

Texas Memory Systems

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Introduction

- Texas Memory Systems Inc.
- Product Line
 - ◆ Hardware
 - ◆ Software
 - ◆ Applications
- Questions, Feedback, and Discussion



Texas Memory Systems, Inc.

- High Bandwidth Specialists
delivering
- High Bandwidth Computing
with
- High Bandwidth I/O
for
- Over 20 Years



TMS Clients

- Army, Navy, Air Force
- DoD, NRO, NSA
- Boeing, Harris, Lockheed, Northrop, Raytheon, TRW
- Los Alamos , Oak Ridge, SwRI
- Princeton, SDSC, USC
- TI, IBM, Intel



TMS Products

- Data Acquisition and SSD
 - ◆ SAM-300
 - ◆ SAM-400
- Real-Time Processing
 - ◆ SAM-350
 - ◆ SAM-450
- Standard and Custom Interfaces
 - ◆ HIPPI, PCI, SBus, and more

Product Overview

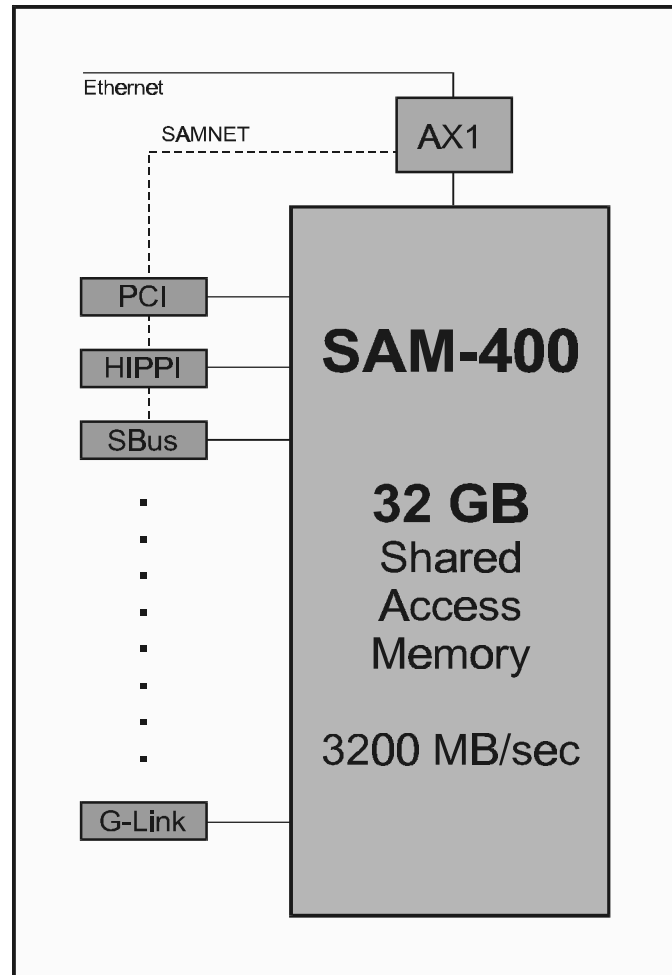
	SAM-300	SAM-400	SAM-350	SAM-450
Memory	12 GB	32 GB	12 GB	16 GB
Bandwidth	1200 MB/sec	3200 MB/sec	2400 MB/sec	6400 MB/sec
Processing	-	-	8 GFLOPS	30 GFLOPS
I/O Ports	8	12	12	12
Port Bandwidth	300 MB/sec	400 MB/sec	300 MB/sec	400 MB/sec
Height	10½"	15¾"	15¾"	15¾"



Applications

- Multi-channel Data Acquisition
- Solid-State Disk and Buffers
- Image Capture
- High-end Logic Analyzer
- Real-time DSP

SAM-400 Architecture





Multi -Channel Data Acquisition

- 12 IO Ports
- 3.2 GB/sec aggregate IO
- 64 GB storage
- Flexible Triggering

Special Interfaces

- 60 to 130 MHz
- 100 to 360 MB/sec
- Timecodes
- Synchronization



ELK 90 Interface

- 90 Mhz differential ECL
- 32-bit, dual 16-bit or dual 8-bit channels
- Data on demand

ECL 132 Interface

- 130 MHz ECL
- 8-bit or 16-bit channel
- Time Code
- Flexible Start/Stop



Standard Interfaces

- HIPPI (100 MB/sec copper)
- SBUS
- PCI
- VMEbus
- Ethernet



TMS Software

- Most host computers supported
 - ◆ Windows NT, solaris, irix, aix, OpenVMS, digital unix
- Simple, portable API
- Real-time run-time software
 - ◆ very low overhead
- Comprehensive Scientific Library
- GNU cross-compilers for AX, MCP

Image Capture

- Airborne image capture system
- Multiple input channels (100+ MB/s)
- Snapshots for several seconds
- Dump Images to RAID
- Start Acquiring again

Logic Analyzer Example

- 128-bit probe @ 125Mhz = 2GB/s
 - ◆ 2 SAM-300s
 - ◆ 8 WI80 (32-bits@62.5 MHz)
- Acquire for 8 seconds
- Display via attached workstation

