Paragon™ System
Diagnostic DIAG2.0.1 Release Notes

Intel® Corporation

Preface

This document describes the DIAG2.0.1 update of the Paragon™ System Diagnostic package. It contains information that is new since the DIAG2.0 release, and does not duplicate previously published information. Use the release notes for the basic release together with the release notes for subsequent updates for complete documentation of the diagnostic system.

In this manual, "operating system" refers to the operating system that runs on the nodes of the Paragon™ supercomputer, unless otherwise specified.

Organization

Chapter 1	This chapter describes the features of this release of the Paragon™ system diagnostics.
Chapter 2	Describes resolved limitations for this release.
Chapter 3	This chapter describes the compatibility, limitations and workarounds for the Paragon™ system diagnostics.
Chapter 4	This chapter describes how to install the Paragon™ system diagnostic software.
Chapter 5	This chapter describes how to update Paragon™ system firmware.
Appendix A	This appendix describes how to install the Diagnostic Station SCO ODT operating system software.
Appendix B	This appendix contains an updated online manual page for the **flashutil** utility.

Notational Conventions

This manual uses the following notational conventions:

Bold   Identifies command names and switches, system call names, reserved words, and other items that must be used exactly as shown.

Italic   Identifies variables, filenames, directories, processes, user names, and writer annotations in examples. Italic type style is also occasionally used to emphasize a word or phrase.

`Plain-Monospace`
                            Identifies computer output (prompts and messages), examples, and values of variables. Some examples contain annotations that describe specific parts of the example. These annotations (which are not part of the example code or session) appear in *italic* type style and flush with the right margin.

`Bold-Italic-Monospace`
                            Identifies user input (what you enter in response to some prompt).

`Bold-Monospace`
                            Identifies the names of keyboard keys (which are also enclosed in angle brackets). A dash indicates that the key preceding the dash is to be held down *while* the key following the dash is pressed. For example:

                            `<Break>`   **`<s>`**   **`<Ctrl-Alt-Del>`**

[   ]   (Brackets) Surround optional items.

. . .   (Ellipsis dots) Indicate that the preceding item may be repeated.

| (Bar) Separates two or more items of which you may select only one.

{   }   (Braces) Surround two or more items of which you must select one.

Applicable Documents

For more information, refer to the *Paragon*™ *System Diagnostic Reference Manual* and the *Paragon*™ *System Diagnostic Troubleshooting Guide*.

Comments and Assistance

Intel Scalable Systems Division is eager to hear of your experiences with our products. Please call us if you need assistance, have questions, or otherwise want to comment on your Paragon system.

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Product Features　　1

Features of This Release

This release of the Paragon™ system diagnostics include the following additional features and enhancements added since the DIAG2.0 version:

- The **flashutil** utility now allows you to update multiple Flash EPROMs easily by returning to the Flash Option menu after each device is programmed. A **-k** switch has been added to allow you to make the **flashutil** utility terminate after the first EPROM is programmed if you want it to. Refer to the new version of the **flashutil** manual page included in Appendix C of this release note, or the online manual page that is part of this release.

- A new **info** command has been added to display system status information. A description follows in this section.

- A new **scroll** command has been added to PSD to allow you to control how successive test names are displayed. A description follows in this section.

- A new **wipedisk** command has been added to control the operation of tests that write on the disks. A description follows in this section.

- SCSI-16 cache-coherency tests have been removed. The new SCSI-16 PSD sub-menu is shown in Figure 1-1.

- A variety of fault corrections have been added—see Chapter 2.

4. SCSI-16 Module Tests
   1. Host Bus Logic Tests/
      1. Host Bus Access Dual-Port RAM Data Line Test
      2. Control Register Test
      3. Interrupt Mask Register Test
      4. Diagnostic Control Register Test
      5. Performance Counter Test
      6. 82510 Serial Interface Initialization Test
      7. 82510 Serial Interface Internal Loopback Test
      8. 82510 Serial Interface External Loopback Test
      9. 82510 Serial Interface Interrupt Test
      10. Daughter Card Interrupt Test
      11. Byte Lane 0-7 Parity Test
      12. Parity Error Interrupt Test
      13. Host Bus Access Dual-Port RAM Cell Addressing Test
      14. Host Bus Access Dual-Port RAM Cell Integrity Test
      15. Host Bus Access Dual-Port RAM Byte Access Test
      16. Host Bus Access Dual-Port RAM Uniqueness Test
   2. Local Bus Logic Tests/
      1. Local RAM Data Line Test
      2. Local RAM Addressing Test
      3. Local RAM Cell Integrity Test
      4. Local RAM Byte Access Test
      5. Local RAM Uniqueness Test
      6. Flash EPROM Checksum Test
      7. Local Bus Access Dual-Port RAM Data Line Test
      8. Local Bus Access Dual-Port RAM Addressing Test
      9. Local Bus Access Dual-Port RAM Cell Integrity Test
      10. Local Bus Access Dual-Port RAM Byte Access Test
      11. Local Bus Access Dual-Port RAM Uniqueness Test
   3. Ethernet Tests/
      1. 82596 LAN Co-processor Self Test
      2. 82596 LAN Co-processor Reset Test
      3. Ethernet Command Unit Test
      4. Ethernet Receive Unit Test
      5. 82596 LAN Co-processor Diagnose Test
      6. 82596 LAN Co-processor Loopback Test
      7. 82503 Transceiver Loopback Test
      8. Ethernet Memory Addressing Test
      9. Ethernet Interrupt Test
      10. Ethernet CRC Test
      11. Ethernet External Loopback Test
      12. X24C02 Serial ROM Read Test
   4. Host-Local Bus Access Dual-Port RAM Tests/
      1. Dual Access Dual-Port RAM Data Line Test
      2. Dual Access Dual-Port RAM Cell Addressing Test
      3. Dual Access Dual-Port RAM Cell Integrity Test
      4. Dual Access Dual-Port RAM Byte Access Test
      5. Dual Access Dual-Port RAM Uniqueness Test

