

The IRAM Demo Board

James Beck

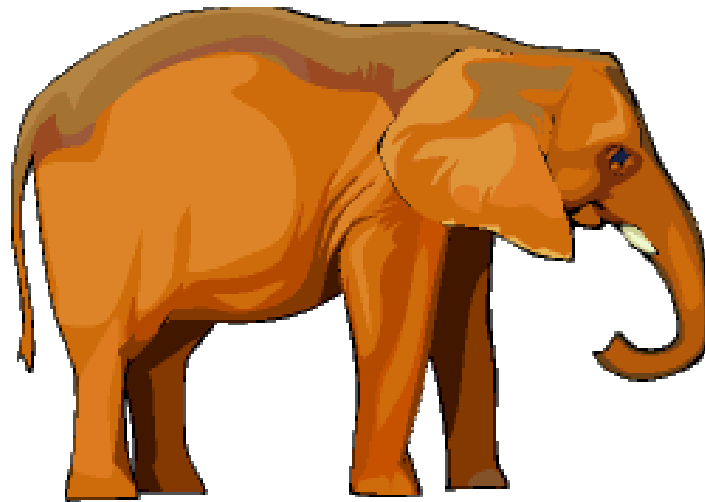
Granlibakken

January 13, 2000

Why Build Demo Hardware?

- Good proof of correct design
- Puts constraints on chip designers
- Best way to discover some things
- System design teaching tool
- Gee-whiz factor
- PR

What is it?



Many Requirements, Little Consensus

- Chip Testbed
- Media Benchmark Cruncher
- CHI* Demonstrator
- Simple Array Computer
- PDA Proof-of-Concept

* Or HCI

Chip Testbed

- Socketed IRAM
- Easy probing
- Debug signals available
- Adjustable frequency
- Adjustable voltage
- Thermal control

- Dull demo

Media Benchmark Cruncher

- MPEG test sequences
- Speech recognition kernels
- Graphics rendering

- Non-realtime
- No human interface

CHI Demonstrator

- Audio I/O
- Realtime video I/O
- Dedicated display
- Large disk
- Ethernet

- Non-portable
- Not IRAM-specific

Simple Array Computer

- Easy network interconnect
- Dense packaging (DIMMs)

- Heat removal
- Not interactive

PDA Proof-of-Concept

- Standalone device
 - Touch screen
 - Microphone & speaker
 - Internal camera
-
- Oversize packaging
 - External battery

Common Requirements

- Direct debug access to IRAM
 - JTAG-based
 - Connected to host PC
 - For code, data & control
- Standard MIPS bus
- Unified develop/test/debug software environment

