



Traffic Generation @ CERN

Dr. Răzvan Beuran
Mihai Ivanovici
Dr. Neil Davies



Outline

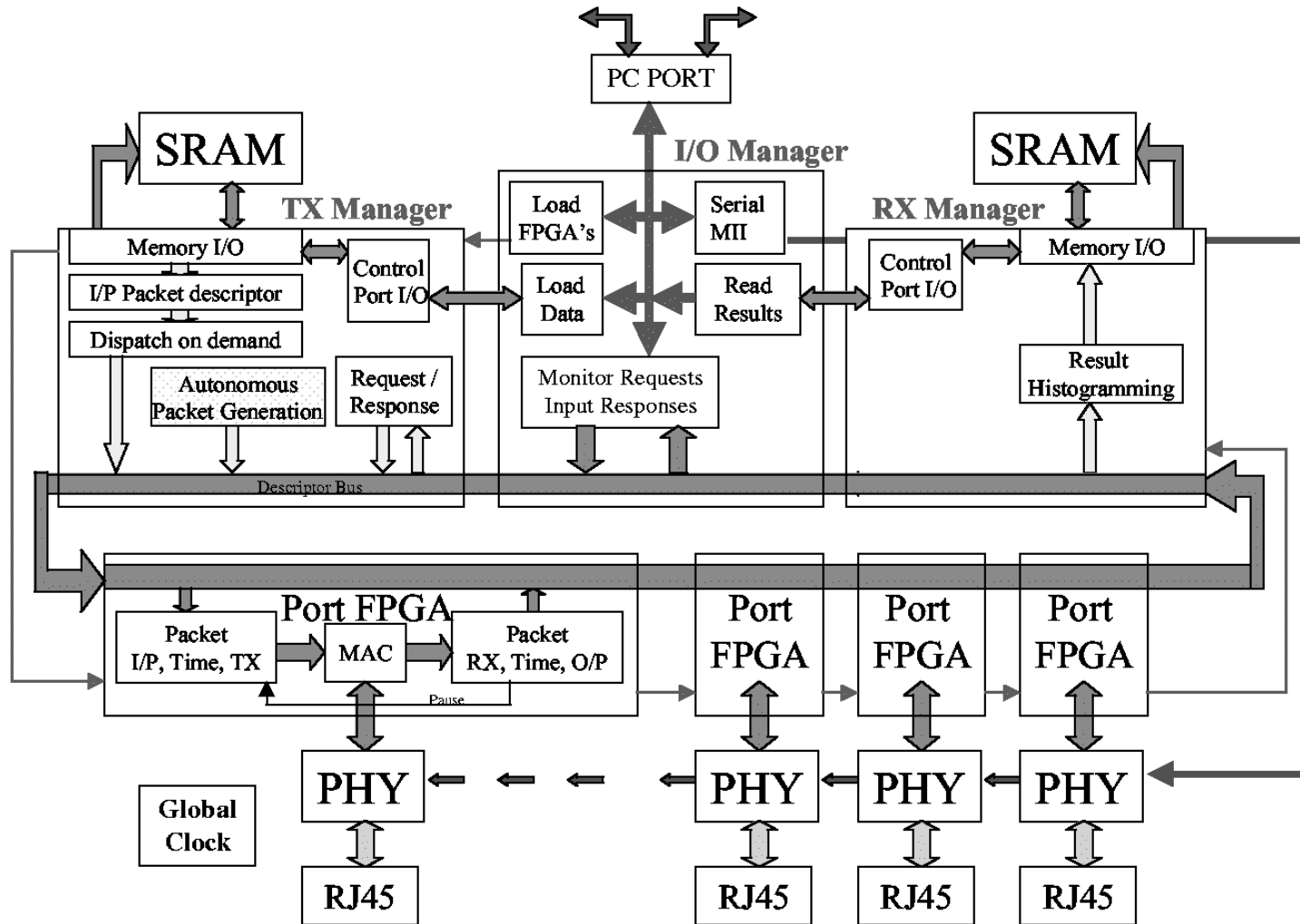
- Test systems
 - Enet32
 - ANT
 - GETB
- Traffic generation
- Test setup