5. SCSI Processor 1 Tests/
   1. Processor 1 Alive Test
   2. Processor 1 Data Path Test
   3. Processor 1 Register-Register Test
   4. Processor 1 Interrrupt Test
   5. Processor 1 Register-Local RAM Test
   6. Processor 1 Local RAM-Register Test
   7. Processor 1 Local RAM-Local RAM Test
   8. Processor 1 Local RAM-Dual Port RAM Test
   9. Processor 1 Dual Port RAM-Local RAM Test
   10. Processor 1 Local RAM-Node RAM Test
   11. Processor 1 Node RAM-Local RAM Test
   12. Processor 1 Select Test
   13. Processor 1 Select w/ATN Test
   14. Processor 1 Command Descriptor Block Test
   15. Processor 1 Read Data Test
   16. Processor 1 Write Data Test
6. SCSI Processor 2 Tests/
   1. Processor 2 Alive Test
   2. Processor 2 Data Path Test
   3. Processor 2 Register-Register Test
   4. Processor 2 Interrrupt Test
   5. Processor 2 Register-Local RAM Test
   6. Processor 2 Local RAM-Register Test
   7. Processor 2 Local RAM-Local RAM Test
   8. Processor 2 Local RAM-Dual Port RAM Test
   9. Processor 2 Dual Port RAM-Local RAM Test
   10. Processor 2 Local RAM-Node RAM Test
   11. Processor 2 Node RAM-Local RAM Test
   12. Processor 2 Select Test
   13. Processor 2 Select w/ATN Test
   14. Processor 2 Command Descriptor Block Test
   15. Processor 2 Read Data Test
   16. Processor 2 Write Data Test
7. DMA Bypass Tests/
   1. Proc 1 Write(Local RAM->Node RAM) Test
   2. Proc 1 Read(Node RAM->Local RAM) Test
   3. Proc 2 Write(Local RAM->Node RAM) Test
   4. Proc 2 Read(Node RAM->Local RAM) Test
   5. Proc 1 & 2 Write(Local RAM->Node RAM) Test
   6. Proc 1 & 2 Read(Node RAM->Local RAM) Test
   7. Proc 1 & 2 Write/Read(Local RAM->Node RAM) Test
   8. Proc 1 & 2 Read/Write(Local RAM->Node RAM) Test
   9. Proc 1 & 2 Write(Local RAM->Node RAM) Backoff Test
8. DMA Controller Tests/
   1. Proc 1 DMA Write Block Test
   2. Proc 1 DMA Channel 0 Interrupt Test
   3. Proc 1 DMA Read Block Test
   4. Proc 2 DMA Write Block Test
   5. Proc 2 DMA Channel 1 Interrupt Test
   6. Proc 2 DMA Read Block Test
   7. Proc 1 & 2 DMA Write(Local RAM->Node RAM) Test
   8. Proc 1 & 2 DMA Read(Node RAM->Local RAM) Test
   9. Proc 1 & 2 DMA Write/Read(Local RAM->Node RAM) Test
   10. Proc 1 & 2 DMA Read/Write(Local RAM->Node RAM) Test
   11. Proc 1 & 2 DMA Write(Local RAM->Node RAM) Backoff Test
   12. Proc 1 DMA Write Large Block Test
   13. Proc 1 DMA Read Large Block Test
   14. Proc 1 DMA Write Misaligned Block Test
   15. Proc 1 DMA Read Misaligned Block Test
   16. Ethernet DMA(Local RAM->Node RAM) Test

Figure 1-1. The SCSI-16 Tests Menu

New Commands

info

info

The **info** command displays a summary of system status information, as shown in the following example:

```
> info
+++++++++++++++++++
INFORMATION SCREEN
+++++++++++++++++++
Paragon Boot Node IP address (OUR_IP_ADDR) is: 137.46.105.29
Diagnostic Station IP address (DS_IP_ADDR) is: 137.46.105.28

       MSG_LEN            = 1792 bytes
       Scan timeout       = 5 second(s)
       LTU mode           = enabled
       Wipe Paragon disk  = disabled
       Screen scroll      = enabled
       Voltage margin     = Normal
       Test control flow  = Halt on error

First node = 8    Last node = 127
Nodes marked FILL: 44
Nodes marked EMPTY: None

Press any key to continue
```

scroll

scroll [on/off]

The **scroll** command allows you to control the way that multiple lines are displayed. In the **scroll off** mode, the titles of tests are overwritten over previous names. The **scroll on** command causes multiple test names to be scrolled down the display. The default is **off**.

wipedisk

wipedisk [on/off]

The **wipedisk** command controls the way that the Disk Write/Read, Total Disk Write, and Total Disk Write/Read tests work. If the **wipedisk** command is set to **on**, the tests write on the disks without prompting for confirmation. If the **wipedisk** command is **off**, the tests prompt for confirmation before writing on the disk.

CAUTION

Setting the **wipedisk** command **on** allows enabled disk-write tests to overwrite all data on the disks. Any data on the disks will be lost and cannot be recovered.

Resolved Limitations   2

The following problem reports are fixed in this release. The number in brackets following each description is the problem report number.

- A scan test is now done before either the **hwcfg** or the **initutil** utilities run, which prompts you to check the cabinets for power if the Paragon™ System is powered down. (7554 and 7555)

- The **cfgpar** utility now creates a new *SYSCONFIG.BIN* file in a temporary location to avoid corrupting the file during interrupts. The completed file is copied to the active location while interrupts are briefly blocked. (10146)

- The new **info** command displays a summary of the active settings of the utilities (such as message length, "himargin/lomargin", etc.). (11469)

- The */usr/adm/syslog* file is no longer cleared when the *diag.tar* file is installed on a diagnostic station. (12783)

- The Total Disk Write test now requires user confirmation—see the description of the **wipedisk** command in Chapter 1. (13283)

- PSD now recovers communication with a RAID that has been corrupted with an interrupted disk-scrub operation. (13366)

- PSD operations work correctly when applied to a SCSI16 node used as a boot node. (13457)

Limitations, Workarounds, and Compatibility   3

This chapter contains known limitations and workarounds in this release of the Paragon™ system diagnostics (PSD). It also contains information about which hardware and software components are compatible. Please read this chapter before you use the diagnostic software.

NOTE

The Paragon system diagnostics should not be running when the Paragon system operating system is to be booted.

Hard Reset Error Recovery

If you use the reset button on a diagnostic station to do a hard reset, or cycle the power on the diagnostic station of any system, you will make an "ungraceful" exit from Paragon System Diagnostics.

When **psd** begins its initialization, it saves a copy of the *SYSCONFIG.BIN* file into *SYSBIN.ORIG*. If the diagnostic station reports:

```
Cannot save the binary configuration file: /u/paragon/diag/SYSBIN.ORIG already
exists
```

Remove this file to run **psd** without error.

FRU Hardware Compatibility

The following tables show the combinations of hardware and firmware that are supported by DIAG1.2.x and DIAG2.0.x (including all diagnostic updates).

NOTE

Blank fields—except for comments—indicate that compatibility for a combination is unknown or unverified.

GP Node Compatibility

Table 3-1 shows which GP Node hardware components and firmware versions are compatible with Paragon System Diagnostics.

