

# bifrost

KTH/CSD course kick-off  
Spring 2010

Robert Olsson

# 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,

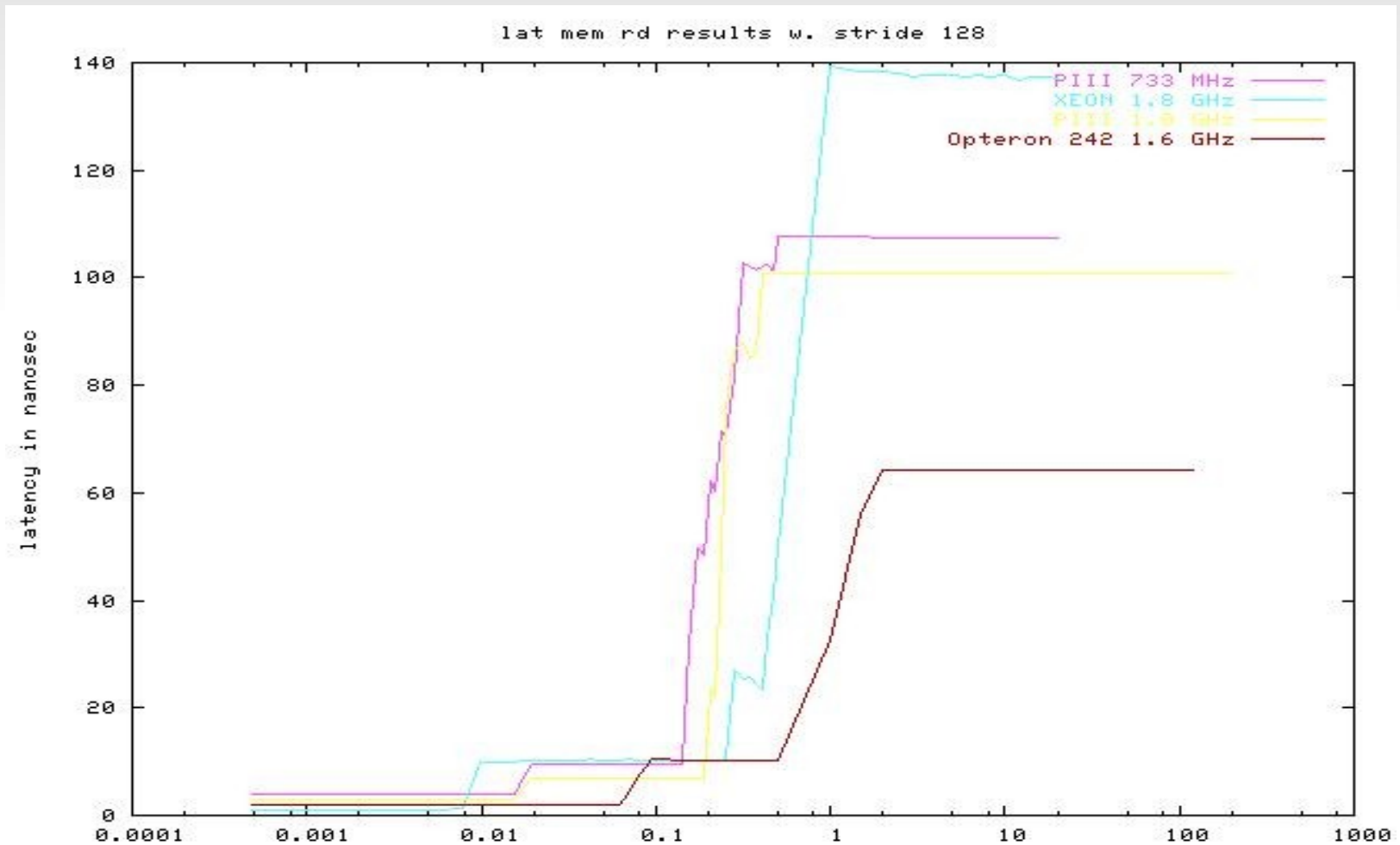
fib\_trie, (routing algo)

