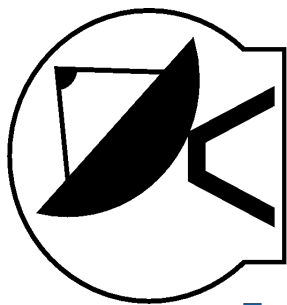

iBOB developments at the Metsähovi Radio Observatory

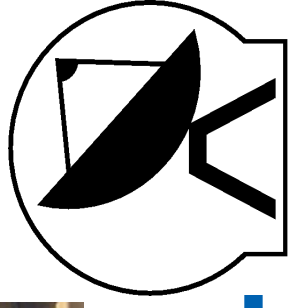
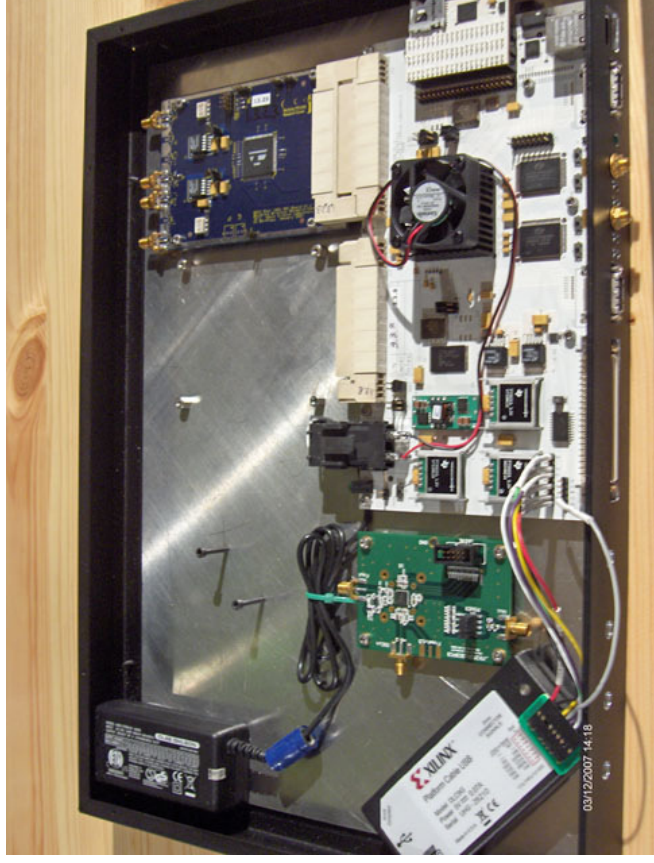
Jan Wagner, iwagner@kurp.hut.fi
Jouko Ritakari, jr@kurp.hut.fi

Jodrell Bank - Bits & Bytes - 17 December 2007



iBOB status

- 3 x iBOB + ADC received ~1 month ago
- Xilinx status:
 - EDK Academic license deal w/ upgrades
 - Free Virtex2p's
- Devel PC
 - Some Xilinx EDK version issues...
- DDC block design :
started thinking...

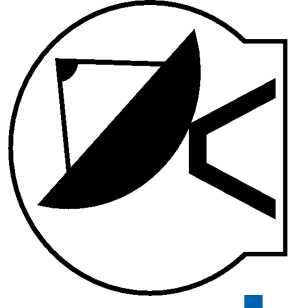
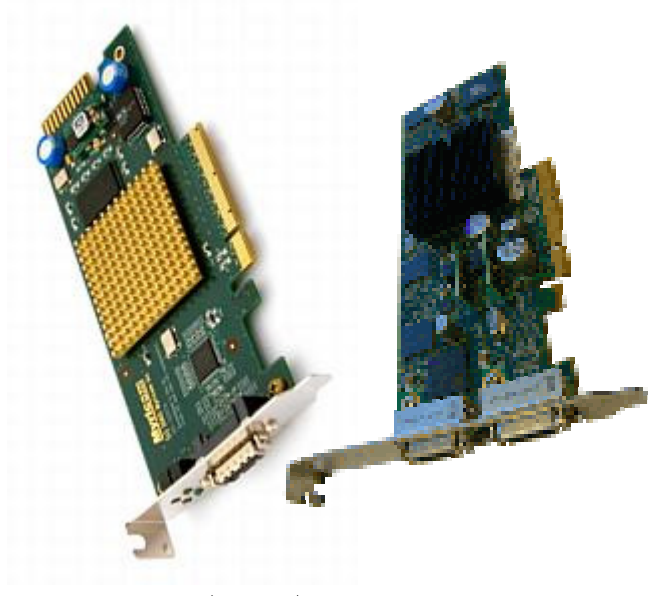
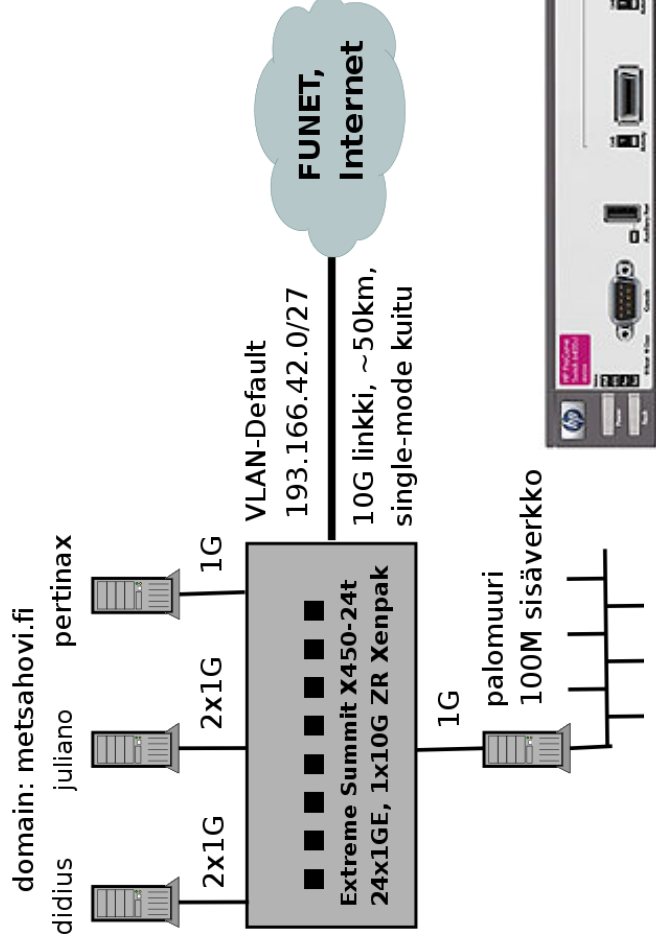