Table 3-1. GP Node Compatibility With DIAG1.2+ and DIAG2.0+

Component	Revision	Comments	Compatible OS Revisions
Node Board	Fab7-011 and up		
Flash EPROM	V3.1	Base version. 32-MB support. Expansion-board NCT failure now a fatal error.	1.2.x, 1.3.x
	V3.2	Fixed reset-hang problem.	1.2.x, 1.3.x
	V3.3	Contains the correct address to check for the existence of an MDC.	1.2.x, 1.3.x
NIC ASIC	A step		
	B step		

MP Node Compatibility

Table 3-2 shows which MP Node hardware components and firmware versions are compatible with Paragon System Diagnostics.

Table 3-2. MP Node Compatibility With DIAG1.2+ and DIAG2.0+

Component	Revision	Comments	Compatible OS Revisions
Node Board	Fab 2.1		
NCT Flash EPROM	V2.0	Base version. CS8-mode test menu, ability to run extended NCTs via scan.	1.3.x
	V2.1	Local bus test, bug fixes in monitor, CS8-mode looping.	1.3.x
	V2.2	Added check of the daughtercard NCT return status. Changed addresses for SCSI-16 Flash EPROM locations.	1.3.x
MP Flex Flash EPROM	V1.1	Initial release.	1.3.x
	V1.2	Base version. Fixes NIC status register reads. Adds HIPPI daughtercard.	1.3.x
	V1.3	Fixes NIC underrun problem. Improves HIPPI bandwidth. Improves BRDY timing, LTU arbitration, and expansion arbitration.	1.3.x
	V1.4	Changed CORR timing to match MDC.	1.3.x
NIC ASIC	B step		

Memory Daughtercard Compatibility

Table 3-3 shows which MDC hardware components and firmware versions are compatible with Paragon System Diagnostics and with which node boards.

Table 3-3. MDC Board Compatibility With DIAG1.2+ and DIAG2.0+

Component	Revision	Comments	Compatible OS Revisions
Node Board	As per GP	GP Nodes must have V3.3 firmware to support an MDC.	
MDC Board	Fab 3	16- and 32-Mbyte versions are available as Fab 3.	
Flash EPROM	V1.2	Base version.	1.2.4-1.2.7, 1.3.x
	V1.4	Bug fixes.	1.2.4-1.2.7, 1.3.x
	V1.5	Fixes hard ECC errors.	1.2.4-1.2.7, 1.3.x

MIO Daughtercard Compatibility

Table 3-4 shows which MIO hardware components and firmware versions are compatible with Paragon System Diagnostics and with which node boards.

Table 3-4. MIO Board Compatibility With DIAG1.2+ and DIAG2.0+

Component	Revision	Comments	Compatible OS Revisions
Node Board(s)	As per GP and MP	MP requires "fast" NIC-B.	
Daughtercard	Fab2		
	Fab3		
Flash EPROM	tftp - 1.13 MIO - 1.0	Base version.	1.2.x, 1.3.x
	tftp - 1.13 MIO - 1.1	Adds Ethernet tests and fixes SCSI and asynchronous bugs.	1.2.x, 1.3.x
	tftp - 1.13 MIO - 1.2	Adds Ethernet tests and fixes SCSI and asynchronous bugs.	1.2.x, 1.3.x
	tftp - 1.13 MIO - 1.3	Fixes Ethernet tests.	1.2.x, 1.3.x

HIPPI Daughtercard Compatibility

Table 3-5 shows which HIPPI hardware components and firmware versions are compatible with Paragon System Diagnostics, and with which node boards.

Table 3-5. HIPPI Board Compatibility With DIAG1.2+ and DIAG2.0+

Component	Revision	Comments	Compatible OS Revisions
Node Board(s)	GP Node - Fab8		
	MP Node - Fab 2.1	Requires V1.5 or later Flash. MP requires "fast" NIC-B.	
Daughtercard	Fab3		
Flash EPROM	V1.2	Base version.	1.2.x
	V1.5	IPI-3 support.	1.3.x
	V1.6	OS bug fixes.	1.3.x

SCSI-16 (SIO) Daughtercard Compatibility

Table 3-6 shows which SCSI-16 hardware components and firmware versions are compatible with Paragon System Diagnostics, and with which node boards.

Table 3-6. SCSI-16 Board Compatibility With DIAG1.2+ and DIAG2.0+

Component	Revision	Comments	Compatible OS Revisions
Node Board(s)	MP Node - Fab 2.1	SCSI-16 is only supported on MP Node boards.	
Daughtercard	Fab 3		
NCT Flash EPROM	V1.0.	Base version.	1.3.x
	V1.2	No cache coherency test.	1.3.x
Flex Flash EPROM	V1.0	Base version.	1.3.x
	V1.1	Various hardware fixes.	1.3.x
	V1.3	No cache coherency test.	1.3.x

RAID Controller Compatibility

Table 3-7 shows which RAID hardware components and firmware versions are compatible with Paragon System Diagnostics.

Table 3-7. RAID Controller Compatibility With DIAG1.2+ and DIAG2.0+

Component	Revision	Comments	Compatible OS Revisions
Controller Board	92/01	Provides RAID OS 3.06.	1.2.x, 1.3.x

Disk Drive Compatibility

Table 3-8 shows which disk drive hardware components and firmware versions are compatible with Paragon System Diagnostics.

Table 3-8. Disk Drive Compatibility With DIAG1.2+ and DIAG2.0+

Manufacturer	Model	Comments	Compatible OS Revisions
Maxtor	MXT-1240	Intel P/N 317961-001	1.2.x, 1.3.x
Seagate	ST31200N	Intel P/N 340573-001	1.2.x, 1.3.x
	ST15230	Intel P/N 341404-001	1.2.x, 1.3.x

Tape Drive Compatibility

Table 3-9 shows which tape drive hardware components and firmware versions are compatible with Paragon System Diagnostics.

Table 3-9. Tape Drive Compatibility With DIAG1.2+ and DIAG2.0+

Manufacturer	Model	Comments	Compatible OS Revisions
HP	35470A	Intel P/N 316897-001	1.3.x
HP	C1533A	Intel P/N 340744-001	1.2.x, 1.3.x
Exabyte	8505	Intel P/N 341640-001	1.3.x

Diagnostic Component Sources

Table 3-10 shows which Diagnostic release contains specific firmware and software revisions. The firmware checksum is shown with the first appearance of a new revision. Later instances of the same revision have the same checksum.

CAUTION

Unreleased packages may be changed or removed without warning.