routing stats to monitor and understand network

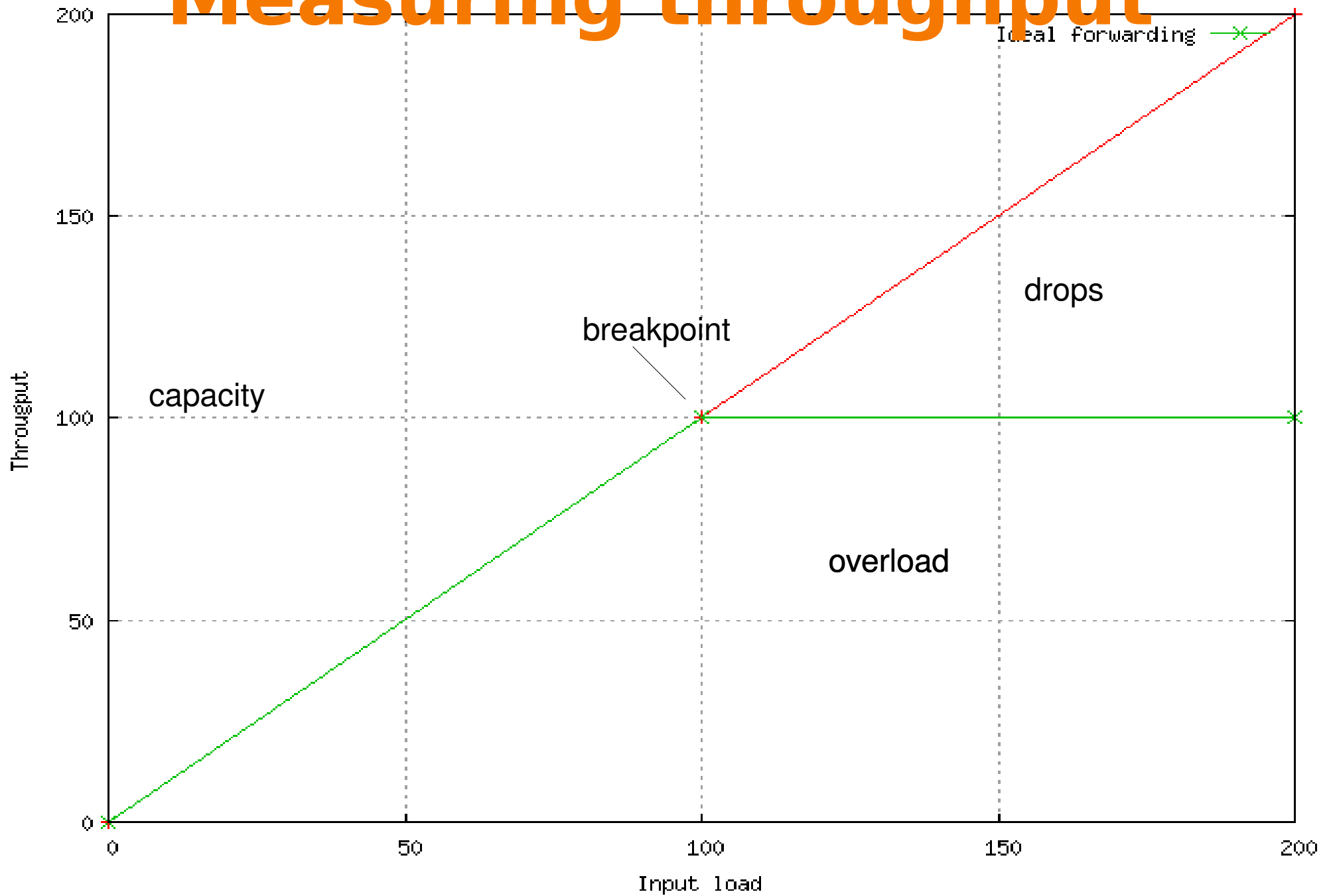
Etc, etc



# Cache effect/Performance



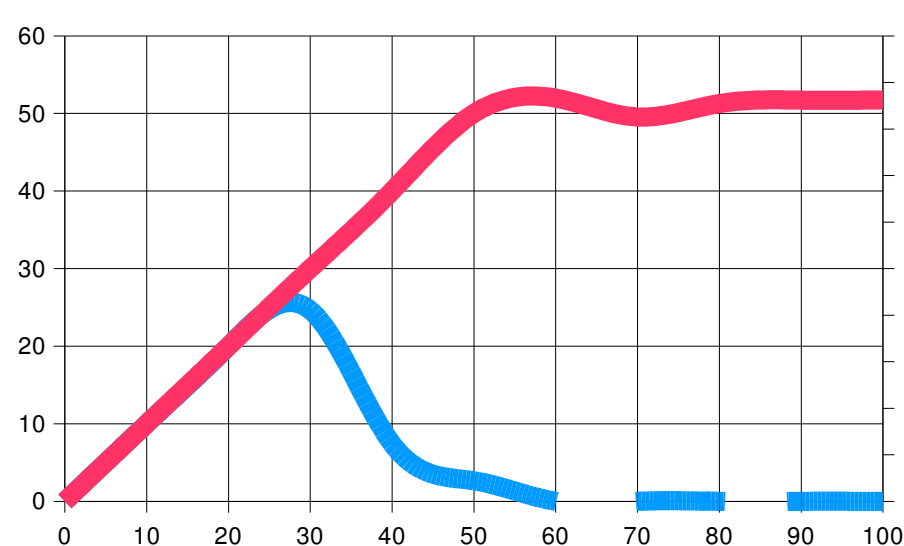
# Measuring throughput



# Overall Effect

- Inelegant handling of heavy net loads
  - System collapse
- Scalabiity 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](mailto:Marten.Wikstron@framsfab.se)

