

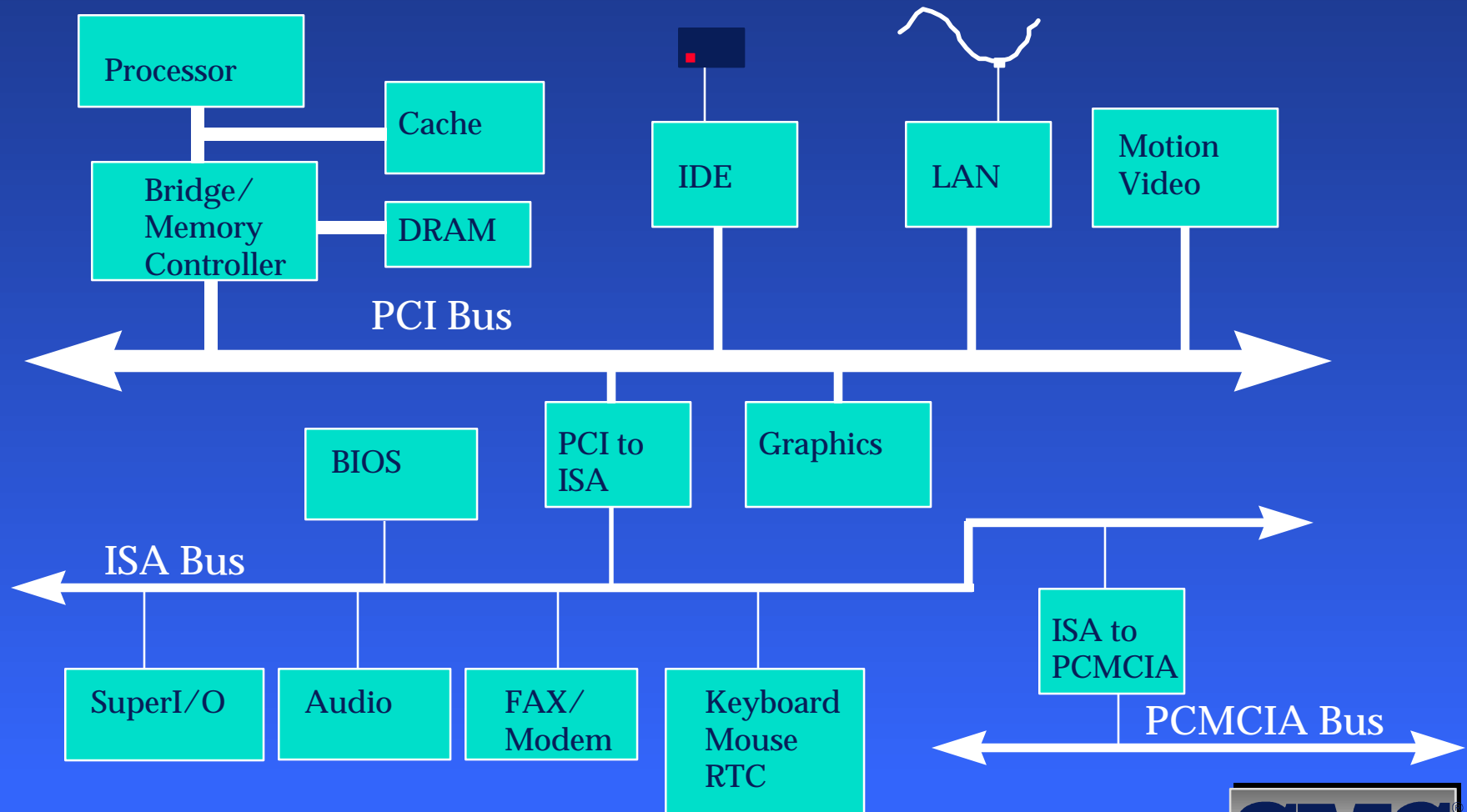
Preserving Legacy DMA's and IRQ's on the PCI Bus

