

Netnod Internet Exchange

RIPE 56

May 2008

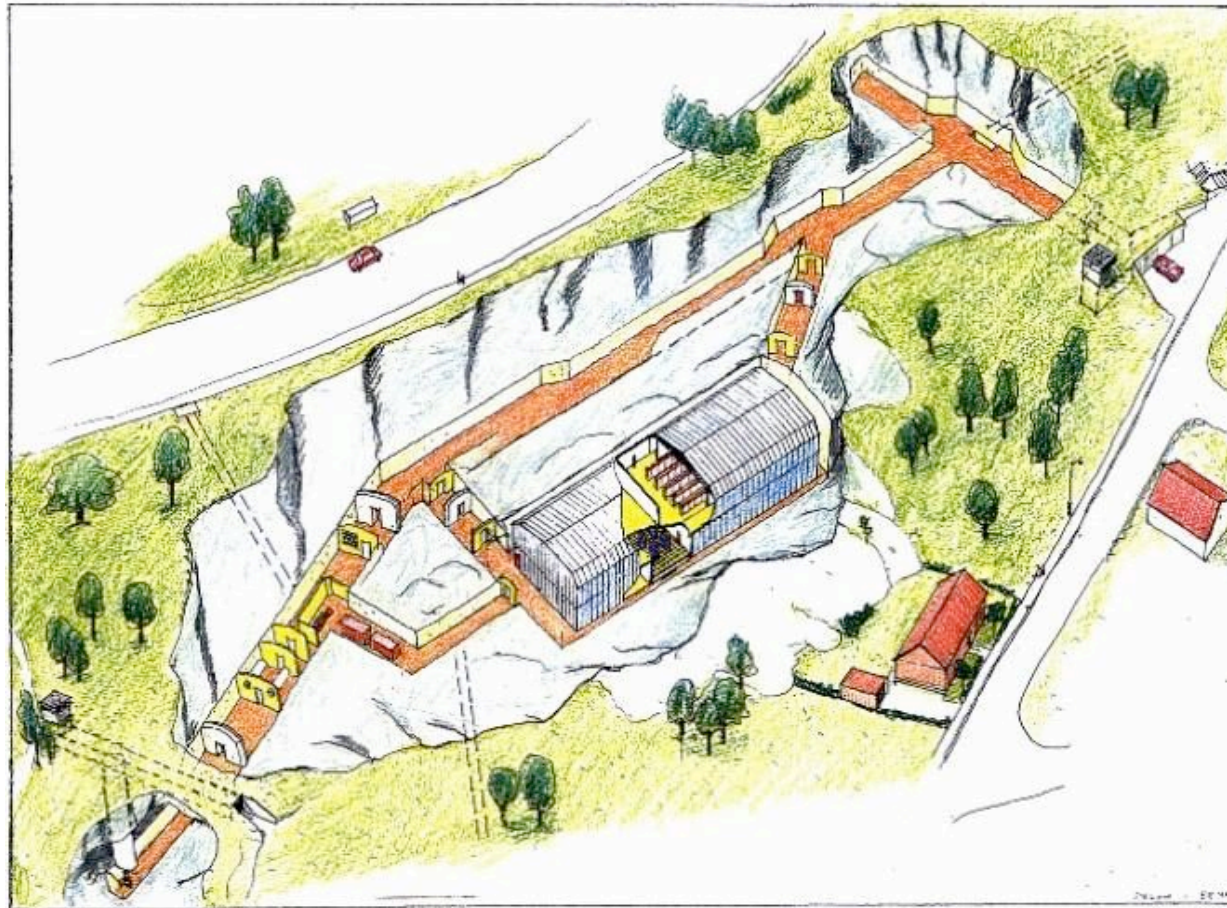
Nurani Nimpuno

What's Netnod?

- Non-profit, neutral exchange
 - Started out at KTH-NOC (1992)
- Netnod founded 1996
 - Owned by the TU foundation
 - National infrastructure
 - Need for high availability
- Operate 6 IXPs in 5 cities
 - 2 switches in Stockholm
 - 51 peers connected



Underground bunkers



Rock Solid Internet Exchange



<http://www.netnod.se>



Rock Solid Internet Exchange



<http://www.netnod.se>



Common infrastructure services

- Official Swedish time through NTP
 - In Malmö, Sundsvall, Gothenburg and one bunker in Stockholm
- i.root-servers.net
- .SE TLD-service
- A number of TLDs in Stockholm
 - Among others Verisign's .com and .net, .DK, .NL, .DE, .NO etc.
- Copy of RIPE routing registry
- TPTEST
 - Consumer broadband test