Table 3-10. Diagnostic Component Sources

Diagnostic Release		Included Firmware								
Version	Date	Scan Driver	GP Node	MP Node	MP Flex	MDC	HIPPI	MIO	SIO	SIO Flex
1.2	Mar 94	0.8	3.3 0x5ffd	-	-	1.2 0xebf7	1.2 0x92e3	1.3 0x0996	-	
1.2.1	Jun 94	0.8	3.3	X0.1 0xf05d	X0.1 0x5da7	1.2	1.2	1.3	-	
1.2.2	Sep 94	1.0	3.3	2.0 0xc086	1.2 0x2c2a	1.4 0xf59e	1.2	1.3	-	
1.2.2.1	Dec 94	1.0	3.3	2.0	1.2	1.4	1.2	1.3	-	
1.2.2.2	Mar 95	1.0	3.3	2.0	1.4 0x3086	1.5 0xf61e	1.2	1.3	-	
2.0	Apr 95	1.0	3.3	2.2 0x77ad	1.4	1.5	1.5 0xd92f	1.3	1.0 0xc1ba	1.0 0x662f
2.0.0.1	Jun 95	1.0	3.3	2.2	1.4	1.5	1.5	1.3	1.0	1.1 0x6ad5
2.0.1	Aug 95	1.0	3.3	2.2	1.4	1.5	1.6 0xbec7	1.3	1.2 0x85bb	1.3 0x7298

Operating System and Diagnostics Compatibility

Table 3-11 shows which operating system and diagnostic revisions are compatible with each other.

Table 3-11. Paragon™ System OS and Diagnostic Compatibility

Operating System		Diagnostics		
Rev	OS Compatible Scan Driver	Rev	PSD Compatible Scan Driver	OS Features
1.2 1.2.1 1.2.2 1.2.3	0.8 1.0	1.2.x 2.0.x	0.8[1] 1.0	Base OS Release
1.2.4 to 1.2.7	0.8 1.0	1.2.2.2 2.0.x	0.8[1] 1.0	MDC Support
1.3.x	1.0	2.0.x	0.8[1] 1.0	

1. The 0.8 scan driver does not support the **scantest** utility.

FRU Hardware Compatibility

The following tables show the combinations of hardware and firmware that are supported by DIAG1.2.x and DIAG2.0.x (including all diagnostic updates).

NOTE

Blank fields—except for comments—indicate that compatibility for a combination is unknown or unverified.

FRU Identification

GP Node Identification

The codes in Table 3-12 identify the FRU (Field Replaceable Unit) numbers for the different GP Node boards that might be in a system.

Table 3-12. GP Node FRU Identification

FRU Number	Description
AIxx	All Pre-1.2-compatible GP Nodes (except 32 MB Fab 8 boards)—MCP *OFF*
AJxx	Pre-1.2-compatible 32 MB Fab 8 GP Nodes—MCP *OFF*
AKxx	1.2-compatible Fab 7 GP Nodes—MCP *ON*
ALxx	Not used
AMxx	1.2-compatible Fab 8 (16 MB) GP Nodes—MCP *ON*
ANxx	1.2-compatible Fab 8 (32 MB) GP Nodes—MCP *ON*

The codes are shown in the *SYSCONFIG.TXT* file, as in the following example line. The "AK" entry in this example identifies a 1.2-compatible Fab 7 unit with the Message Coprocessor (MCP) turned on:

```
S 0 GPNODE AK00 16 MIO B02
```

Refer to Appendix D of the *Paragon*™ *System Diagnostic Reference Manual* for more information.

MP Node Identification

The codes in Table 3-13 identify the FRU (Field Replaceable Unit) numbers for the different MP Node boards that might be in a system.

Table 3-13. MP Node FRU Identification

FRU Number	Description
AHxx	Fab 2.1 (128 Mbyte)
AGxx	Fab 2.1 (64 Mbyte)
AFxx	Fab 2.1 (32 Mbyte)
AExx	Fab 2.1 (16 Mbyte)

The codes are shown in the *SYSCONFIG.TXT* file. Refer to Appendix D of the *Paragon™ System Diagnostic Reference Manual* for more information.

Memory Daughtercard (MDC) Identification

The FRU (Field Replaceable Unit) numbers for the memory daughtercards are not shown in the configuration files.

MIO Daughtercard Identification

The FRU identification for MIO boards in *SYSCONFIG.TXT* is a placeholder and does not contain type or revision information.

HIPPI Daughtercard Identification

The FRU identification for HIPPI boards in *SYSCONFIG.TXT* is a placeholder and does not contain type or revision information.

SCSI-16 Daughtercard Identification

The FRU identification for SCSI-16 boards in *SYSCONFIG.TXT* is a placeholder and does not contain type or revision information.

Power Controller Identification

The following versions of Power Controllers are used—all of which are compatible with the current release of Diagnostics:

```
PC AU00
PC AU01
PC AU02
```

LED Controller Identification

The only version of the LED Controller is identified as follows:

```
LED AM00
```

Backplane Identification

A variety of backplane versions are used—all of which are compatible. The following is an example:

```
BP A AC00
```

Installation Instructions 4

This chapter describes the steps necessary to install the Paragon™ System Diagnostic Software.

NOTE

To install the Paragon System Diagnostic Software, you must have completed the installation of the SCO OPEN DESKTOP Release 3.0.0. (This is the same release used with the previous version of Diagnostic Software.) If the operating system is not in place, follow the procedure shown in Appendix A to install it before installing the diagnostic software.

To check the version of the operating system on the diagnostic station, type the following command at the OS prompt:

   uname -X

If it does not report "Release = 3.2v4.2", you must install a new operating system.

The procedures in this chapter use the conventions described in the Preface. You should also be aware of the following conventions:

- The instruction "Enter *character(s)*" means type the indicated character(s), and then press the **<Enter>** key. For example, "Enter **y**" means type the letter "y", and then press the **<Enter>** key.

- In prompts, square brackets surround a default value. Pressing **<Enter>** selects the indicated default value.

- Some steps in these procedures cause a great deal of information to be displayed. However, the step as described here may show only the last message displayed. Also, do not be concerned if the indicated message does not appear immediately. Some steps take several minutes to complete.

Installing the Paragon™ System Diagnostic Software

Installation Time:	Approximately 10 minutes.
Installation Media:	One cartridge tape labeled "Paragon™ System Diagnostic Software DIAG2.0.1" (633972-003).
Information you need:	*root* password. IP address of the Paragon System boot node. IP address of the diagnostic station. The total number of cabinets in the Paragon system.

Requirements for Installation

You will need certain data on hand for use during the installation. Use this form to gather and record the required data.

Data Needed	Enter data in this column
Total number of Paragon system cabinets.	
The *root* password for the diagnostic station.	*Protect system passwords in a secure place.*
The IP Address of the Paragon system Boot Node.	
The IP Address of the diagnostic station.	

CAUTION

If you installing over an existing installation of the diagnostic software, save any files in the directory */u/paragon/diag* that you don't want to be overwritten (such as *.psd.mac*).

Installing the Diagnostic Software

1. Shut down the operating system on the Paragon system with the following steps:

   A. On the Paragon System, change to the root directory:

      cd /

   B. Sync the memory:

      sync;sync

   C. Close down the operating system:

      shutdown now

   D. Unmount all file systems:

      umount -A

   E. Stop the processor:

      halt

   F. Return to the diagnostic station prompt:

      ~~.