SuperI/O Devices on the PCI Bus

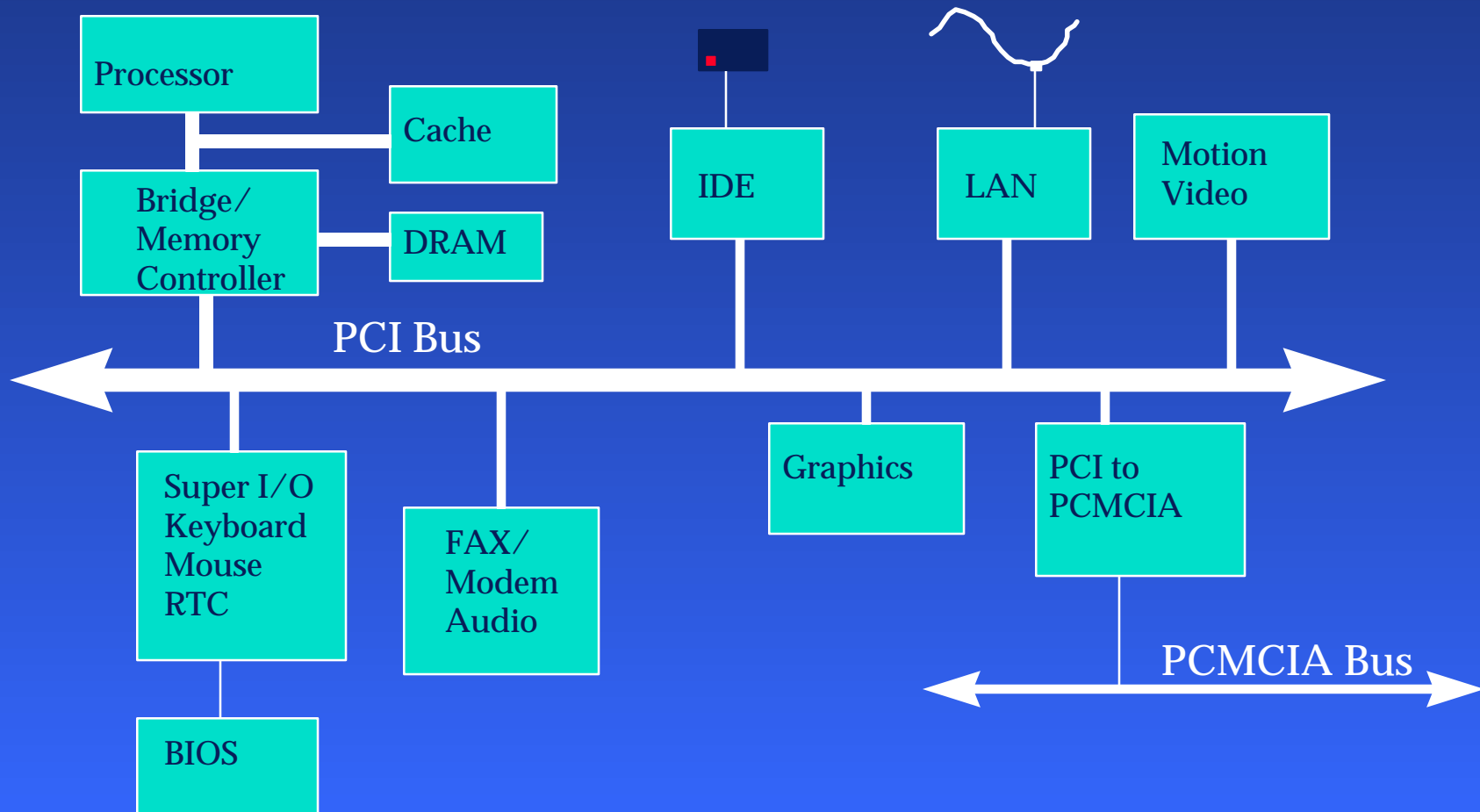
Richard Wahler
Manager
PC I/O Products



System of Today



System of Tomorrow



Benefits

- Faster Performance
 - ISA
 - » 720nsec
 - » 1.4 Mbytes/sec
 - PCI
 - » 60 nsec
 - 66 Mbytes/sec



Benefits

- Reduce System Cost
- Reduce Processor Usage
- Free PCI Bus Bandwidth



Devices Affected

- Floppy Disk
- Serial Ports
- Parallel Ports
- Sound Chips
- Modem/FAX



Issues

- Software Compatibility
 - Legacy DMA Support
 - Legacy IRQ Support
 - Legacy Addresses
- Transparent to Application Software
- Transparent to OS and BIOS



Solution

- Distributed DMA
- Serial IRQ



Distributed DMA

- One System DMA Master
- Multiple System DMA Slaves
- No Change to PCI Specification
- No Additional Pins Required
- No “Legacy Connector” Required



DMA Master

- Receives System Writes/Reads for Legacy DMA Addresses
- Re-Transmits DMA Information to the DMA Slaves
- Gathers Status Information from the DMA Slaves