Connecting to Netnod

- Stockholm
 - Charges include the cost of two separately routed fiber pairs
 - One to each bunker
- Other cities
 - ISP have to find a fiber provider themselves
 - Coordination needed to patch through to us

Pricing structure

(further reduced in 2008)

- Stockholm*
 - Outer city
 - 2x10GE: 350k SEK (~37,5k €)
 - 2x1GE: 280k SEK (~30k €)
 - Inner city:
 - 2x10GE: 265k SEK (~28,4k €)
 - 2x1GE: 195k SEK (~19,8k €)
- Malmö/Gothenburg/Sundsvall
 - 10GE: 110k SEK (~11,8k €)
 - 1GE: 75k SEK (~8k €)

**Note:*

Stockholm fees include 2 connections & 2 separate fiber pairs

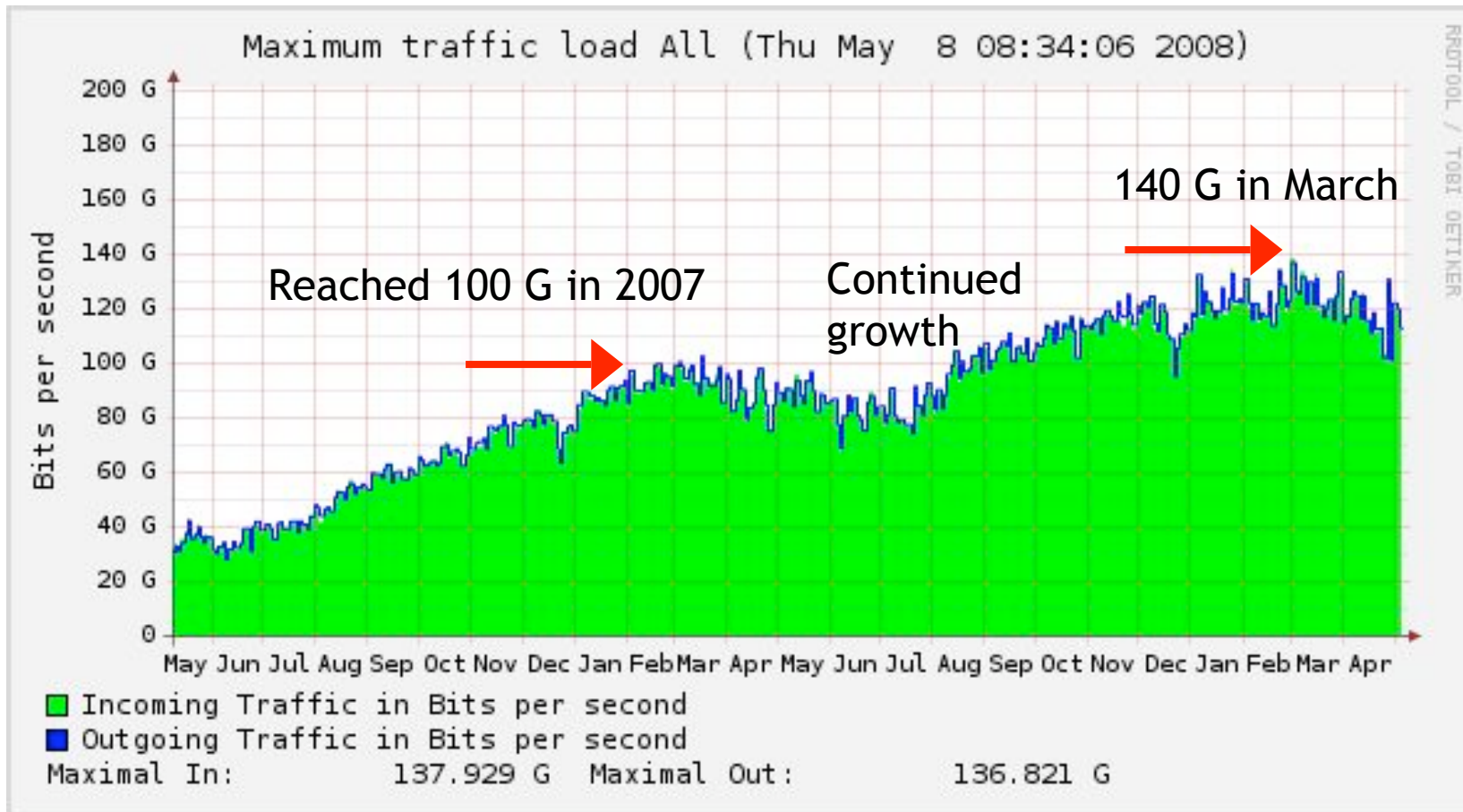
Top ISPs

(Highest average last 24h)

