NetFPGA: A Tool for Network Research & Education

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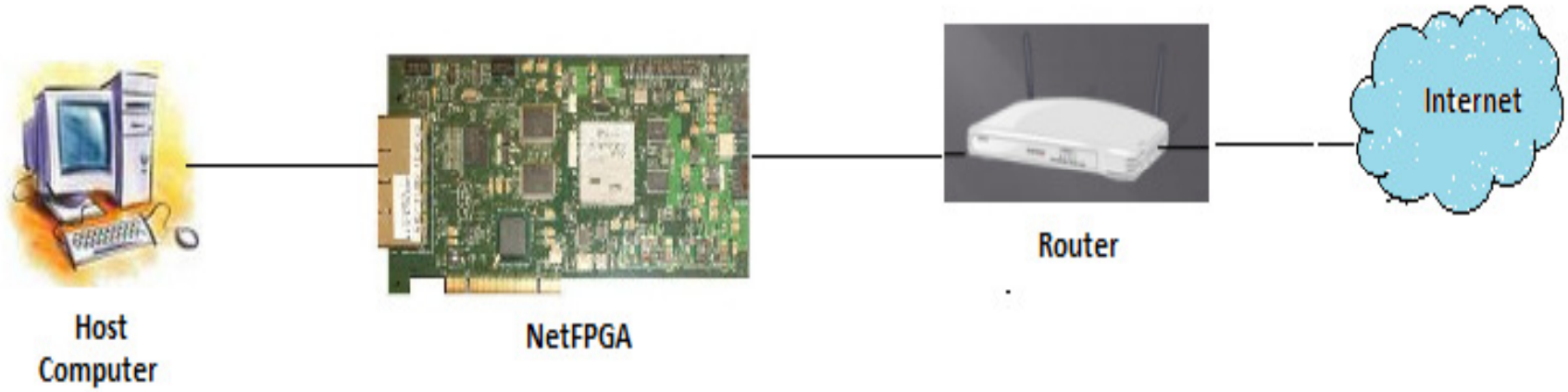
NetFPGA an experimental platform

- For research and academics to build real networking hardware
- Deploy and Debug them in operational networks
- Combination of Networking software that runs on a PC and Hardware accelerator with FPGA driving Gigabit links
- Usage:
  - Build an IP router
  - Build Ethernet switch
  - Use it as a 4-port NIC
  - Test networking designs
  - Supports Synopsys VCS, ModelSim for verilog simulations

- Two versions of NetFPGA were been introduced. The 1st one was NetFPGA v.1 ,in this the user can upload there own software protocols to control the FPGA board.
- This software can access the registers present inside the hardware. After this came the NetFPGA v.2 in which PCI were used to configure the control board. The control board has a simple logic analyzer which does all the processing.
- At present its being used for class inside Stanford to help them build there own IP router. Adding to this there is this Protocol called RCP which is being implemented over NetFPGA whose functionality is to control the rate of TCP connections. Also NetFPGA is being used for building IDS in which its functionality is to sniff high speed traffic and help in intrusion detection system.



NetFPGA

Provides Design Environment
Build your own IP Router
Intrusion Detction System
Rate Control Protocol developed at Stanford

Question

How does NetFPGA aid the academic/research communities in the networking field?

- It exposes the student community to lower layers of the network stack with hands on practicals
- Combines speed (hardware accelerator) and flexibility (software) to build customized network systems.
- Allows to test/implement multiple devices of a network design at low cost and effort