

FDDI/9000 EISA Adapter Release Notes

HP 9000 Networking



**Manufacturing Part Number: B5502-90007
E1299**

United States

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1 **FDDI/9000 EISA Adapter
Release Notes**

FDDI/9000 EISA Adapter Release Notes

The information in this release note covers versions **B.10.20.11** and **B.11.00.07** for HP FDDI/9000 EISA LAN adapters for servers (product number A3659A) and for workstations (product number B5502A).

What's in Version B.10.20.11

The following sections describe HP FDDI/9000 EISA products A3659A for servers and B5502A for workstations for **HP-UX B.10.20.11**.

NOTE

The HP FDDI/9000 EISA Adapter complies with FCC regulatory standards. See the *Installing and Administering FDDI/9000 EISA and FDDI/9000 HSC* manual (provided with the product) for the complete FCC Regulatory Compliance statement.

Benefits

The FDDI/9000 EISA Adapter is a high-performance FDDI networking solution for HP servers and workstations. This adapter provides the physical and data-link services as defined by the ANSI X3T9.5 specifications for FDDI and is supported over the TCP/IP network protocol stack.

Features

Using fiber optic media, the FDDI/9000 EISA Adapter offers a back-to-back or single-attach connection via an FDDI concentrator, and a dual-attach connection directly onto an FDDI dual-ring network. This adapter also supports dual homing and high availability environments using MC/ServiceGuard.

Fixes

Four patches have been incorporated into this version of FDDI/9000 EISA software. See the section "Patches and Fixes in this Version" for more information.

Known Problems and Workarounds

None

Compatibility Information and Installation Requirements

Software Requirements

- HP-UX 10.20 operating system.

If you are currently running HP-UX 9.x, you must upgrade to HP-UX 10.01, then to 10.20 before installing the FDDI/9000 EISA software version B.10.20.03, or later.

Hardware Requirements

- HP 9000 server or workstation with an EISA bus
- A CD-ROM to install/update media
- Fiber optic cable terminated with a MIC connector

Memory and Disk Space Requirements

- 16 MB memory
- 800 KB free disk space

Install/Upgrade With System Up or Down

One reboot is required for installation and configuration.

Installing and Upgrading FDDI/9000 EISA

The *Installing and Administering HP EISA FDDI/9000 and HP HSC FDDI/9000* manual (J3703-90004) contains complete instructions for installing this product. Refer to this document for more information.

Compatibility Information and Installation Requirements

NOTE

If you install the FDDI/9000 EISA Adapter (hardware) before the software, the system will display the following error: "Warning: one or more EISA cards could not be configured." **Ignore this message.** When you install the software, you will resolve this problem.

If you have an earlier version of FDDI/9000 EISA, you must do the following:

1. Remove all FDDI EISA patches.
2. Install this version (B.10.20.11).

Patches and Fixes in Version B.10.20.11

The following patches have been incorporated into this version of the FDDI/9000 EISA software:

- PHNE_18869
- PHNE_17285
- PHNE_17061
- PHNE_15665

Details regarding these patches and/or fixes follow:

Table 1-1

PHNE_18869

Symptom	Defect
1. The system panics with an instruction page fault with promiscuous mode enabled on the EISA FDDI interface.	1. While dismantling a promiscuous stream, the promiscuous mode function pointer in the driver's board structure is set to NULL. If a packet destined for the same stream is processed on another processor simultaneously, it could result in an instruction page fault panic due to the function pointer being NULL.
2. The lanscan command does not show the interface status correctly for EISA FDDI interface.	2. The if_flags in the ifnet structure was not being updated properly on a ring disconnect indication being received. This results in the lanscan and ifconfig commands showing the interface status as up even when the cable is disconnected.
3. Aborts/Underruns are observed when frames larger than 3000 bytes are transmitted, with EISA SCSI present on the system.	3. This problem was fixed in an earlier patch by increasing the transmit FIFO watermark on the FSI chip to MTU size. However, the FIFO watermark was getting reset to the default value after a card reset.