- Linux 2.4 peaks at 27Kpps

- Pentium Pro 200, 64MB RAM

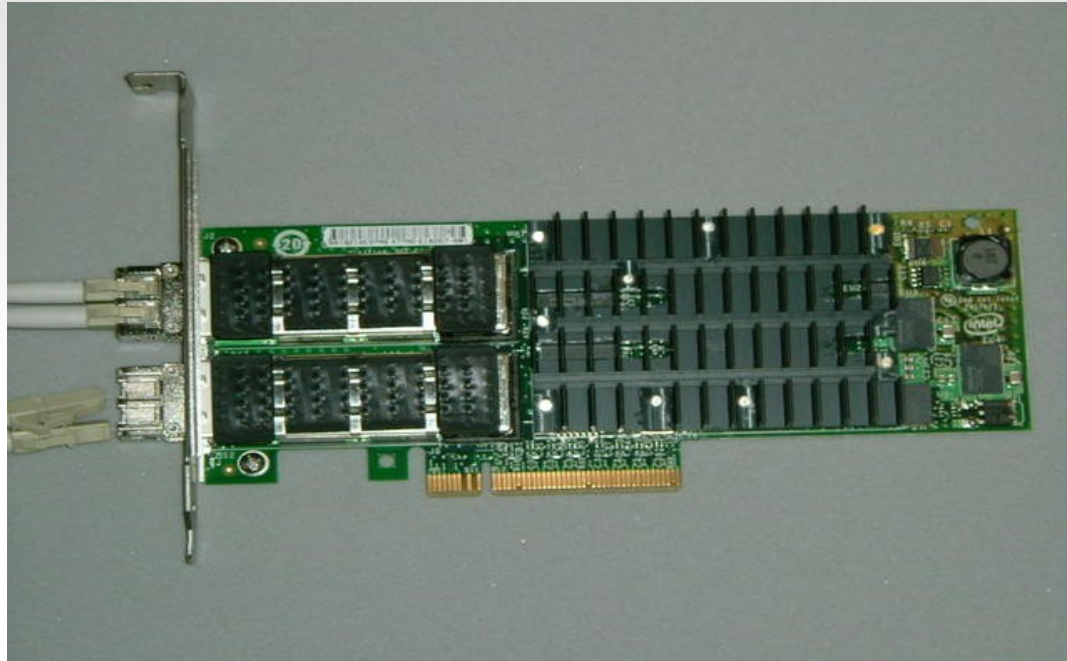
# Lab



**Not all were selected...