Many Requirements, Three Solutions

- Chip Testbed
- Media Benchmark Cruncher
- CHI Demonstrator

- Simple Array Computer

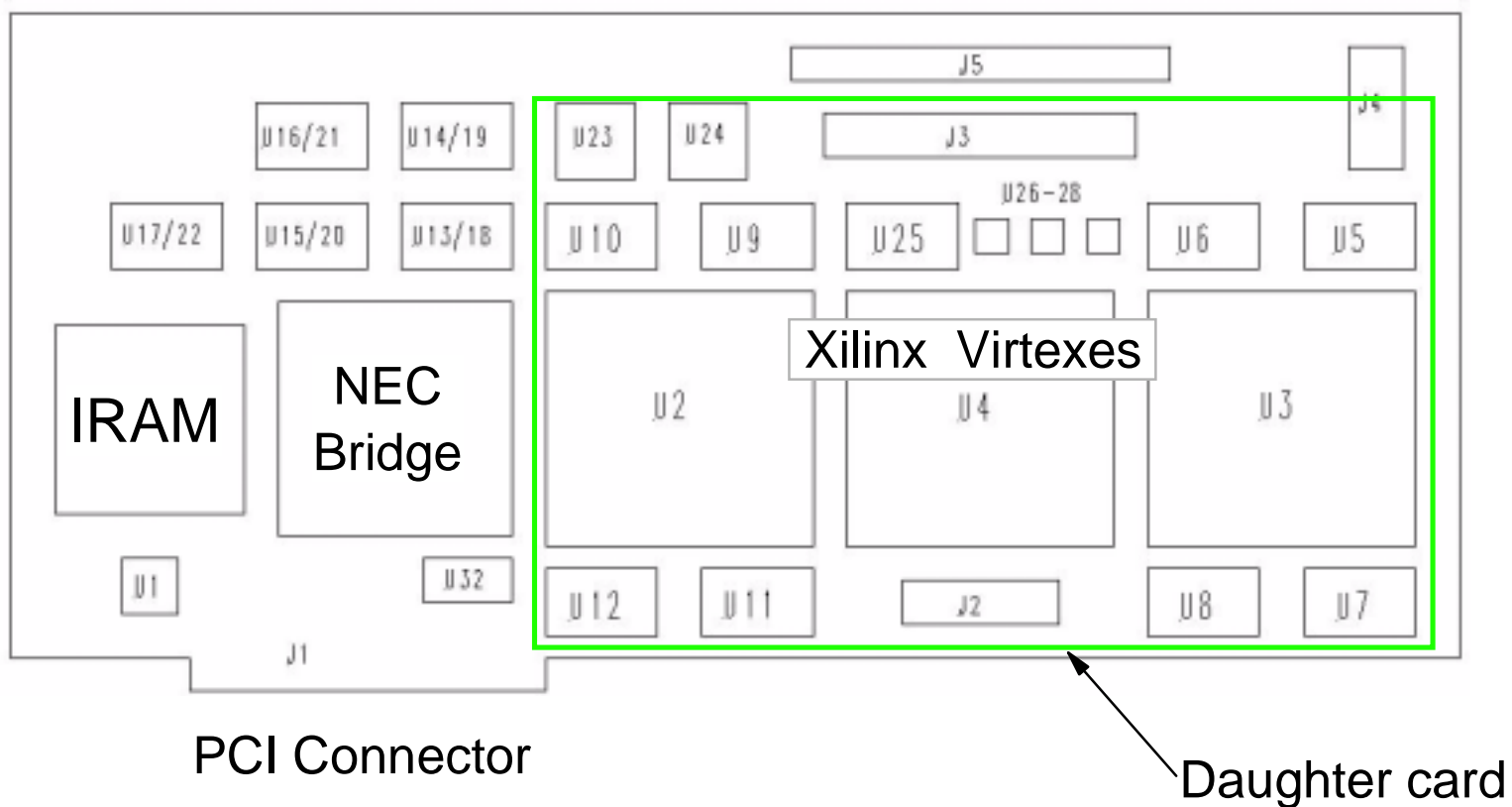
- Handheld Proof-of-Concept

Who Does What?

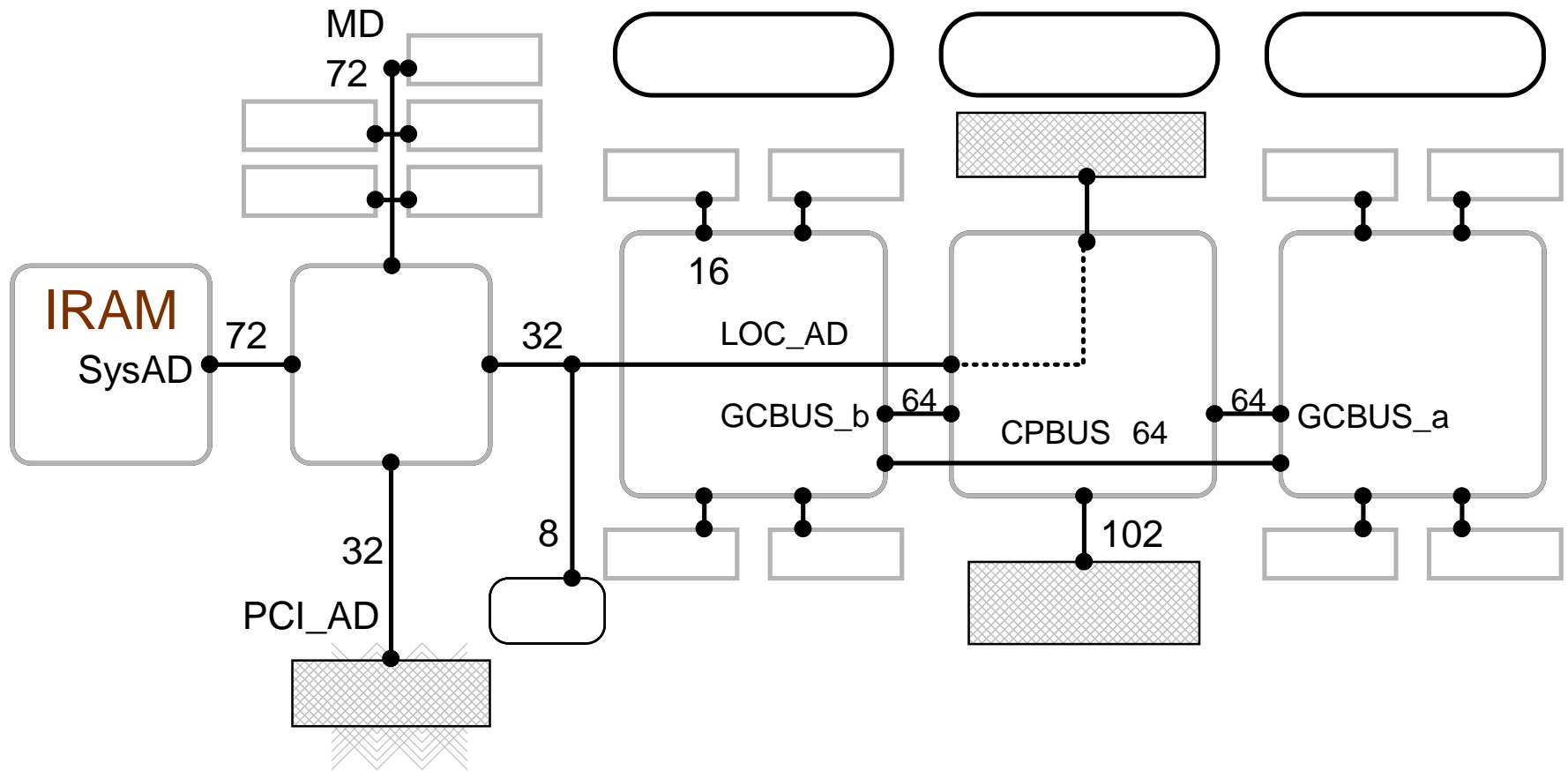
- SCOREboard: BRASS
- Smart DIMM: IRAM
- SpeechCorder: ICSI

