d|i|g|i|t|a|l ™

DECbrouter ™ 90 Release Notes
Firmware Version 10.3(10)
May 1996

Important
Read This First

On networks containing both DECbrouter 90 and Cisco routers, some customers have attempted to load system images obtained from Cisco on the DECbrouter 90.

Because of differences in hardware architecture between the DECbrouter 90 and Cisco routers, system images for Cisco routers (such as Cisco 2500 software) should not be loaded on the DECbrouter 90. The only software supported on the DECbrouter 90 is distributed through Digital and should only be installed under instruction by Digital to resolve specific identified problems.

Introduction

Before you install the software for the DECbrouter 90, read the section *Read This First* for important information. Also, read the *Software Product Description* for a detailed description of the DECbrouter 90 functionality for the current software release.

This document contains information about the following topics:

- Quick–start instructions

- Important notes for the DECbrouter 90 unit

Performance Guidelines

For optimum network reliability, observe the following recommendations and guidelines:

- You can operate the synchronous serial interface on the DECbrouter 90T1 at speeds up to 2048 Kb/s.

- You can operate one synchronous serial interface on the DECbrouter 90T2 and 90T2a at clock speeds up to 2048 Kb/s and the other port at speeds no faster than 64 Kb/s.

The DECbrouter 90 is designed to serve as an Access or Leaf router. Although the DECbrouter 90 supports numerous routing, bridging and protocol translation features, it is not recommended that more than four of these protocols run simultaneously on any one router. Furthermore, when utilizing the DECbrouter 90 in large Frame–Relay or X.25 networks, it is not recommended that this product serve as the central router for star topology style implementations.

Although this restriction is heavily dependent upon the number and types of protocols running and the amount of traffic the DECbrouter 90 is processing, it is not recommended that more than 15 VCs (DLCIs, PVCs or SVCs) be configured per DECbrouter 90 when connecting to a Frame–Relay cloud or a X.25 PSDN.

Configuring the DECbrouter 90 Unit

The DECbrouter 90 unit is preconfigured to transparently bridge all network protocols using the IEEE 802.1d spanning tree protocol. HDLC encapsulation is used on the serial interfaces. This allows the DECbrouter 90 to be used immediately with no other configuration required. Refer to the *Installation Guide* for instructions on connecting the serial line and Ethernet cables and applying power.

To configure the DECbrouter 90 to route selected protocols and to enable remote network management, follow the configuration setup questionnaire described below.

Running the Configuration Script

To run the DECbrouter 90 configuration script, proceed as follows:

1. Verify that you have a VT100 compatible terminal and an H8571–J adapter.

2. To adapt to Digital's MMJ connector, connect the H8571–J adapter to the console port of the DECbrouter 90, then attach the VT100 compatible terminal to the 9–pin console port. The port is the same as a PC/AT serial port. Set the terminal for 9600 baud, 8 bit, no parity, and disable XON/XOFF flow control.

3. Issue the following commands:

```
Router>ENABLE
Router>SETUP
```

The DECbrouter 90 prompts you for information that establishes default parameters for each protocol that you select and uses HDLC on the serial interface. The DECbrouter 90 allows you to establish the network addresses for each interface, and enable remote management via SNMP, LAT, and TELNET. If you have any specialized configuration requirements, use the CONFIGURE command. Refer to the configuration and reference volumes to determine the required commands.

Caution

If you use the configuration script to enable bridging, it will default to the DEC protocol spanning tree. This can cause problems in some networks. You may want to change this back to the IEEE protocol as described under the Interoperability Guidelines section.

Using Flash Load Helper

The following sections describe Flash Load Helper, which now comes standard with the 9.14(8) boot flash being shipped with this DECbrouter 90 product.

Overview

This section describes the requirements, purpose, and advantages of Flash Load Helper. Flash Load Helper is a software function that provides a method for users of the DECbrouter 90 to upgrade their system software. The main advantage of Flash Load Helper is that it simplifies the upgrade procedure without requiring additional hardware; however, it does require some brief network downtime. Flash Load Helper involves an automated procedure that switches from the current running image to the ROM–based bootstrap image, downloads to Flash, and switches back to the newly downloaded image. Flash Load Helper includes the following features:

- It performs extensive validations before erasing the current Flash image. That is, it confirms access to the specified source file on the specified server before erasing Flash and reloading to the ROM image for the actual upgrade.

