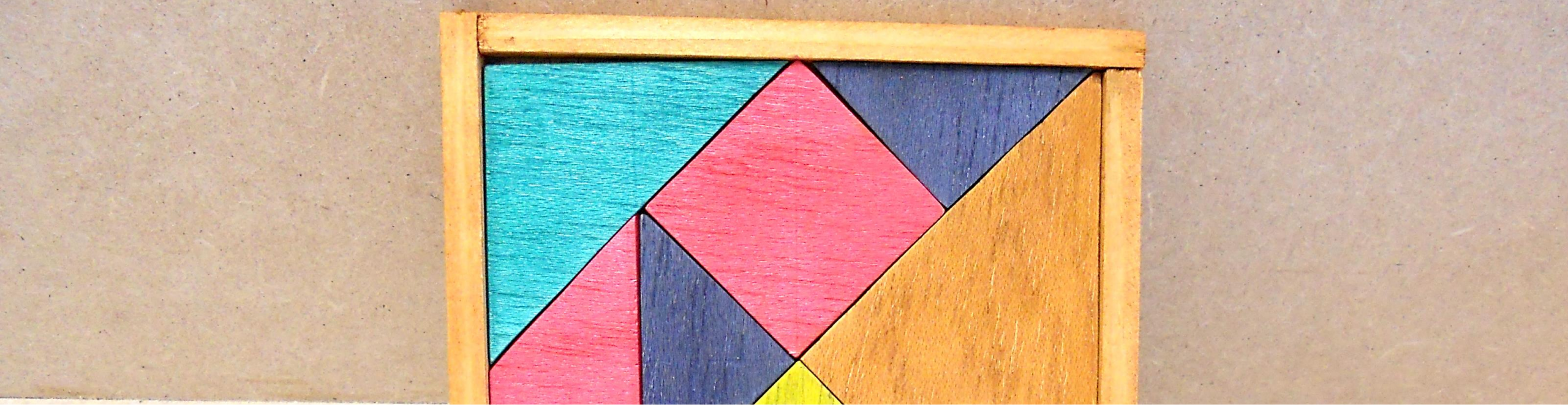


Tangram: Integrated Control of Heterogeneous Computers

Raghavendra Pradyumna Pothukuchi, Joseph L. Greathouse, Karthik Rao, Christopher Erb, Leonardo Piga, Petros Voulgaris, Josep Torrellas

