

CLOUDS-ON-A-CHIP

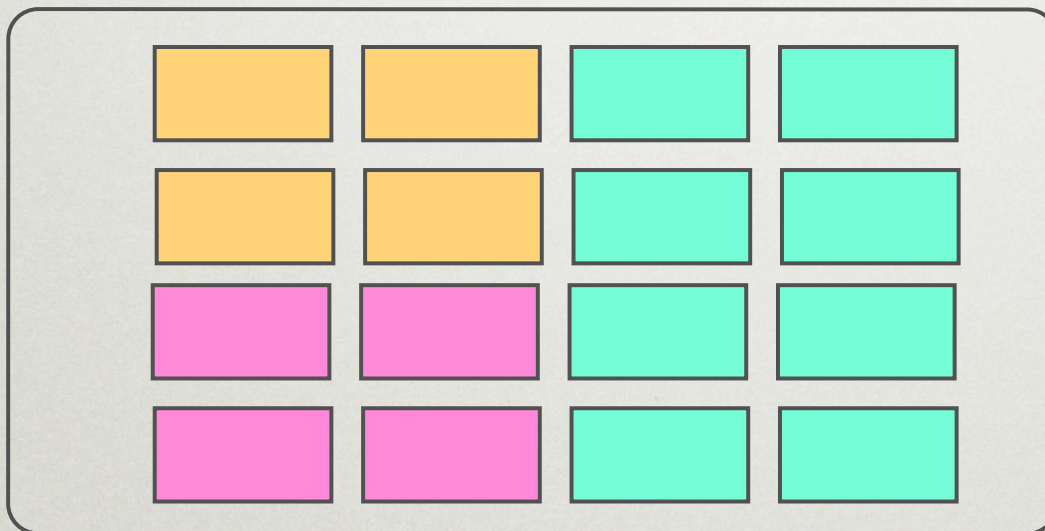
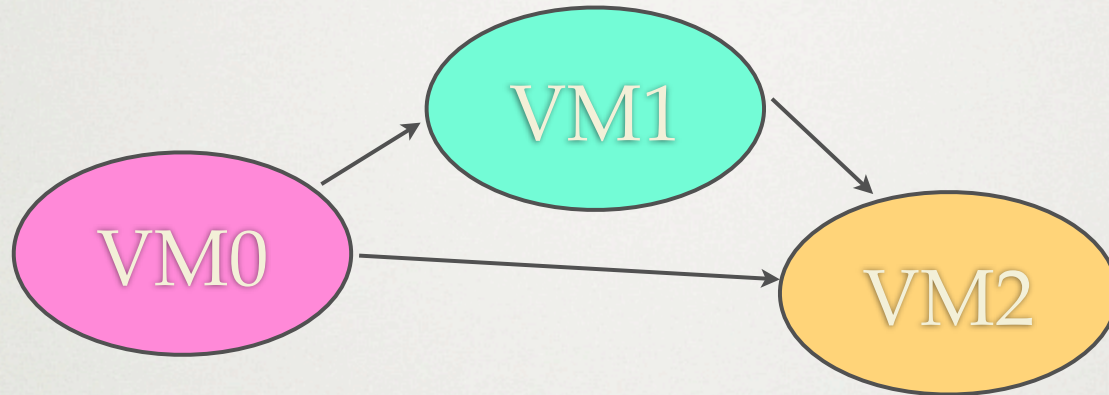
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CONTEXT

- Multi-core processors:
 - today:
4-56 cores (Xeon Phi), 100s (NVidia)
 - tomorrow: 100s / 1000s of cores.
- Clouds:
 - networks of virtual machines