FDDI/9000 EISA Adapter Release Notes
Patches and Fixes in Version B.10.20.11

Table 1-1 PHNE_18869 (Continued)

Symptom	Defect
4. The EISA FDDI driver does not report any errors when an invalid multicast address is added by a user.	4. All FDDI multicast addresses have the I/G (Individual/Group) bit set to 1. The driver code was not checking for attempts to add multicast addresses with the I/G bit 0, and would return success.
5. EISA FDDI nettl log messages do not appear after a card reset.	5. Since nettl is not started when the card init is done during bootup, EISA FDDI error messages are not logged to nettl during boot. To determine whether error messages can be logged with nettl, a flag in the driver's board structure, which indicates whether a card init has been done, is used. This flag was getting reset during a card reset, and so subsequent error log messages were not getting logged with nettl.
6. Enhancement request to have SNMP subagent supported on the EISA FDDI driver.	6. The EISA FDDI SNMP subagent was not being supported. The reason to have this feature is to maintain consistency between the different FDDI cards, and the ability to manage all the FDDI networks from OpenView management station.
7. Disable of Multicast addresses fails on EISA FDDI.	7. The DLPI ioctl, DL_HP_DISABMULTI would return success, but the multicast address in the CAM on the EISA FDDI card was not getting deleted. This was happening because the multicast address was not being sent to the card in the correct format.

Table 1-1 PHNE_18869 (Continued)

Symptom	Defect
8. Data page fault panic in fdi0_open.	8. The panic was happening when the EISA FDDI device file was opened, with no EISA FDDI card configured on the system. Under these circumstances, the open routing tries to access a null board structure pointer, resulting in a data page fault panic.

Table 1-2 PHNE_17285

Symptom	Defect
1. When the MTU of the EISA FDDI interface is set or reset using the lanadmin(1M) command with -M or -R options respectively, the command completes without any errors but does not set/reset the MTU value for the interface.	1. When lanadmin(1M) is run with the -M option to set the MTU for the interface, or with the -R option to reset it to the default value, it sends a 'change MTU' ioctl (I/O Control) request to the driver. The driver did not handle this request nor returned an error. As a result, the lanadmin(1M) command completed without errors, but did not set/reset the MTU.
2. When lanadmin(1M) is used to set the physical address of the interface to the broadcast address (0xffffffff) or to 0 (0x000000000000), the command succeeds.	2. When the lanadmin(1M) command is used with the -A option to set the physical address of the interface to either 0xffffffff or 0x000000000000, the driver did not check for these addresses and set the physical address as such. This is inconsistent with the behavior of other networking cards/drivers. This behavior prevented the physical address from being set to either of the above values.

FDDI/9000 EISA Adapter Release Notes
Patches and Fixes in Version B.10.20.11

Table 1-2 PHNE_17285

Symptom	Defect
3. netstat(1M) used with the -i option shows a large number of inbound errors on the EISA FDDI interface.	3. Packets which were being dropped, either due to the interface being configured down (using the ifconfig(1M) command), or due to the driver not being able to decipher the protocol type of the packet, were counted as inbound errors for IP.
4. When the EISA FDDI interface is configured down using the ifconfig(1M) command, an unbound SAP promiscuous stream opened on the interface failed to receive IP/ARP packets coming in on the interface.	4. When an unbound stream in SAP promiscuous mode is operating over the EISA FDDI interface and the interface is configured down using the ifconfig(1M) command, the driver stops sending IP/ARP packets to the promiscuous stream. The expected behavior is to continue sending these packets to the promiscuous stream.
5. The system may panic with a 'Data page fault' when the EISA FDDI interface is operating in promiscuous mode with heavy inbound traffic.	5. Under heavy network traffic, with the EISA FDDI interface in promiscuous mode, when a call to allocate memory failed, an inbound buffer could be freed more than once, resulting in a system panic.
6. The system panics with a 'Data page fault' when promiscuous mode is repeatedly turned on and off over the EISA FDDI interface.	6. When promiscuous mode is turned on/off repeatedly, there was a time window during which the stream, which had previously turned promiscuous mode off, was closed before the card's promiscuous mode was turned off by the driver. The time window was introduced because of the order in which the driver carried out the steps to disable promiscuous mode on the interface. Due to this time window, some packets were still sent to a non-existent stream, leading to a system panic.

Table 1-2 PHNE_17285

Symptom	Defect
7. The 'Operation Status' of the EISA FDDI interface, as displayed by the lanadmin(1M) command, is not marked 'down' when there is a cable disconnect.	7. The ifOper MIB variable, that is displayed as the 'Operation Status' by the lanadmin(1M) command, shows the operational state of the interface. The EISA FDDI driver did not update the value of ifOper to 'down' when it detected a cable disconnect.

Table 1-3 PHNE_17061

Symptom	Defect
1. The system panics with a data page fault when many Input/Output (I/O) cards are configured on a system with EISA FDDI card/driver.	1. When multiple I/O cards are configured it is possible that the driver's attempt to map its I/O buffer fails. Under these conditions, when the driver attempts to unmap these I/O buffers, the system panics with a data page fault.
2. NFS server daemons operating over EISA FDDI hang, eventually followed by a system hang.	2. When the driver fails to enqueue packets for transmission (as was seen under heavy NFS traffic), the driver treats these packets as dropped. However, it failed to free the buffers for the packet. This resulted in kernel memory leak, eventually leading to a system hang.

