to version 1.1.5 which shipped with MPE/iX 6.0:

- Improved performance

- New Just-In-Time Compiler (JIT)

- Support for the latest JDK 1.1 version

- Reduced resource requirements

- Reduced start-up time for the Java VM

- Simplified operation

NOTE   After updating to Release 6.0 Express 1, JDK 1.1.7B must be manually
            installed by streaming `JINSTJDK.INSTALL.JAVA`

Java, POSIX, and MPE/iX

Java on MPE/iX is based on Sun's reference implementation of Java for UNIX. Because it is a derivative of a UNIX implementation, Java/iX lives almost entirely within the POSIX/HFS environment of MPE/iX. You can invoke Java from the normal MPE Command Interpreter ":" prompt, but you should keep in mind that all filenames operated on by Java will be interpreted as POSIX HFS filenames rather than MPE `FILE.GROUP.ACCOUNT` names.

The Installation Environment

All of the files that make up the installation of Java/iX reside in the MPE HFS directory starting at:

`/usr/local/java/<version>/`

For example, after installing 1.1.7B, there will be a directory:

`/usr/local/java/jdk1.1.7/`

Additionally, each time you install a version of the JDK, a symbolic link named:

`/usr/local/java/latest/`

will be set to point to that JDK version. Thus the standard way of invoking Java is to go through the /latest/ directory link. In this way, a new version of Java may be installed and

applications will immediately start using it. You can keep as many releases of the JDK on the system as you like. Those releases other than the one pointed to by the /latest/ symbolic link will have to be referred to through a path that includes the version number, or in some other fashion. For example, you could create your own symbolic link in the shell as follows:

```
$ ln -s /usr/local/java/jdk1.1.5 /usr/local/java/production
```

and then use this /production/ path in your applications. This would allow you to install new releases of the JDK without impacting your current Java applications. Once you have tested a new release, you can simply change the /production/ link to point to the new version.

To remove a version of Java from your system, simply remove all files starting at

```
/usr/local/java/<version>
```

For example, if you wish to remove the 1.1.5 version of Java after (or before) installing 1.1.7B, you can use the command:

```
$ rm -rf /usr/local/java/jdk1.1.5
```

Important Directories under /usr/local/java/latest

/bin   Contains the user executables. This is the directory that needs to be on your `PATH` in order to execute Java programs. The actual executables are in `/bin/PA-RISC/green_threads/`.

/lib   Contains the standard Java classes.zip file and some config files. Shared libraries (XL files) implementing the runtime Java system are in `/lib/PA-RISC/green_threads/`.

Invoking Java from the POSIX Shell

For convenience, the directory /usr/local/java/latest/bin should be added to your `PATH` environment variable. This can be done in a user's .profile, or in the system wide /etc/profile.local file with a command such as:

```
export PATH=/usr/local/java/latest/bin:$PATH
```

Java can also be invoked by specifying the full path to the executable, as in:

```
$ /usr/local/java/latest/bin/java HelloWorld
```

Of course, it is possible to specify a specific version of Java as in:

```
$ /usr/local/java/jdk1.1.7/bin/java HelloWorld
```

With version 1.1.7B, the set of environment variables required for Java have been simplified. You no longer need to set `SYSNAME` or `THREADS_FLAG`.

CLASSPATH

The `CLASSPATH` environment variable needs to be set only if you need to specify nonstandard directories other than "." for finding .class files.

If you have not set `CLASSPATH`, the default path will include these directories:

```
/usr/local/java/jdk1.1.7/classes
```

```
/usr/local/java/jdk1.1.7/lib/classes

/usr/local/java/jdk1.1.7/lib/classes.zip
```

If you have set CLASSPATH, the following directories will be APPENDED to the list you provide:

```
/usr/local/java/jdk1.1.7/classes

/usr/local/java/jdk1.1.7/lib/classes

/usr/local/java/jdk1.1.7/lib/classes.zip
```

NOTE   If you are running 'appletviewer', and have not set CLASSPATH, the current directory (".") will not be included in the default CLASSPATH for security reasons.

If all your .class files are in your current working directory, you need not set CLASSPATH at all. If you need to have a directory of your own included in the CLASSPATH, you need only include that directory (and "." if you want it) when you set CLASSPATH. You do not need to include the standard Java classes.zip, or the other "system" directories above, as they will be appended to your CLASSPATH automatically. Note that this is NOT the case if you use the -classpath command line option of the various Java executables. In that case you must specify ALL the locations to be searched. Because of this, the CLASSPATH environment variable method is greatly preferred. JDK 1.2 (the Java 2 platform) will fix this aspect of the -classpath command line option so that it behaves the same as the CLASSPATH environment variable.

LD_LIBRARY_PATH

If you will be invoking native code from your Java program (using JNI, or perhaps the TurboImage class library), Java needs to know where to look for any native libraries that your code tries to load. This is the purpose of the LD_LIBRARY_PATH environment variable. If you are not invoking your own native code, then you do not need to set this variable.

If you do not set LD_LIBRARY_PATH, the default will include the following directory, which contains the standard Java runtime shared libraries:

```
/usr/local/java/jdk1.1.7/lib/PA-RISC/green_threads
```

If you set LD_LIBRARY_PATH, then YOUR list of directories will be APPENDED AFTER the above directory.

New Just-In-Time Compiler

The 1.1.7B release of Java/iX includes the latest version of Hewlett-Packard's Just-In-Time (or JIT) Compiler for Java, which provides increased performance for Java programs by transparently converting the interpreted virtual machine bytecodes into native PA-RISC instructions at runtime.

The JIT defaults to being enabled, but can be disabled by passing the -nojit option to the java command, or the -J-nojit option to javac and many of the other JDK commands.

Performance Improvements and Resource Requirement Reductions

With 1.1.7B, several improvements were made to the MPE/iX implementation to reduce the resources required for each instance of the Java Virtual Machine, and to reduce the amount of time and overhead required to start a VM. These changed have resulted in the elimination of approximately half of the start-up overhead.

Here is a summary of differences between 1.1.5 and 1.1.7B:

```
                           1.1.7                 1.1.5
----------------------     ------------------    -----------------------
Thread stack allocation    dynamic               static (39MB stack req.)
# of Thread stacks         dynamic               fixed, ~35
max # of Threads           limited by ;NMSTACK=  fixed, ~35
Thread stack size          128KB                 1MB
Min ;NMSTACK for shell     default (2MB) works   NMSTACK=40000000
Default min heap           256KB                 64MB
Default max heap           64MB                  64MB
Out of memory result       Exception thrown      VM aborts with SIGBUS
# of fork/exec to start    1                     multiple, perhaps many
Can fork VM?               yes                   no
```

Thread Stacks

Since the Java Virtual Machine is a multithreaded environment, a stack must be allocated for each thread. Currently Java/iX uses a "Green Threads" package which simulates multiple threads within a single process.

In 1.1.5, storage for thread stacks was statically allocated on the stack at start-up. This resulted in several problems:

- The number of threads that was supported was a fixed number.

- The VM needed to run with ;NMSTACK=**40000000**, which required that the user enter the POSIX environment using at least this large of an NMSTACK so that it would be inherited by the eventual Java VM.

- The first thread used the highest addresses in the stack, resulting in an apparent 39MB stack size for even the most trivial Java program.

- Functions invoked from within the VM that required executing a `fork` and `exec` sequence would fail. This included executing shell commands and processes from within Java, and the jdb Java debugger.

- Running out of memory could cause an abort rather than throwing an OutOfMemoryException.

- The JIT required a large stack size, and could potentially run on any thread, so each thread stack was allocated a full megabyte of storage.

In 1.1.7, the following changes have been made to address these problems:

- Thread stacks are now allocated as needed, starting at low addresses in the stack. This has reduced the minimum ;NMSTACK= requirements for the VM from nearly 40MB to around 1.5MB. Because the shell now has a 2MB default NMSTACK, simple Java programs can now be run without any special ;NMSTACK= parameter being specified anywhere.

- At start-up, the VM will determine what ;NMSTACK= value is in effect, and will allow allocation of as many thread stacks as will fit within this limit. When the limit is exceeded, an OutOfMemoryException will be thrown. The default ;NMSTACK= value of 2MB for the POSIX shell means that approximately three threads can be created before a larger ;NMSTACK= will need to be specified by the user. This is enough to run the javac java compiler and non-threaded java programs. Programs that use AWT create several internal threads and will require a larger VM STACK. The JAVA executable has a default NMSTACK of 10MB, which will be in effect if the VM is invoked directly from the CI, and should be enough for most applications.

- Ordinary thread stacks have been reduced from 1MB to 128KB in size. The JIT now has its own dedicated stack which is sized as needed by the particular JIT version.