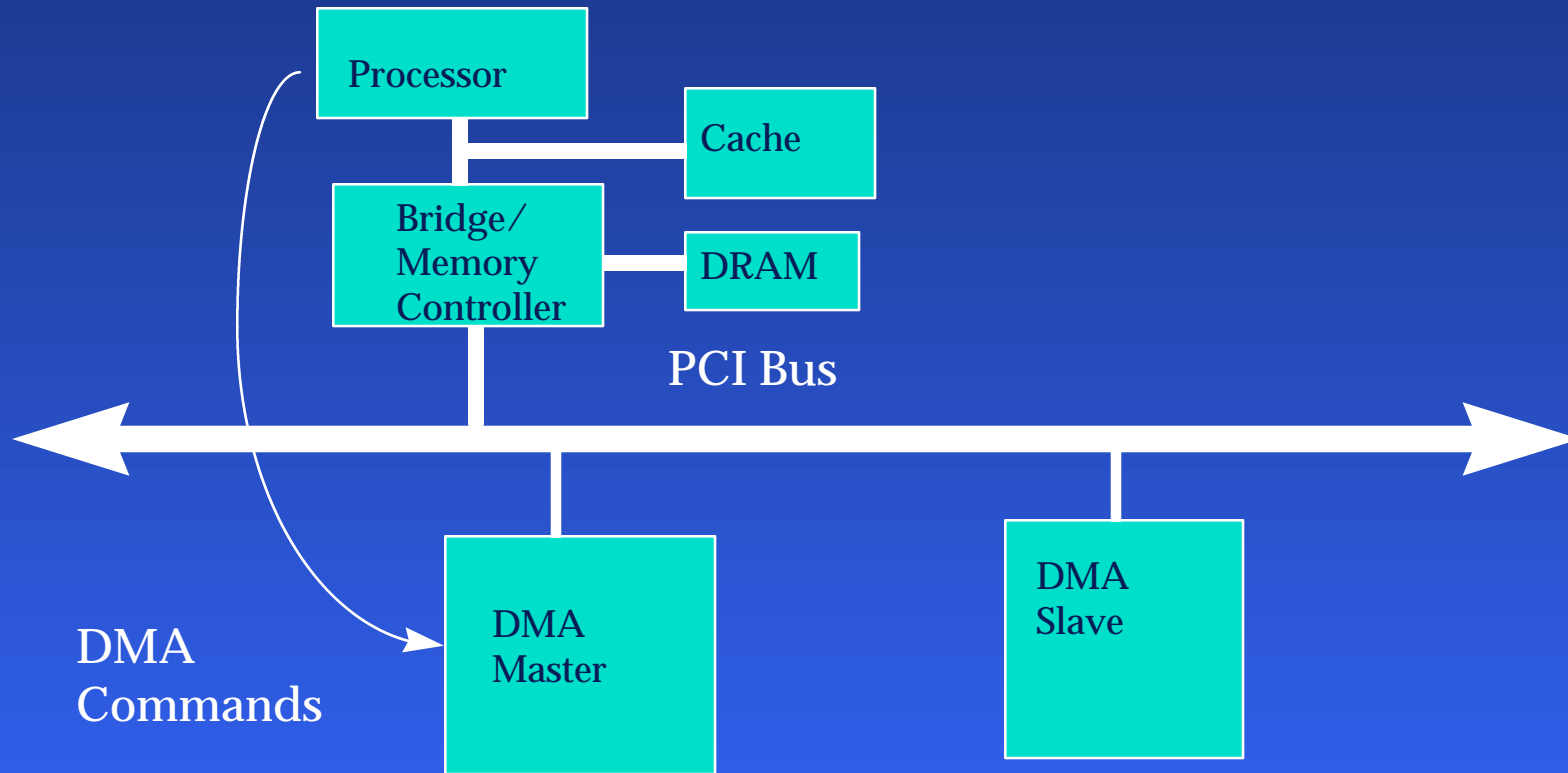


DMA Slave

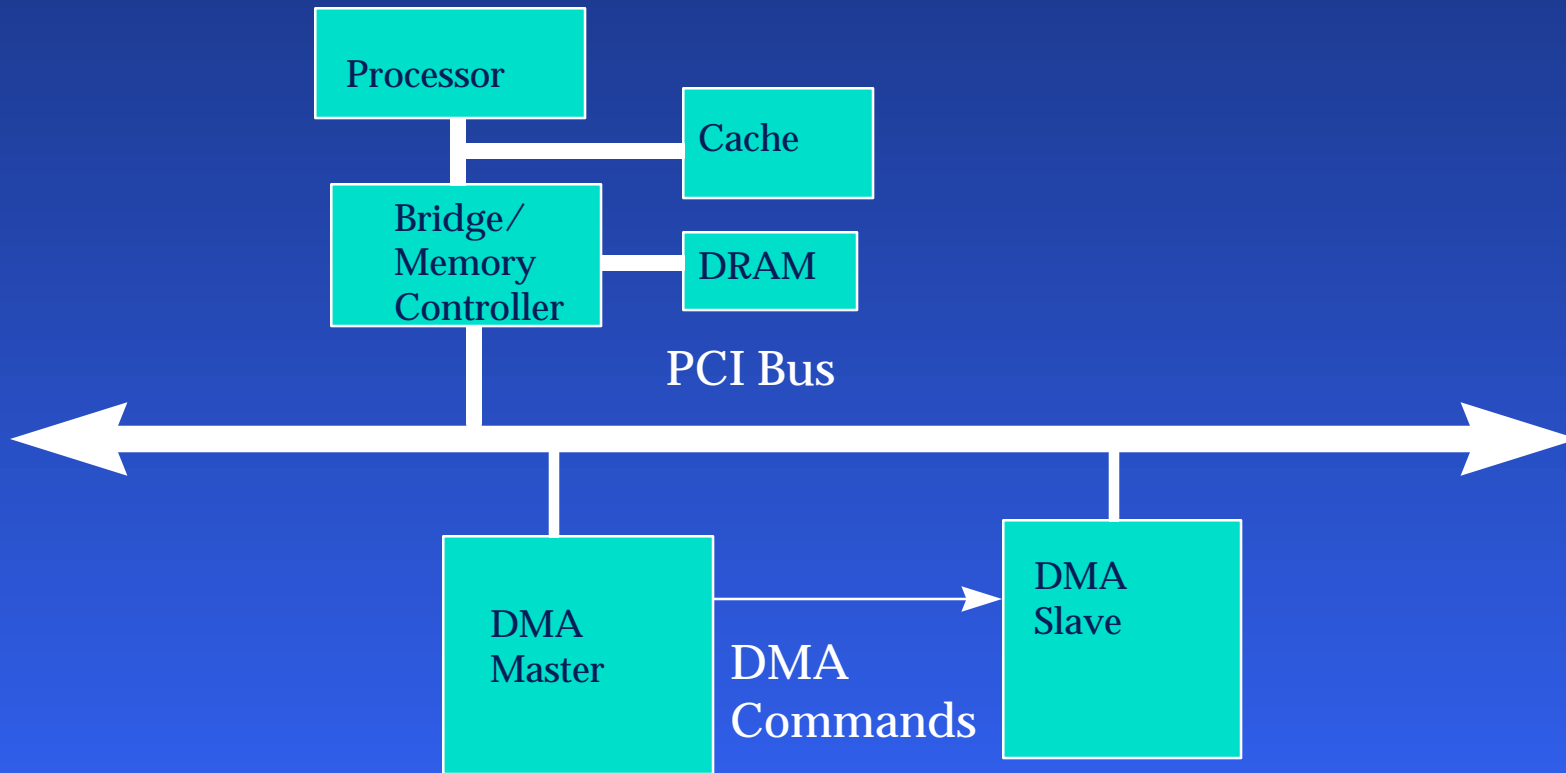
- Interfaces to DMA Master
 - Receives DMA Information
 - » Start Address
 - » Transfer Count
 - Provides DMA Status