FDDI/9000 EISA Adapter Release Notes
Patches and Fixes in Version B.10.20.11

Table 1-3 PHNE_17061 (Continued)

Symptom	Defect
<p>3. High checksum errors and degraded network performance, observed over EISA FDDI interface, on B and d class systems which are non-cache coherent I/O (that is, CCIO).</p>	<p>3. On systems without CCIO support, the driver needs to maintain cache coherency during DMA transactions, by flushing/purging the CPU cache as necessary. The EISA FDDI driver did not synchronize its inbound data buffer pool with the processor cache. Hence, stale data was passed up to the upper layers, resulting in checksum errors and re-transmissions, leading to degraded performance. To verify this problem, run <code>netstat(1M)</code> to display bad checksum. In addition, check if the system supports CCIO, run the following command on the system:</p> <pre data-bbox="922 1045 1256 1100">/usr/bin/grep "^ccio" /stand/system</pre>
<p>4. When OSI stack is configured on top of EISA FDDI interface it fails to communicate with its peers, resulting in application aborts.</p>	<p>4. The control field in the packet header of outbound Unnumbered Information (UI) packets in the EISA FDDI driver was not initialized. As a result, communication was not established with remote hosts, causing application aborts.</p>
<p>5. System panics during system shutdown when OSI stack is configured over EISA FDDI driver.</p>	<p>5. During system shutdown, the OSI stack sends the OSIUNBIND request to the driver. The driver failed to unbind the protocol stack stream as it incorrectly compared the service access pooling (SAP) values and returned an error. However, the OSI stack was unbound and any attempt by the driver to send packets on that stream resulted in a system panic.</p>

Table 1-3 PHNE_17061 (Continued)

Symptom	Defect
6. System crashes, with either an HPMC or a memory protection fault panic, under high network traffic over the EISA FDDI interface.	6. Under heavy network traffic conditions, the EISA FDDI driver may sometimes invoke internal card resets to recover from transmit hangs. In the driver's watchdog timer, when attempting an internal reset (for automatic recovery), the driver invokes a kernel sleep routine while waiting for reset completion. Since the watchdog timer executes in an interrupt system context, calling sleep leads to a system crash (HPMC or memory protection fault). An alternate mechanism of completing resets in driver interrupt routines has been implemented.
7. System panics with an instruction page fault when multiple promiscuous streams are enabled over the EISA FDDI interface.	7. When multiple streams enable promiscuous mode on a single interface, the driver failed to distinguish between bound and unbound streams. As a result, the streams queue pointer was corrupted, resulting in a panic.
8. The <code>netfmt(1M)</code> output for traces generated by the EISA FDDI driver is incorrect.	8. The EISA FDDI formatting routines were using incorrect offsets into the trace buffers, resulting in incorrect output.

Table 1-4 PHNE_15665

Symptom	Defect
1. The EISA FDDI interface may hang after logging the message, "Waited for stat2_in4 but it never came" to syslog.	1. A software reset mechanism was introduced in the EISA FDDI driver to work around hardware defects in the Motorola FDDI system Interface (FSI) chip. This mechanism did not detect all the circumstances under which the card had to be reset.

FDDI/9000 EISA Adapter Release Notes
Patches and Fixes in Version B.10.20.11

Table 1-4 PHNE_15665

Symptom	Defect
2. When an attempt is made to change the MAC address of the card using <code>lanadmin(1M)</code> , the link becomes unusable for up to 10 seconds and the MAC address remains unchanged.	2. The MAC address of the card cannot be changed. Users were not prevented from attempting to do this.
3. DLPI applications that use hierarchical sub-binding to SNAP SAPs other than IP or ARP may sometimes receive packets not meant for them from the EISA FDDI link.	3. The driver forwarded SNAP packets that were neither IP nor ARP to all applications registered with SNAP SAPs other than IP or ARP.

EISA FDDI 10.20: New Defect Fixes

Besides the above patch fixes, this release also has:

1. Fix for IOVR leak in the EISA FDDI driver during a card reset.
2. The `fddiif` and `fddilink` commands have been enhanced to support writing their output to a file. A `-o` option has been added to both the commands.
3. After a card reset, multicast addresses enabled previously were not reloaded. This has been fixed.
 In this release these are no longer treated as inbound errors.
4. Fix to not hold spinlock around call to `copyout`.

What's in Version B.11.00.07

The following describes HP EISA FDDI/9000 products A3659A for servers and B5502A for workstations for **HP-UX B.11.00.07**.