- Functions like Runtime.exec are now able to successfully fork from inside the VM.

Setting the NMSTACK Size for the Java VM Process

As noted above, it is no longer necessary to run the shell with a 40 million byte stack limit in order to then run Java. Programs which need to create a large number of threads will need a larger stack limit.

When a process is created in the "MPE style" by calling the CREATE or CREATEPROCESS intrinsics, the new process will have its ;NMSTACK= limit set by the default value linked into the program file, unless it is overridden by a CREATEPROCESS option. So if you are invoking the Java VM directly from the CI through a command file like JAVA.PUB.SYS, or the :RUN command, the new VM process will get the 10MB NMSTACK value of the JAVA executable, which should be enough for approximately 65 threads.

When a new process is started via the POSIX fork and exec sequence, the new son process inherits the NMSTACK limit of its father process. The NMSTACK limit of the last process that was created by CREATE[PROCESS] affects all forked descendants of that process. To see why, we have to look at what fork and exec do. fork creates a new process that is an exact copy of the calling process, so obviously it should and must have the same NMSTACK limit as the old process that it is a copy of. Once the fork is complete, exec is called to change the program being executed by the process from the copy of the original to the new program we wish to run. Unfortunately at this point the stack for the process has been set up (based on the copy of the original process) and there is no opportunity to change it, even if the new program would like to specify a different limit.

When executing program from inside the POSIX shell, the fork and exec sequence is used by the shell (and most other "POSIX" type programs), which means that the same NMSTACK limit will apply to every one of these processes. This means that whatever ;NMSTACK= was in effect when you entered the shell from the CI using the :RUN SH.HPBIN.SYS command (or equivalent) will apply to everything (like Java) that you run from inside the shell.

If you will be invoking Java from within the shell, and you need more than approximately three threads for your program. Then you will need to arrange to have specified a larger ;NMSTACK= value when you ran the first shell. Java requires approximately 1.5MB of NMSTACK for a single thread program, and 128KB more for each additional thread.

If you want to use 100 simultaneous threads in your Java program, you would want to enter the shell with a command such as:

```
:RUN SH.HPBIN.SYS;INFO="-L";NMSTACK=14000000
```

Heap Changes

The default minimum heap (java -ms option) has been changed from 64MB to 256KB in version 1.1.7B. The default maximum value is still set to 64MB, which is under the 80,000,000 byte system default ;NMHEAP= limit and thus does not involve the problems of ;NMSTACK=. Should you need more than ~70MB of Java heap storage, you will need to both specify the larger limit using the java -mx option AND specify a larger ;NMHEAP= value in the same way that a larger ;NMSTACK= is specified.

The smaller default minimum heap value reduces the memory management overhead and start-up time for the VM.

Extra Process Elimination at Start-up Time

One of the biggest reductions in start-up overhead was realized by eliminating the extra fork/exec sequences of the standard VM start-up shell scripts.

On UNIX systems, processes are very cheap to start, and every time the shell wants to run a program it simply forks and execs to do it. On MPE however, this is a VERY expensive process.

In the JDK 1.1.5 version of Java/iX, if you want to execute the "javac" command to compile a program, here's what happens when the user types:

```
$ javac -g HelloWorld.java
```

- The shell reads /usr/local/java/jdk1.1.5/bin/javac which is a symbolic link to /usr/local/java/jdk1.1.5/bin/.java_wrapper.

- The shell forks a copy of it self to read and execute the .java_wrapper script.

- The .java_wrapper script executes three POSIX commands to break apart the $0 argument to the script. Each of these requires a fork and exec to create a new process to run the command!

- The .java_wrapper forks a new shell and it execs /usr/local/java/jdk1.1.5/bin/PA-RISC/green_threads/javac which is yet another shell script.

- The /usr/local/java/jdk1.1.5/bin/PA-RISC/green_threads/javac script invokes another script (another fork/exec) to break up the parameters to the javac command. For EACH parameter, this script does MORE fork/execs to help chop up the input.

- Finally the /usr/local/java/jdk1.1.5/bin/PA-RISC/green_threads/javac script execs /usr/local/java/jdk1.1.5/bin/PA-RISC/green_threads/java, which is the actual VM executable, passing it the name of the javac class to be executed to run the compilation.

The result of all this is that the user spends several seconds waiting while the system forking repeatedly.

In 1.1.7B, all of the above nonsense has been replaced by a single program. All of the extra fork/exec sequences are gone. The new start-up sequence looks like:

```
$ javac -g HelloWorld.java
```

- The shell reads `/usr/local/java/jdk1.1.7/bin/javac`, which is a symbolic link to `/usr/local/java/jdk1.1.5/bin/.java_wrapper`, which is a symbolic link to: `/usr/local/java/jdk1.1.5/bin/PA-RISC/green_threads/JAVA`, which is the new do-everything Java executable. The shell `fork`s and `exec`s this program.

- The `/usr/local/java/jdk1.1.5/bin/PA-RISC/green_threads/JAVA` program internally performs the functions of the old .java_wrapper, and `/usr/local/java/jdk1.1.5/bin/PA-RISC/green_threads/javac` scripts, then calls the Java VM directly, without an additional `fork` or `exec`.

This optimization applies to most of the standard JDK commands, though there are a few (less commonly used) which still follow the old execution path. This optimization does not currently apply to the _g versions of the java commands which invoke the java_g debugging version of the `VM`.

Legato 3000 NetWorker Storage Node for MPE/iX

by Alex Early
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The HP 3000 NetWorker Storage Node for MPE/iX is supported in MPE/iX 6.0 Express 1. The HP 3000 NetWorker Storage Node for MPE/iX allows the HP 3000 to support directly connected DLT7000 libraries. The Storage Node requires additional Legato software, NetWorker server software (NT or UNIX), and Autochanger license. With the Storage Node, the HP 3000 supports DLT 1/8, 2/15, 2/28, 3/30, 4/48, etc... A complete list can be found at *http://www.hp.com/go/3000*.

Configuring Libraries on MPE/iX

To configure the DLT Library on an HP 3000, perform the following steps:

 Step 1. After booting, run ODE at the ISL prompt:

```
ISL> ODE
```

NOTE	The MPE ISL ODE "RUN MAPPER" utility does not recognize and list fast-wide robotics devices.

 Step 2. Run mapper to get device paths:

```
ODE> RUN MAPPER
***STARTING EXECUTION OF MAPPER****
Processor Identification:
...I/O Configuration:
Type HW SW Revisions
Path Component Name ID Mod Mod Hdwr Firm
...
/4/4 HP-PB Fast Wide SCSI . . .
/4/4.0.0 C1194F . . .
/4/4.1.0 DLT7000 . . .
/4/4.2.0 DLT7000 . . .
/4/4.3.0 DLT7000 . . .
/4/4.4.0 DLT7000 . . .
```

 Step 3. Boot the system. At the MPE prompt, run sysgen and start the io section:

```
: sysgen
SYSGEN version E . . .
sysgen> io
** IO configurator commands **
```

Step 4. If not already configured, configure the differential card and the pseudo/target
level of the SCSI path:

```
io> apath 10/4/4 id=HP28696A
io> apath 10/4/4.0 id=pseudo
io> apath 10/4/4.1 id=pseudo
io> apath 10/4/4.2 id=pseudo
io> apath 10/4/4.3 id=pseudo
io> apath 10/4/4.4 id=pseudo
```

Step 5. Configure the robotic transport/"picker" and DLT tape drives:

```
io> adev 30 id=HPC1194F path=10/4/4.0.0
io> adev 31 id=DLT7000 path=10/4/4.1.0 mode=autoreply
io> adev 32 id=DLT7000 path=10/4/4.2.0 mode=autoreply
io> adev 33 id=DLT7000 path=10/4/4.3.0 mode=autoreply
io> adev 34 id=DLT7000 path=10/4/4.4.0 mode=autoreply
```

Step 6. Verify the bindings between the PATH, LDEV number, ID, PMGR (device
drivers), and LMGR attributes for each device configured.

• Verify the binding for the device adapter (the fw/differential dam):

```
io> lpath 10/4/4.0.0
PATH: 10/4/4 LDEV:
ID: HP28696A TYPE: DA
PMGR: FWSCSI_DAM PMGRPRI: 6
LMGR: MAXIOS: 0
```

Repeat this verification step for lpath 10/4/4.1, 4.2, 4.3, and 4.4.

• Verify the binding for the targets (the transparent dm):

```
io> lpath 10/4/4.0
PATH: 10/4/4.0 LDEV:
ID: PSEUDO TYPE: DA
PMGR: TRANSPARENT_MGR PMGRPRI: 6
LMGR: MAXIOS: 0
```

 Repeat this verification step for lpath 10/4/4.1, 4.2, 4.3, and 4.4.