Test systems

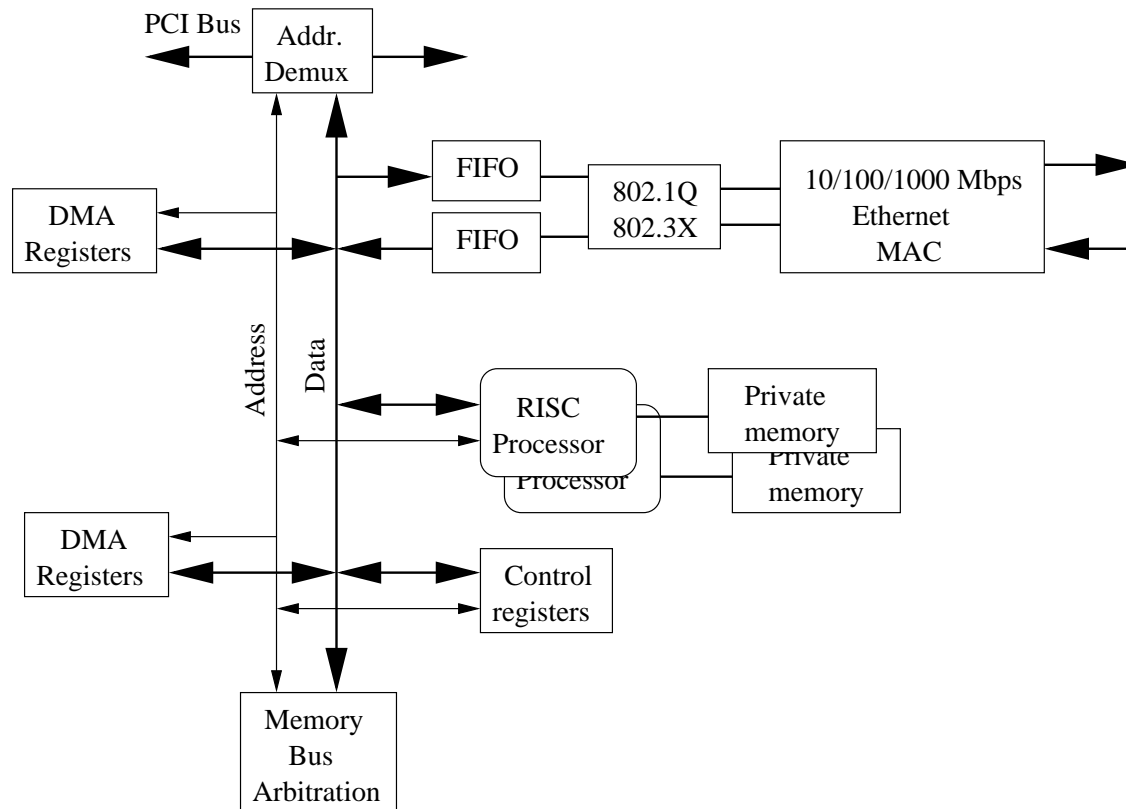
- Enet32
 - FPGA-based custom-designed platform
 - 32-port FastEthernet traffic generation
- ANT (Advanced Network Tester)
 - Using Alteon programmable NICs
 - Ethernet & IP traffic up to 1 Gbps
- GETB (Gigabit Ethernet Tester Board)
 - Dual-port FPGA custom-designed board
 - Ethernet & IP traffic up to 1 Gbps