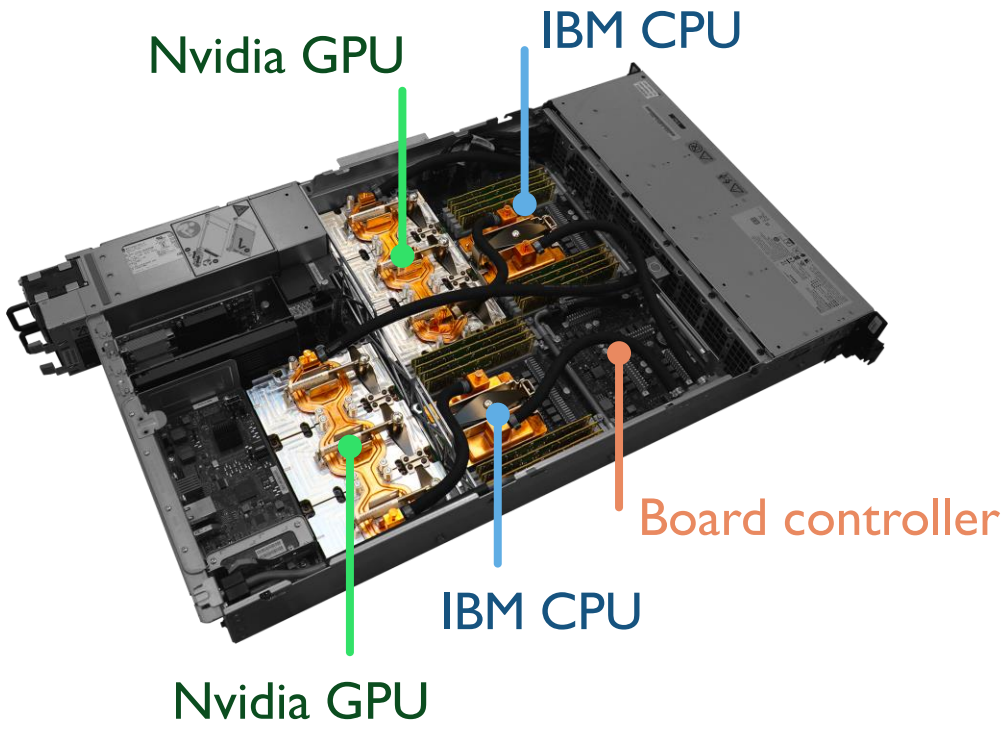
ILLINOIS AMD

International Symposium on Microarchitecture (MICRO), October 2019

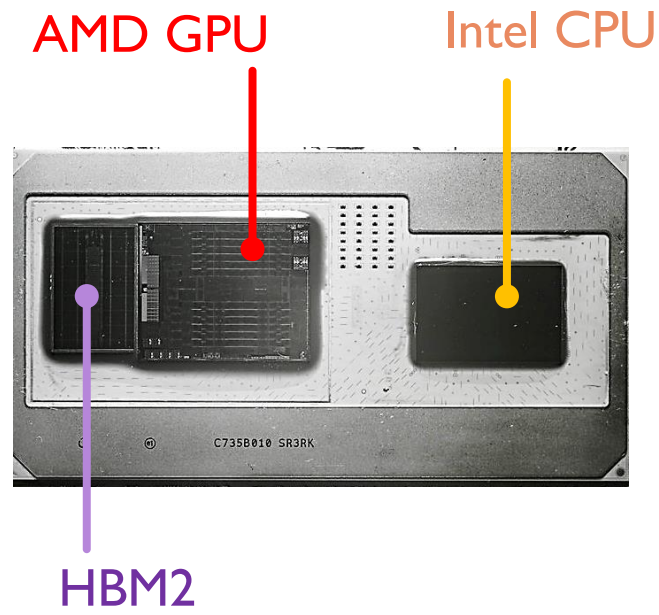
Session III B 5:10 PM, Monday

Heterogeneity Comes With Modularity

Heterogeneous computers are integrated from independent subsystems



(Image courtesy: NVIDIA)



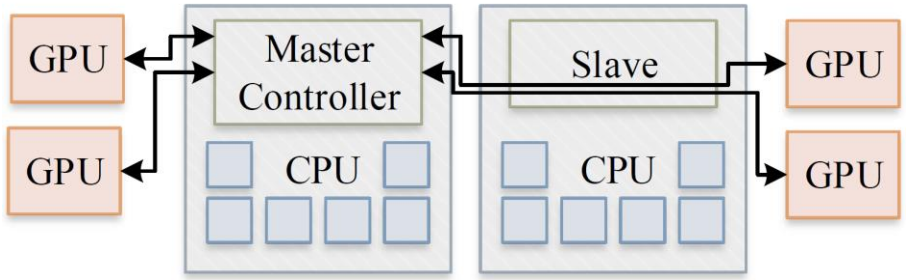
Challenge: System-wide efficiency with distributed resource control

