

COMMUNICATOR 3000

MPE/iX Release 7.5 Patch Revision 2028

HP 3000 MPE/iX Computer Systems



Beechlen Development, Inc.

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Communicator Summary

This *Communicator 3000* provides general and detailed information on the new and enhanced functionality from Beechglen Development, Inc. for MPE/iX Release 7.5.

Beechglen is committed to supporting HP3000 systems as long as the installed base wants to run them. Many HP3000s continue to run mission-critical applications and plan on doing so for many years. It has long been understood that MPE would stop running after 12/31/2027 due to a design decision HP made 40 years ago in the CALENDAR intrinsic and other operating system functions. Rumors even reported that MPE system would crash after that date. This is simply not true as the date rolls over to 1900.

Beechglen has developed patches that extend the MPE operating system to January, 2038. But, what value is there in an operating system that will run in 2038 if the available storage subsystems were created prior to Y2K? Not to mention as MPE based PA-RISC servers age, the hardware failures will inevitably become more common leading to increased downtime and/or data loss.

The articles in this Communicator describe the following enhancements and available products and services that reduce the risk and enable Beechglen customers to continue to rely on HP3000s for business essential applications.

- New high performance SSD Disk arrays to replace obsolete Nike, AutoRaid, VA and XP disk arrays
- HP3000 Cloud Hosting services which increases the reliability and reduces the risk of running legacy HP3000s
- Introducing 2028 Patches - Operating System patches which extend system dates and functionality beyond 2027 to 2038

1. New high performance SSD Disk Arrays

By Doug Werth, Director of Technical Support Services, Beechglan Development, Inc.

General Information

There are a very limited number of disk array models that are compatible with HP3000s. SCSI based disk arrays including the Nike Model 20 and AutoRaid 12 are now extremely old and less reliable as each day passes. One cannot get complacent even with stockpiles of used disks as a double disk failure will result in data loss. Furthermore, the availability of controllers and batteries supplies are dwindling.

Fibre Channel disk arrays, which are only directly compatible with A-class and N-class HP3000s carry more risk than their Model 20 and AutoRaid predecessors. The VA7410 arrays are very complicated and are notorious for catastrophic data loss from even the most basic service such as replacement of a cache battery, and the compatible replacement disk drives are nearly 15 years old.

In summary, there is an ongoing and increasing risk of extended downtime and/or data corruption in continuing to utilize any of the legacy disk arrays on mission-critical HP3000 systems.

Solution

Beechglan's New high performance SSD BGDSAN and cloud backup solutions offer replacement for legacy disks and tape storage arrays with new, low-cost high-performance BGDSANs.

Features and Options

- Very compact, fits in as little as 1U rack space
- Up to 30% faster than XP12000 Arrays
- Built on new high-performance SATA Disk Drives, SAS drives, or Solid State Disks (SSDs)
- Open source software, no ongoing licensing fees
- High performance Fiber Channel Interfaces
- Built on standard x86 hardware providing low cost entry point and forward compatibility to prevent obsolescence on older hardware.
- Optional real time synchronization between two arrays for High Availability data protection
- Create clusters of disk arrays. Optionally synchronize to one or more BGDSANs at remote locations for Disaster Recovery solutions
- Flexible configurations. Can connect single array to multiple HP3000s simultaneously.

2. HP3000 Cloud Services

By Doug Werth, Director of Technical Support Services, Beechglen Development, Inc.

Introduction

What drives companies to move their computer systems and critical applications to the cloud? The motives are varied, but among many reasons moving HP3000 systems to the cloud is because the cloud increases reliability and security, offers ease of management and high availability, and reduces cost of ownership.

This is especially true for legacy systems like the HP3000. As described in Chapter 1, the risk to continue running on HP3000s increases with every day that passes. Hardware, and in particular disk and tape drives, are failing at an advanced rate. System operation and management staff can be overburdened scheduling critical repairs and hardware maintenance. Hardware failures result in extended downtimes and significant business impact while waiting for hardware support technicians to retrieve the necessary parts and arrive onsite and perform the repairs.