Enet32



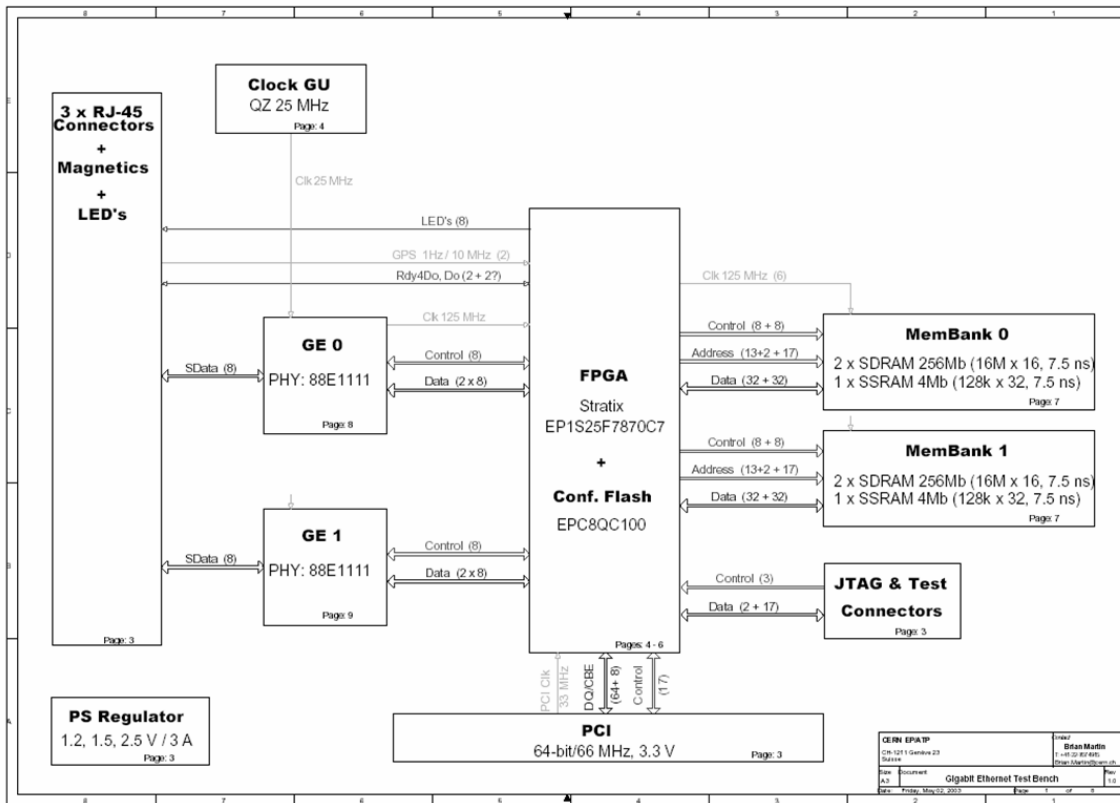


ANT



Alteon NIC architecture

GETB

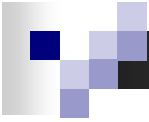


GETB architecture

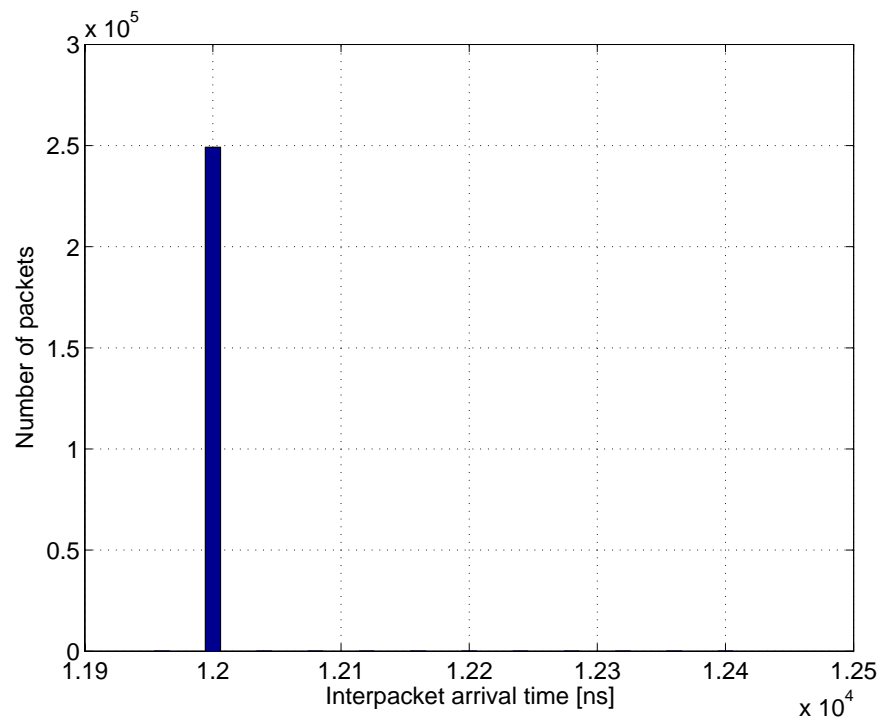


Traffic generation

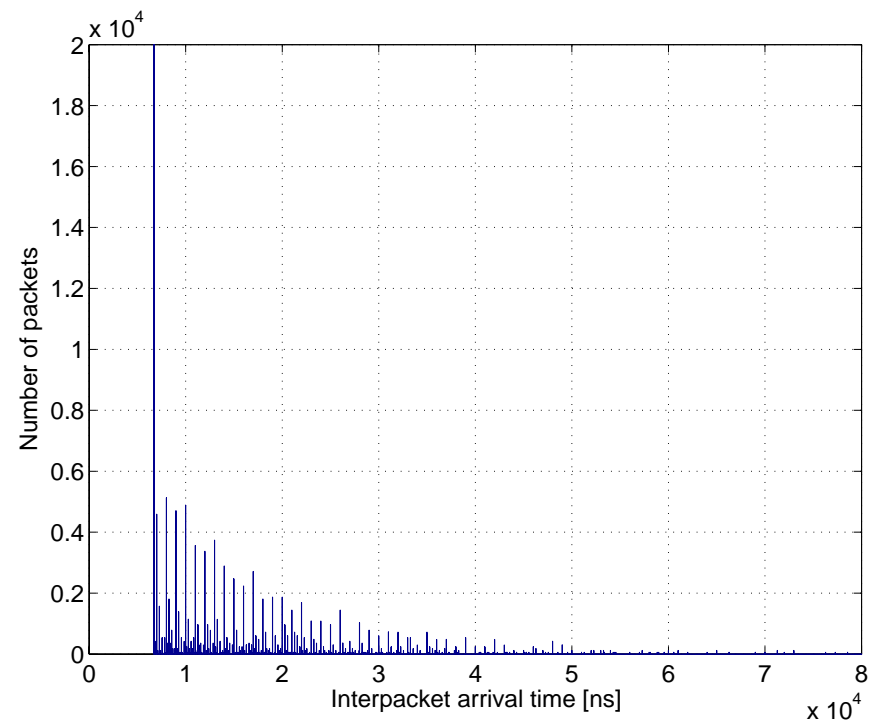
- Pre-computed traffic descriptors uploaded to the test system
 - Describe traffic patterns in terms of
 - source & destination addresses
 - packet size
 - inter-packet gap
- Test system generates traffic according to the descriptors, in real-time



Generated traffic (Enet32)