• Verify the binding for the picker (the pass-through driver):

```
io> lpath 10/4/4.0.0
PATH: 10/4/4.0.0 LDEV: 30
ID: HPC1194F TYPE: MOSAR_AC
PMGR: MO_SCSI_PTHRU_DM PMGRPRI: 10
LMGR: LOGICAL_DEVICE_MANAGER MAXIOS: 0
```

Repeat this verification step for lpath 10/4/4.1, 4.2, 4.3, and 4.4.

• Verify the binding for the tape drives (the differential tape dm):

```
io> lpath 10/4/4.1.0
PATH: 10/4/4.1.0 LDEV: 31
ID: DLT7000 TYPE: TAPE
PMGR: SCSI_TAPE2_DM PMGRPRI: 10
LMGR: LOGICAL_DEVICE_MANAGER MAXIOS: 0
```

Repeat this verification step for lpath 10/4/4.2.0, 4.3.0, and 4.4.0.

Configuring the Storage Node on the NetWorker Server

Complete the configuration process on the Storage Node on the NetWorker server.

Verify the ldev Specifications

```
io> ldev 30/34
LDEV: 30 DEVNAME: OUTDEV: 0 MODE:
ID: HPC1194F RSIZE: 128 DEVTYPE: MOSAR_AC
PATH: 10/4/4.0.0 MPETYPE: 24 MPESUBTYPE: 4
CLASS:
LDEV: 31 DEVNAME: OUTDEV: 0 MODE:
ID: DLT7000 RSIZE: 128 DEVTYPE: TAPE
PATH: 10/4/4.1.0 MPETYPE: 24 MPESUBTYPE: 8
CLASS: TAPE
...
LDEV: 34 DEVNAME: OUTDEV: 0 MODE:
ID: DLT7000 RSIZE: 128 DEVTYPE: TAPE
PATH: 10/4/4.4.0 MPETYPE: 24 MPESUBTYPE: 8
CLASS: TAPE
```

Save the Configuration Changes

- Hold the configuration changes:

  ```
  io> hold
  ```

- Exit the io section:

  ```
  io> exit
  ```

- If you have followed the local convention for backing up the configuration file, keep the changes:

  ```
  sysgen> keep
  keeping to group CONFIG.SYS
  ```

  Purge old configuration (yes/no)?y

IMPORTANT   Check with system management to make sure you can keep the changes to the configuration file.

- Exit sysgen and reboot according to local convention:

  ```
  sysgen> exit
  ```

ALLBASE/BRW JCWs for Year 2000

by Kelly Sznaider
Support Technology Lab

For year 2000 compliance, two JCWs were created in earlier versions of BRW. However, the defaults of these JCWs have been changed as of version A.01.57.

As year 2000 rapidly approaches, it is strongly recommended to use four-digit years instead of two-digits. If four-digit years are used in your files and databases, then these BRW JCWs can be ignored.

The remainder of this article provides information about the BRW JCWs which support the reading and writing of two-digit years. They describe how BRW should interpret these years, as 1900 based or 2000 based. As of version A.01.57, the defaults are 2000 based instead of 1900 based.

HP's MM II customers using ALLBASE/BRW should review these JCWs carefully and preset them accordingly.

This change in the product's behavior is specific to ALLBASE/BRW, not BRW/V.

1. Set the JCWs in session mode and also, in BRWJOB/BRWJ000 for batch processing.

   The JCWs will map '00'..'49' to '2000'..'2049' or to '1900'.. '1949' depending upon the settings. Two-digit years of '50' to '99' are mapped to '1950'..'1999' regardless of the setting of the JCWs.

2. If these JCWs are not set, then it is the same as setting these JCWs to 1. Setting these JCWs to 1 (or not setting them) assumes two-digit years with the century as "20" (for years '00' to '49' only). Setting the JCWs to 0 assumes two-digit years with the century as "19", which was the default prior to version A.01.56.

3. The JCWs can be set differently depending upon the desired results.

   • ALLBASE/BRW versions A.01.56 and earlier set the JCWs as the following if not specified:

   ```
   BRWCENTURYROUNDING     = 0

   BRWUSERCENTURYROUNDING = 0
   ```

   • As of version A.01.57, the JCWs are defaulted as:

   ```
   BRWCENTURYROUNDING     = 1

   BRWUSERCENTURYROUNDING = 1
   ```

BRWCENTURYROUNDING

The following apply to `BRWCENTURYROUNDING`:

• If set to 1 (or not set), a date range of 1950 - 2049 is assumed for all two-digit years in user parameters values, constants in calculated items and selection conditions, and in data files.

- If set to 0, a date range of 1900 - 1999 is assumed for all two-digit years in data files.

BRWUSERCENTURYROUNDING

The following apply to BRWUSERCENTURYROUNDING:

- If BRWCENTURYROUNDING is set to 0, then this JCW is examined.

- If set to 1 (or not set), a date range of 1950 - 2049 is assumed for all two-digit years in parameter values and for date constants appearing in calculated items or selection conditions. (This JCW excludes data files.)

- If set to 0, a date range of 1900 - 1999 is assumed for all two-digit years in parameter values and for date constants appearing in calculated items or selection conditions (excluding data files).

NOTE　　　The date range can affect some reports which assume that 01/01/00 is the smallest possible year, or that 12/31/99 is the largest possible year.

For example, if the JCWs were set as the following for ALLBASE/BRW A.01.56:

```
BRWCENTURYROUNDING not set
BRWCENTURYROUNDING = 1
```

Then for A.01.57, specify the JCW settings to get the same functionality as in A.01.56:

```
BRWCENTURYROUNDING = 0
BRWCENTURYROUNDING not set (or = 1)
```

If either of these JCWs are currently specified, then you should specify both JCWs in your logon environments prior to version A.01.57. Then when ALLBASE/BRW is upgraded to version A.01.57 or later, the BRW application will continue to query correctly using 1900 as the base.

HP 3000 997 Large Memory Subsystem

by Dave Snow
Commercial Systems Division

With MPE/iX Release 6.0 Express 1, a Large Memory Subsystem is supported on HP 3000 997 Servers (HP 3000 996/995/992/991/990). Servers must first be upgraded to HP 3000 997 Servers to use the Large Memory Subsystem.

The new Large Memory Subsystem consists of a memory carrier card (A3839A, containing no memory) and 1 GB memory modules (A3832A). With MPE/iX Release 6.0 Express 1, four memory modules containing a total of 4 GB (only 3.75 GB is usable at this time) can be loaded on to the memory carrier card.

With MPE/iX Release 6.5 expected to ship in the first quarter of 2000, eight memory modules will be supported per memory carrier card and at least two memory carrier cards will be supported per system providing support for at least 16 GB of memory in HP 3000 997 Servers.

All memory array cards supported on the HP 3000 997 Server (128 MB, 256 MB, 512 MB and 768 MB) may be intermixed with the Large Memory Subsystem.   However, when HP 3000 997 Servers are integrated in the factory, only the 256 MB array card will be factory integrated with the Large Memory Subsystem. When ordered with the Large Memory Subsystem, other memory array cards will be field integrated.

HP 3000 997 Servers using the HP 3000 Large Memory Subsystem require the 997 Server to have processor dependent code (PDC) version 6.05 (J605) or later.

There are several advantages to using the Large Memory Subsystem over previous memory array cards.

- The Large Memory Subsystem can increase HP 3000 997 Server performance by as much as 6% when using eight processors and a large amount of memory.

- The Large Memory Subsystem is cheaper on a per megabyte basis than any other HP 3000 997 memory array card.

- With MPE/iX Release 6.5 shipping in the first quarter of 2000, the Large Memory subsystem will allow support of at least 16 GB of memory in HP 3000 997 Servers.

- The Large Memory Subsystem uses one PMB slot thus freeing up PMB slots. These slots can be used for adding more HP 3000 997 processors (maximum of 8 with this release but increasing to twelve in the first quarter of 2000) or for adding more HSC I/O bus converters (maximum of 6 with this release).

HP SureStore E Disk Array MC256

by Rich Bassett--CSY Lab
Alex Early--CSY Product Marketing

The Hewlett-Packard SureStore E Disk Array MC256 provides high-capacity, high-speed mass storage, with continuous data availability, ease of service, scalability, and connectivity. The disk array can be connected to multiple server systems. The HP 3000 supports the MC256 through Fast-wide SCSI connections. The disk array can have up to 32 SCSI ports. It can be directly connected to the HP 3000 or connected via the SCSI-Fibre Channel Router for distances up to 10km.

The disk array is the first RAID disk array to truly provide continuous data availability. It is designed for nonstop operation and continuous access to all user data. The disk array has no active single point of component failure. It is not expected to fail in anyway that would interrupt user access to data. The MC256 is easily configured on the HP 3000.