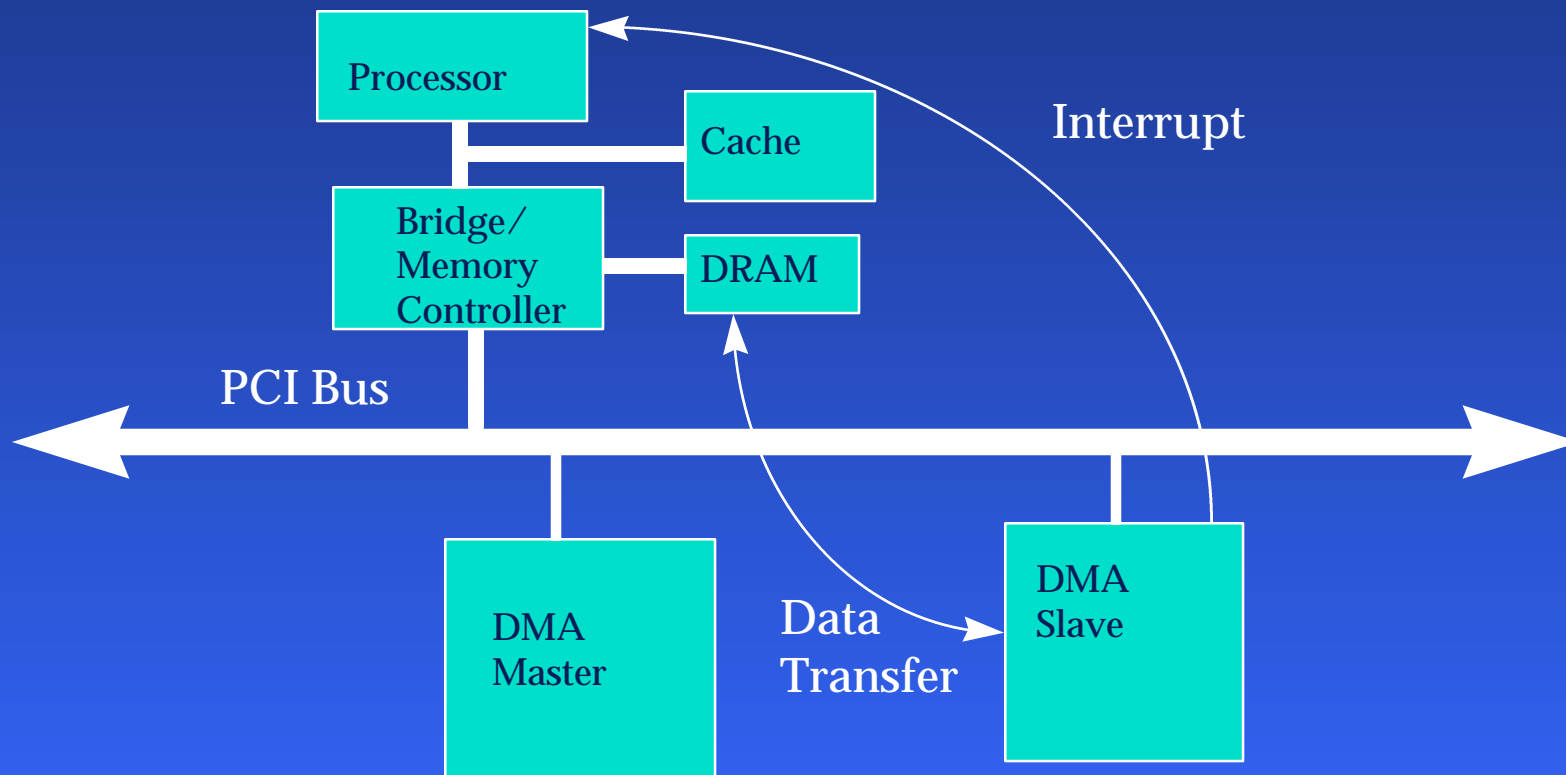
Legacy to DMA Master



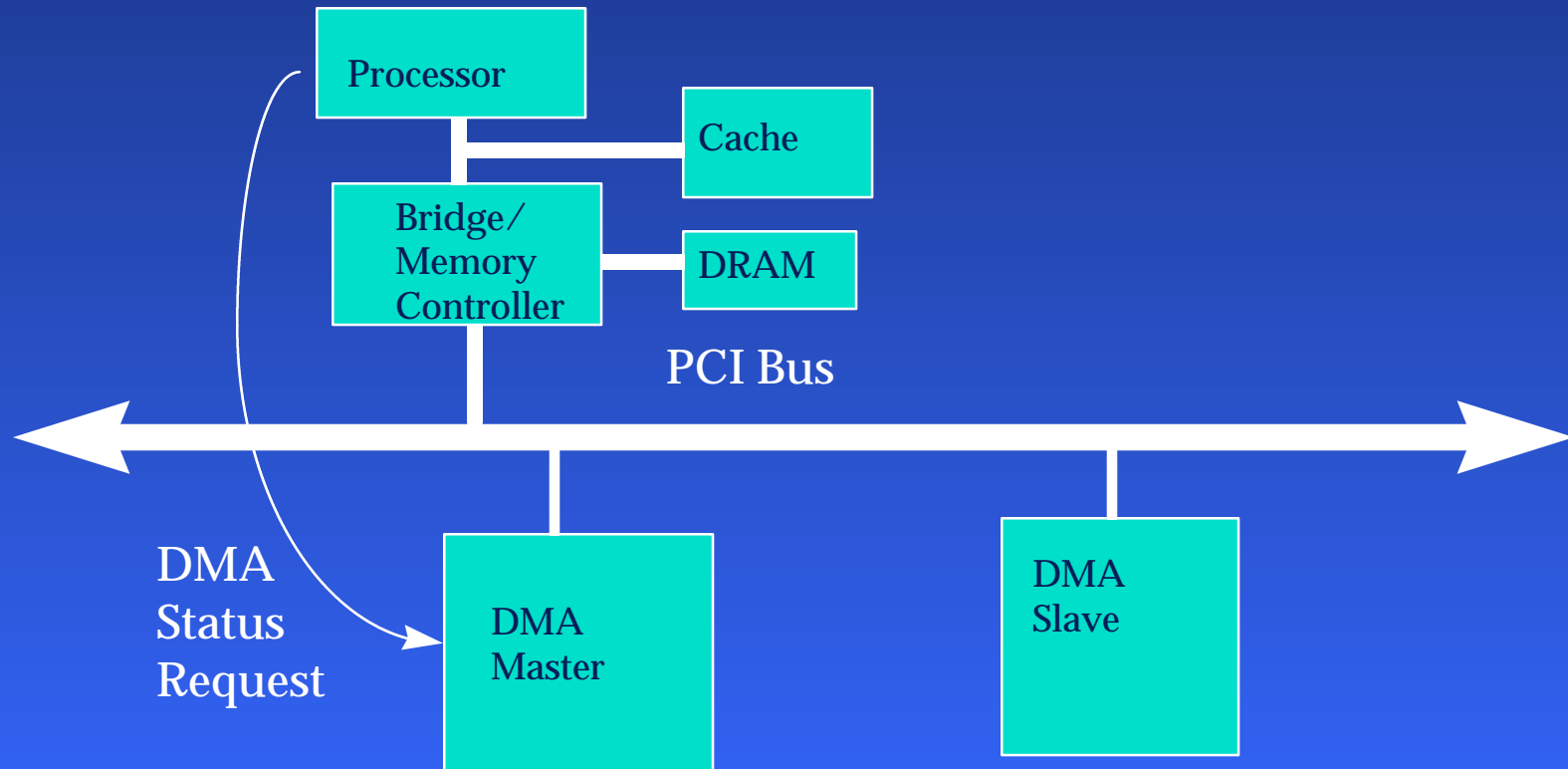
DMA Master to Slave



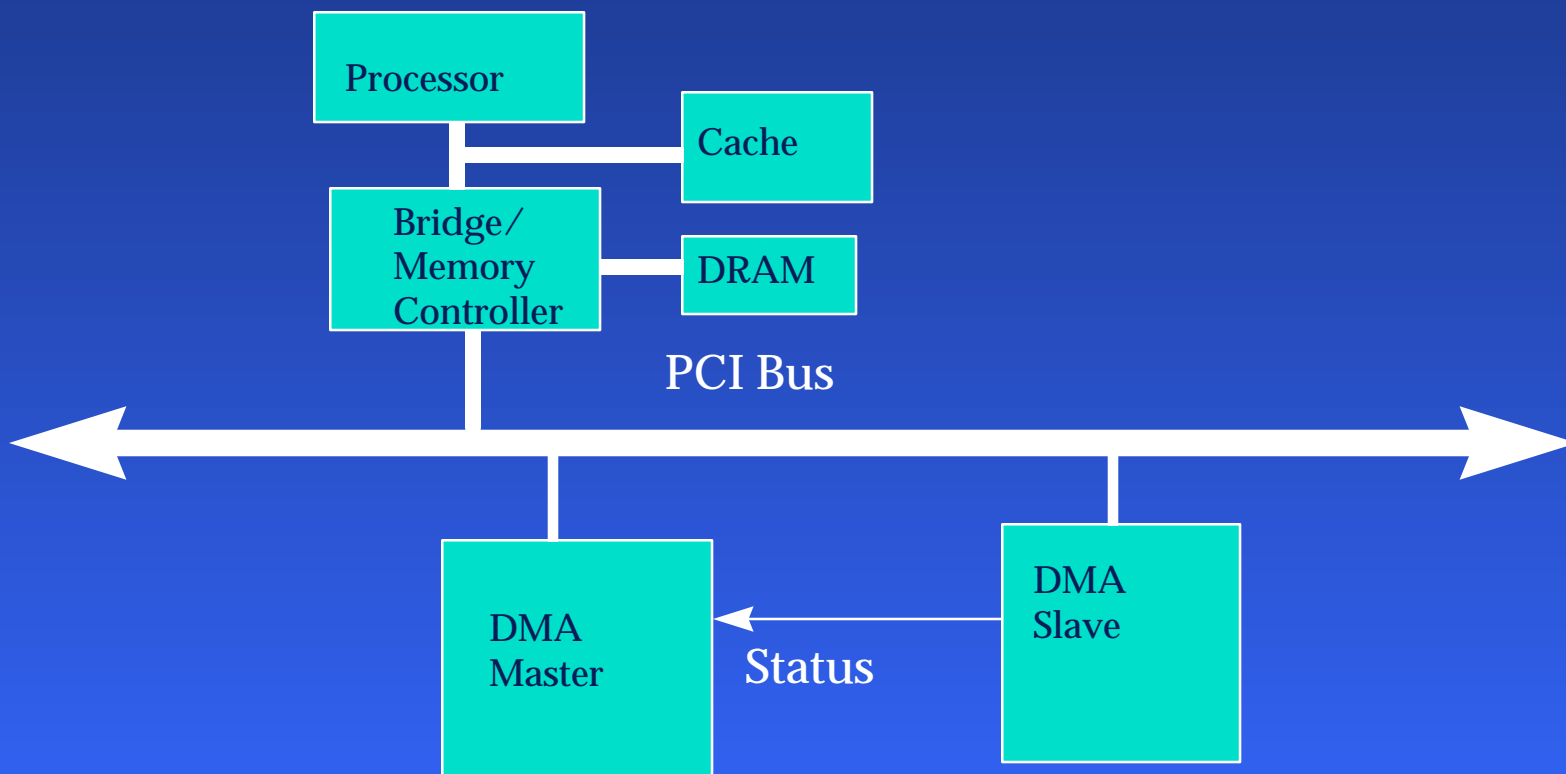