2. Verify that the correct version of the SCO Open Desktop® operating system is installed on the diagnostic station:

   A. Login as *root* on the diagnostic station.

   B. Issue the following command to find out what version of the operating system is installed:

      DS#*uname -X*

      Eleven lines of information will be printed on the display. The *Release...* line should read:

      Release = 3.2v4.2

      If it does not, you must install a new version of the operating system onto the diagnostic station, using the procedure in Appendix A, before continuing with this procedure.

3. Change to the root directory:

   DS#*cd /*

4. Change the **umask** for directory creation:

    DS#*umask 022*

5. If a diagnostic daemon is running, stop it with the following command:

    DS#*dsdc stop*

NOTE

Ignore any of the following messages: dsdc: Command not
found or DSD shutdown: DSD is not running or DSD
shutdown: [DSD shutdown complete] and continue with the
installation.

The daemon will either be restarted automatically when the
diagnostic station is rebooted, or restarted manually at the end of
this procedure.

6. Insert the Paragon™ System Diagnostic Software tape in the tape drive.

7. Extract the files from the tape:

    (This step takes a few minutes.)

    DS#*tar xvpf /dev/rct0*

8. If this is the first installation of this release, go to step 9. If you are unsure, check to see whether
    the Diaboard driver is current with the following command:

    DS#*strings /unix | grep Dia*

    If the version is 1.0, go to Step 16. Otherwise, continue to Step 9.

9. The scan utilities directory has now been created. Change to that directory:

    DS#*cd /etc/conf/pack.d/scan*

10. Install the Driver:

    DS#*./buildscan*

If the OS has previously been installed, you may be prompted about whether you want to rebuild the kernel. Answer **yes** (**y**).

The system now builds */unix.*

(This step takes a few minutes.)

NOTE

The following messages are normal; ignore them:

```
device driver for scan does not exist configuring
scan driver into kernel

/dev/scan does not exist, building into kernel
```

11. When asked if you want this kernel to boot by default, enter **y** (for yes).

12. When asked if you want the kernel environment to be rebuilt, enter **y** (for yes).

13. Shutdown the diagnostics station:

    DS#**shutdown -y -g0**

14. When prompted to reboot, press **<Enter>**.

15. Login as *root* on the diagnostics station.

16. Do one of the following:

    • Check that *DIAG_ALIAS* and *PARA_ALIAS* are defined in the */etc/hosts* file. The alias variables should be included on the lines that contain the Paragon System and Diagnostic Station IP numbers. (This is the recommended way to define system IP addresses.)

    ```
    xxx.xx.xx.xx DS_name DIAG_ALIAS DS_name.def.com
    xxx.xx.xx.xx Paragon_name PARA_ALIAS
    ```

    • Modify the */u/paragon/diag/psdenv* file to include the IP definition lines as follows: (This is the old way of defining system IP addresses for PSD.)

    ```
    OUR_IP_ADDR=Paragon Boot Node IP Address
    DS_IP_ADDR=Diagnostic Station IP Address
    ```

17. Change directory to */usr/paragon/boot*:

    DS#*cd /usr/paragon/boot*

    Find out if *DEVCONF.TXT* and *MAGIC.MASTER* files exist. If they are not found in
    /usr/paragon/boot, then do the next step. If the files are present, skip the next step.

18. Do one of the following:

    • Restore the *DEVCONF.TXT* and *MAGIC.MASTER* files now if you saved them prior to
      installation of SCO ODT 3.0.0.

    • Create *DEVCONF.TXT* and *MAGIC.MASTER* files. You can alter the samples found in
      /u/paragon/diag/sample. Refer to the *Paragon System Diagnostics Reference Manual* for
      a detailed description of these files.

19. Change directory to */u/paragon/diag*:

    DS#*cd /u/paragon/diag*

20. Use the **config** utility to generate the diagnostic configuration files:

    DS# *./config*

21. Use **flashutil** to update the Paragon System Flash EPROM contents in your system. See Chapter
    5 of these release notes on how to update the Flash EPROMs.

22. If you did not do Steps 11 through 15 to build a new scan driver and did not reboot the diagnostic
    station, restart the diagnostic daemon manually:

    DS#*dsdc start*

NOTE

The message DSD started is normal.

23. To enter the diagnostic menu, enter:

    DS#*psd*

Updating Paragon™ System Firmware | 5

The chapter describes how to use **flashutil** to update the firmware in a Paragon™ system.

CAUTION

This procedure updates all nodes at the same time. There is a very small risk in this method: if a power glitch occurs during the approximately 25 seconds required for updating, it is possible that the contents of every EPROM could be corrupted.

The alternative is to update one node at a time, or a small range of nodes. A power glitch would then disturb the EPROM contents in only a single node or a small set of nodes. However, a 512-node machine, for example, would require several hours to update that way.

If a power glitch occurs while updating the specified node, you may not be able to recover this node. Recovering from a power glitch may require an external EPROM programmer to reprogram a flash EPROM.

NOTE

You must install the Paragon™ system diagnostic software before you update any firmware.

If your Paragon system has GP node firmware below version V3.1, you need to update those nodes to V3.1 prior to updating to V3.3.

If you receive Response timeout: node... errors, when using **flashutil**, check that the small power connecters (1" x 1", with three wires) in the lower-right corner of the backplanes are seated properly.

1. There are three methods for updating the Paragon system firmware. Choose one of the following methods:

   • Update one node at a time:

     DS#*flashutil -s node*

     This is the safest method for protecting against power glitches.

   • Update a range of nodes:

     DS#*flashutil -s first_node..last_node*

     You may use the node-range option to do a section of your system at a time. This method localizes the risk to a group of nodes. Updating a cabinet of nodes is possible with this method.

   • Update your entire system:

     DS#*flashutil*

     This choice carries the greatest risk, but provides the quickest update. All nodes are updated in parallel.

2. Choose the target Flash from the menu that **flashutil** displays:

```
Please select the Flash memory for the update

         1 ---> Program the GP         Flash memory
         2 ---> Program the MIO        Flash memory
         3 ---> Program the HIPPI      Flash memory
         4 ---> Program the MDC        Flash memory
         7 ---> Program the SIO        Flash memory
         8 ---> Program the MP         Flash memory
         9 ---> Program the MP Flex    Flash memory
        10 ---> Program the SIO Flex   Flash memory
        28 ---> ROM version report
        29 ---> Display fw_all.bin version info
        30 ---> Exit flashutil no Flash programming
```

To update GP nodes (for example), enter *1*

NOTE

The HIPPI selection works on 256 Kbyte firmware. It will not program older 128 Kbyte HIPPI devices (Fab 2).