Solution

Host your legacy HP3000 systems with Beechglen. With over 20 years of cloud hosting experience for Production, Archive, and Disaster Recovery HP3000s Beechglen has the experience and expertise to reliably host and manage HP3000s. Reclaim your floor space, reduce costs, reduce risk, and extend the life of your HP3000.

Cloud hosting reduces risk in the following areas:

- Disk Drive and array failures. All systems are hosted on Beechglen New high performance SSD fiber channel SANs on brand new SATA or SAS HDDs, or SSDs.
- Tape/Tape Drive Failures. Eliminate operation staff for tape mounts, aging tape drives, and tape libraries. All Beechglen hosted systems are backed up using our TripleStore tape less backups. Increase security with encrypted backups that are saved in multiple locations including the cloud.
- Mitigate 2028 issues. As described in the following article, all Beechglen hosted HP3000 systems will receive patches to run beyond 12/31/2027.
- Hardware support. Repair parts inventory and engineers are onsite to service hardware failures with minimal downtime. Entire pre-built servers are kept at the ready to quickly replace servers.
- Security. Cloud hosted systems are placed on a dedicated VLAN completely isolated from other systems. Firewall rules restrict access to authorized clients and users.

3. Introducing 2028 Patches

by Mike Hornsby, CTO, Beechglen Development, Inc.

Technical Overview

Many MPE/iX operating system procedures and intrinsic functions rely on the CALENDAR Intrinsic and the internal binary format of the CALENDAR date argument return. The CALENDAR intrinsic returns a 16 bit value, allowing 9 bits for day of year and 7 bits for the year. The base year is presumed to be 1900, limiting the maximum year to 2027 since the largest number represented by 7 bits is 127.

Several different MPE/iX Intrinsic functions (such as but not limited to: FMTCALENDAR, HPFMTCALENDAR, ALMANAC, and DATELINE) extract the CALENDAR returned value and subsequently format the year based on 1900.

CALENDAR

NM and CM callable.

Returns the calendar date, including the day of year and the year since 1900.

Syntax

```
U16
  date:=CALENDAR;
```

Functional Return

date 16-bit unsigned integer (assigned functional return)

Returns the calendar date in the following format:

Bits	Value/Meaning
7:9	Day of year
0:7	Year since 1900

Binary 9 bits: 11111111 = 511 Maximum value. Enough for up to 366 days in a year
 Binary 7 bits: 1111111 = 127 Maximum value. Allows for year 1900 + 127 = 2027

Solution

Patches developed by Beechglen address this issue by altering the base year to 2028 for CALENDAR year return values < 10. This effectively extends the CALENDAR range to 12/31/2037. Beyond 1/13/2038 would require more extensive patching as the internal hardware and software time is kept as the number of seconds since 00:00:00 1/1/1970.

Application Considerations

Each system applying these patches should be evaluated for customer and third party code that calls the CALENDAR intrinsic directly. For example, MANMAN calls CALENDAR to calculate an internal date. This instance was easily patched and integrated into the MANMAN application. In other applications, the object and source code that calls CALENDAR will need simple modifications.

Native Mode Programs (NMPRG) can be examined for NM CALENDAR CALLS using the LINKEDIT LISTPROG command. Compatibility Mode programs (PROG) can be examined using the LISTPROG utility. At the time of this publication Beechglenn is in the process of evaluating third party applications on a case-by-case basis. A vendor compatibility matrix can be found in [Chapter 3](#) of this document. Thus far, Adager has been certified to function normally to 12/31/2037.

Who Should Consider Applying 2028 Patches?

- Anyone who plans to run their HP3000 system beyond 12/31/2027
- Anyone using future dates in applications. Examples include shop floor calendars and patient scheduling.
- Expiration dates for labeled tapes are kept in CALENDAR format and already are already exhibiting problems for customers with 10 year retention dates on tapes.

Note: The Year >2027 patches have been developed as enhancements under the Beechglenn Development Inc. MPE/iX Source Code Agreement with Hewlett-Packard. As provided in this agreement, these patches can only be provided as enhancements to MPE/iX systems covered under a support agreement from Beechglenn Development Inc.

