Status and Plans for GRAPE-5 and GRAPE-6

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Status of GRAPE-5

- GRAPE-5 is now in existence, thanks to Atsushi Kawai.
- Prototype GRAPE-5 system with 4 GRAPE-5 chips has been working since October.
- Production system will be ready by early summer this year

The GRAPE-5 prototype board

The board is in Room 16-825 now.

GRAPE-5 compared to GRAPE-3

- Improved calculation speed (8× per chip)
- Improved communication speed (> 50MB/s using PCI)
- Improved accuracy (5 bits → 8 bits)
- Support for periodic boundary condition (programmable force cutoff)
- Larger memory for the neighbor list?

GRAPE-5 Availability

- Contact Intertek for quote and delivery date...
- First delivery in this summer (I hope)
- Price/board $\sim$ 15k\$ (plus handling fee of trading company, plus ...)
- Host requirement: PCI interface.
- Recommended host: DEC (Compaq) Alpha with Digital UNIX.

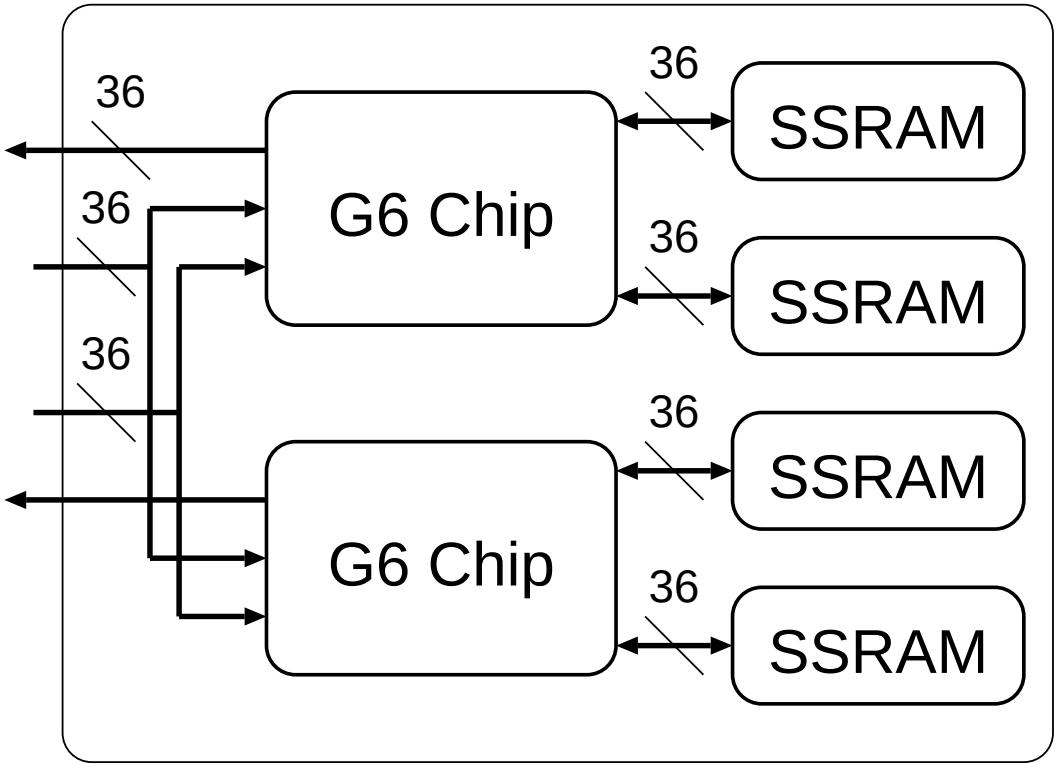
GRAPE-6

- Successor of GRAPE-4
- Improved calculation speed ($> 70\times$ per chip)
- Peak speed $>$ 200Tflops
- Improved communication speed ($>$ 2GB/s)
- Support for periodic boundary condition
- Chip design complete (sample by Feb 15th)