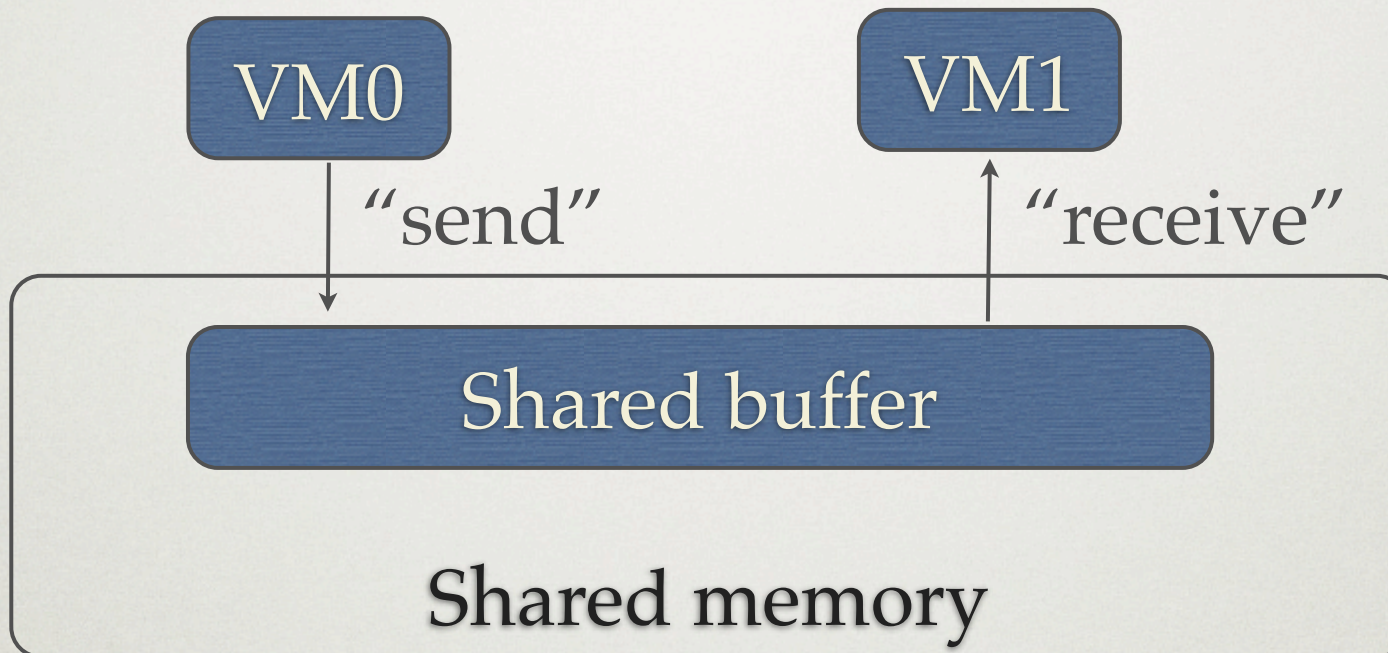
CONTEXT



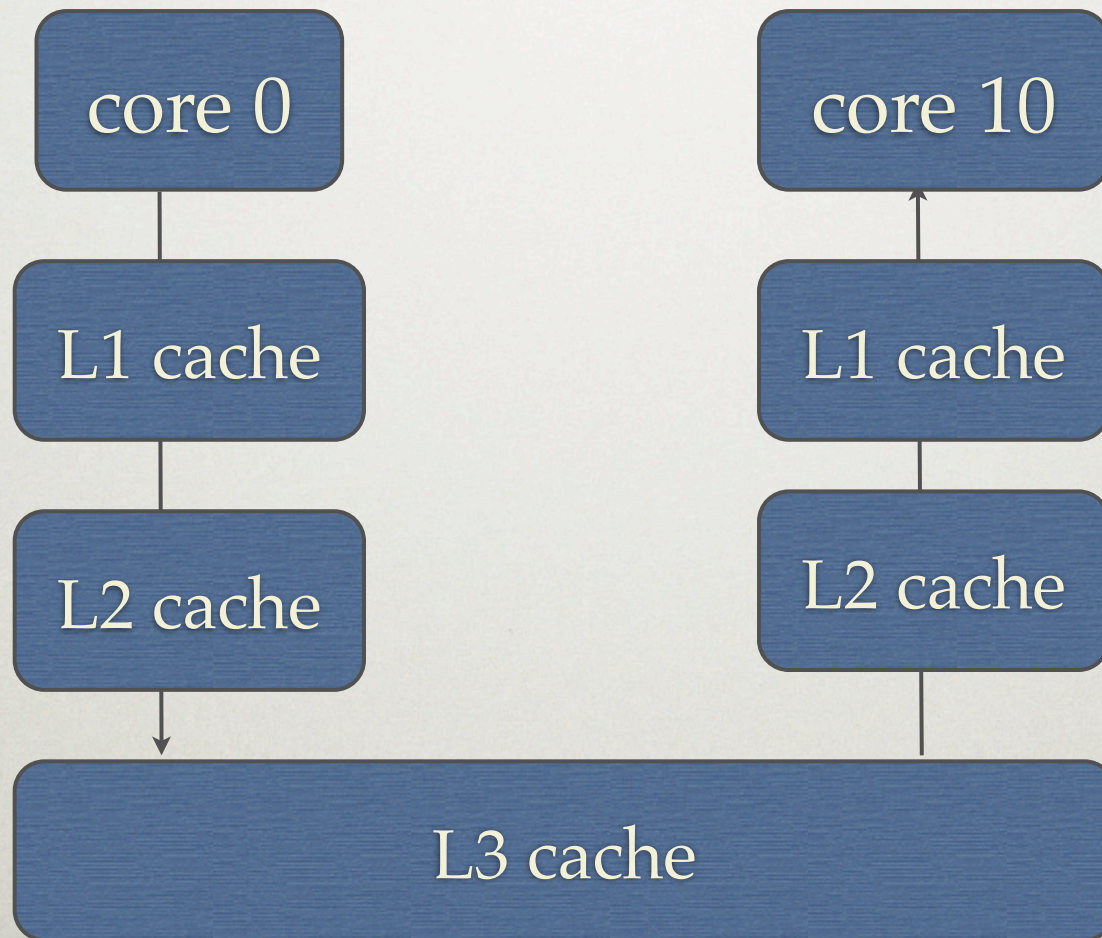
multi-core chip

New context enabled by parallelism:
physical co-location on the chip