State-of-the-Art Resource Controllers

Limitation 1: Many heuristic algorithms

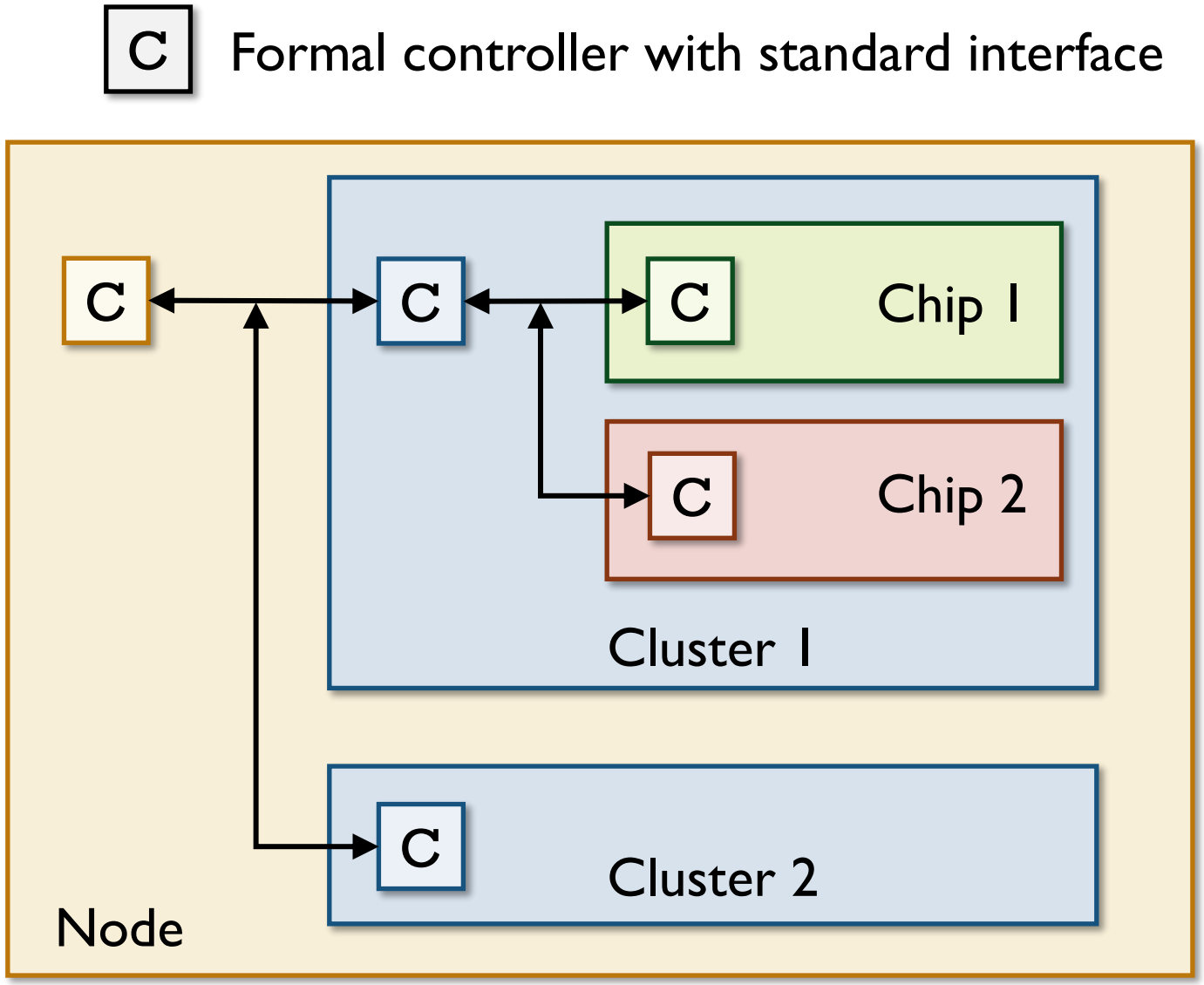
Conflicting, ineffective and little reuse