**



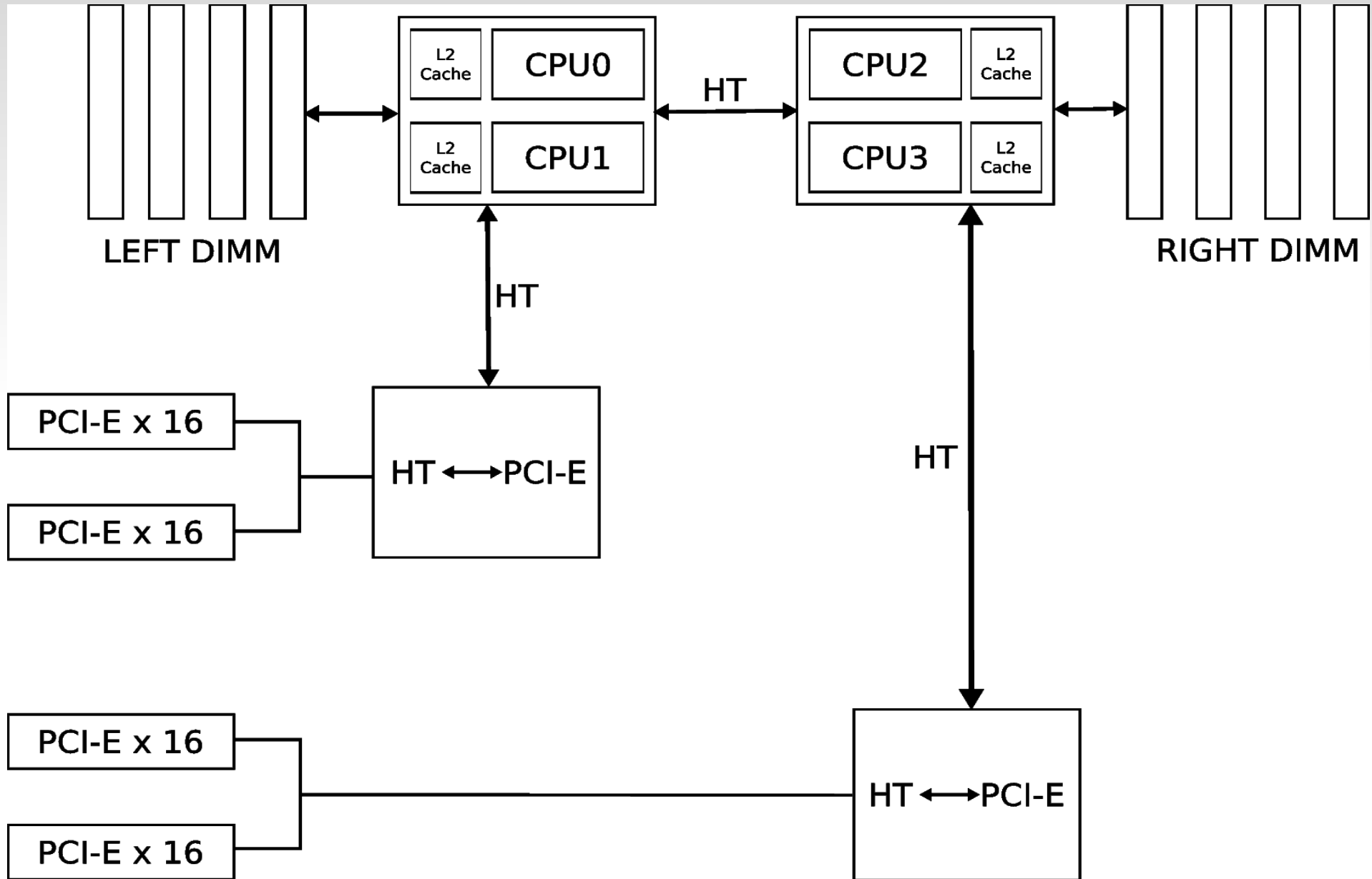
# Hardware - NIC



Intel 10g board Chipset 82598

Open chip specs. Thanks Intel!