OLD-SCHOOL ON-CHIP VIRTUAL NETWORK

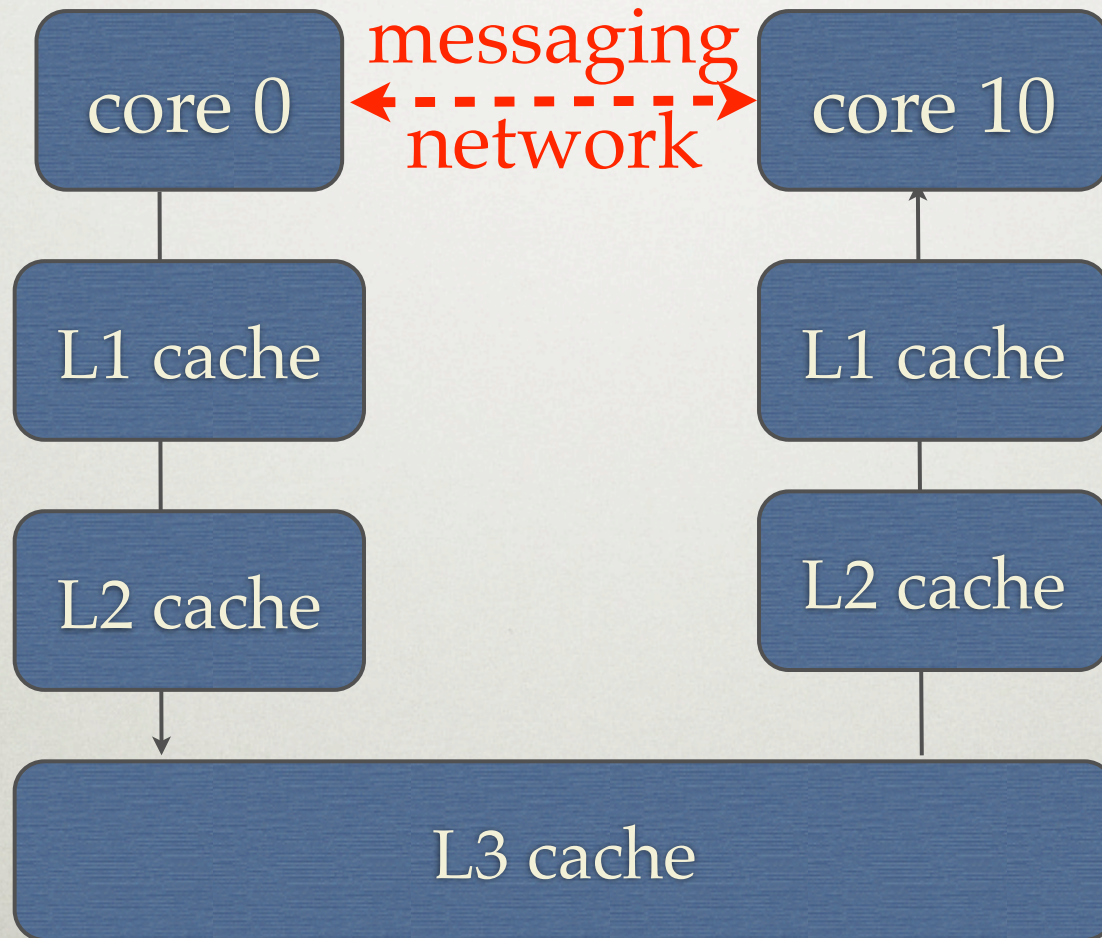


OLD-SCHOOL ON-CHIP VIRTUAL NETWORK

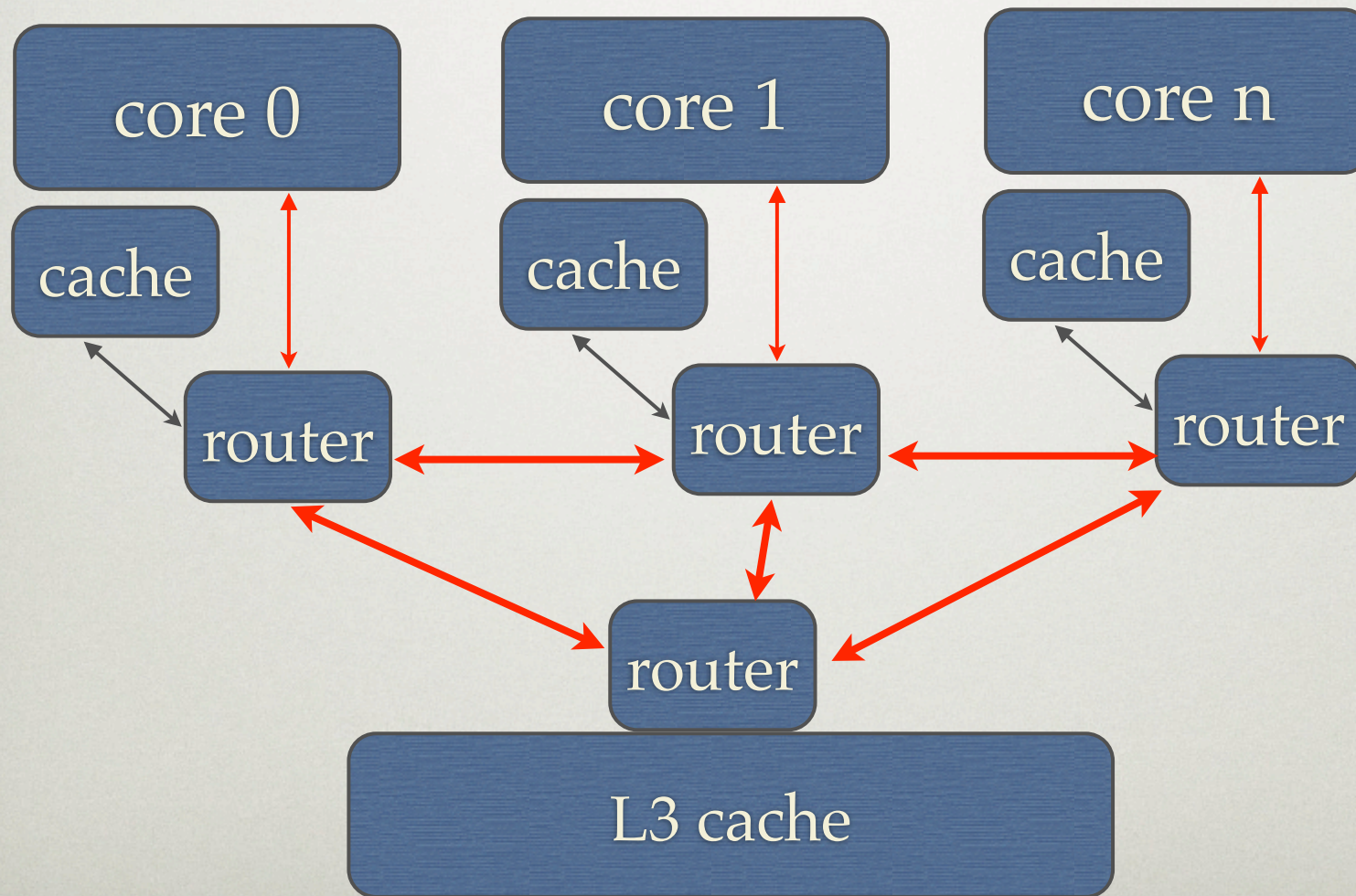


REALITY OF NEW ON-CHIP PHYSICAL NETWORKS