Announcing Support of the HP SureStore E Disk Array MC256

The following is a summary of site, software and hardware requirements for support of the HP SureStore E Disk Array MC256. Device installation and support is to be provided by HP. For detail information on the support and configuration of MC256, refer customers to the Operating System Configuration Guide (A5701-90910). Support of MC256 product will have the following general restrictions:

- Support will only be allowed on a dedicated SCSI bus, with no other types of devices (homogeneous bus environment).

- Daisy-chaining of two or more MC256 units are not supported.

- Maximum of 15 LDEVs per SCSI bus (Maximum of 8 LDEVs for performance)

NOTE   Having 9 or more LDEVs configured will cause performance degeneration under high I/O loads.

- No support for shared SCSI busses.

- F/W SCSI Device Adapter Card (28696A, known as "Wizard") firmware MUST be at level 3728 or greater.

- 9x9 Core I/O card (A2372-60004 or A3453-60010, known as "Mustang") will be conditionally supported with the following restrictions:

  — Must disconnect all internal F/W SCSI drives.

  — Must have firmware level of 3636.

  — Up to 8 LDEVs will be supported (Tested limit).

- LDEV 1 boot will have the following conditions:

  — ONLINE HOT replacement of FRUs is supported with the exception of microcode downloading, online memory replacements, disk adapter replacements.

— Only RAID 1 is support for LDEV 1.

— Microcode down-loading, online memory replacements and disk adapter replacements must be performed with no jobs or sessions logged on.

— LDEV 1 capacity limited to 4 Gbytes (due to NIO IODC limits).

MC256 has certified this disk to operate with the following MPE/iX Releases:

- MPE/iX 5.5 PowerPatch 7 + KXL9 or MPE/iX 6.0 PowerPatch 1 + KXL9

Support on 5.5 and 6.0 will have the following restrictions:

- No logging to the host of any vendor unique error codes. These codes are used to identify any hardware component (FRU) that has failed. For example, the failure of a fan inside the device would be reported as a FRU error.

- SYSMAP will identify the MC256 device as non-supported.

- No predictive support.

- SYSGEN product ID is "HPDARRAY".

- MC256 microcode revision level B++(rev 36) or later is required. Host mode table should be set to 08.

- Target address support only (Multi- LUN support available on request)

An additional requirement for support is that each MC256 will have a telephone modem connected for remote access. Normally, the MC256 will call HP support when it detects any errors. SCSIDSK2 can be used on the MC256 to validate access to the device. For information on support, see the HP support plan.

DVD Supported on the HP 3000

by Alex Early and Dave Black
Commercial Systems Division

The embedded CD-ROM shipped with many HP 3000 servers has come to the end of its life. However, many customers purchased HP 3000s with CD-ROMs to take advantage of system update material and manuals that are available on CDs. The A3715A, a 12x CR-ROM, is being replaced by the new DVD-ROM. The DVD-ROM supports usage of the older CD-ROM disks.

Customers wishing to take advantage of DVD-ROM for updates, can simply add a DVD-ROM to their HP 3000 system. For customers in support contracts, who have older CD-ROMs, your CD-ROM will be replaced with a DVD-ROM, if there are no CD-ROMs available. The DVD-ROM drive unit has a 32X CD-ROM transfer rate. The DVD-ROM is supported in the following packages:

Product Numbers

0950-3398	DVD-303 SCSI Slot-Load DVD-ROM Drive Unit
A5220A	Embedded Product Number.
C4318SZ opt 108	Highlander Factory Rack
C4314A	Highlander Deskside Standalone
C4315A	Highlander Field Rack

Current Limitations on Use

There is a limitation on the use of the DVD-ROM due to a defect that is currently being investigated by the lab. The defect is documented in SR 4701-423095. The one-line description for that defect is:

NOTE   Data corruption on DVD drives when I/O rate is >300 per sec.

During certification testing for the DVD drives it was discovered that, when running the DVDs on faster or busy systems (when the IO rates are above 300 IOs per second), data corruption can occur to files being brought in from the DVD to disk. This tends to happen with large files.

The corruption area of the file is misplaced data from the same file. The corruption has been seen as a loose repeating pattern as small as 208 bytes and as large as 8624 bytes in length. The problem has been seen on a 959/400KS.

The main effect of this is that customers using `HPINSTAL` must have their systems in an "idle state" when using the DVDs. If you are using `HPINSTAL`, then nothing else can be going on with the system. This is to ensure that the IOs do not exceed 300 per second.

CSY recognizes this will be an issue for customers and is working to resolve this problem. The DVDs need to be made available in order to resume shipments of new systems.

ALLBASE/SQL Version G3 Article Update

by Doug Myers
Database Lab, Commercial System Division

Correction to Previously Published Article

The complete article showing new features in ALLBASE/SQL Version G3 was published in the Communicator for Release 6.0. The following sections show correct syntax to replace that from the original article. In the syntax and example below, the comma is replaced by the word 'IN'.

Position

Searches for the presence of the string *stringexpr1* in the string *stringexpr2* and returns a numeric value that indicates the position at which *stringexpr1* is found in *stringexpr2*

Syntax

[POSITION (*stringexpr1 IN stringexpr2*)]

Example 2

```
SELECT POSITION ('world' IN 'hello world')
FROM SYSTEM.TABLE
WHERE NAME = UPPER('vendors');
```

Returns the numeric value 7.

HP System Account and Directory Naming Structure

by The Release Delivery Team
Commercial Systems Division

The following is an updated list of the HP System Accounts. This information replaces that published in the *Communicator 3000 for MPE/iX 6.0* and the *HP 3000 MPE/iX Release 6.0 System Software Maintenance Manual*. HP recommends copying this page to replace the appropriate pages in these manuals.

Since the MPE operating system originated, Hewlett-Packard has developed and maintained a number of system accounts that are considered reserved. To avoid overwriting your user accounts and directories, Hewlett-Packard recommends that you do not use reserved names. Rename all non-Hewlett-Packard accounts and directories that use any of the reserved names.

System Accounts

HP currently reserves the following accounts:

BIND	HPPL87	SAMBA
CLL	HPPL89	SNADS
CONV	HPSKTS	SOFTREP
HPLANMGR	HPSPOOL	SUPPORT
HPNCS	ITF3000	SYS
HPOFFICE	JAVA	SYSLOG
HPOPTMGT	NETSCAPE	SYSMGR
HPPL85	RJE	TELESUP

4   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 6.0 Express 1 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. Enhancements, NPCONFIG Variable on NW Spooler, DLT4000/DLT7000 Differential Tape Drives, IMAGE/SQL Enhancement: P and Z Data Types, Java Database Connectivity (JDBC) Driver, Java Developer's Kit, Legato NetWorker Storage Node for MPE/iX, FTP Enhancements, and HP 3000 997 Large Memory Subsystem

Table 4-1. MPE/iX Product Releases

Release	SUBSYS	Date Code	Product(s) Introduced/Added

C.55.00		R3628	MPE/iX Release 5.5 (Non-Platform Release)
			
			HP Loader Dependent Libraries
			Subsystem Dump Facility
			HP Stage/iX
			HP Patch/iX
			TurboSTORE/iX 7x24 True-Online Backup
			HP Optical Disk Libraries:
			   C1150B - 40GB
			    C1160B - 80GB
			    C1170B - 100GB
			TCP/IP Network Printer Support
			Telnet/iX Server
			DTS/TIO Dynamic Configuration
			Online System Device Configuration

	C.55.01	R3638	PowerPatch 1 based on Release 5.5 ALLBASE/SQL CAST function HP Telnet/iX—full functionality CCSY Access Server 979/x00KS support High Availability Disk Array support
	C.55.02	R3715	Express 2 based on Release 5.5 CI enhancements VPlus enhancements DTS/TIO new functionality

Table 4-1. MPE/iX Product Releases

Release	SUBSYS	Date Code	Product(s) Introduced/Added
	C.55.03	R3732	Express 3 based on Release 5.5 COBOL II/iX enhancements 100VG-AnyLAN Network Adapter introduced 100Base-T Network Adapter introduced ALLBASE/SQL release G2 ODBCLink/SE ODBC driver introduced TurboIMAGE/XL B-Tree and scalability enhancements IMAGE/SQL B-Tree enhancement 9 GB Disk Drive NMMGR Node Maintenance Manager enhancements New SCSI Disks: ST32272N, ST32272WC (2 GB) ST34572N, ST34572WC (4 GB) XP34361W (4 GB)
	C55.04	R3748	Express 4 based on Release 5.5 Year 2000 enhancements MPE/iX new date intrinsics 997/100-500 support Enhancements for: Transact V and Transact/iX Dictionary/3000 COBOL II/iX Inform/V HP ALLBASE/BRW QUERY/iX
	C55.05	R3813	PowerPatch 5 based on Release 5.5 989/100, 989/200, 989/400, 989/600 support 997/600, 997/800 support A3699A - HP-IB I/O Bus Converter New SCSI Disks: A4909A - 18GB, WD A5239A - 18GB, WD Enhancements for Image/SQL and TurboIMAGE/XL: Dynamic data set expansion for master sets Performance enhancement for TPI Image Row-level locking 80 GB Image data sets ODBCLink/SE E.56.12
	C.55.06		PowerPatch 6 based on Release 5.5 Bug Fixes only