~~SCOREboard~~ Layout

IRAM Demo Board



Data Paths



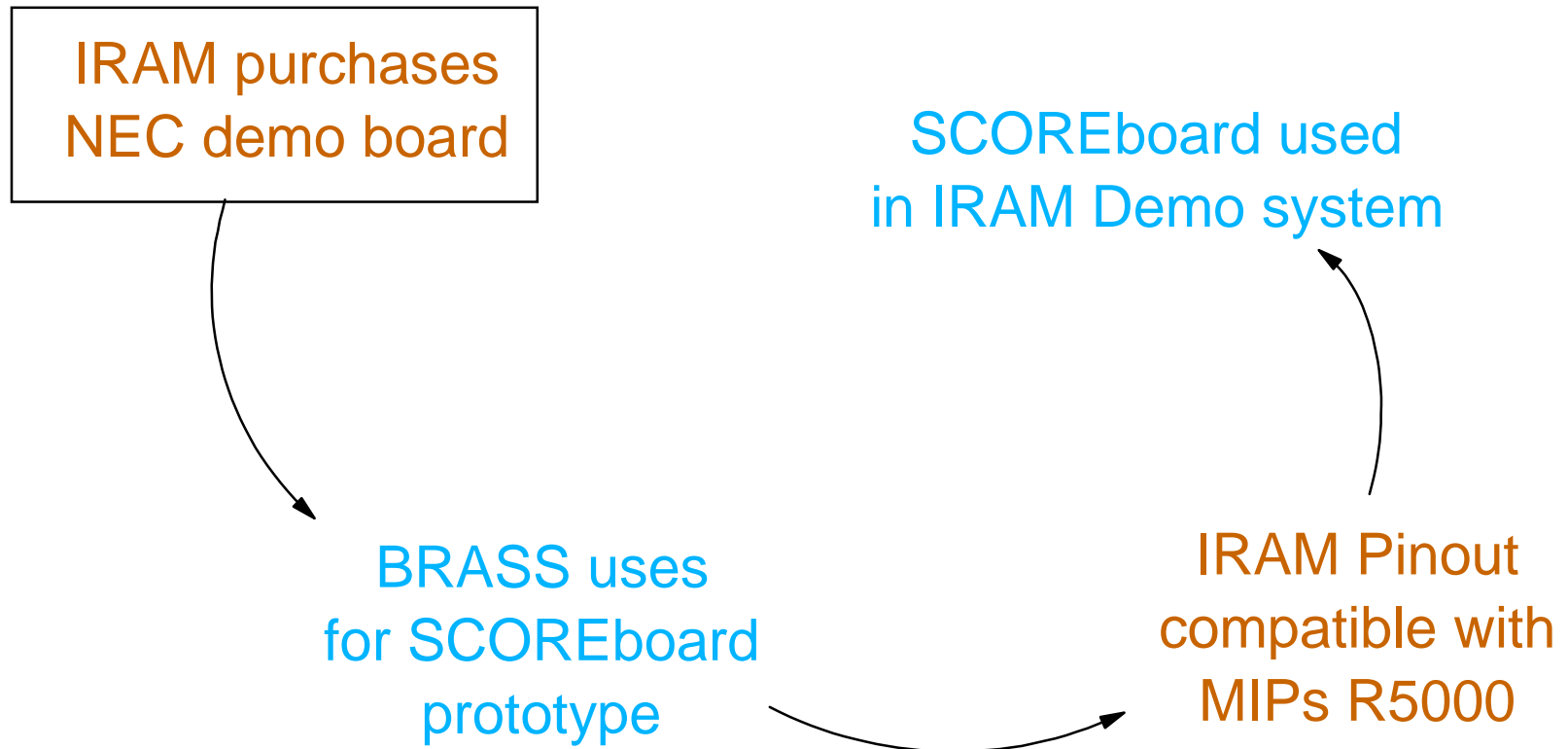
Why Use the SCOREboard?

- NEC Bridge chip is our 1st choice
- Daughter card allows expansion
- Virtexes don't get in the way
- Hardware effort already underway
- Shared effort for software
- Economies of scale 😊

Why **Not** Use the SCOREboard?

- Hardware overkill
- Constrains IRAM pinout

What Goes Around...



Demo Boards Schedule

Provisional

- SCOREboard: 3/00
- Tapeout IRAM: 4/00
- Fab IRAM: 6/00
- Smard DIMM: Q3/00
- SpeechCorder: Q4/00