- It warns the user if the image being downloaded is not appropriate for the system. The Flash Load Helper will not detect over sized files which are too large for the DECbrouter 90.

- It has improved recovery chances after Flash upgrade failures for remote Telnet users without console access. Flash Load Helper prevents reloads to the ROM image for Flash upgrade if the system is not set up for auto booting and the user is not on the console terminal. By doing this, at least the boot ROM image can be brought up as a last resort rather than have the system wait at the ROM monitor's prompt for input from the console terminal.

- Flash Load Helper retries Flash downloads automatically up to six times. The retry sequence is as follows :

  – first try

  – retry after 120 seconds

  – retry after 240 seconds

  – reload ROM image

  – first try after reloading ROM image

  – retry after 120 seconds

  – retry after 240 seconds

Users have an opportunity to save any configuration changes made before they exit out of the system image.

Users logged into the system are notified of the impending switch to the boot ROM image, so that they do not lose their connections unexpectedly.

Console output during the Flash Load Helper operation is logged into a buffer that is preserved through system reloads. Users can retrieve the buffer contents from a running image. The output is useful where console access is unavailable or there is a failure in the download operation.

Reconfiguring before Upgrading Flash

There may be some cases when, because of your current configuration, the Flash Load Helper operation may fail. For example, this could occur when IP is being bridged, or when IP–un-numbered is being used for the IP address on a serial interface. The host the router is trying to retrieve the TFTP or MOP image from must have a routed or bridged connection to the DECbrouter 90 independent of the DECbrouter 90 itself. The DECbrouter 90 does not route or bridge any traffic while in the rom boot mode. In these cases, you may have to reconfigure your network and system(s) before attempting to upgrade the Flash image.

Executing Flash Load Helper for Copy TFTP Flash

This section describes how to execute Copy TFTP Flash from the ROM–based bootstrap image to Flash memory. Enter the COPY TFTP FLASH command beginning in privileged EXEC mode, which automatically invokes the Flash Load Helper.

The COPY TFTP FLASH command can always be invoked from a console terminal. The command can, however, be invoked from a virtual terminal (for example, a Telnet session) only if the system is configured for auto booting. This means that the boot bits in the system configuration register must be non–zero.

```
Router# copy tftp flash
ERR: Config register boot bits set for manual booting
```

The above error message is displayed if the user is on a Telnet session and the system is set for manual booting. (The boot bits in the configuration register are zero.) This step helps minimize the chance of having the system go down to the ROM monitor prompt (and taken out of the remote Telnet user's control) in case of any catastrophic failure in the Flash upgrade. The system would try to bring up at least the boot ROM image if it cannot boot an image from Flash. The user must go into global configuration mode and change the configuration register value (through the CONFIG–REGISTER command) so that the boot bits are non–zero before reinitiating the copy tftp flash command.

```
*************************** NOTICE ******************************
Flash load helper v1.0
This process will accept the TFTP copy options and then terminate the
current system image to use the ROM based image for the copy. Router
functionality will not be available during that time. If you are logged
in via Telnet, this connection will terminate. Users with console access
can see the results of the copy operation.
****************************************************************
```

If any terminals other than the one on which this command is being executed are active, the following message appears:

```
There are active users logged into the system.
Proceed? [confirm] y
System flash directory:
File  Length   Name/status
  1   4309568  igs-bfpx.10-06
[4309568 bytes used, 4079040 available, 8388608 total]
```

Enter the IP address or name of the remote host you are copying from:

```
Address or name of remote host [255.255.255.255]? 16.135.16.188
```

Enter the name of the file you want to copy:

```
Source file name? /igs-bfpx.10-2-5
```

Enter the name of the destination file:

```
Destination file name [default = source name]?
Accessing file '/igs-bfpx.10-2-5' on 16.135.16.188....
Loading from 16.135.16.188:
Erase flash device before writing? [confirm]
```

If you indicate yes, to erase Flash, the dialog continues. The COPY TFTP FLASH operation verifies the request from the running image by trying to TFTP a single block from the remote TFTP server. Then the Flash Load Helper is executed, causing the system to reload to the ROM–based system image.

```
Erase flash device before writing? [confirm] y
Flash contains files. Are you sure? [confirm]
```

If the file does not seem to be a valid image for the system, a warning is displayed and a separate confirmation is sought from the user:

```
Copy '/igs-bfpx.10-2-5' from TFTP server
as '/igs-bfpx.10-2-5' into Flash WITH erase? y


%SYS-5-RELOAD: Reload requested
%FLH: rxboot/igs-bfpx.10-2-5 from 16.135.16.188 to flash ...
```