3. The **flashutil** program returns a message asking if you want to reset the Paragon system.

```
This program will reset the Paragon system. Do you wish to
continue? (y/n)
```

To cancel at this point, enter either a carriage return or *n* (for no).

To update, enter *y* (for yes).

4. The program initializes the system, loads the nodes with the code to reprogram the EPROMs, along with the *fw_all.bin* file, which contains the new firmware for all flash EPROMs, then displays a warning message. You now have one last chance to abandon the update:

```
Warning! current flash EPROM contents will be erased and
replaced.
Proceed? (yes/no)
```

Enter "no" to abandon the update, or enter "yes" to update.

Any response other than *yes* (fully spelled out) cancels the update.

flashutil then sends a command to each node in sequence, causing the node to program the flash EPROM image that now resides in RAM into the selected flash EPROM. **flashutil** displays a "+" for each node on which the target EPROM is programmed, and a "-" for each node on which the target EPROM is not found. For example, if there are five nodes in a system, with the third one including an MIO daughtercard, **flashutil** displays the following series as it goes through the nodes to reprogram MIO flash EPROMs:

```
--+--
```

If no error message follows the "+" sign, the node programmed correctly. A "-" sign indicates that the selected target was not found on that node—it does not indicate an error or an empty slot.

NOTE

A system that contains GP nodes with a mix of old (pre-V3.1) and new firmware (for example when a board is placed in a system that has previously been updated) will need to be operated the same as if all nodes in the system contain the old firmware.

5. If you do enter *yes*, the update proceeds. Each node returns a status message to **flashutil** (via the scan bus) when it completes the update.

6. Confirm that all target EPROMs now contain the correct updated firmware. Use the **flashutil** utility with the **-r** and **-t** switches to display the version number that it finds on the node boards:

```
DS#flashutil -r -t gp
```

flashutil will display a report showing the version numbers of the node flash EPROMs in your system:

```
GP.FLASH -                 (expected count=4, actual count=4)
  Version V3.3 found on the following nodes:
   00A00 00A01 00A02 00A03
```

Installing the SCO Operating System   A
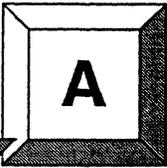
This appendix describes the steps necessary to install SCO Open Desktop Release 3.0.0.

The procedures in this appendix use the conventions described in the Preface. You should also be aware of the following conventions:

- The instruction "Enter *character(s)*" means type the indicated character(s), and then press the **<Enter>** key. For example, "Enter *y*" means type the letter "*y*", and then press the **<Enter>** key.

- In prompts, square brackets surround a default value. Pressing **<Enter>** selects the indicated default value.

- Some steps in these procedures cause a great deal of information to be displayed. However, the step as described here may show only the last message displayed. Also, do not be concerned if the indicated message does not appear immediately. Some steps take several minutes to complete.

Installing SCO OPEN DESKTOP Release 3.0.0

Installation Time: Approximately 45 minutes.

Installation Media: One cartridge tape labeled "SCO OPEN
                                                        DESKTOP R3.0.0 for the Paragon™ Diagnostic
                                                        Workstation SCO Mass Install Tape Vol 1 of 1"
                                                        (312978-001).

                                                        One disk labeled "SCO OPEN DESKTOP R3.0.0
                                                        for the Paragon™ Diagnostic Workstation N1
                                                        Boot Disk" (312974-001).

                                                        One disk labeled "SCO OPEN DESKTOP R3.0.0
                                                        for the Paragon™ Diagnostic Workstation N2
                                                        File System Disk" (312975-001).

                                                        One disk labeled "SCO OPEN DESKTOP R3.0.0
                                                        for the Paragon™ Diagnostic Workstation N2
                                                        File System Disk for the ST31200N Disk Drive"
                                                        (637588-001).

                                                        One disk labeled "SCO OPEN DESKTOP R3.0.0
                                                        for the Paragon™ Diagnostic Workstation M01
                                                        Master Install Disk" (312976-001).

Requirements for Installation

You will need certain data on hand for use during the installation. Use this form to gather and record the required data.

Data Needed	Enter data in this column
The SCO Serial Number (located in the SCO OPEN DESKTOP box).	
The SCO Activation Key (located in the SCO OPEN DESKTOP box).	
The system name of the diagnostic station.	
The root password of the diagnostic station.	*Protect system passwords in a secure place.*
The IP address of the diagnostic station.	
The domain name of the diagnostic station (use the **hostname** command to find it).	
The Netmask of the diagnostic station.	
The Broadcast IP address of the diagnostic station.	
The IP address of the Paragon System Boot Node.	
The total number of Paragon system cabinets.	

It is essential to make backup copies of:

- Diagnostic station-specific files */etc/hosts* and */etc/resolv.conf* (if they exist).

- Paragon System diagnostic configuration files */usr/paragon/boot/DEVCONF.TXT*, */usr/paragon/boot/MAGIC.MASTER*, and */usr/paragon/BOOTMAGIC.md* files (if they exist).

- Paragon OSF/1 files which reside on the diagnostic station in the directory trees */usr/local/bin* and */usr/paragon/boo*.

If you haven't done so already, shut down the operating system on the Paragon System with the following steps:

1. On the Paragon System, change to the root directory:

    cd /

2. Sync the memory:

    sync;sync

3. Close down the operating system:

    shutdown now

4. Unmount all file systems:

    umount -A

5. Stop the processor:

    halt

6. Return to the diagnostic station prompt:

    ~~.

Reinstalling SCO OPEN DESKTOP

If you are reinstalling SCO OPEN DESKTOP over an existing system, use a utility, such as **fdisk**, to delete the active UNIX partition on the diagnostic station.

1. To find the active partition (see the manual page for fdisk to interpret the returned information), enter:

    fdisk -p

2. Delete the active partition. For example, if partition 1 is active, enter:

    fdisk -d 1

Install SCO OPEN DESKTOP Procedure

WARNING

These procedures overwrite the Paragon System diagnostic station disk drive. Make a backup of any user file(s) you want to retain.

1. Insert the SCO N1 Boot disk into the disk drive.

2. Boot the diagnostic station by turning the power on.

3. At the boot prompt, press **<Enter>.**

4. When prompted, insert the proper file system disk:

    A. If your Paragon system uses ST31200N disk drives (1G-byte), insert the SCO N2 File System disk for the ST31200N disk drive and press **<Enter>**.

    B. Otherwise, insert the SCO N2 File System disk and press **<Enter>**.

NOTE

Ignore the normal message `warning: /dev/ropipe was not in mount table.`

5. When prompted to select the type of tape drive, enter the following:

    scsi

NOTE

The prompt in the next step refers to the MIT System Image Vol. I tape. Our corresponding product is called the *"SCO Mass Installation Toolkit Tape Vol. I"* and is used in place of the MIT tape.