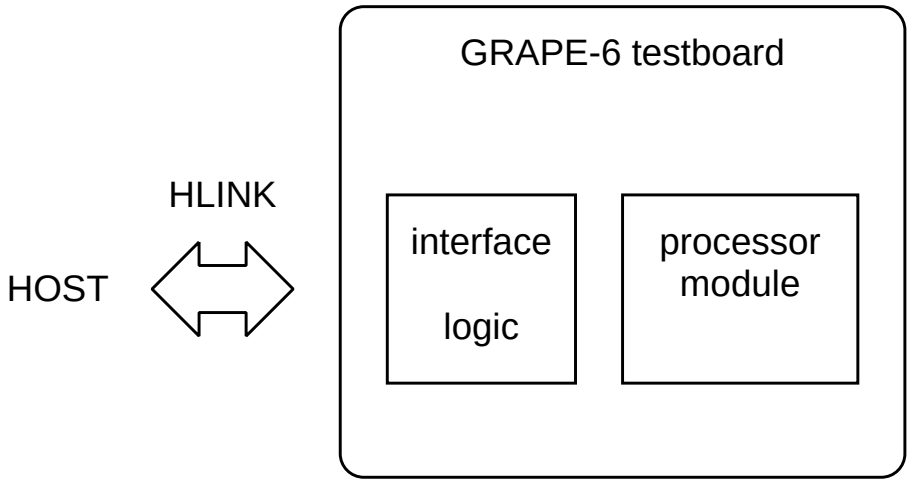
GRAPE-6 Processor Chip

- 0.25 μm custom design (IBM SA-12, 1.8M gates)
- 2.5 V power supply, 100 MHz operation (worst case)
- 6 pipelines in a chip
- $>$ 30 Gflops (equivalent) per chip
- system clock: 25 MHz
- Single chip equivalent to single GRAPE-4 board