# Block hw structure



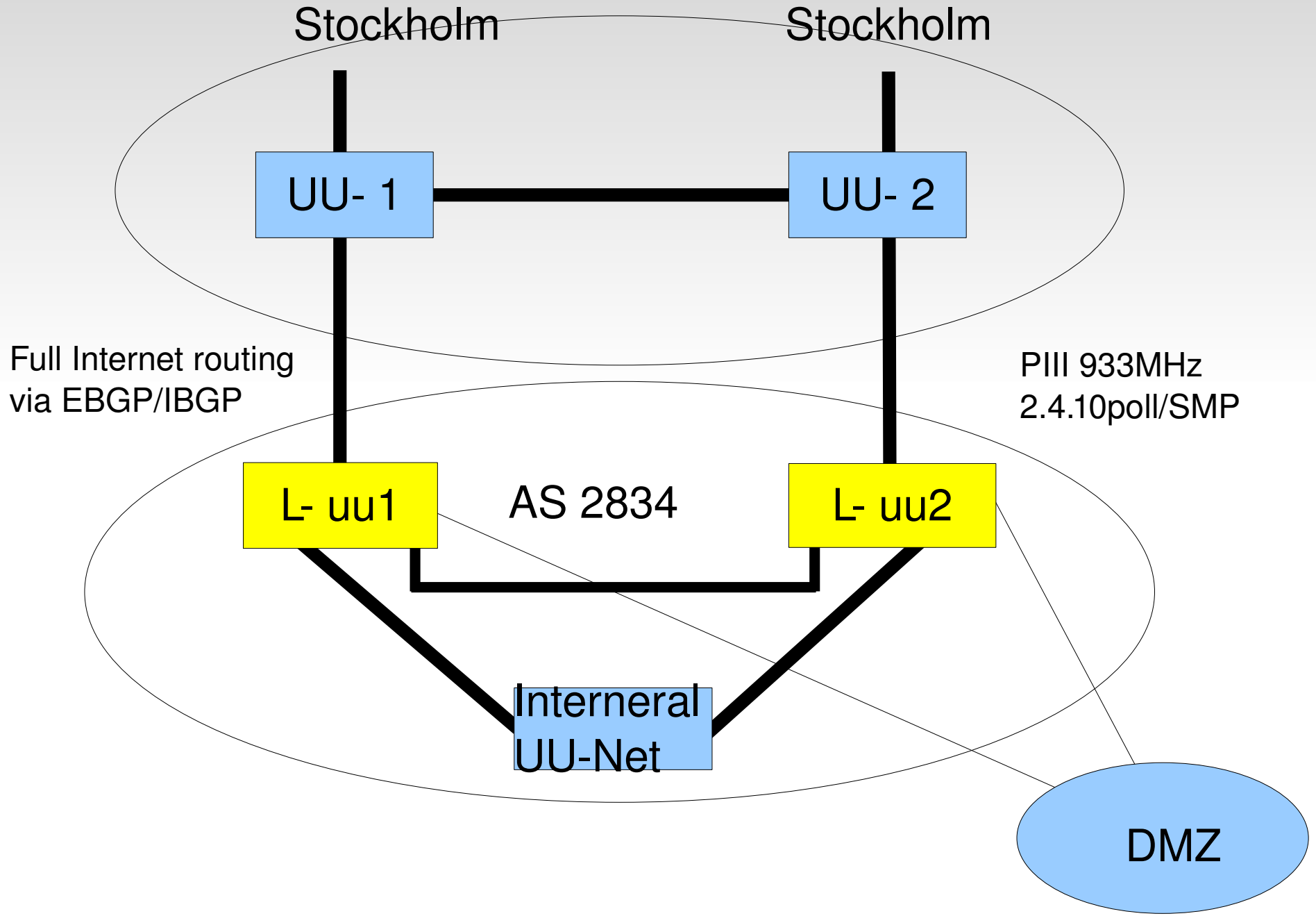
# Hardware - Box (set 2)



