# CPCI Development System

## Overview

The CompactPCI® Development Systems available from Alta Technology are made up of one or more computational processing nodes utilizing Alta's family of CompactPCI (CPCI) Single Board Computers (SBC).


Alta's CPCI/SBC family implements Digital Equipment Corporation's Alpha 21164, the Pentium® and the StrongARM® processors in 6U single and dual slot CompactPCI formats.

CompactPCI technology takes advantage of readily available PCI silicon and packages it into a more rugged form factor. In addition, because CompactPCI boards are mounted vertically, CDS systems provide superior cooling and air flow. CDS systems are fully enclosed and can be rack mounted for maximum reliability and optimal use of floor space.

Multiple computational processing nodes are tied together in an asymmetrical, loosely coupled ring topology using arbitrated loop Fibre Channel or Fast Ethernet with crossbar switches utilizing Parallel Virtual Machine (PVM) software running under a Linux kernel. Gigabit Ethernet and Myrinet are also supported in this type of switched topology

## Processor Technology

The CPCI/SBC-A500™ takes advantage of Digital Semiconductor's 500 MHz 21164 Alpha microprocessor's high performance interface chipset to access main memory through a 256-bit memory bus and the 33MHz 64-bit PCI data bus. On-board and external memory caches for data and instructions insures unrivaled performance for compute intensive applications. Additionally, dedicated main memory of up to 1Gbyte per processing node provides for efficient processing of memory intensive applications.

Similar boards are available implementing Intel's Pentium and Digital's low power, high performance RISC processor, the StrongARM SA110.

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## Scalable Performance Benchmarks

| CPU's | 2 | 4 | 8 | 16 |
|---|---|---|---|---|
| SPECfp95* | 42 | 84 | 168 | 337 |
| BIPS | 4 | 8 | 16 | 32 |

* Extrapolated from 1 CPU results



## Interconnection Topology

Multiple processor nodes are connected using Fast Ethernet, Gigabit Ethernet or Myrinet. Each processing node has a standard 10/100 Fast Ethernet connection. This capability enhances the topology and allows for inclusion of outside hardware and software. The option of Gigabit Ethernet and Myrinet are also available.

## Standard I/O Devices

All CompactPCI Development Systems support a wide variety of standard peripheral devices such as:

- 2 EIDE connections
- 32-bit PMC for add-in PCI capability
- 2 serial and 1 parallel port
- Ultra Wide SCSI
- high performance video cards
- RAID disk subsystem

The PCI bus operates at 132Mbytes/sec at 33MHz.

## Software

Alta's CompactPCI Development Systems run Linux with either PVM (Parallel Virtual Machines) or MPI (Message Passing Interface), Windows NT™, FORTRAN and C.