Limitation 2: Centralized control



Slow, non-modular and ineffective

Tangram: Fast, Modular and Coordinated

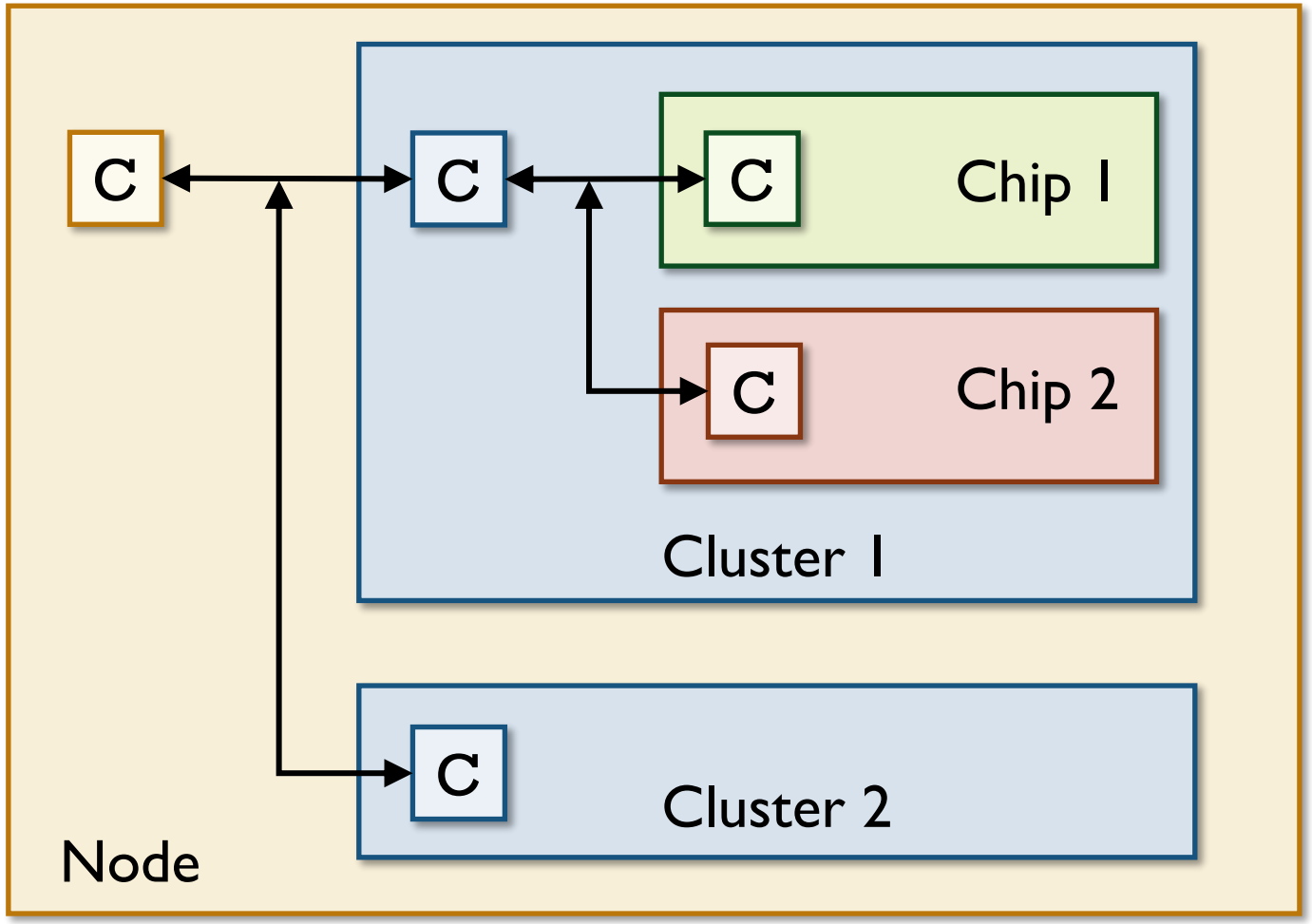


Tangram: Fast, Modular and Coordinated

C Formal controller with standard interface

