Chapter 1

Introduction

1.1 Overview

The CM5-HIPPI is a high-performance network interface that enables CM-5 applications to engage in high-speed data transfers with HIPPI-compliant supercomputers, workstations, and storage systems. Figure 1 shows an example of a CM-5 system with a CM5-HIPPI interface.

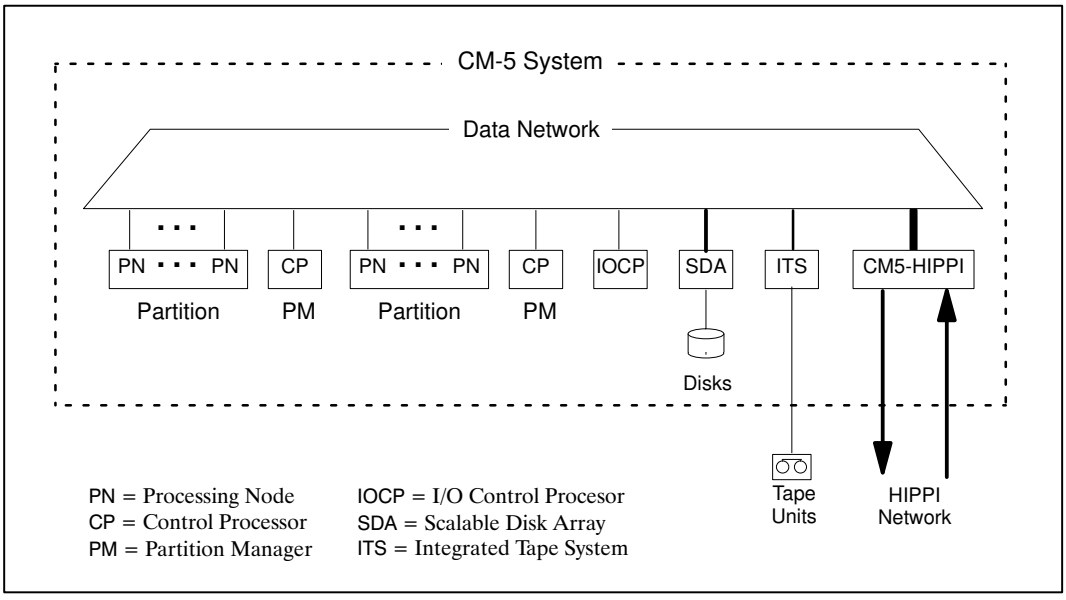

Figure 1. CM-5 system with CM5-HIPPI.

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The CM5-HIPPI is connected directly to the CM-5 data network (DR) and is viewed by the partition managers as a shared resource. Client software running on the partition managers interacts with a remote interface (RIF) server running on CM5-HIPPI hardware to manage the transfer of data between buffers in PN memory and the HIPPI network. This client/server mechanism allows any CM-5 partition to access any CM5-HIPPI interface. See Figure 2.