DMA Slave to Memory



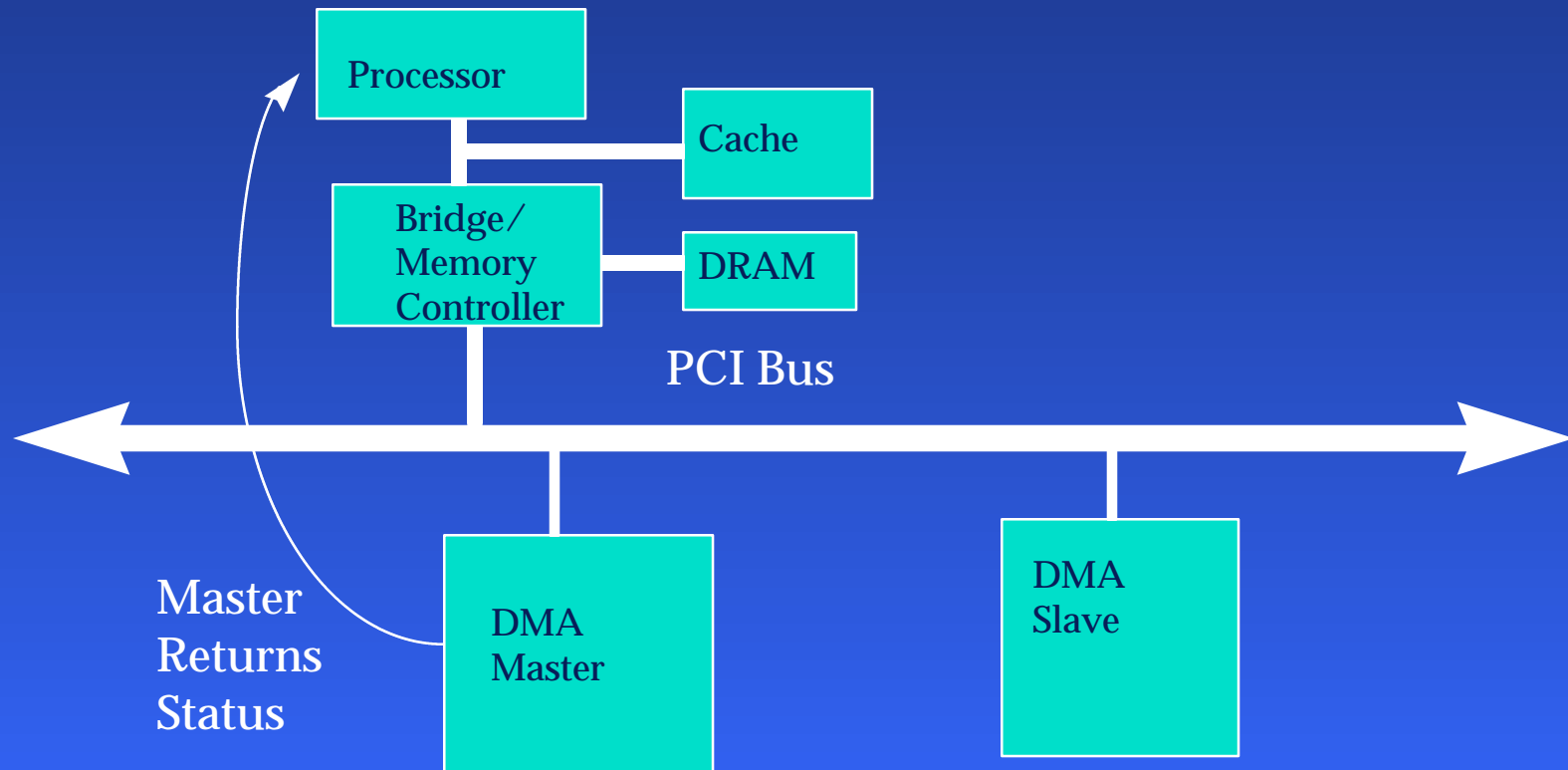
Legacy Status Request From Master



Master gets Status



Master Returns Status



DMA Slave

- PCI BUS Master
- Legacy Mode or ...
- Interface Directly to Software.
- 32 Bit Address Support
 - 4 Gigabytes
- 24 Bit Transfer Count
 - 16 Megabytes