If you had indicated no, to not erase Flash, and there was no file duplication, the dialog continues as follows:

```
Erase flash device before writing? [confirm] n
Copy '/igs-bfpx.10-2-5' from TFTP server
as '/igs-bfpx.10-2-5' into Flash WITHOUT erase? y
```

If you had indicated no, to not erase Flash, and there was file duplication, the dialog continues as follows:

```
Erase flash device before writing? [confirm] n
File '/igs-bfpx.10-2-5' already exists; it will be invalidated!
Invalidate existing copy of '/igs-bfpx.10-2-5' in flash memory?
[confirm] y
Copy '/igs-bfpx.10-2-5' from TFTP server
as '/igs-bfpx.10-2-5' into Flash WITHOUT erase? y
```

If the configuration has been modified but not yet saved, you will be prompted to save the configuration, as follows:

```
System configuration has been modified. Save? [confirm]
```

If you confirm to save the configuration, you might also receive this message:

```
Warning: Attempting to overwrite an NVRAM configuration previously written by
a different version of the system image. Overwrite the
previous NVRAM configuration? [confirm]
```

Users with open Telnet connections will be notified of the system reload, as follows:

```
**System going down for Flash upgrade**
```

In case of TFTP failures, the copy operation will retry up to three times. If the failure happens in the middle of a copy (part of the file has been written to Flash), the retry will not erase Flash unless you specified an erase. The partly written file will be marked as deleted and a new file opened with the same name. If Flash runs out of free space in this process, the copy is terminated.

After the Flash Load Helper finishes its copy (whether successful or not), it attempts to do a default boot from Flash. This means that if the Flash was erased and a new image downloaded, the new image is booted up. If Flash was not erased and a file appended in Flash, the original Flash image is booted up. If the default boot from Flash fails, the bootstrap image in ROM is booted up.

Executing Flash Load Helper for Copy MOP Flash

This section describes how to execute Copy MOP Flash from the ROM–based bootstrap image to Flash memory. Enter the COPY MOP FLASH command beginning in privileged EXEC mode, which automatically invokes the Flash Load Helper. The same rules outlined in the Copy TFTP Flash example pertain to this section also.

```
DBR90>copy mop flash


                      ****  NOTICE  ****
Flash load helper v1.0
This process will accept the copy options and then terminate
the current system image to use the ROM based image for the copy.
Routing functionality will not be available during that time.
If you are logged in via Telnet, this connection will terminate.
Users with console access can see the results of the copy operation.
                    ----******** -----
```

```
Proceed? [confirm] y
System flash directory:
File  Length   Name/status
  1   4309568  igs-bfpx.10-06
[4309568 bytes used, 4079040 available, 8388608 total]
Source file name? igs-bfpx.sys
Destination file name [igs-bfpx.sys]? igs-bfpx.sys
Erase flash device before writing? [confirm] y
Flash contains files. Are you sure you want to erase? [confirm] y
Copy 'igs-bfpx.sys' into Flash WITH erase [yes/no] y


%SYS-5-RELOAD: Reload requested
%FLH: igs-bfpx.sys from MOP server to flash ...
System flash directory:
File  Length   Name/status
  1   4309568  igs-bfpx.10-06
[4309568 bytes used, 4079040 available, 8388608 total]
Erasing device...  ... erased
Mop2flash: Loading igs-bfpx.sys into flash from interface Ethernet0
address 08002b002469  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!


Verifying checksum...  OK (0x6390) Flash copy took 223964 msecs
%FLH: Re-booting system after download Loading igs-bfpx.10-2-5 at 0x3000040,
size = 4463980 bytes [OK]


F3: 4289264+174684+297392 at 0x3000060


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                        San Jose, California 95134-1706


Cisco Internetwork Operating System Software
IOS (tm) 3000 Software (IGS-BPX-L), Version 10.2(5), RELEASE SOFTWARE
(fc1)
Copyright (c) 1986-1995 by cisco Systems, Inc.
Compiled Thu 23-Mar-95 01:52 by kmac
Image text-base: 0x03025DC0, data-base: 0x00001000


DECbrouter 90 router (68030) processor (revision A) with 6140K/2048K
bytes of m.
Processor board serial number 00000000
SuperLAT software copyright 1990 by Meridian Technology Corp).
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
1 Ethernet/IEEE 802.3 interface.
2 Serial network interfaces.
32K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash (Read ONLY)


DBR90>
```

Monitoring Flash Load Helper

Use the show flh–log command in EXEC mode to view the system console output generated during the Flash Load Helper operation. Since you may be a remote Telnet user performing the Flash upgrade without a console connection, this command allows you to retrieve console output when your Telnet connection has terminated due to the switch to the ROM image. The output indicates what happened during the download, and would be particularly useful if the download failed.