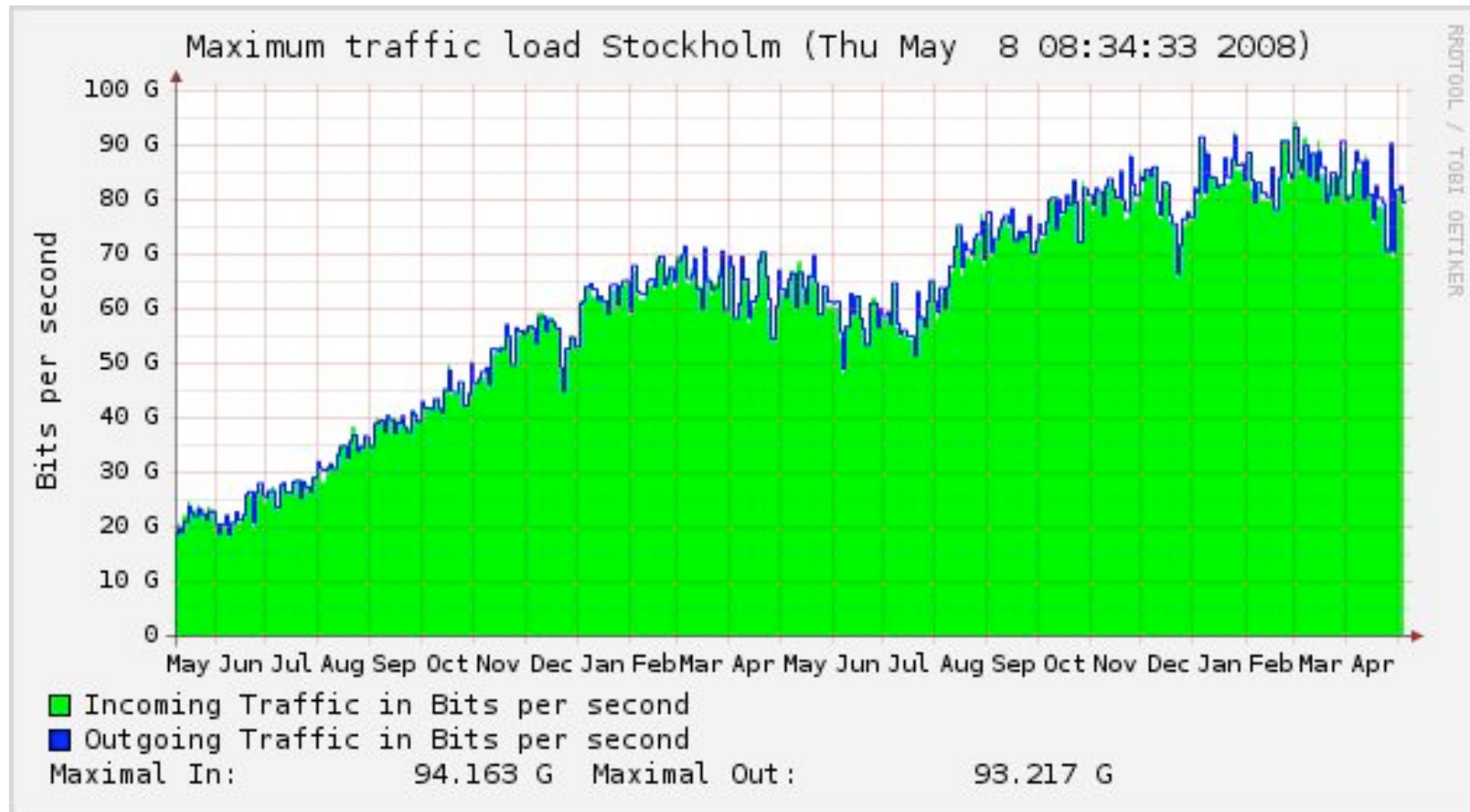
No	ISP	AS	Traffic
1	B2 Bredband AB	2119	9.77 Gb/ s
2	Com Hem AB	39651	8.31 Gb/ s
3	TeliaSonera AB Networks	3301	6.67 Gb/ s
4	Skycom AB	29518	5.70 Gb/ s
5	Bahnhof AB	8473	5.06 Gb/ s
6	Port80/Rix Telecom AB	16150	4.23 Gb/ s
7	IP-Only Telecommunication AB	12552	3.59 Gb/ s
8	Cogent Communications Deutschl	174	2.79 Gb/ s
9	TDC Sverige AB	3292	2.77 Gb/ s
10	Lidero Network AB	13189	2.24 Gb/ s
11	DNA Services Lt d	16086	1.99 Gb/ s
12	RETN Ltd.	9002	1.67 Gb/ s
13	Tele2 Sverige AB	1257	1.62 Gb/ s
14	Ownit Broadband AB	33885	1.39 Gb/ s
15	COMSTAR-Direct CJSC	8359	1.29 Gb/ s
16	Riksnet, Rätt Internet-Kapacit	34610	1.18 Gb/ s
17	Saunalahti Group Oy j	6667	1.05 Gb/ s
18	DCS.net	21202	1.04 Gb/ s
19	Net at Once Sweden AB	35706	908.17 Mb/ s
20	Telecom3 Networks AB (T3)	28908	897.27 Mb/ s