6. When prompted:

   A. Verify that the SCO M01 Master Install diskette is in the floppy drive.

   B. Verify that the SCO Mass Installation Toolkit Tape Vol. 1 is in the tape drive.

   C. Press **<Enter>**.

   (This step takes about 30 minutes.)

NOTE

Ignore the message `errno 26, Text file busy....`

7. When prompted to set system time, enter *y* (for yes).

   If you are not in North America, enter *n* (for no) in response to step 8 and go to step 11.

8. When asked if you are in North America, enter *y* (for yes) or enter *n* (for no).

9. When asked for your time zone, enter your time zone number and press **<Enter>**.

10. When asked if daylight savings applies to your time zone, enter either *y* (for yes) or *n* (for no).

11. Enter the correct date and time using the format of year, month, day, hour and minute. This example is for a date and time of March 9, 1994 at 6:22 p.m.:

    9403091822

12. When asked if you want to set the system name, enter *y*.

13. Enter your diagnostic station name and press **<Enter>**.

14. When asked if the mail system should be a different name, enter *n*.

15. When prompted, press **<Enter>** to continue.

16. When prompted to serialize the system, respond with *y*.

NOTE

If you respond "Yes" to the question in step 17, you will be forced
to start this procedure over at step 1.

17. When asked if you want to execute floppy-based serialization, respond with *n*.

18. Enter Serial Number and Activation Key codes at the prompts.

    (This step takes about 20 seconds.)

19. When asked if you want to change your answer to any of these questions, respond with *q*.

    The system now builds */unix*. (This step takes a few minutes.)

20. When prompted to reboot the system, remove any remaining floppy disk(s) and/or tape(s) and press **<Enter>** to reboot.

NOTE

In the next step you have only 5 seconds to press **<Enter>** after
the boot prompt appears.

21. When the boot prompt appears, enter single-user mode by pressing **<Enter>** within 5 seconds.

22. Wait for the single-user mode login prompt, then enter the password:

    paragon3

23. Run the password utility:

    passwd

24. When prompted to choose your own password, respond with *1*.

25. When prompted, enter your new password.

26. When reprompted, reenter your new password.

NOTE

Do not restore the password file from a backup. Doing so will compromise the system security and may cause boot problems on the diagnostic station. Use the **passwd** or **sysadmsh** utilities to change the diagnostic station password.

27. Edit the file */etc/default/tcp* by changing the lines in the *tcp* file as shown in Table A-1.

Table A-1. Edit Values in the */etc/default/tcp* File

Current	Change To:
DOMAIN = default.com	DOMAIN = *DS system's Domain name*
IPADDR = nnn.nnn.nnn.nnn	IPADDR = *DS system's IP address*
NETMASK = nnn.nnn.nnn.nnn	NETMASK = *netmask*
BROADCAST = nnn.nnn.nnn.nnn	BROADCAST = *broadcast IP address*

28. Restore your */etc/hosts* file from your backup copy, if one was created, or modify the existing */etc/hosts* file.

NOTE

When you restore the */etc/hosts* file, you must also alias the DS domain name to the DS IP number. Use the **hostname** command to find the domain name.

29. Reboot the diagnostic station:

   reboot

This completes the installation of the basic SCO OPEN DESKTOP Release 3.0.0 software on the diagnostic station.
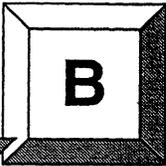
Revised Online Manual Pages   B

This appendix includes a revised online manual page for the **flashutil** utility.

FLASHUTIL   FLASHUTIL

Allows reprogramming of the flash EPROMs on Paragon™ system node boards and daughtercards.

Syntax

flashutil [-a] [-b *binFile*] [-c *cfgFile*] [-defhiLno] [-p [*target*]] [-q *version*] [-r]
[-s *x*[..*y*]] [-t *select*] [-v] [-x]

Arguments

-a	Reprogram nodes one at a time (serially). The default is to program all nodes at the same time.
-b *binFile*	Specify the binary firmware image pathname. Defaults to */u/paragon/diag/fw_all.bin*.
-c *cfgFile*	Specifies the pathname of the binary system configuration file. Defaults to */u/paragon/diag/SYSCONFIG.BIN*.
-d	Debug mode. This switch causes the program to print extra trace information.
-e	Excludes the version selected by the **-q** switch from the **-r** flash version report.
-f	When this program runs normally, warnings and confirmations are issued to prevent unintentionally resetting the Paragon System and to confirm the program operation. This switch causes the program to bypass the confirmation requests.
-h	Displays usage information.
-i	Specifies that the nodes are not to be initialized. Assumes the nodes are already in a state to accept commands to update the firmware.
-k	Specifies that **flashutil** should exit after programming. The default is to return to the Flash Option menu to allow you to program additional EPROMs.
-L	Displays version information for a file containing firmware binaries. The default file is */u/paragon/diag/fw_all.bin*, but the **-b** switch may be used to specify a different file. This switch is used either alone or in combination with the **-b** switch—all other switches are inactive when used with the **-L** switch.
-n	Specifies that a response won't be expected from the NIC boot loader.
-o	Specifies the update is to be performed on a system containing one or more GP nodes with "old" firmware (317053-004).

FLASHUTIL *(cont.)*   # FLASHUTIL *(cont.)*

-p [*target*]   Programs the target flash EPROMs on the specified nodes. The *target* may be any of the following: *gp, mio, hippi, sio, sioflex, mdc, mp,* or *mpflex*. If you do not specify a target, **flashutil** prompts for one. If the specified target does not exist on a selected node, the request is ignored.

-q *version*   A query filter for the **-r** flash version report. The **-q** switch only searches for the version specified and only for the target type of firmware specified by the **-t** switch. This switch must be used with the **-r** switch.

-r   The flash version report switch specifies that no flashes are to be programmed. The optional target type, as specified by the **-t** switch, indicates which type of flash EPROM to report version information on. If no **-t** switch is used, version information is reported for all types of flash memories in the system. Version reports can be filtered using the **-e** and **-q** switches.

-s *x[..y]*   Specifies a single node or range of nodes on which to perform the firmware update. The default is all nodes in the configuration file (*/u/paragon/diag/SYSCONFIG.BIN*, if not specified). The node numbers are specified using the "diagnostic" numbering system—refer to Appendix C in the *Paragon™ System Diagnostic Reference Manual*.

-t *select*   Selects which target types to gather version information on. The *select* parameter can be *gp, mio, hippi, sio, sioflex, mdc, mp,* or *mpflex*. One or more target types may be specified with commas as delimiters (no spaces) between the target types. If **-t** is not specified, version information on all types of flashes in the system is reported. This switch must be used with the **-r** switch.