iBOB Networking Status

- Got all network hardware 09/10

- HP 6400cl + X2 SR optics 6 k€
- Chelsio eval kit: 2 boards +CX4 1.5 k€
- Myrinet SR, Myrinet CX4 1.5 k€

=> Breeze to set up!

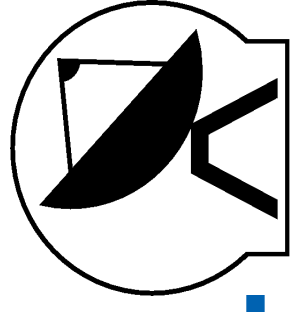


iBOB Receiver PCs

- Set up two iBOB receiver PCs :
 - nForce 680i, 4 GB, 2 x AMD dual-core Opteron
 - storage node: 12 SATA in RAID-0
- Intel 975, 2GB, Core 2 Duo
- simple network testing, 4 SATA in RAID-0

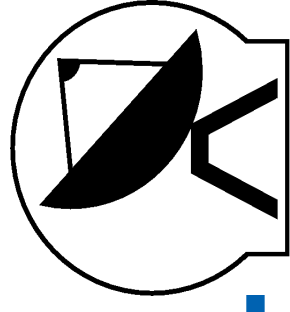
Both PCs on the Internet via 10G NIC(s)

Tested the 10G networking and RAID ... =>



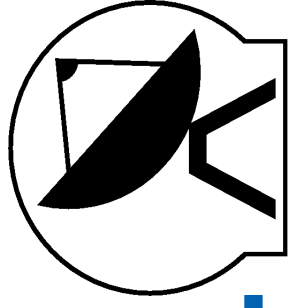
10G Network Tests

- MTU : 1500, 4470, 9000 via the HP 6400c1 switch
Zero problems! UDP + TCP
- 10G NIC evaluation tests: *iperf*, *Tsunami*
www.metsahovi.fi/vlbi/instr/10g-tests/
- Out of box – 4470/9000 MTU
~9 Gbps TCP, 8 Gbps UDP (!), 1.5 Gbps Tsunami
- Fine tuning:
 - Slight TCP and IPv4 tweaking : TCP ~9.5 Gbps!
 - Chelsio, Myrinet checksumming peculiarity - SO_NO_CHECK
 - Checksummed: 2 x 4.9 Gbps (2 cores) No checksums : 1 x 9.9 Gbps
- Tsunami: new v1.2 “Petabit Tsunami”
 - 7 Gbps memory-to-memory, 3.5 Gbps memory-to-RAID



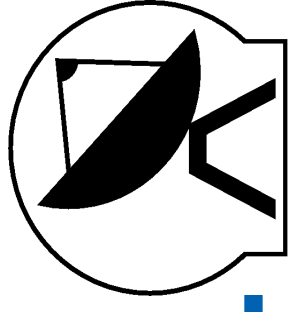
RAID performance tests

- iBOB data capture to RAID
- Tested with standard *bonnie++*, Ari's *wr-nexgen* 80GB, 800GB files to 12-SATA RAID0 (3TB)
- Sequential write with file system: ~4 Gbps
- Directly to block device `/dev/md0` :
 - ≥4.5 Gbps minimum, ~5.5 Gbps average
 - => can capture iBOB data easily!
- ⇒ Combine 10G NIC and RAID performance => ...



Mark5C++

- RAID performance : got ≥ 4.5 Gbit/s
- Net performance : got 9.9 Gbps
- W.Brisken, Mark5C command set is simple
- Make Mark5 command server emulator (perl?)
- Wrote udp2raid, raid2udp in best Haystack fashion
 - Uses zero-copy for best performance
- Deliver a Mark5C++ ahead of Mark5C!



Conclusions

iBOB 10G transfers over Internet : could start now

JIVE & co : should get HP 6400cl!

Metsähovi iBOB devel : January

Mark5C++ : January?