Assuming the sample Flash Load Helper operation shown in the preceding section, "Executing Flash Load Helper," the output appears as follows:

```
DBR90# show flh-log
%FLH: /igs-bfpx.10-2-5 from 16.135.16.188 to flash ...
System flash directory:
File  Length   Name/status
  1   4309568  igs-bfpx.10-06
[4309568 bytes used, 4079040 available, 8388608 total]
Accessing file '/igs-bfpx.10-2-5' on 16.135.16.188...
Loading from 16.135.16.188:
Erasing device...  ... erased
Loading from 16.135.16.188:
!!.!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!![OK -
4309568/8388608 bytes]


Verifying checksum...  OK (0x6390)
Flash copy took 223964 msecs
%FLH: Re-booting system after download
Loading igs-bfpx.10-2-5 at 0x3000040, size = 4463980 bytes [OK]


F3: 4289264+174684+297392 at 0x3000060


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Cisco Internetwork Operating System Software
IOS (tm) 3000 Software (IGS-BPX-L), Version 10.2(5), RELEASE SOFTWARE
(fc1)
Copyright (c) 1986-1995 by cisco Systems, Inc.
Compiled Thu 23-Mar-95 01:52 by kmac
Image text-base: 0x03025DC0, data-base: 0x00001000


DECbrouter 90 router (68030) processor (revision A) with 6140K/2048K
bytes of m.
Processor board serial number 00000000
SuperLAT software copyright 1990 by Meridian Technology Corp).
```

```
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
1 Ethernet/IEEE 802.3 interface.
2 Serial network interfaces.
32K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash (Read ONLY)


DBR90>
```

Memory Requirements

The DECbrouter 90 software Version 10.3(10) image size exceeds 4 MB. This image can only be used with DECbrouter 90 models DEWB1–N Rev=C, DEWB2–N Rev=C, and DEWBR–N Rev=C or higher. The DEWB1–M, DEWB2–M, DEWBR–M models do not have the correct boot rom or enough DRAM or enough OS flash to load and run V10.3(10). The models DEWB1–N Rev A/B, DEWB2–N Rev A/B, DEWBR–N Rev A/B have the correct boot flash and enough DRAM to load this image; however, they do not contain enough OS flash to run the V10.3(10) image.

Upgrading to a New Software Release

If you are upgrading to IOS Release 10.3 from an earlier software release, you should save your current configuration file before configuring your router with the Release 10.3 software.

IP Multicast and Mrouted

Version 3.3 of mrouted, which was announced on August 26, 1994, has a multicast traceroute facility that does not work through the DECbrouter 90. The DECbrouter 90 does have multicast tracing utilities that can be used to manage multicast internetworks. An interoperable solution will be provided in a maintenance release of IOS Release 10.3.

Forwarding of Locally Sourced AppleTalk Packets

Our implementation of AppleTalk does not forward packets with local source and destination network addresses. This behavior does not conform to the definition of AppleTalk in Apple Computer's *Inside AppleTalk* publication. However, this behavior is designed to prevent any possible corruption of the AARP table in any AppleTalk node that is performing MAC–address gleaning.

IOS Release 10.3(10) Software Caveats

This section describes possibly unexpected behavior by IOS Release 10.3(10). Unless otherwise noted, these caveats apply to all 10.0 releases, up to and including 10.3(10). The caveats listed here describe only the serious problems. These issues will be addressed in a future DECbrouter90 release. If you are encountering any of the following problems, please consult with your support provider for information on when a resolution will be available.

Basic System Services

If the transmit queue limit is set to a low value (for example, through priority queuing), traffic on the interface might be subject to delayed transmission.

DECnet

When DECnet conversion is enabled, discard routes are inserted into the Connectionless Network Service (CLNS) routing table.

IBM Connectivity

- When a Synchronous Data Link Control (SDLC) device is reloaded, the connection is not automatically reestablished. To reestablish the connection, issue the configuration commands `shut` and `no shut`.