-v   Specifies using the verbose mode.

-x   Echoes the checksum of the specified flash and the checksum of the firmware image to be programmed.

Description

flashutil is a stand-alone program that reprograms or reports firmware version information about any flash memory on a node board or daughtercard in a Paragon system.

The system is initialized using **initutil**. Then **tftp** loads the boot node's RAM with the binary image of the firmware to be programmed, along with the executable code to actually perform the programming operation. The boot node broadcasts the codes to all other nodes over the mesh routing backplane and starts them executing. The program sends a command sequentially to each node causing it to erase and reprogram a flash EPROM or to return firmware version information. If **-a** is specified, then the update is performed serially; otherwise, all nodes are programmed in parallel.

FLASHUTIL *(cont.)*

When reprogramming EPROMs, the **flashutil** utility sends a target-selection command sequentially to each selected node. An update command is then sent to each selected node in sequence. The program on each node checks for the specified target on that node, and on any expansion boards connected to it. If the targeted flash EPROM exists, the program erases and reprograms it. If the **-a** switch is used, the reprogramming is performed serially, one node at a time. Otherwise, the reprogramming is done in parallel on all selected nodes.

flashutil begins with a menu to select which firmware to update (if no **-p** switch is used on the command line):

```
Please Select the Flash option below

 1 ---> Program the GP      Flash memory
 2 ---> Program the MIO     Flash memory
 3 ---> Program the HIPPI   Flash memory
 4 ---> Program the MDC     Flash memory
 7 ---> Program the SIO     Flash memory
 8 ---> Program the MP      Flash memory
 9 ---> Program the MPFLEX  Flash memory
10 ---> Program the SIOFLEX Flash memory
28 ---> Flash version report
29 ---> Display fw_all.bin version info
30 ---> Exit flashutil no Flash programming
```

If a program update is selected, **flashutil** reads the binary image file and displays the version the nodes are to be updated to. **flashutil** then reads the binary configuration.

If the **-f** switch is not used, **flashutil** issues a confirmation request to prevent unintentionally resetting the attached Paragon system.

```
"This program will reset the attached Paragon system"
"Please confirm with y/n (n): "
```

To cancel an update, enter either **<Return>** or **<n>**.

NOTE

The "Display fw_all.bin version info" selection does not result in an exit from the **flashutil** program. After the information is displayed, the menu is repeated.

FLASHUTIL *(cont.)*   # FLASHUTIL *(cont.)*

flashutil initializes the nodes and MRC's in the Paragon system based on the configuration found in the binary configuration file (the default is */u/paragon/diag/SYSCONFIG.BIN*). The initialization is done using *initutil -l -p*, or *initutil -w -o -p* if the **-o** flag was used. If the **-o** flag is not used, a Level 1 mesh test is performed prior to loading the non-boot nodes. The Level 1 mesh test sequentially tests the mesh connections between the current node and each of its installed neighbors.

Rev. -004 GP node firmware (prior to GP node fab 7-011) requires the non-boot nodes to auto-boot using the NIC bootloader. The **-o** flag causes **initutil** to wait for the non-boot nodes to enter the NIC bootloader. This mode then relies on the successful broadcast of the update firmware over the mesh.

flashutil checks for the IP addresses of the boot node and the diagnostic station from the */etc/hosts* file on the diagnostics station. The DIAG_ALIAS and PARA_ALIAS tags need to exist before **flashutil** proceeds.

Once all nodes have completed their self tests (and optionally the Level 1 mesh test), the boot node loads three files from the diagnostic station via ethernet (**tftp**):

loader	Mesh loader.
fw_all.bin	New firmware binary image.
flash.node	Node-executable code for programming the EPROMs.

The mesh loader program broadcasts the binary image and the node executable files to the other nodes in the system. **flashutil** then causes the mesh loader to start the node executable on the other nodes and itself. **flashutil** then presents a confirmation request (if **-f** is not used):

```
Warning! current Flash EPROM contents will be erased and
replaced.
Proceed? (yes/no)
```

Enter "**yes**" (fully spelled out) to proceed. Anything else aborts the update.

flashutil then sends a command to each node in sequence, causing the node to program the flash EPROM image that now resides in RAM into the target flash EPROM. **flashutil** displays a "+" for each node that is programmed, and a "-" for each node on which the specified target Flash is not found. For example, if there are five nodes in a system, with the third one including an MIO daughtercard, **flashutil** displays the following series as it goes through the nodes to reprogram MIO Flash EPROMs:

```
--+--
```

If no error message follows the "+" sign, the target flash was programmed correctly. A "-" sign indicates that the selected target was not found on that node—it does not indicate an error.

FLASHUTIL *(cont.)*   # FLASHUTIL *(cont.)*

A system that contains GP nodes with a mix of old and new firmware (for example, when a board is placed in a system that has previously been updated) needs to be handled as if all nodes in the system contain the old firmware.

Use **flashutil -r [-q version] [-t select] [-e]** or **romver** to verify that all target flashes were updated. Doing this causes each node to return a checksum of the contents of the flash EPROM specified, and **flashutil** compares those checksums to ones kept in a database. All nodes that match firmware versions with checksums in the database are displayed under that version heading, while nodes that don't match any checksum are displayed under a "??" version heading. An example of this output is shown below:

```
GP FLASH                        (expected count = #, actual count = #)
Version # found on the following nodes:
cbs-node-#      cbs-node-#      cbs-node-# ...
cbs-node-#      cbs-node-#      cbs-node-# ...

MIO FLASH                       (expected count = #, actual count = #)
Version # found on the following nodes:
cbs-node-#      cbs-node-#      cbs-node-# ...
cbs-node-#      cbs-node-#      cbs-node-# ...
```

Note that the expected count is determined from the configuration file */u/paragon/diag/SYSCONFIG.BIN* and the actual count is from the results sent to **flashutil** from the nodes. If these counts differ, *SYSCONFIG.BIN* or */usr/paragon/boot/DEVCONF.TXT* may not reflect the actual system configuration.

Examples

To update a single GP node:

> *flashutil -s node# -p gp*

To update any target at one particular node:

> *flashutil -s node#*

A menu prompts for a target flash to program.

To quickly update all MP node firmware:

> *flashutil -p mp*

To report version information for all flash EPROMs in a system:

> *flashutil -r*

FLASHUTIL *(cont.)*   FLASHUTIL *(cont.)*

To check for all MP nodes with V1.4 FLEX bits:

> *flashutil -r -t mpflex -q V1.4*

Files

/u/paragon/diag/fw_all.bin	Binary EPROM image
/u/paragon/diag/loader	Mesh bootloader
/u/paragon/diag/flash.node	Node executable

See Also

cfgpar, initutil, mrcutil, psd, romver, rstutil