Illustration of a Beechglenn patched MPE System

System START

```
ISL> start norecovery
MPE/iX launch facility
...
DATE (M/D/Y)? 12/13/2028
TIME (H:M:S)? 13:37
*****
Year > 2027 Patches Copyright
Beechglenn Development Inc. 2017
All Rights Reserved
WWW.BEECHGLEN.COM
*****
WED, DEC 13, 2028, 1:37:00 PM (y/n)? y
```

:SETCLOCK/:SHOWCLOCK

```
:setclock date=12/31/2037;time=23:30;now
Year>2027 Patches Copyright
Beechglenn Development Inc. 2017
All Rights Reserved www.Beechglenn.com
```

```
:showclock
SYSTEM TIME: THU, DEC 31, 2037, 11:30:12 PM
CURRENT TIME CORRECTION:          0 SECONDS
TIME ZONE:      5 HOURS  0 MINUTES WESTERN HEMISPHERE
```

:LISTF,3

```
:listf purgeme,3
FILE: PURGEME.Y2028.SYS
```

```
FILE CODE : 0                      FOPTIONS: BINARY, FIXED, NOCCTL, STD
BLK FACTOR: 1                      CREATOR : **
REC SIZE: 256 (BYTES)              LOCKWORD: **
BLK SIZE: 256 (BYTES)              SECURITY--READ   : ANY
EXT SIZE: 0 (SECT)                  WRITE           : ANY
NUM REC: 0                          APPEND          : ANY
NUM SEC: 0                          LOCK             : ANY
NUM EXT: 0                          EXECUTE         : ANY
MAX REC: 1023                       **SECURITY IS ON
                                      FLAGS           : NO ACCESSORS
NUM LABELS: 0                       CREATED : WED, DEC 13, 2028,  1:53 PM
MAX LABELS: 0                       MODIFIED: WED, DEC 13, 2028,  1:53 PM
DISC DEV #: 2                       ACCESSED: WED, DEC 13, 2028,  1:53 PM
SEC OFFSET: 0                       LABEL ADDR: **
VOLCLASS  : MPEXL_SYSTEM_VOLUME_SET:DISC
```

:STREAM AT/IN & :SHOWJOB

```
:STREAM JOB1;IN=2
#J4
:STREAM JOB2;DATE=12/18/28;AT=23:00
#J5
:SHOWJOB
JOBNUM  STATE  IPRI  JIN  JLIST  INTRODUCED  JOB NAME
#S1     EXEC           20  20     WED  1:37P  MANAGER.SYS
#J3     EXEC           10S LP    WED  1:37P  JINETD,MANAGER.SYS
2 JOBS:
  0 INTRO
  0 WAIT; INCL 0 DEFERRED
  2 EXEC; INCL 1 SESSIONS
  0 SUSP
JOBFENCE= 0; JLIMIT= 60; SLIMIT= 60
CURRENT: 12/13/28 13:56
JOBNUM  STATE  IPRI  JIN  JLIST  SCHEDULED-INTRO  JOB NAME
#J4     SCHED    8  10S LP    12/15/28 13:56   JOB1,MANAGER.SYS
#J5     SCHED    8  10S LP    12/18/28 23:00   JOB2,MANAGER.SYS
1 SCHEDULED JOB(S)
```


Chapter 3 - Certified Vendors / Applications

The following list of vendors certified on Beechglen patched MPE systems that their software is Y2028 compatible.

Vendor	Application, Utility, or Package	Notes
Adager	Adager	
Robelle	QEDIT, SUPRTOOL	

Last updated 2/23/2018

Chapter 4 – About Beechglen

About Beechglen:

Since 1988, Beechglen has provided mission-critical support for HP3000 systems. Beechglen markets custom SSD storage arrays for the HP3000 as well as customized HP3000 Cloud Hosting and Disaster Recovery services.

For more information, contact info@beechglen.com or visit www.beechglen.com