

# General Purpose Network Infrastructure

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# Unlocking innovation

- Networks have a rapidly evolving set of needs
  - Fundamental operational needs (load balancing, security, real-time content delivery, etc.)
- Core equipment still acts as a “set of tubes”
  - Really hard to extend, make it do something else
- The proven, most agile platform is out in the cold
  - No clear reason why that is the case

# The need for programmability

- Open APIs may attract unforeseen apps
  - Juniper and Cisco have both announced open APIs
- Software routers could be an alternative...
  - ... if we can make them run fast enough, that is.
  - Good for anything that require lots of compute/storage
- Examples:
  - Caching in the network (storage)
  - Load Balancing (programmability)
  - Fast Prototyping (virtualization)

# The need for general purpose network equipment

## Cisco Quantum Flow Processor

- March 2008
- 1.2GHz, 90nm, 800M transistors
- 80W
- 40 cores, 4 threads per core
- Flat DRAM
- **plus TCAMs**

## Intel Nehalem

- November 2008
- 2.8 GHz, 45nm, 730M transistors,
- 80W
- 4 cores, 2 threads per core
- DDR3 DRAM, integrated memory controllers,
- **plus x86 instruction set, virtualization, sleep/perf states...**

Not that far...

- Riding technology curve: 32nm on track for 2009
- Analogy: Mainframes v. Servers?

So how could **protocols** and **applications** change if **everything** from your laptops to your web servers looks, smells, and acts like a **general purpose server**?