NOTE

The HP EISA/FDDI adapter complies with FCC regulatory standards. See the *Installing and Administering HP EISA FDDI/9000 and HP HSC FDDI/9000* manual (provided with the product) for the complete FCC Regulatory Compliance statement.

Benefits

HP EISA FDDI/9000 is a high-performance FDDI networking solution for HP servers and workstations. HP EISA FDDI/9000 provides the physical and data-link services as defined by the ANSI X3T9.5 specifications for FDDI and is supported over the TCP/IP network protocol stack.

This version of HP EISA FDDI/9000 supports the 32-bit version of HP-UX 11.00 operating system.

Features

HP EISA FDDI/9000 supports ANSI specifications for high-performance FDDI networking using fiber optic media via single-attach or dual-attach connections. HP EISA FDDI/9000 also supports dual homing and high availability environments using MC/ServiceGuard.

Fixes

There are four patches included in this version. See the section "Patches and fixes in this Version (b.11.00.07)" for more information.

Known Problems and Workarounds

None

Compatibility Information and Installation Requirements

Software Requirements

- HP-UX 11.0 operating system.

Hardware Requirements

- HP 9000 server or workstation with an EISA bus
- A CD-ROM to install/update media
- Fiber optic cable terminated with a MIC connector

Memory and Disk Space Requirements

- 16 MB memory
- 800 KB free disk space

Install/Upgrade With System Up or Down

One reboot is required for installation and configuration.

Installing and Upgrading FDDI/9000 EISA

The *Installing and Administering HP EISA FDDI/9000 and HP HSC FDDI/9000* manual (J3703-90004) contains complete instructions for installing this product. Refer to this document for more information.

If you have an earlier version of FDDI/9000 EISA, you must do the following:

1. Remove all EISA FDDI patches.
2. Install this release (B.11.00.07).

Patches and Fixes in Version B.11.00.07

The following patches have been incorporated into this version of the FDDI/9000 EISA software:

- PHNE_16503
- PHNE_15667
- PHNE_13395
- PHNE_18665

Details regarding these patches and/or fixes follow:

Table 1-5

PHNE_16503

Symptom	Defect
1. The driver fails to disable previously enabled multicast addresses, with error code set to 'EINVAL'.	1. When lanadmin(1M) is run with the -M option to set the MTU for the interface, or with the -R option to reset it to the default value, it sends a 'change MTU' ioctl (I/O Control) request to the driver. The driver did not handle this request nor returned an error. As a result, the lanadmin(1M) command completed without errors, but did not set/reset the MTU. The driver has been fixed to handle the ioctl request and enhance set/reset the MTU as expected. An error (EINVAL) is returned if the driver cannot handle the request. For example, EINVAL is returned when the requested MTU value is too high (>4352) or too low (<100).
2. The driver returns garbled data when queried for statistics by applications using the Network Management library calls.	2. the Network Management functions use the DL_HP_GET_MIB_STATS ioctl to communicate with the driver. This ioctl was not supported.

Table 1-5 PHNE_16503 (Continued)

Symptom	Defect
3. lanadmin displays Operation Status as "down(2)" even if the interface is up.	3. The driver was not updating the operation status field in its data structure after the initialization was complete. As a result, incorrect status was displayed by the lanadmin(1M) command.
4. System hangs under heavy network traffic over EISA FDDI.	4. Under heavy network load, the driver fails to enqueue packets due to lack of transmit descriptors. In such a condition the driver is supposed to free the buffers associated with the packet. This was not being done. As a result, kernel runs out of memory leading to a system hang.

Table 1-6 PHNE_15667

Symptom	Defect
1. The EISA FDDI interface may hang after logging the message "waited for stat2_line4 but it never came" to syslog.	1. A software reset mechanism was introduced in the EISA FDDI driver to work around the hardware defects in the Motorola FDDI System Interface (FSI) chip. This mechanism did not detect all the circumstances under which the card had to be reset.
2. When an attempt is made to change the MAC address of the card using lanadmin(1M), the link is unusable for up to 10 seconds and the MAC address remains unchanged.	2. The MAC address of the card cannot be changed. Users were not prevented from attempting to do this.
3. Under certain conditions, too many informative driver messages are logged to syslog, causing it to overflow.	3. SMT and other informative messages were incorrectly sent to syslog instead of the NetTL log.

FDDI/9000 EISA Adapter Release Notes
Patches and Fixes in Version B.11.00.07

Table 1-6 PHNE_15667 (Continued)

Symptom	Defect
4. The fddiif utility sometimes reports negative numbers in the statistics.	4. though the statistics are maintained as unsigned integers by the driver, fddiif displayed them as signed values.
5. When the locale is set and lanadmin(1M) is used in the interactive mode, the following error message is displayed after a certain number of commands are executed: Cannot open shared library	5. The EISA FDDI lanadmin(1M) shared library did not close the catalog file after using it.