- Logical Link Control, type 2 (LC2) ping functions do not exist.

- When the `dlsw icanreach mac_exclusive` and `dlsw icanreach mac_address` commands are issued to specify a single MAC address to be filtered, all traffic is filtered instead.

- A router might reboot when a `clear dlsw circuit` command is entered.

- If there are two DLSw priority peers (the "priority" keyword is given in the remote peer definition), when one peer is reloaded, the other peer might crash.

- A DLSw peer on demand connection might not be disconnected even after all Logical Link Control (LLC) connections are disconnected between the peers.

Interfaces and Bridging

Packets incoming to a Hot Standby Router Protocol (HSRP) hot standby MAC address are erroneously process switched, regardless of the route–cache status on the interface.

IP Routing Protocols

- In a multicast network with Protocol Independent Multicast (PIM) – Sparse running in one portion of the network and PIM – Dense in the other part, groups with a known Route Processor (RP) address still have the D (Dense) bit set.

- Running multiple Enhanced Interior Gateway Routing Protocol (EIGRP) autonomous systems might consume all available memory in the router.

- Sometimes a router's serial interface will send an IP fragment that is longer than the outward bound serial interface's maximum transmission unit (MTU). The workaround is to change the serial MTU on both of the routers connected to the link to the size of the largest fragment the router attempts to send.

ISO CLNS

- If two routers running intermediate system (IS) – IS are connected via multiple point–to–point links and one of the links fails in only one direction, it is possible for traffic to be sent down the failing link (and lost). This is caused by a deficiency in the IS–IS protocol specification.

- Issuing a Connectionless Network Service (CLNS) ping to one of the router's own addresses will cause the router to reload if debug clns packet is on. A workaround is to have this particular debug on when pinging to one of the router's own addresses.

- The clns split–horizon command does not function for frame–relay circuits.

Novell IPX, XNS, and Apollo Domain

Infrequently, a router might crash with the following message:

```
System was restarted by error - Software forced crash,
PC 0x12E0E8.
```

Wide–Area Networking

- TCP header compression does not work over Point–to–Point (PPP) interfaces. To work around, turn off ip tcp header–compression.

- With transparent bridging over a PPP link and stack compression enabled, you might occasionally see the message:

```
%LINK-3-TOOBIG: Interface Serialx, Output packet size
of yyyy bytes too big.
```

  Afterwards, PPP will not run, and a reload of the router is required.

- When authenticating to a peer using Password Authentication Protocol (PAP), the user-name password might be sent to a peer that is not authenticated. Currently there is no mechanism to disable outbound PAP.

Note

This problem may present a security risk.

Interoperability Caveats

Bridging

When using the DECbrouter 90 in a network with other Digital bridges, such as the DECbridge 90, DECNIS 600, LANbridge 150, or LANbridge 200, you should manually configure all bridges in the topology to use the IEEE spanning tree. The DECbrouter 90 implementation of "DEC" spanning tree, under specific conditions (if no "Epoch 1" bridges, such as the LB100 or other older versions of DEC spanning–tree only bridges, are present in the extended LAN), can cause these bridges to cycle continuously between "IEEE" and "DEC" modes as they attempt to determine which protocol is in use on the network. If you are uncertain wether or not this applies to your network, contact your support provider.

To configure the DECbrouter 90 to use the IEEE spanning tree, issue the following configuration command:

```
BRIDGE 1 PROTOCOL IEEE
```

DECnet Phase V

DECnet Phase V is the implementation of OSI specifications (ISO8473 CLNP, ISO9542 ESIS, and ISO10589 ISIS) and backward compatibility for DECnet Phase IV routing. You cannot mix DECnet Phase IV and Phase V nodes on the same LAN with the DECbrouter 90 and other Phase V Digital routers. Furthermore, you cannot interconnect Phase IV and Phase V nodes across a WAN circuit using the DECbrouter 90 and other Phase V Digital routers.

You can use the DECbrouter 90 with other Phase V Digital routers if the entire network is either all Phase IV or a pure OSI environment, but not both. In addition, there are no interoperability restrictions when using only DECbrouter 90 routers to interconnect Phase IV and Phase V nodes in a LAN/WAN network environment. Unlike the DECNIS 500/600 and other Digital Phase V routers, the DECbrouter 90 uses a different and incompatible method for interconnecting Phase IV and Phase V networks.

ATTENTION

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

ACHTUNG!

Dieses is ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

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