AMD Opteron 2356 with one quad core 2.3GHz Barcelona CPUs on a TYAN 2927 Motherboard (2U)



# 10 year in production at Uppsala University



# KTH/CSD

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



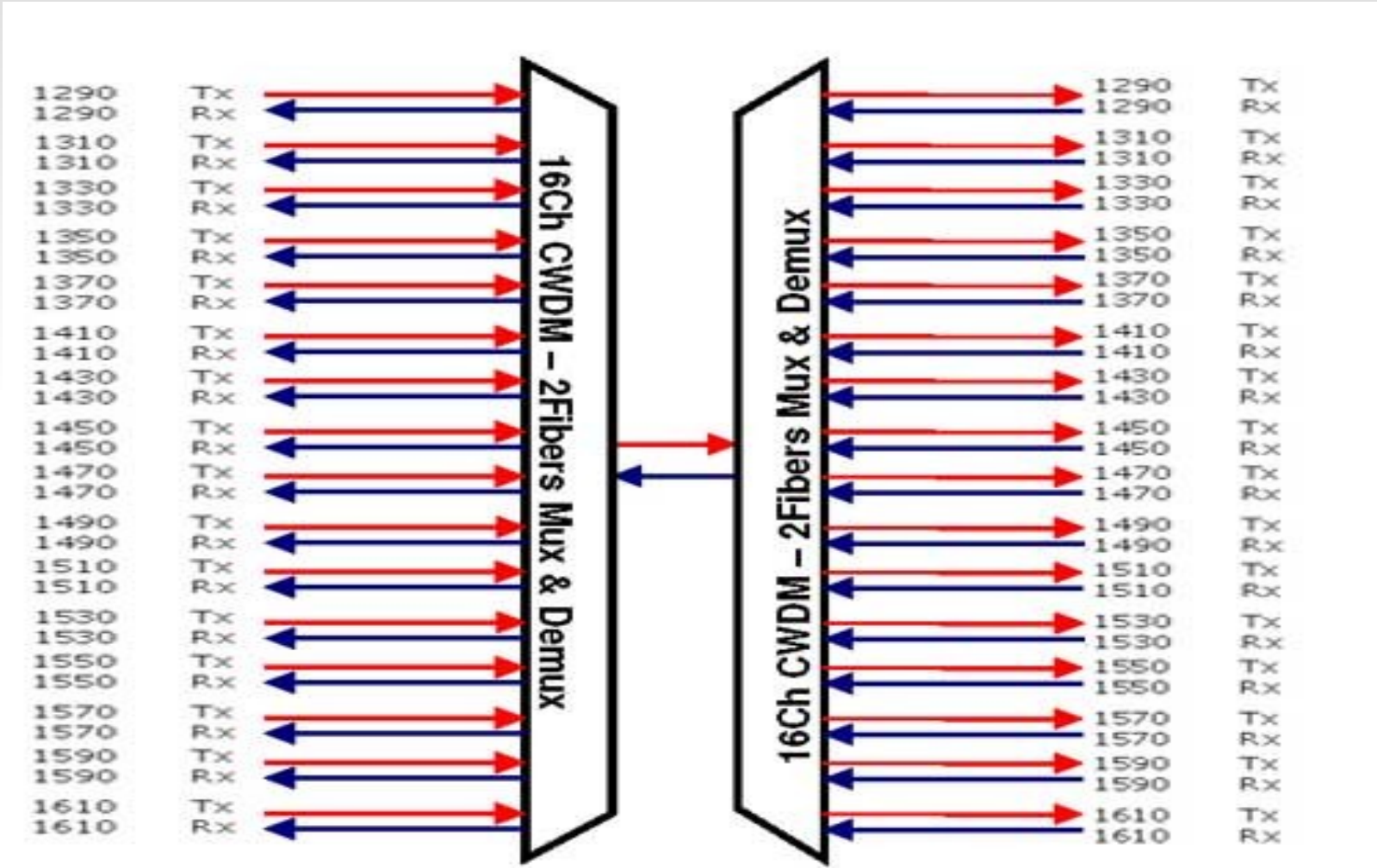