Table 1-7 PHNE_13395

Symptom	Defect
1. Inbound data corruption is seen on non-cache coherent systems when UDP checksum is turned off. This problem is observed readily on D200/D210 systems with EISA FDDI.	1. A missing cache purge at the time the receive buffer is set up causes stale data to appear in the received packets. The stale data starts at cache line boundaries and can run to multiples of the cache line size.
2. An underrun is seen on transmission of every frame larger than 3000 bytes when EISA SCSI is present.	2. When EISA SCSI is present, system firmware automatically disables BCLK stretching, resulting in a slight slowdown of the EISA bus. This, coupled with the limited bandwidth of the EISA bus, restricts the ability of the EISA FDDI card to DMA the packet at the rate needed by the FDDI network. The EISA FDDI card, by default, sets its transmit FIFO watermark to 2KB, which means that it starts transmission on the FDDI network after it has got 2 KB of data in its FIFO. This patch increases the watermark to the FDDI MTU (4352 bytes).

Table 1-7 PHNE_13395 (Continued)

Symptom	Defect
3. HPMCs could occur during the execution of the code that autorecovers the interface after transmit time.	3. The transmit hang autorecovery code uses the kernel sleep/wakeup synchronization mechanism to await the completion of events. As autorecovery could be initiated with no process context, the above scheme does not work. The fix incorporates an interrupt driven state transition mechanism to complete the recovery.

Table 1-8 PHNE_18665

Symptom	Defect
1. When the MTU of the EISA FDDI interface is set or reset using the lanadmin(1M) command with -M or -R options respectively, the command completes without any errors but does not set/reset the MTU value for the interfaces.	1. A missing cache purge at the time the receive buffer is set up causes stale data to appear in the received packets. The stale data starts at cache line boundaries and can run to multiples of the cache line size.
2. When lanadmin(1M) is used to set the physical address of the interface to the broadcast address (0xffffffff) or to 0 (0x000000000000), the command succeeds.	2. When the lanadmin(1M) command is used with the -A option to set the physical address of the interface to either 0x000000000000 or 0xffffffff, the driver did not check for these addresses and set the physical address correctly. This is inconsistent with the behavior of other networking cards/drivers that prevent the physical address from being set to the above values. The driver has been fixed to return an error (EINVAL) for the above values.

FDDI/9000 EISA Adapter Release Notes
Patches and Fixes in Version B.11.00.07

Table 1-8 PHNE_18665 (Continued)

Symptom	Defect
<p>3. The system panics with a 'Data page fault' when promiscuous mode is repeatedly turned on and off over the EISA FDDI interface.</p>	<p>3. When promiscuous mode is turned on/off repeatedly, there was a time window during which the stream, which had previously turned promiscuous mode off, was closed before the card's promiscuous mode was turned off by the driver. The time window was introduced because of the order in which the driver carried out the steps to disable promiscuous mode on the interface. Due to this time window, some packets were still sent to a non-existent stream, leading to a system panic. Apart from correcting the order of steps followed to disable promiscuous mode, the driver code has been changed to synchronize access to the promiscuous mode related data structures by using locks.</p>
<p>4. The system may panic with a 'Data page fault' when the EISA FDDI interface is operating in promiscuous mode with heavy inbound traffic.</p>	<p>4. Under heavy network traffic, with the EISA FDDI interface in promiscuous mode, when a call to allocate memory failed, an inbound buffer could be freed more than once, resulting in a system panic. The code has been modified to insure that the inbound buffer will be freed only once.</p>
<p>5. Aborts/Underruns are observed when frames larger than 3000 bytes are transmitted, with EISA SCSI present on the system.</p>	<p>5. This problem was fixed in an earlier patch by increasing the transmit FIFO watermark on the FSI chip to MTU size. However, the FIFO watermark was getting reset to the default value after a card reset. Also, the transmit FIFO watermark is now set to MTU size after a card reset.</p>

EISA FDDI 11.0: New Defect Fixes

Besides the above patch fixes, this release also has:

1. Fix for IOVR leak in the EISA FDDI driver. During a card reset, the transmit buffers were not getting unmapped.
2. The `fddiif` and `fddilink` commands have been enhanced to support writing their output to a file. A `-o` option has been added to both the commands.
3. After a card reset, multicast addresses enabled previously were not reloaded. This has been fixed.
4. Fix to not hold spinlock around call to `copyout`.