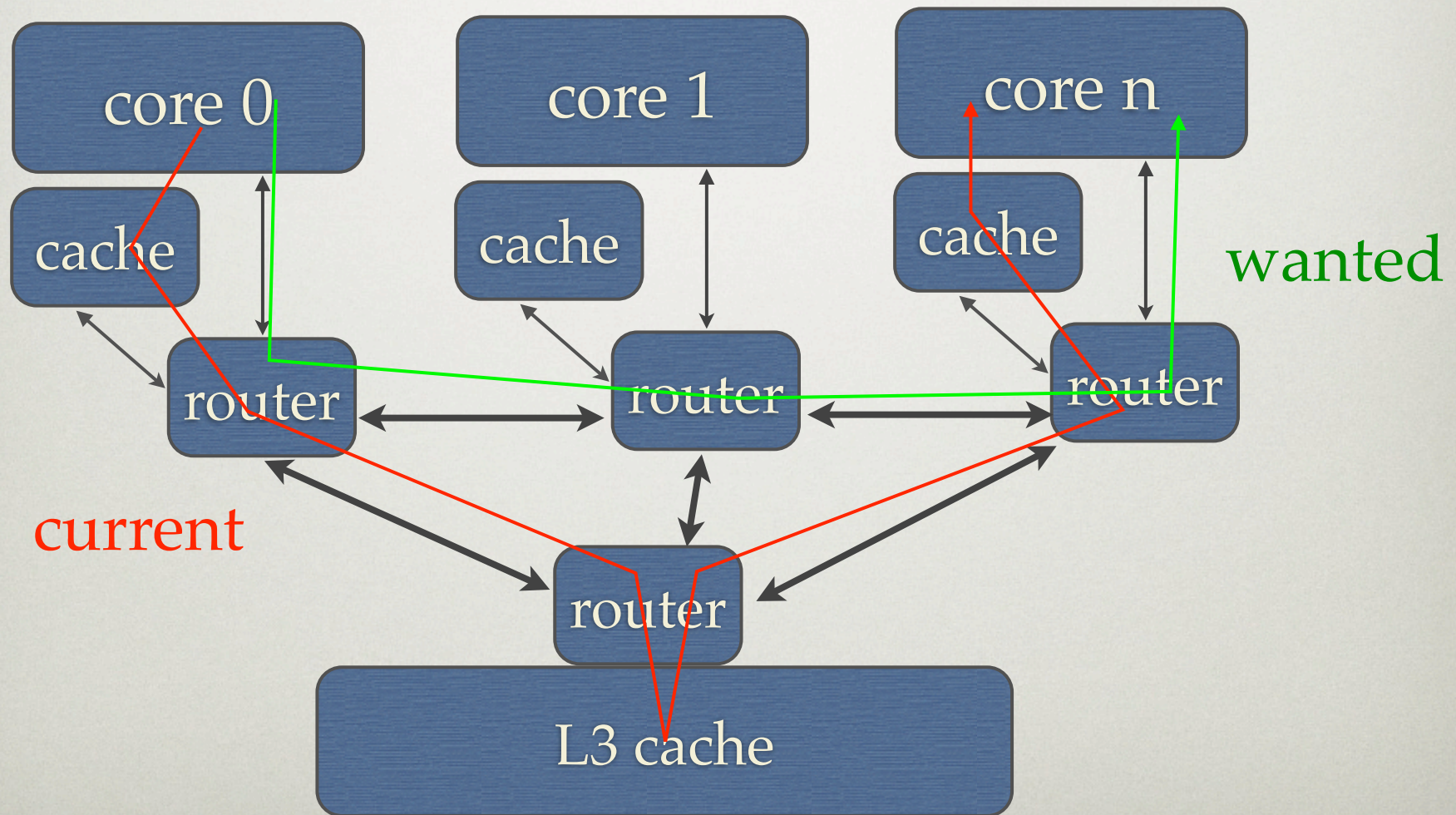
Inter-processor, direct



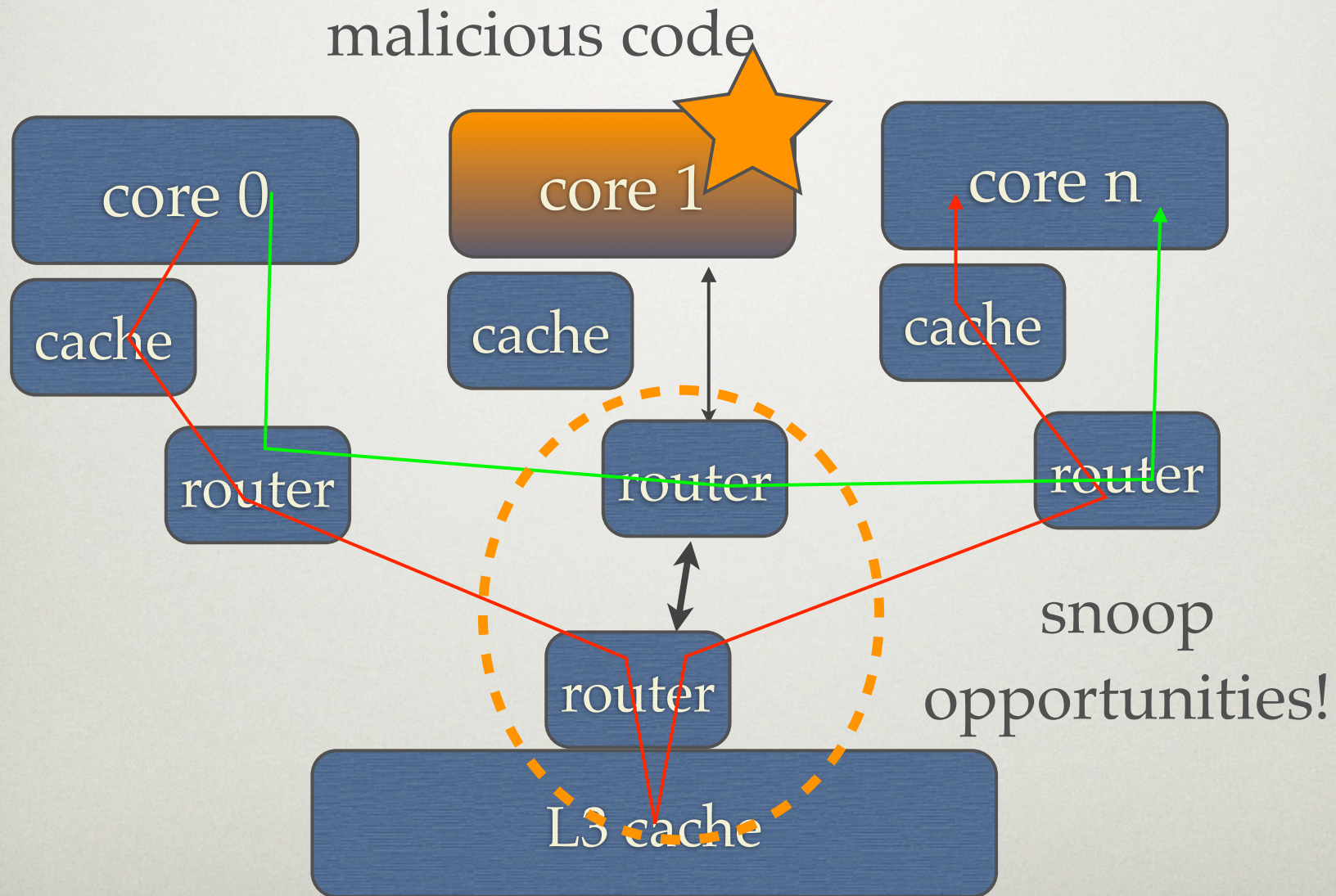
REALITY OF NEW ON-CHIP PHYSICAL NETWORKS



PROBLEM 1: UNNECESSARILY LONG PATHS



PROBLEM 2: NETWORK SECURITY



2 TOPICS

- **Short-cuts in the NoC**
 - What interfaces can be used?
 - How much latency can be gained?
- **NoC security**
 - What are the attack vectors?
 - Which protocols can be used to harden?

Difficulty:5
Theory:3
Design:5
Impl:4
Exp:3
Impact:4

Difficulty:5
Theory:4
Design:3
Impl:3
Exp:2
Impact:5