Network Processors: Prospects for Practical Deployment

Hot Interconnects Panel

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Where are we?

• No longer a question
  – whether NPs have a market
  – Every major vendor uses some NP in some product(s)
• Used in a variety of products and applications
  – Access Points, switches, firewalls, etc
• Increasing in volume and revenue
Prospects in future networks

- Multi-threaded multi-core architecture goes mainstream
  - Expect impact on host I/O sub-systems (esp. on high end server platforms)
- Level of flexibility needed varies
  - Limited re-configurability vs full programmability
  - Nice continuum that spans FPGAs to fully programmable NPUs
- Challenges
  - Realizing the promise of field upgrades and programmability
  - Software reliability and its impact on high availability
  - Tools/languages for real-time, distributed, multi-processing

Role of open interfaces

- Software ecosystem
  - Need for wide-spread availability of software IP
    - *ala* silicon IP libraries available today
  - Interfaces to NPUs work at two levels
    - Programming individual engines at instruction level
      - A couple of architectures will emerge as industry standards
    - Integration of NPU building blocks with router/switch software (management, control plane, re-configuration, etc)
    - NPF establishing standards in this area
  - Standardized tools and programming environments will emerge
    - *Rational Rose* like stuff a matter of time

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Role of merchant NPs vs proprietary NPs

- Both have a place for some time
- Analogous to what happened in CPU world (e.g., ATT*, Digital*, HP*, Sun*, …)
- At low to mid end, utility NPUs have already established a beachhead (Wintegra*, Intel, etc)
  - Access points, Line cards, Print servers, IBM* postal scanners
  - Largest markets being served (DSLAMs, wireless base stations, firewalls, line cards)

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Thanks!