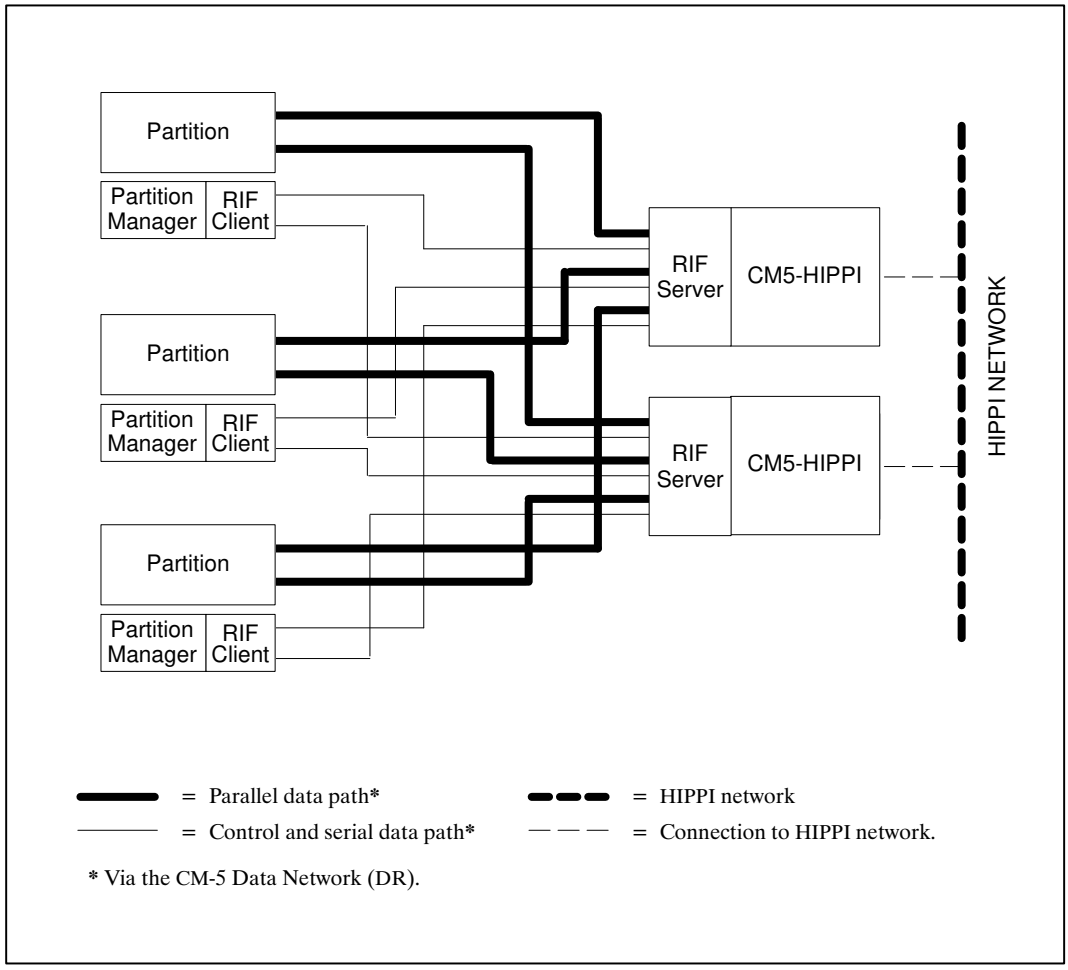

Figure 2. CM5-HIPPI as a shared resource.

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HIPPI-FP and HIPPI-PH transfers follow the datagram model. This is a packet-based communication mode in which the connection between the sender and receiver exists only for the duration of a single packet transfer. Packet control logic at the physical layer automatically establishes a new connection for each packet and breaks it when the packet transfer is done. This packet control is exercised entirely at the network interface level and is invisible to the application.

The partition manager's operating system is CMOST, an enhanced version of SunOS. This means CMOST provides all of the standard UNIX mechanisms for I/O, including sockets, pipes, character devices, block devices, and serial files. CMOST extends this UNIX I/O environment to support UNIX socket operations on parallel data. The extensions to UNIX I/O include

- new system calls for handling parallel socket I/O:

```
CM_send()
CM_recv()
CM_sendto()
CM_recvfrom()
CM_sendmsg()
CM_recvmesg()
```

- an enhanced MBUF mechanism to support parallel data types
- the new protocol stack to support HIPPI-PH and HIPPI-FP datagrams
- access to TCP/IP via the LE layer embedded in HIPPI-FP packets
- remote interface client (RIFC) software
- cm5ftp — an FTP application with extensions for transferring parallel data

A CM-5 application initiates CM5-HIPPI I/O via system calls to the appropriate socket primitives. CMOST supports calls for the standard 4.3 BSD primitives for creating, binding and connecting sockets, as well as for reading, writing, sending, and receiving serial and parallel data.

NOTE: This preliminary edition of the CM5-HIPPI User Guide focuses on HIPPI-FP and HIPPI-PH socket programming issues. Readers wishing to learn more about socket-based network programming are encouraged to read the Sun Microsystems *Network Programming Guide* or other UNIX networking documentation.

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