bifrost

KTH/CSD course kick-off
Spring 2010

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What is bifrost?

Small Linux USB
For infrastructure
For research
Name of network and collaboration

Why Linux?

What about Red Hat/Debian Ubuntu etc?
For who?

Networking people
Unix/Linux
Needing a small flexible distro
Objectives?

Hardware selection – Crucial
Software selection    - Crucial
Testing           - Crucial
Development        - Crucial
Basic functions?

Routing
Firewalling
Login services
Traffic logging
Gateways etc
Virtualization and/or Namespaces
Basic functions?

Routing
Firewalling
Login services
Traffic logging
Gateways etc

Ipv4, ipv6
Routing

Routing uses tested versions of quagga
Bgp, OSPF both Ipv4, ipv6
R & D related to bifrost

Close collaboration with Linux networking Developers and industry

NAPI (3 years) now in most network drivers
Pktgen testing in linux,
fib_trie, (routing algo)
routing stats to monitor and understand network
Etc, etc
Cache effect/Performance
Measuring throughput

- Capacity
- Breakpoint
- Overload
- Drops

Graph showing throughput over input load with ideal forwarding line and overload point.
Overall Effect

- Inelegant handling of heavy net loads
  - System collapse
- Scalability affected
  - System and number of NICS
    - A single hogger netdev can bring the system to its knees and deny service to others

Summary 2.4 vs feedback

March 15 report on lkml
Thread: "How to optimize routing performance"
reported by Marten.Wikstron@framsfab.se
- Linux 2.4 peaks at 27Kpps
- Pentium Pro 200, 64MB RAM
Lab
Not all were selected...
Hardware - NIC

Intel 10g board Chipset 82598

Open chip specs. Thanks Intel!
Hardware – Box (set 2)

AMD Opteron 2356 with one quad core 2.3GHz Barcelona CPUs on a TYAN 2927 Motherboard (2U)
10 year in production at Uppsala University

Full Internet routing via EBGP/IBGP

PIII 933MHz
2.4.10poll/SMP

DMZ
Current focus
Optical to Open Source Router
Low-Power
Video
Virtualization
Performance
Cost
Optical modules

Optical sender and receiver in one module

SFP  1G
XFP  10G
SFP+ 10G
XFP Optical modules

XFP's uses LC-connectors
DOM - Optical Monitoring

Optical modules can support optical link monitoring RX, TX power, temperatures, alarms etc

Newly added support to Bifrost/Linux
Interface (XFP) Board

SUN Neptune 10g PCIe x8
CWDM MUX/DEMUX 4 Ports

Price idea 600 Euro
CWDM MUX/ DEMUX 16 Ports
The link with KTH_LAN is used as a primary link for almost all (in & out) traffic (except for the direct traffic with SSVL and CSC_NETLAB). In case of the link failure to KTH_LAN the Internet connection will be available via SSVL network. Valhallavägen router has a static default (with administrative distance = 255) route to CSC_NETLAB. Only the traffic originated within VV router will be forwardable via this link; VV router has an IP address from CSC_NETLAB range on one of its interfaces; the traffic that is not originated within VV is not provided with transit service by CSC_NETLAB.
That's all

Questions?
Project's ideas

DOM 4-port GIGE card/Linux igb driver
GateWay Optical/WiFi
Energy – Router Power Reduction/Linux
Energy – Ultracaps/Solar or UPS