Table 4-1. MPE/iX Product Releases

Release	SUBSYS	Date Code	Product(s) Introduced/Added
	C.55.07	R3910	Express 7 based on Release 5.5 989/150, 989/250, 989/450, 989/650 support 997/1000, 997/1200 support ALLBASE/SQL Release G3 New String Functions ALLBASE/BRW JCWs for year 2000 DLT4000/DLT7000 Differential Tape Support IMAGE/SQL Enhancement Entering data with P and Z data types SPLIT and UPDATE commands allow mapped type Legato NetWorker Storage Node NPCONFIG variable for NW Spooler
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

Supported Releases

The naming conventions for the different types of releases have been changed slightly to clarify the type of release being discussed. The terms used to describe or refer to the releases are:

Mainline Release A mainline release involves the recompilization and reintegration of all software release components (FOS, SLT, and SUBSYS tapes). The release number is changed (for example, 5.0 or 5.5) and the update "UU" field of the V.UU.FF is changed. There are two types of mainline releases: *Platform* and *Non-Platform*.

Platform Release A platform release (previously also known as a "core" release) is a subset of a mainline release. Typically, the release number ends with a "0" such as 5.0. Platform releases are *automatically distributed* to all customers with support contracts.

Non-Platform Release A non-platform release (previously known as a "major" release) is a subset of the mainline release. The release number typically ends with a "5" such as 5.5. Non-platform releases must be *explicitly ordered* by customers.

Both platform and non-platform releases can be referred to as *mainline releases* when not discussing distribution or extended support life.

The following matrix provides information on the supported Commercial Systems MPE/iX mainline releases. It lists the currently supported releases and the SPUs they are supported on. The matrix also provides all known factory support termination dates. When a mainline release becomes unsupported, the factory will not provide any support services for that release. Online calls are not accepted and patches are not created; customers are advised to roll to a supported release.

- In general, HP will support the two most recent mainline releases.

- In order to facilitate customers moving to new releases, we will support the oldest release for at least six months after the new release ships. In other words, Release "N-2" will still be supported for at least six months after Release "N" ships.

- The release of an Express Release or a Powerpatch on any particular release does not extend its support life.

Given the rate with which we ship releases, this new strategy implies that any particular release will be supported for at least three years, and in most cases, most releases will be supported for a significantly longer period of time.

This new strategy is effective now. This implies that Release 5.0, which first shipped

February 17, 1995, will become obsolete as early as six months after Release 6.0 ships.

Table 4-2. Supported System Release Matrix

Supported Releases	Supported Systems	Support Termination Date
Release 5.5 (C.55.xx)	920, 922, 932, 935, 948, 950, 955, 960, 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, 980-100, 980-200, 980-300, 980-400, 987/150RX, 987/150SX, 987/200RX, 987/200SX, 989/150, 989/250, 989/350, 989/450, 989/650, 989/100, 989/200, 989/400, 989/600, 990, 990DX, 992/100, 992/200, 992/300, 992/400, 992/100DX, 992/200DX, 992/300DX, 992/400DX, 991DX, 995/100DX, 995/200DX, 995/300DX, 995/400DX, 995/500DX, 995/600DX, 995/700DX, 995/800DX, 991CX, 995/100CX, 995/200CX, 995/300CX, 995/400CX, 995/500CX, 995/600CX, 995/700CX, 995/800CX, 996/80, 996/100, 996/200, 996/300, 996/400, 996/500, 996/600, 996/700, 996/800, 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 6.0 (about end of year 2000)

Table 4-2. Supported System Release Matrix

Supported Releases	Supported Systems	Support Termination Date
Release 6.0 (60.xx)	920, 922, 932, 935, 948, 950, 955, 960, 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, 980-100, 980-200, 980-300, 980-400, 987/150RX, 987/150SX, 987/200RX, 987/200SX, 989/150, 989/250, 989/350, 989/450, 989/650, 989/100, 989/200, 989/400, 989/600, 990, 990DX, 992/100, 992/200, 992/300, 992/400, 992/100DX, 992/200DX, 992/300DX, 992/400DX, 991DX, 995/100DX, 995/200DX, 995/300DX, 995/400DX, 995/500DX, 995/600DX, 995/700DX, 995/800DX, 991CX, 995/100CX, 995/200CX, 995/300CX, 995/400CX, 995/500CX, 995/600CX, 995/700CX, 995/800CX, 996/80, 996/100, 996/200, 996/300, 996/400, 996/500, 996/600, 996/700, 996/800, 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 6.5 (about end of year 2001)

5　Catalog of User Documentation

This chapter provides listings of customer manuals for the HP 3000 computer system. The listings are divided into two sections:

- "MPE/iX New or Updated Manuals," which lists all manuals that have been introduced or changed since the MPE/iX 6.0 Release.

- "Manual Collections," which lists manuals by collections in alphabetical order. For detailed information on a particular manual or manual collection, refer to the *MPE/iX Documentation Guide*.

If your contract includes Material-Based Services, you will receive both software and manual revisions. For additional copies of new or revised manuals, you can order Manual Update Services (MUS).

Many of the learning products listed in this chapter can be individually ordered by calling HP Parts Direct Ordering at 800-227-8164. Specify the part number of the manual you are interested in when ordering.

MPE/iX 6.0 New or Updated Manuals

This section lists customer manuals introduced or updated from MPE/iX 6.0 Release through MPE/iX 6.0 Express 1 Release.

Table 5-1. MPE/iX 6.0 New or Updated Manuals

Manual Title	Part No.	Latest Edition
ALLBASE/SQL Database Administration Guide	36216-90214	8/97
ALLBASE/SQL Reference Manual	36216-90215	10/98
ALLBASE/SQL Message Manual	36216-90213	8/97
Asynchronous Serial Communications Programmer's Reference Manual	32022-90052	10/98
Communicator 3000 MPE/iX Release 6.0	30216-90269	10/98
Communicator 3000 MPE/iX Release 6.0 Express 1	30216-90286	6/99
Configuring and Managing MPE/iX Internet Services	32650-90859	10/98
Configuring Systems for Terminal, Printer, and Other Serial Devices	32022-90051	10/98
HP 3000 MPE/iX System Software Maintenance Manual	30216-90272	10/98
HP 3000/iX Network Planning and Configuration Guide	36922-90037	10/98
HP ARPA File Transfer Protocol User's Guide	36957-90158	10/98
HP Telnet/iX User's Guide	36957-90156	10/98
Installing and Managing HPARPA File Transfer Protocol Manager's Guide	36957-90157	10/98
Legato NetWorker Storage Node for MPE/iX Installation Guide	B6266-90001	12/98
Legato NetWorker Storage Node for MPE/iX User's Guide	B6266-90002	12/98
Legato NetWorker Storage Node for MPE/iX Supplement	B6266-90003	12/98
Legato NetWorker Storage Node for MPE/iX Supplement	B6266-90004	3/99
MPE/iX Commands Reference Manual	32650-90864	10/98
MPE/iX Documentation Guide	32650-90866	10/98

Table 5-1. MPE/iX 6.0 New or Updated Manuals

Manual Title	Part No.	Latest Edition
MPE/iX Error Messages Addendum	32650-90874	10/98
NS 3000/iX Error Messages Reference Manual	36923-90041	10/98
NS 3000/iX NMMGR Screens Reference Manual	36922-90038	10/98
NS 3000/iX Operations and Maintenance Manual	36922-90039	10/98
ODBCLink/SE Reference Manual	36217-90407	7/98
Using the Node Management Service (NMS) Utilities	32022-90053	10/98