Serial IRQ

- Time Multiplexed Signal
- 17 Standard IRQs
- Support for 32 IRQs

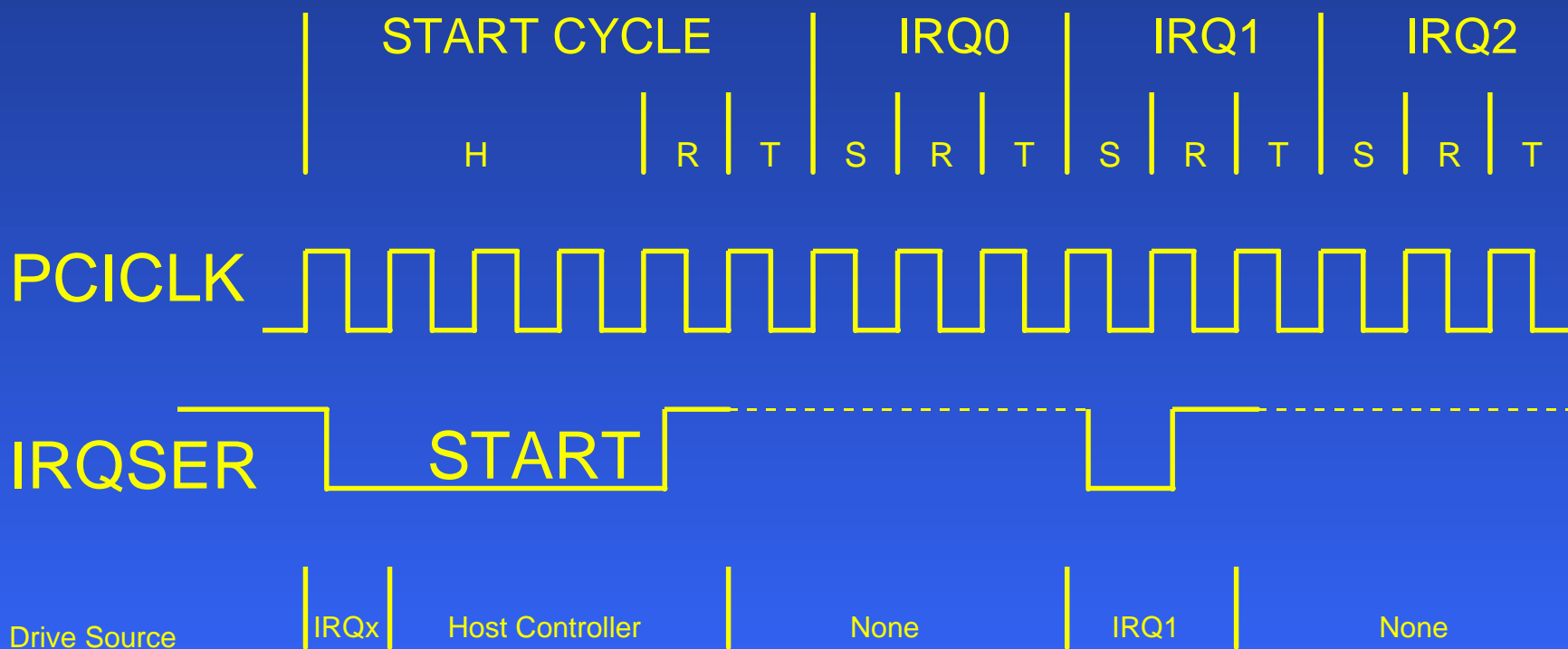


Serial IRQ

- Serial Transfer
 - When IRQ Status Changes
 - Started by any Device
 - IRQ Can be Shared



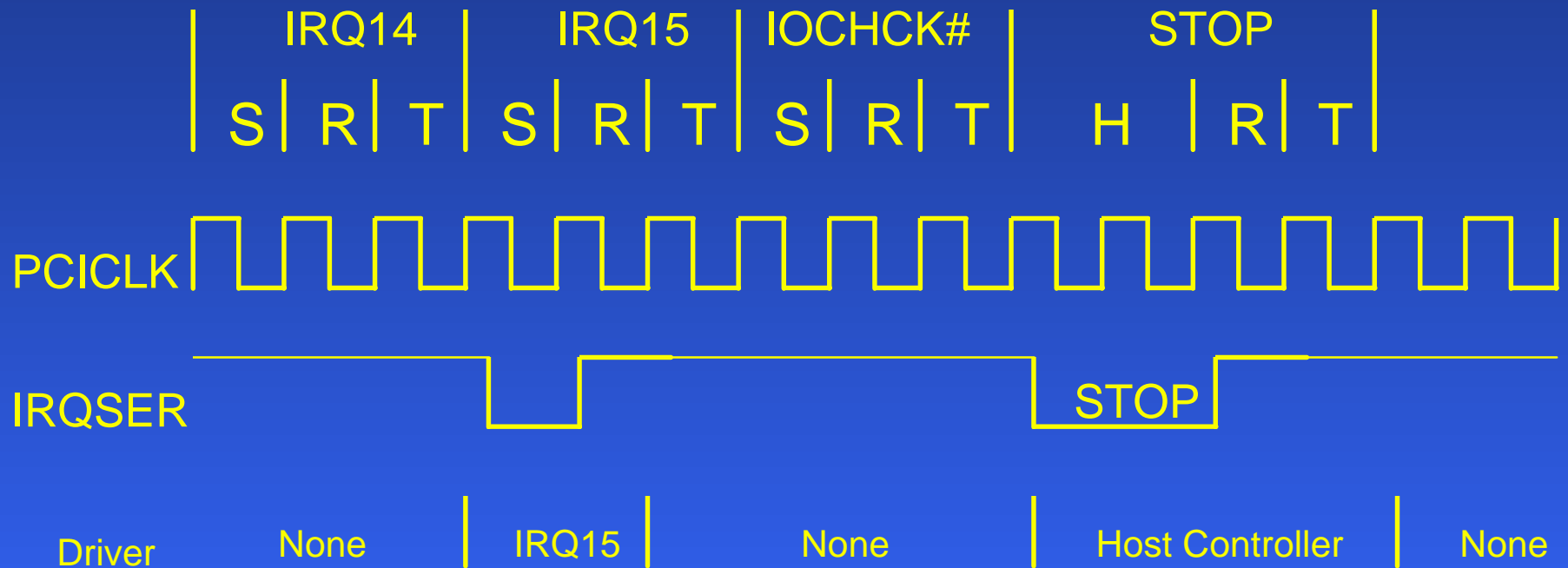
Start Cycle



H=Host Control; R=Recovery; T=Turn-around; S=Sample



Stop Cycle



H=Host Control; R=Recovery; T=Turn-around; S=Sample



Serial IRQ

- Low Latency
 - 55 to 100 PCI Bus Clocks
 - 1.5usec to 3usec
- Runs at the PCI Bus Clock
 - 33 Mhz Now
 - 66 Mhz Future



Open Specifications

- Available
 - SMC BBS 516-273-4936
 - [HTTP://www.smc.com](http://www.smc.com)