Real system prototype

32% faster
13% lower energy



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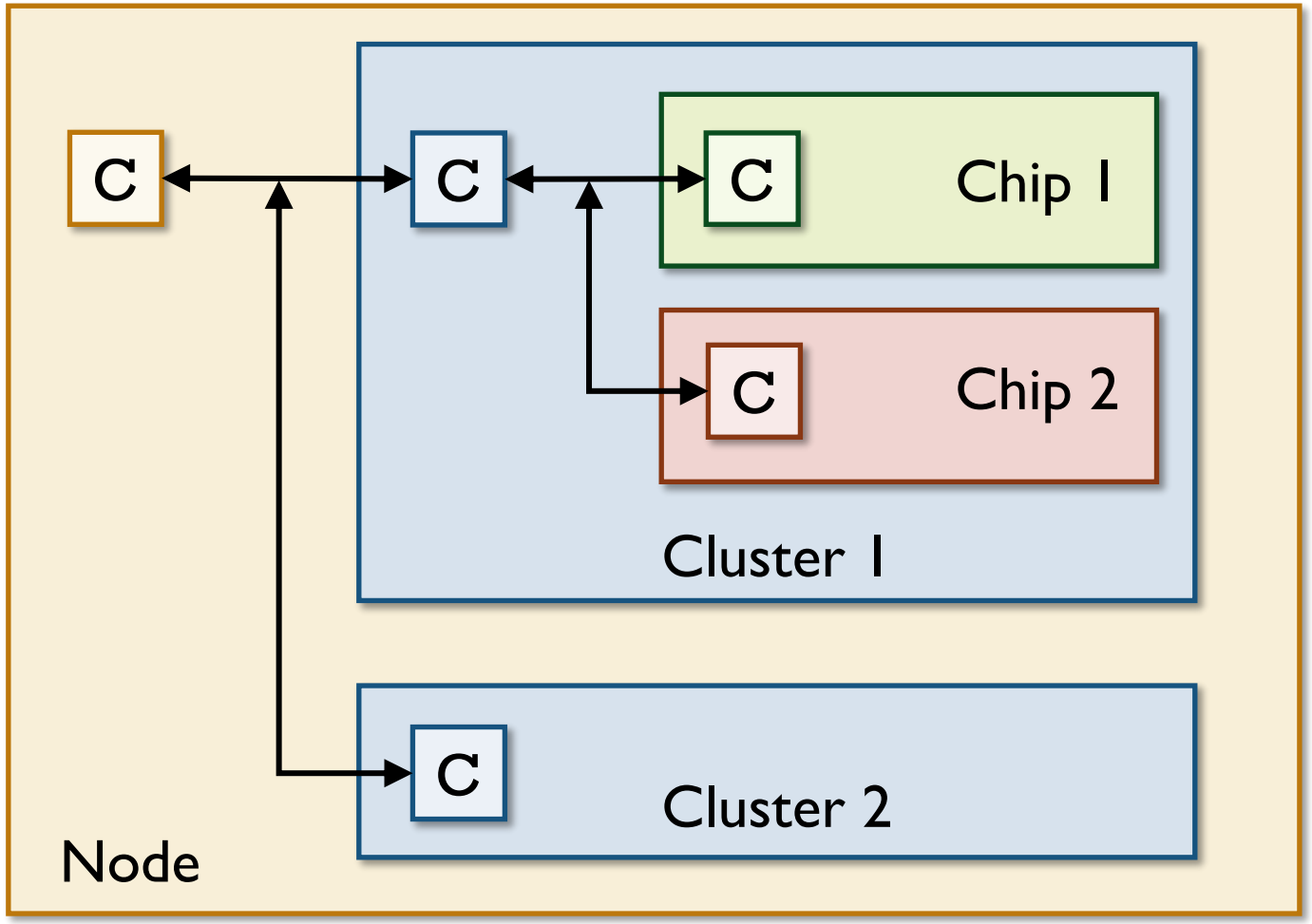

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