Manual Collections

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
MPE/iX Operating Systems						
CI Programming Quick Reference Pocket Card	32650-90269	32650-90316	Dec-90	n	y	y
Communicator 3000 (6.0)	30216-90269	30216-90269	Oct-98	n	y	y
Communicator 3000 (PowerPatch 5 based on 5.5)	30216-90257	30216-90257	Jul-98	n	n	y
FCOPY Reference Manual	32212-90003	32212-90008	Jun-92	y	y	y
HP 3000 MPE/iX System Software Maintenance Manual	30126-90223	30216-90272	Oct-98	n	y	y
HP 3000 Series 9X8LX Computer Systems: Commands Reference	B3813-90011	B3813-90012	Apr-94	y	y	y
HP 3000 Series 9X8LX Computer Systems: Getting Started	B3813-90003	B3813-90014	Apr-94	y	y	y
HP 3000 Series 9X8LX Computer Systems: Task Reference Manual	B3813-90009	B3813-90010	Apr-94	y	y	y
HP 3000 Series 9X8LX Computer Systems: Understanding Your System	B3813-90001	B3813-90013	Apr-94	n	y	y
HP Easytime/XL Quick Reference Card	B1940-90001	B1940-90611	Jun-92	n	n	n
HP Easytime/XL User's Guide	B1940-90002	B1940-90602	Sep-91	n	n	n
MPE/iX Commands Reference Manual	32650-90003	32650-90864	Oct-98	n	y	y
MPE/iX Day to Day Tasks	A1707-90004	A1707-96034	Jun-92	n	y	y
MPE/iX Documentation Guide	32650-90144	32650-90866	Oct-98	y	y	y
MPE/iX Error Messages Addendum		32650-90874	Oct 98	n	y	y
* The documentation website address is: *http://www.docs.hp.com*.						

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
MPE/iX Error Messages Manual Vol 1	32650-90066	32650-90481	Apr-94	y	y	y
MPE/iX Error Messages Manual Vol 2	32650-90152	32650-90851	Jul-96	y	y	y
MPE/iX Error Messages Manual Vol 3	32650-90368	32650-90483	Apr-94	y	y	y
MPE/iX Glossary of Terms and Acronyms	32650-90146	32650-90391	Jun-92	y	y	y
MPE/iX Quick Reference Guide	32650-90032	32650-90873	Oct-98	n	y	y
MPE/iX System Utilities Reference Manual	32650-90081	32650-90490	Apr-94	y	y	y
SORT-MERGE/XL General User's Guide	32650-90082	32650-90499	Apr-94	y	y	y
SORT-MERGE/XL Programmer's Guide	32650-90080	32650-90080	Jan-91	y	y	y
Using HP 3000: Advanced Skills Tutorial	32650-90872	32650-90872	Oct-98	y	y	y
Using HP 3000: Fundamental Skills Tutorial	32650-90871	32650-90871	Oct-98	y	y	y
Development Tools and Distributed Computing						
Accessing Files Programmer's Guide	32650-90017	32650-90394	Jun-92	y	y	y
ALLBASE NET User's Guide	36216-90031	36216-90101	Apr-94	y	y	y
ALLBASE/SQL Advanced Application Programming Guide	36216-90100	36216-90099	Apr-94	y	y	y
ALLBASE/SQL C Application Programming Guide	36216-90023	36216-90080	Jun-92	y	y	y
ALLBASE/SQL COBOL Application Programming Guide	36216-90006	36216-90081	Jun-92	y	y	y
ALLBASE/SQL Database Administration Guide	36216-90005	36216-90214	Aug-97	y	y	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
ALLBASE/SQL FORTRAN Application Programming Guide	36216-90030	36216-90079	Jun-92	y	y	y
ALLBASE/SQL Message Manual	36216-90009	36216-90213	Aug-97	y	y	y
ALLBASE/SQL Pascal Application Programming Guide	36216-90007	36216-90082	Oct-92	y	y	y
ALLBASE/SQL Performance and Monitoring Guidelines	36216-90102	36216-90103	Apr-94	y	y	y
ALLBASE/SQL Reference Manual	36126-90001	36216-90215	Oct-98	n	y	y
Asynchronous Serial Communications Programmer's Reference Manual	32022-61001	32022-90052	Oct-98	n	y	y
BASIC Interpreter Reference Manual	30000-90026	30000-90026	Nov-78	n	n	n
BASIC/3000 Compiler Reference Manual	32103-90001	32103-90001	Sep-77	y	n	n
BASIC/V to HP Business BASIC/V Conversion Guide	32115-90004	32115-90004	Sep-87	y	n	n
Berkeley Sockets/iX Reference Guide	32650-90363	32650-90372	Apr-94	y	y	y
Command Interpreter Access and Variables Programmer's Guide	32650-90011	32650-90493	Apr-94	y	y	y
Compiler Library/XL Reference Manual	32650-60014	32650-90029	Oct-88	y	n	y
Data Dictionary Managing Information Network Primer	5958-8527	5958-8527	Nov-86	n	n	n
Data Entry and Forms Mgmt System VPLUS Reference Manual	32209-90001	32209-90001	Nov-87	y	n	y
Data Entry and Forms Mgmt System VPLUS Technical Addendum	32209-90021	32209-90021	Apr-90	y	n	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
Data Types Conversion Programmer's Guide	32650-60010	32650-90015	Oct-89	y	y	y
DBChange Plus Technical Addendum for MPE/iX Release 4.0	36386-90005	36386-90005	Jun-92	y	n	y
DBChange Plus User's Guide	36386-90001	36386-90001	Feb-91	y	n	y
DCE for the HP 3000	B3821-90001	B3821-90002	Oct-95	y	n	y
Dictionary/3000 Reference Manual	32244-90001	32244-90001	Dec-87	y	n	y
Dictionary/3000 Documentation Update Notice	32244-90013	32244-90013	Oct-96	n	n	n
EDIT/3000 Reference Manual	03000-90012	32650-90385	Aug-80	y	y	y
Getting Started as an MPE/iX Programmer	32650-90008	32650-90421	Jun-92	y	y	y
Getting Started with HP IMAGE/SQL	36385-90008	36385-90011	Dec-94	y	y	y
Getting Started with HP Software Revision Controller (SRC)	30234-60002	30234-90002	Nov-88	n	n	n
Getting Started with TRANSACT	32247-60002	32247-90007	Jul-88	y	n	y
High Level Screen Management Intrinsics Library Reference Manual	32424-60001	32424-90002	Nov-87	y	n	y
HP 3000 Basic for Beginners	03000-90025	03000-90025	Nov-72	n	n	n
HP ALLBASE Query User Guide Kit	32426-64001	32426-64001	Oct-89	n	n	n
HP ALLBASE/4GL Developer Administration Manual	30601-90201	30601-90205	May-92	y	n	y
HP ALLBASE/4GL Developer Quick Reference Guide	30601-90210	30601-90211	May-92	y	n	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
HP ALLBASE/4GL Developer Reference Manual Vol 1	30601-90202	30601-90206	May-92	y	n	y
HP ALLBASE/4GL Developer Reference Manual Vol 2	30601-90204	30601-90208	May-92	y	n	y
HP ALLBASE/4GL Installation Manual	30601-64212	30601-64213	May-92	n	n	n
HP ALLBASE/4GL Developer Self-Paced Training Guide	30601-90203	30601-90207	May-92	y	n	y
HP ALLBASE/4GL Software Update Notice B.06 Release	5961-7797	5063-3725	Feb-93	y	n	y
HP ALLBASE/BRW Reference Manual	35360-90051	35360-90052	Jan-92	y	n	y
HP ALLBASE/BRW SW Update Notice for MPE/iX (BRW A.01.50)	35360-90204	35360-90203	Apr-94	y	n	y
HP ALLBASE/BRW Tutorial	35360-90201	35360-90202	May-92	y	n	y
HP Browse/XL User's Guide	36384-90001	36384-90001	Oct-90	y	n	y
HP Business BASIC Programmer's Guide	32115-90003	32115-90003	Jul-87	y	n	y
HP Business BASIC Quick Reference Guide	32115-90002	32115-90002	Jul-85	n	n	n
HP Business BASIC Reference Manual	32115-90001	32115-90001	Jul-87	y	n	y
HP Business BASIC/XL Migration Guide	32715-60002	32715-90003	Oct-89	y	n	y
HP Business BASIC/XL Reference Manual	32715-60001	32715-90001	Oct-89	y	n	y
HP C Programmer's Guide	92434-90002	92434-90009	Jul-96	y	n	y
HP C/iX Library Reference Manual	30026-90001	30026-90004	Oct-92	y	n	y
HP C/iX Reference Manual	31506-90005	31506-90011	Jun-92	y	n	y
HP COBOL II/V Reference Manual	32233-90001	32233-90001	May-89	y	n	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
HP COBOL II/XL Migration Guide	31502-60011	31500-90004	Oct-88	y	n	y
HP COBOL II/XL Programmer's Guide	31500-90002	31500-90014	Jul-91	y	n	y
HP COBOL II/XL Quick Reference Guide	31500-90003	31500-90015	Jul-91	y	n	y
HP COBOL II/XL Reference Manual	31500-90001	31500-90013	Jul-91	y	n	y
HP EDIT Quick Reference Guide	30316-90005	30316-90017	Dec-90	n	n	n
HP EDIT Reference Manual	30316-90001	30316-90016	Dec-90	y	n	y
HP FORTRAN 77/iX Migration Guide	31501-90004	31501-90023	Jun-92	y	n	y
HP FORTRAN 77/iX Programmer's Guide	31501-90011	31501-90022	Jun-92	y	n	y
HP FORTRAN 77/iX Reference Manual	31501-90010	31501-90021	Jun-92	y	n	y
HP GlancePlus User's Manual (for MPE/iX Systems)	B1787-90001	B1787-90008	Apr-92	y	n	y
HP IMAGE/SQL Administration Guide	36385-90001	36385-90012	Aug-97	y	y	y
HP Link Editor/iX Reference Manual	32650-90030	32650-90309	Dec-90	y	n	y
HP Link Editor/iX Technical Addendum	32650-09476	32650-90845	Oct-95	y	n	y
HP Pascal/iX Migration Guide	31502-60011	31502-90004	Nov-87	y	n	y
HP Pascal/iX Programmer's Guide	31502-90002	31502-90023	Jun-92	y	n	y
HP Pascal/iX Reference Manual	31502-90001	31502-90022	Jun-92	y	n	y
HP Performance Collection Software User's Manual	50700-90022	50700-90038	Apr-92	n	n	n
HP RPG/iX Pocket Guide	30318-90002	30318-90002	Oct-89	n	n	n
HP RPG/iX Programmer's Guide	30318-60001	30318-90001	Jul-89	y	n	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
HP RPG/iX Reference Manual	30318-60002	30318-90011	Dec-93	y	n	y
HP RPG/iX Reference Manual Software Update Notice	30318-90016	30318-90017	Mar-95	y	n	y
HP RPG/iX Utilities Reference Manual	30318-60003	30318-90006	Oct-89	y	n	y
HP Search/XL User's Guide	36383-90001	36383-90001	Oct-90	y	n	y
HP Software Revision Controller (SRC) Implementation Guide	30234-60002	30234-90003	Nov-88	n	n	n
HP Software Revision Controller (SRC) Quick Reference Card	30234-60002	30234-90005	Nov-88	n	n	n
HP Software Revision Controller (SRC) User's Guide	30234-60002	30234-90001	Nov-88	n	n	n
HP Software Revision Controller/XL Product Information Update	30234-60002	30234-90006	Nov-88	n	n	n
HP Symbolic Debugger/iX User's Guide	31508-90003	31508-90014	Jun-92	y	n	y
HP System Dictionary/XL COBOL Definition Extractor	32257-90001	32257-90001	Dec-87	y	n	y
HP System Dictionary/XL General Reference Manual Vol 1	32256-90004	32256-90004	May-88	y	n	y
HP System Dictionary/XL General Reference Manual Vol 2	32256-90005	32256-90005	May-88	y	n	y
HP System Dictionary/XL Intrinsics Reference Manual	32256-90002	32256-90002	May-88	y	n	y
HP System Dictionary/XL SDMAIN Reference Manual	32256-90001	32256-90001	May-88	y	n	y
HP System Dictionary/XL Self-Paced Customer Training	32254-91001	32254-91001	Aug-87	n	n	n