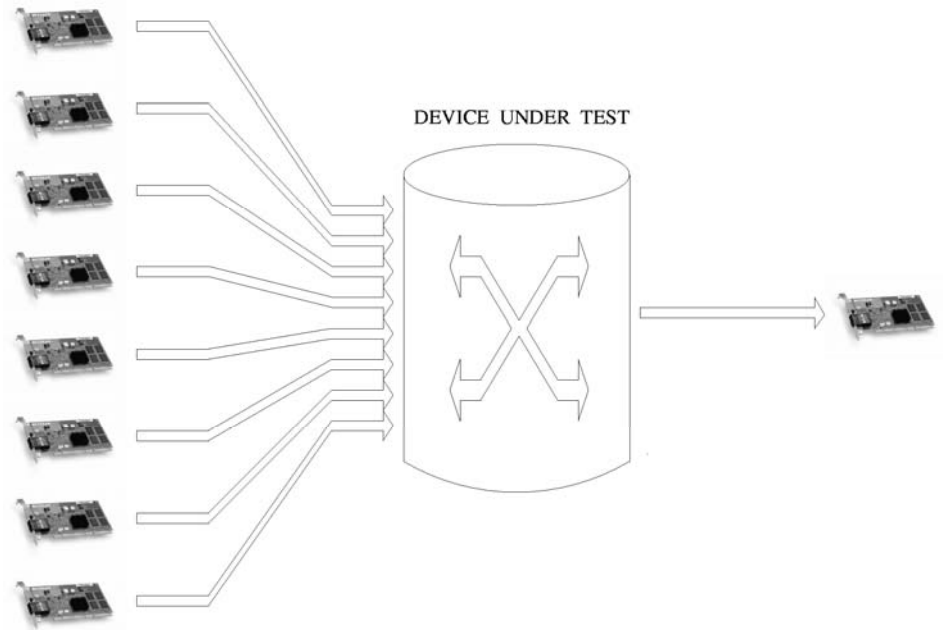
CBR traffic

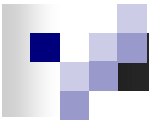


Poisson traffic

Test setup

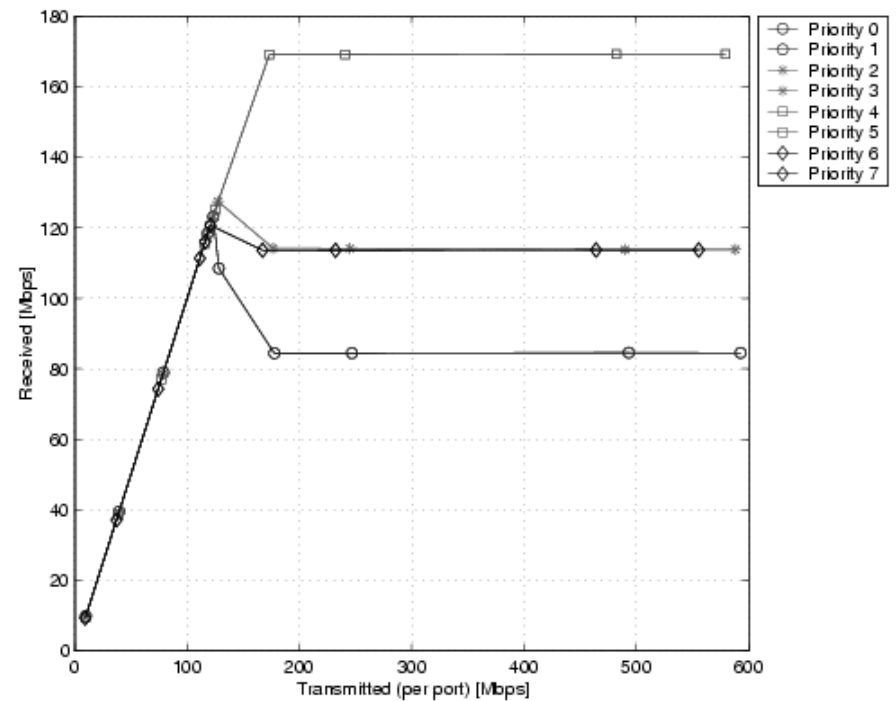
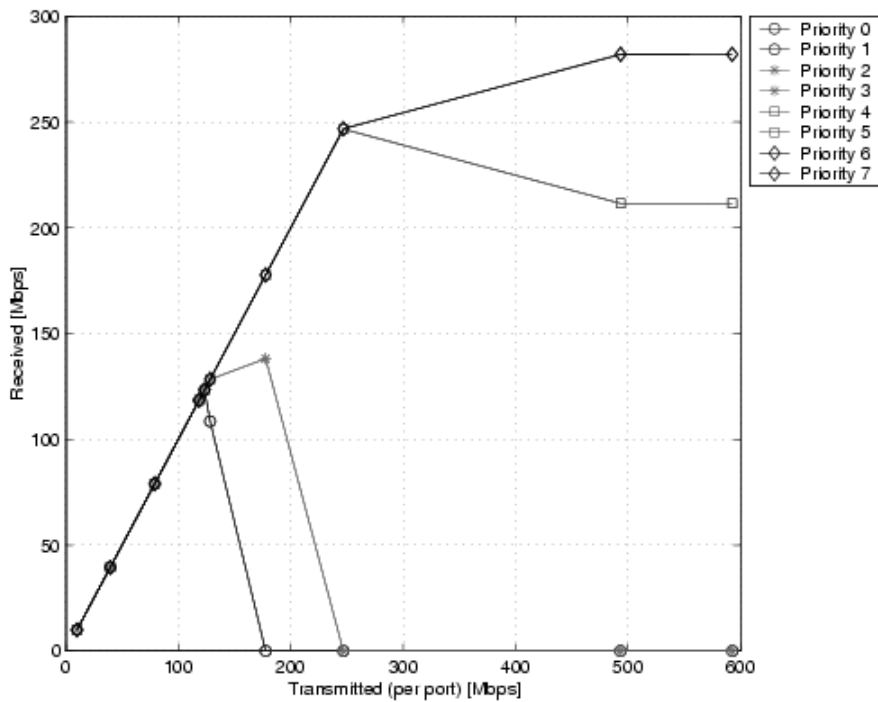
- Test systems with up to 140 ports
- Measure in real-time
 - Packet loss
 - Average delay
 - Throughput
 - Histograms etc.





Results

■ SP and WRR bad behaviour





Conclusions

- Systems used for thorough tests on switches and networks
- High performance traffic generation
 - Due to our low-level approach
- Reusability of the FPGA platforms
 - ATLAS Trigger traffic emulator
 - Network emulator