GRAPE-6 processor module

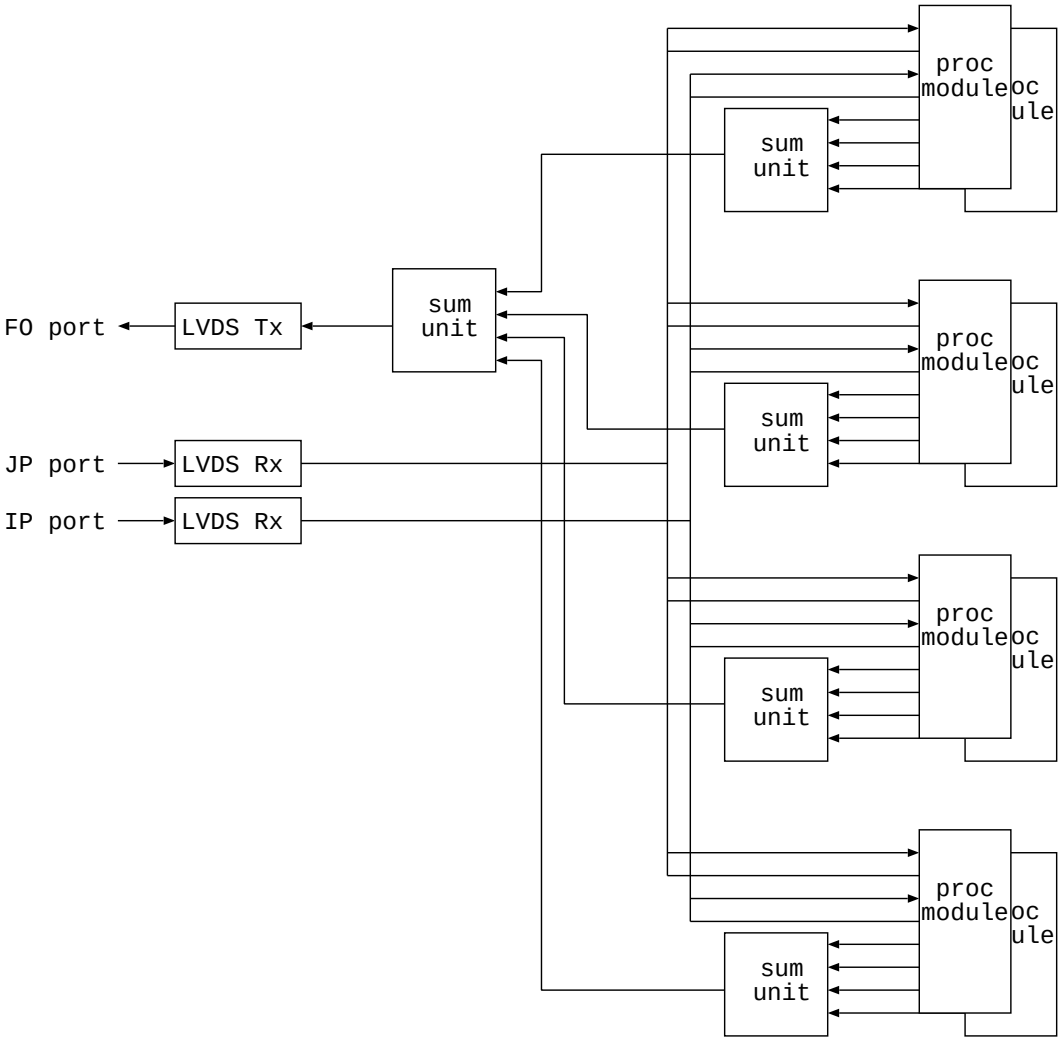


A "baby" GRAPE-6



- Single module with PCI interface
- PCI interface same as GRAPE-4/5
- Hopefully be working by March?

A GRAPE-6 "junior"



- Single board with 16-chips

A GRAPE-6 "junior" (continued)

- New and faster PCI interface with 64-bit PCI support
- 500 Gflops/board
- Plan for commercial availability by 2000-2001
- Price unknown... (need to negotiate with Big Blue)

Summary

- **GRAPE-5 is now completed and will commercially available *soon***
- **"Baby" GRAPE-6 will be completed pretty soon.**
- **GRAPE-6 "junior" will hopefully be commercially available in 2000-2001.**

List of GRAPEs...

Hokkaido University	GRAPE-3A	3
Tohoku University	GRAPE-3A	2
Yamagata University	HARP-2	1
National Astronomical Observatory of Japan	GRAPE-3A	3
Tokyo Institute of Technology	HARP-2	1
Tokyo Institute of Technology	GRAPE-4	1
University of Tokyo (Hongo, Tokyo)	GRAPE-3A	12
University of Tokyo (Komaba, Tokyo)	GRAPE-4	36
Science Museum of Japan	GRAPE-3A	5
Kobe University	GRAPE-3A	1
Kyoto University	GRAPE-3A	1
ETL	MD-GRAPE	1
RIKEN	MD-GRAPE	1
Indian Institute of Astrophysics (??, India)	GRAPE-3A	2
Max Planck Institute for Astronomy (Heiderberg)	GRAPE-3A	8
Max Planck Institute for Astronomy (Munich)	GRAPE-3A	5
Max Planck Institute for Astronomy (Garching)	GRAPE-3A	1
University of California at Berkeley (Berkeley, CA)	GRAPE-3A	1
University of Heiderberg (Heiderberg)	HARP-2	1
University of Victoria (?, Canada)	GRAPE-3A	2
University of Wales (Cardiff, UK)	GRAPE-3A	1
Gyeongsang National University (?, Korea)	GRAPE-3A	1
University of Arizona (Tuscon, Arizona)	GRAPE-3A	3
IoA	GRAPE-3A	5
IoA	GRAPE-4	1
IoA	HARP-2	1
University of Leiden (Leiden)	GRAPE-3A	1
University of Sternwarte (Goettingen)	GRAPE-3A	1
Drexel University (Philadelphia)	GRAPE-4A	1
Indiana University (Bloomington, Indiana)	GRAPE-4A	1
Marseille Observatory (Marselle)	GRAPE-4A	1
Marseille Observatory (Marselle)	GRAPE-3A	6
Edinburgh University (Edinburgh)	GRAPE-3A	1
Kiel University (Kiel)	GRAPE-3A	1
Princeton University (Princeton)	GRAPE-3A	1
Columbia University (New York)	GRAPE-3A	2