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
HP System Dictionary/XL Utilities Reference Manual	32256-90003	32256-90003	May-88	y	n	y
HP Toolset/XL Reference Manual	36044-60001	36044-90001	Jan-84	y	n	y
HP TRANSACT Documentation Update Notice	32247-90028	32247-90028	Oct-96	y	n	y
HP TRANSACT Quick Reference Guide	32247-90020	32247-90027	Oct-96	y	n	y
HP TRANSACT Reference Manual	32247-60003	32247-90026	Apr-94	y	n	y
INFORM/V User's Guide	32246-60002	32246-60002	Mar-88	y	n	y
Introduction to MPE/XL for MPE V Programmers	30367-90005	30367-90005	Oct-89	y	n	y
Introduction to MPE/XL for MPE V System Administrators	30367-90003	30367-90017	Dec-90	y	n	y
IPC Communications Programmer's Guide	32650-90019	32650-90019	Nov-87	y	y	y
ISQL Reference Manual for ALLBASE/SQL & IMAGE/SQL	36216-90096	36216-90095	Apr-94	y	y	y
KSAM/3000 Reference Manual	30000-90079	32650-90386	Jun-92	y	y	y
Learning HP EDIT	30316-90002	30316-90015	Dec-90	y	n	y
Message Catalogs Programmer's Guide	32650-90021	32650-90021	Mar-90	y	y	y
Migration Process Guide	30367-90007	30367-90019	Jun-92	y	n	y
MPE Segmenter Reference Manual	30000-90011	30000-90011	Aug-86	y	n	y
MPE V to MPE XL: Getting Started Mentor's Guide	30367-90004	30367-90004	Oct-89	y	n	y
MPE V to MPE XL: Getting Started Self-Paced Training	30367-90002	30367-90002	Oct-89	y	n	y
MPE/iX AIF: OS Reference Manual	36374-90001	36374-90013	Dec-94	n	y	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
MPE/iX Developer's Kit Reference Manual Vol 1	36430-90001	36430-90007	Apr-94	y	y	y
MPE/iX Developer's Kit Reference Manual Vol 2	36430-90002	36430-90008	Apr-94	y	y	y
MPE/iX Intrinsics Reference Manual	32650-90028	32650-90821	Dec-94	y	y	y
MPE/iX Shell and Utilities Reference Manual Vol 1	36431-90001	36431-90007	Apr-94	n	n	.pdf
MPE/iX Shell and Utilities Reference Manual Vol 2	36431-90003	36431-90008	Apr-94	n	n	.pdf
MPE/iX Shell and Utilities User's Guide	36431-90002	36431-90006	Apr-94	n	n	.pdf
Native Language Programmer's Guide	32650-90022	32650-90207	Sep-91	n	y	y
ODBCLINK/SE Reference Manual	36217-90406	36217-90407	Jul-98	n	n	y
Process Management Programmer's Guide	32650-90023	32650-90023	Nov-87	y	y	y
QUERY/V Reference Manual	30000-90042	32650-90387	May-87	y	y	y
Resource Management Programmer's Guide	32650-90024	32650-90024	Nov-87	y	y	y
RPG/V Reference Manual	32104-90001	32104-90001	Sep-89	y	n	n
SPL to HP C/XL Migration Guide	30231-60001	30231-90001	Oct-89	y	n	y
Switch Programming Guide	32650-60030	32650-90014	Nov-87	y	n	y
System Debug Reference Manual	32650-90013	32650-90824	Apr-94	y	y	y
The POSIX.1 Standard: A Programmer's Guide ISBN-0-8053-9605-5	-	36430-90006	Apr-94	n	n	n
Trap Handling Programmer's Guide	32650-90026	32650-90026	Mar-90	y	n	y
TurboIMAGE/XL Database Management System Reference Manual	30391-90001	30391-90010	Aug-97	y	y	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
Up and Running with ALLBASE/SQL	36389-90011	36389-90016	Jun-92	y	y	y
User Logging Programmer's Guide	32650-90027	32650-90027	Jul-88	y	y	y
Using KSAM/XL	32650-90168	32650-90487	Mar-94	y	y	y
Using VPLUS/V: An Introduction to Forms Design	32209-90004	32209-90004	Aug-86	y	n	y
High Availability						
Auto/Restart/XL User's Guide	36375-90001	36375-90004	Oct-92	y	y	y
Installation/Upgrade Procedures for SHAREPLEX	B3933-90005	B3933-90005	Jun-97	n	n	.pdf
Legato NetWorker ClientPak for MPE/iX Installation Guide	B5475-90001	B5475-90001	Dec-97	n	n	.pdf
Legato Networker ClientPak for MPE/iX Release 5.0 Supplement	B5475-90005	B5475-90005	Feb-98	n	n	.pdf
Legato NetWorker ClientPak for MPE/iX Users Guide	B5475-90002	B5475-90002	Dec-97	n	n	.pdf
Legato NetWorker Storage Node for MPE/iX Installation Guide	B6266-90001	B6266-90001	Dec-98	n	n	.pdf
Legato NetWorker Storage Node for MPE/iX Users Guide	B6266-90002	B6266-90002	Dec-98	n	n	.pdf
Legato Networker Storage Node for MPE/iX Release 5.5 Supplement	B6266-90003	B6266-90003	Dec-98	n	n	.pdf
Legato Networker Storage Node for MPE/iX Release 5.5 Supplement	B6266-90004	B6266-90004	Dec-98	n	n	.pdf
Mirrored Disk/iX User's Guide	30349-90003	30349-90005	Jun-92	y	y	y
NBSpool for MPE Reference Guide	B3933-90002	B3933-90002	Jun-97	n	n	.pdf