SUN Neptune 10g PCIe x8

# CWDM MUX/DEMUX 4 Ports



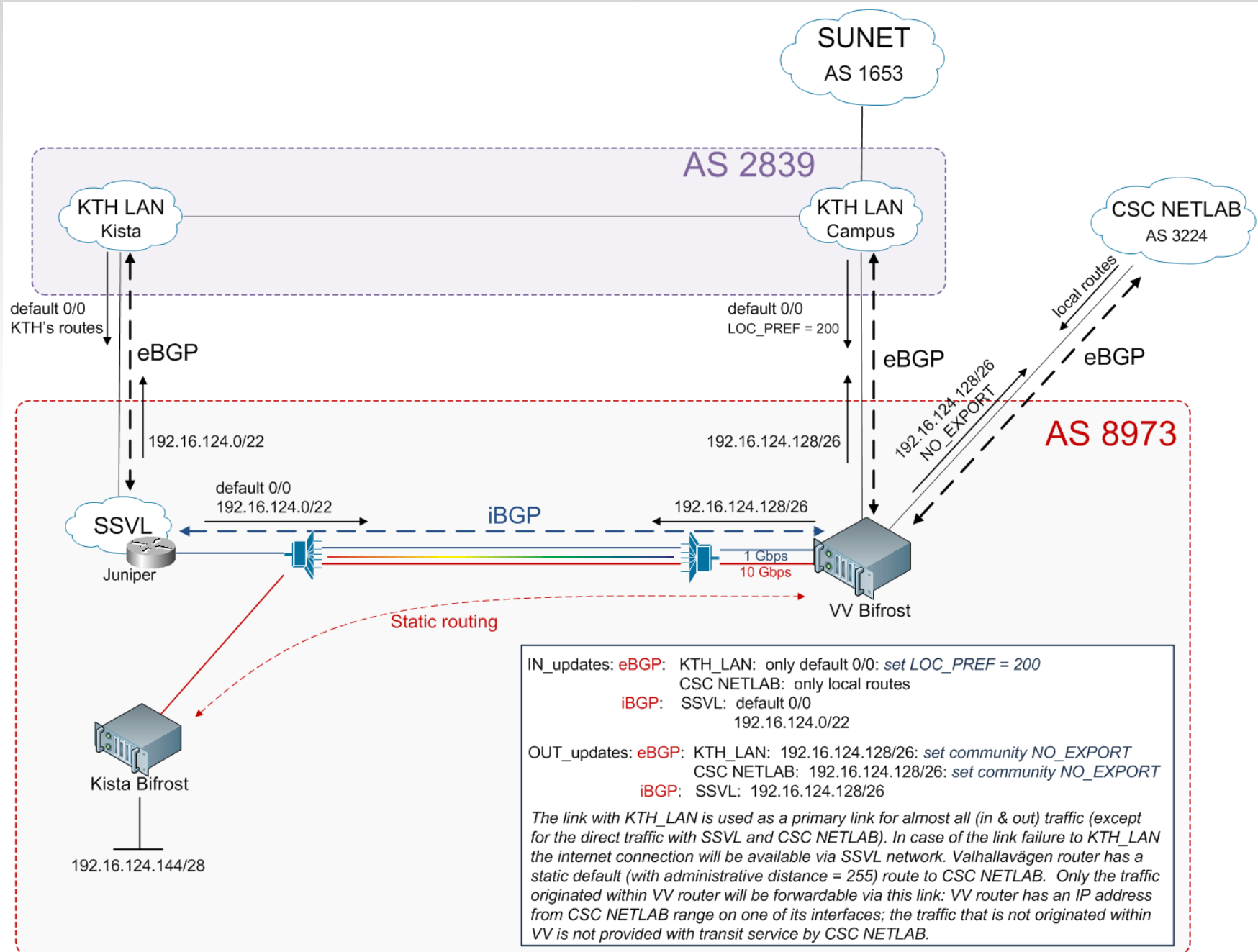
Price idea 600 Euro

# CWDM MUX/DEMUX 16 Ports





# Usage



**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