Threaded Network Interrupts

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network-thread-irq.odp
Disclaimer

I'm not a network guru

I had to fight for the hardware I have
Threaded Interrupts

- Similar to NAPI code
- Interrupt comes in, disable the device
- Thread is awoken
- Thread polls on device, processing packets
- Finished and enables device
Benchmarking

- On my 1Gb NICs, all kernels had same result in netperf
  - Saturated network

- 10 Gig NIC
  - Could not get working with the threaded infrastructure
    - I'm not a network device expert
    - Decided to just give up and test with the RT patch
      - This is far from optimizing the design
Benchmark Machine

- Two Nehalem machines
- 2 x 4 core Intel Xeons
- Chelsio Communications Inc T310 10GbE Single Port Adapter
Benchmark

- Ran netperf -H host
- Red Hat Enterprise Linux 5.4
- Full Preempt Real Time Patch (PREEMPT_RT)
  - 2.6.31-rt10
- Hard and Soft interrupts as threads
  - RT patch without PREEMPT_RT enabled
- Soft interrupts as threads
  - RT patch with only PREEMPT_SOFTIRQ set
- Vanilla Linus Kernel
  - 2.6.31 downloaded from kernel.org
Cons

- Horrible latency on server config (no kernel preemption)
- Redesign of network infrastructure
Pros

- Can schedule in handler
- Easier locking algorithms
- Prioritize interrupts
- Smoother desktop experience
Discussion
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