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
NBSpool Release Notes Version 9.7	B3933-90008	B3933-90008	Jun-97	n	n	.pdf
NetBase for MPE Reference Guide	B3933-90001	B3933-90001	Jun-97	n	n	.pdf
NetBase Release Notes Version 9.7	B3933-90007	B3933-90007	Jun-97	n	n	.pdf
NetBase SQL Shadowing Handbook	B3482-90006	B3482-90006	Jun-97	n	n	.pdf
VISTA Plus for MPE Administrators Guide	B3933-90004	B3933-90004	Jun-97	n	n	.pdf
VISTA Plus for MPE User's Guide	B3933-90003	B3933-90003	Jun-97	n	n	.pdf
VISTA Release Notes Version A.07	B3933-90006	B3933-90006	Jun-97	n	n	.pdf
System Hardware and Diagnostics						
CPU Upgrade Manual (9x9KS)	-	A2375-90012	Jan-98	n	n	.pdf
Expansion Cabinet Installation Guide (99X/Family)	-	A1809-90006	May-97	n	n	.pdf
Firmware Update Guide (99X/Family)	-	A1820-90002	May-97	n	n	.pdf
Firmware Update Quick Reference (99X/T-Class)	-	A1820-90003	May-97	n	n	.pdf
HP 3000 9X9KS Site Preparation and Requirements Guide	-	A2375-90073	Nov-96	n	n	.pdf
HP 3000 and HP 9000 PA-RISC Computer System Support Log	09740-90013	09740-96033	Feb-96	n	n	.pdf
HP 3000 CS 99x/890/T500 Families Operator's Guide	A1809-90009	A1809-96019	Apr-97	n	n	n
HP 3000 Series 9X8LX/RX Computer Systems Inst. and Configuration Guide	A2051-90006	A2051-96006	Oct-93	n	n	n
HP 3000/9x9KS Installation Guide	-	-	-	n	n	.pdf

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
HP PA-RISC Computer Systems Integrated Cabinet Installation Guide (9X9KS)	-	A2375-90007	Jan-98	n	n	.pdf
HP PA-RISC Computer Systems System Upgrade Guide (9X9KS)	-	A2375-90010	Feb-97	n	n	.pdf
I/O Upgrade Manual (9X9KS)	-	A2375-90027	Jan-98	n	n	.pdf
Installation Guide (99X Family)	-	A1809-90001	Oct-97	n	n	.pdf
Internal Peripherals Update Guide (9X9KS)	-	A2375-90008	Jan-98	n	n	.pdf
Operator's Guide (99X Family)	-	A1809-90009	Jun-97	n	n	.pdf
Site Preparation and Requirements Guide (99X Family)	-	A1809-90002	May-97	n	n	.pdf
System Memory Upgrade Guide (9X9KS)	-	A2375-90009	Jan-98	n	n	.pdf
System Upgrade Installation Guide (CS 99X Family) (990/992 to 996)	-	A3310-90002	May-97	n	n	.pdf
System Upgrade Installation Guide (CS 99X Family) (991/995 to 996)	-	A3310-90001	May-97	n	n	.pdf
Networking and Communications						
APPC Subsystem on MPE/XL Node Manager's Guide	30294-61002	30294-90007	Jun-92	n	n	n
Configuring and Managing Host-Based X.25 Links	36939-61004	36939-90054	Oct-98	n	y	y
HP ARPA File Transfer Protocol User's Guide	36957-61002	36957-90158	Oct-98	n	y	y
HP SNA Products Remote System Configuration Guide	J2220-61025	30292-90008	Mar-95	y	y	y
HP SNMP/XL User's Guide	36922-61029	36922-90036	Mar-94	y	n	y
HP Telnet/iX User's Guide	36957-90154	36957-90156	Oct-98	n	y	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
HP-PB 100Base-T Network Adapter Installation and Service Guide	B5427-90001	B5427-90001	Aug-97	n	y	y
HP-PB 100VG-AnyLAN Network Adapter Installation and Service Guide	B5426-90001	B5426-90001	Aug-97	n	y	y
LU 6.2 API Application Programmer's Reference Guide	30294-61000	30294-90008	Jun-92	n	n	n
Managing Host-Based X.25 Links Quick Reference Card	36939-61003	36939-90051	Dec-94	n	y	y
NetIPC 3000/XL Programmer's Reference Manual	36920-61005	5958-8600	Oct-89	y	n	y
NS Cross-System NFT Reference Manual	36920-61003	5960-1634	Jan-89	n	n	n
NS3000/iX Error Messages Reference Manual	36923-61000	36923-90041	Oct-98	n	y	y
NS3000/iX NMMGR Screens Reference Manual	36922-61003	36922-90038	Oct-98	n	y	y
SNA IMF Programmer's Reference Manual	30293-61005	30293-90009	Jun-92	y	n	y
SNA IMF/XL Node Manager's Guide	30293-61000	30293-90010	Jun-92	n	n	n
SNA Link/iX Node Manager's Guide	30291-90009	30291-90009	Mar-94	y	y	y
SNA NRJE Node Manager's Guide	30292-61000	30292-90007	Oct-92	y	n	y
SNA NRJE User/Programmer Reference Manual	30292-61001	30292-90006	Oct-92	y	n	y
Using NS3000/iX Network Services	36920-61000	36920-90008	May-94	y	y	y
Using SNA IMF Pass Thru	30293-61008	30293-90006	Dec-90	y	n	y
Network and System Management						
Configuring and Managing MPE/iX Internet Services	32650-90835	32650-90859	Oct-98	n	y	y

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
Configuring Systems for Terminals, Printers, and Other Serial Devices	32022-61000	32022-90051	Oct-98	n	y	y
Customizing Terminal and Printer Type Files with the Workstation Configurator	5959-2870	32022-90031	Feb-94	n	y	y
HP 3000/iX Network Planning and Configuration Guide	36922-61023	36922-90037	Oct-98	n	y	y
HP OpenView System Manager Manager's Guide	36936-61002	36936-90202	Mar-95	n	n	n
HP OpenView System Manager User's Guide	36936-61001	36936-90201	Mar-95	n	n	n
HP Security Monitor/iX Manager's Guide	32650-90455	32650-90498	Apr-94	n	y	y
HP Security Monitor/iX User's Guide	32650-90454	32650-90497	Apr-94	y	y	y
Installing and Managing HP ARPA File Transfer Protocol Network Manager's Guide	36957-61001	36957-90157	Oct-98	n	y	y
Manager's Guide to MPE/iX Security	32650-90474	32650-90473	Apr-94	y	y	y
Managing Spooler Operations Quick Reference Pocket Card	32650-90268	32650-90488	Apr-94	n	n	n
MPE/iX HP 3000 Series 99X Software Startup Manual	36123-90046	36123-90046	Apr-94	n	n	n
Native Mode Spooler Reference Manual	32650-90166	32650-90867	Oct-98	n	y	y
New Features of MPE/iX: Using the Hierarchical File System	32650-90351	32650-90492	Apr-94	y	y	y
NS3000/iX Operations and Maintenance Reference Manual	36922-61005	36922-90039	Oct-98	n	y	y
Openview DTC Technical Reference Manual	5961-9820	5961-9882	Oct-94	n	n	n

Table 5-2. Manual Collections

Manual Title	Previously Used CO Number	Part Number	Latest Edition	Laser ROM 11/97 LR	Instant Info 6.0	View on the WEB*
Performing System Management Tasks	32650-90004	32650-90854	Jul-96	y	y	y
Performing System Operation Tasks	32650-90137	32650-90484	Apr-94	y	y	y
STORE and TurboSTORE/iX Products Manual	B5151-90001	B5151-90002	Jul-96	y	y	y
System Startup, Configuration, and Shutdown Reference Manual	32650-90042	32650-90855	Jul-96	y	y	y
Troubleshooting Terminal, Printer and other Serial Devices	32022-61002	32022-90030	Oct-93	y	y	y
User's Guide to MPE/iX Security	32650-90472	32650-90471	Apr-94	y	y	y
Using HP OpenView DTC Manager	D2355-90001	D2355-95018	Jan-93	n	n	n
Using the HP 3000 Workload Manager	B3879-90001	B3879-90002	Dec-94	y	y	y
Using the Node Management Services (NMS)Utilities	32022-61005	32022-90053	Oct-98	n	y	y
Volume Management Reference Manual	32650-90045	32650-90491	Apr-94	y	y	y
* The documentation website address is: *http://www.docs.hp.com*.						

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