Solid State Disk

- Disk Emulation
- Multiple Protocols
- Multiported
- Zero seek time
- 100 MB/sec and up
- Hierarchical storage

SSD Example

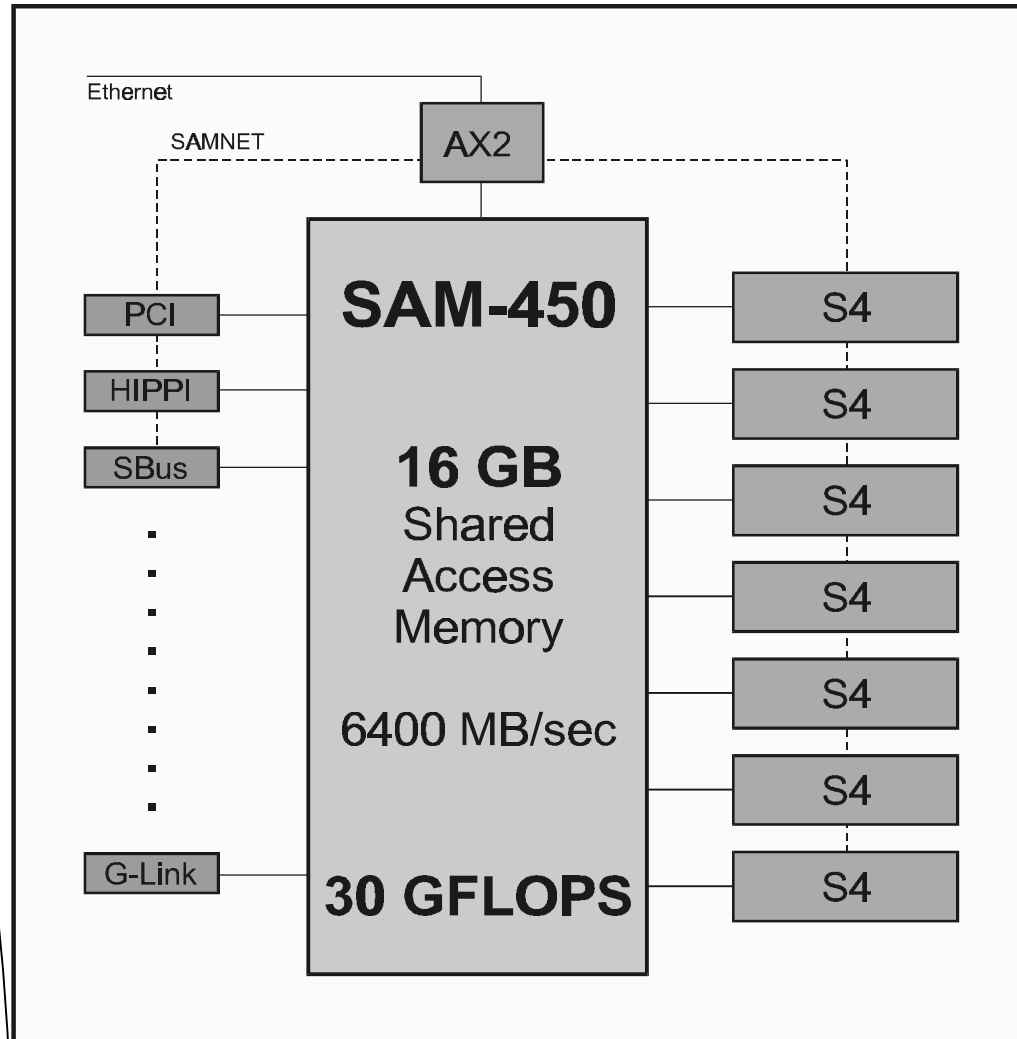
- SAM SSD is intelligent buffer between supercomputers
 - ◆ IBM SP/2 + HIPPI + IPI-3
 - ◆ Intel Paragon + HIPPI + FP
 - ◆ Cray T3E + HIPPI + FP
 - ◆ MAXSTRAT RAID + HIPPI + IPI-3*

* Third party

Real Time DSP

- Radar and Sonar Processing
- Interference Cancellation
- Signal Detection

SAM-450 Architecture





AX2 Scalar Processor (2 nodes)

- 500 MHz Alpha chip per node
- 256 MB SDRAM per node

S4 Scientific Processor (2 nodes)

- 4 GFLOPS
- \$6.25 per MFLOPS

Each S4 Node Can Do:

1K CFFT	31 μ sec
64K CFFT	2.7 msec
1M CFFT	52.6 msec
$[1K \times 1K]^2$ MMUL	1.4 sec
64K CDOTPR	656 μ sec
512x512 RFFT2D	10.1 msec

AX2, S4 Software

- AX2 nodes independently programmed
- Each AX2 controls several S4 nodes
- S4 scientific math library
 - ◆ 200+ optimized functions
 - ◆ simple function call API
- TRES+ real-time executive
 - ◆ Multi-tasking, semaphores, dynamic objects, etc..



Summary

- Gigabyte/Sec I/O
- Cost-effective Memory Technology
- High-throughput Systems
- Processors Optimized for DSP
- Low-overhead Software
- Excellent Customer Support