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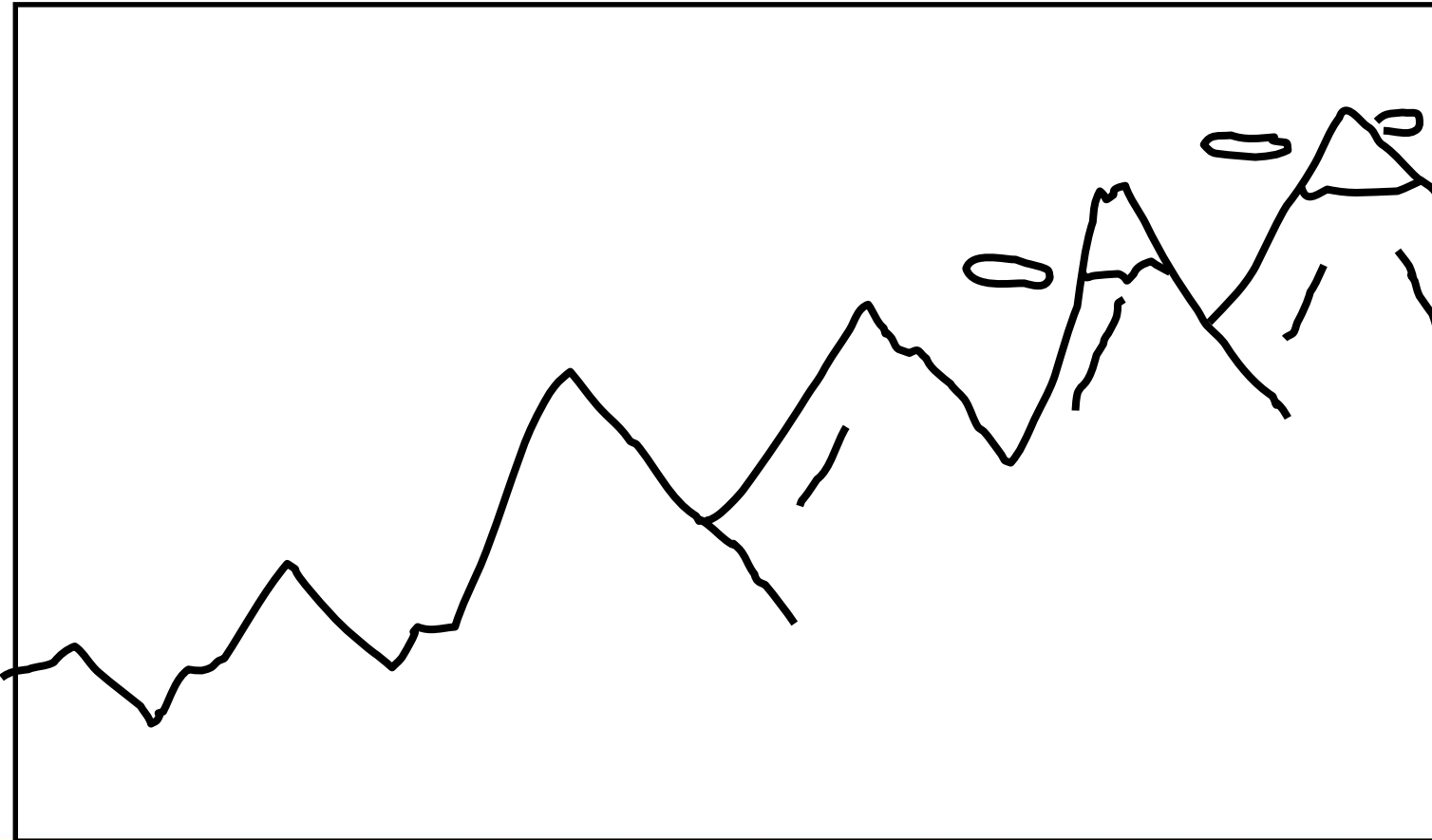
Cumulative traffic



Traffic - Stockholm



My ability to draw mountains over time



*(Stolen from Dmitri Martin)

Some observations

- Total traffic above 100 G in 2007
 - Continued growth!
- Membership now above 51
 - Increased interest from Russia and other countries
- Continued 10 GE port demand
 - Doubling in 10 GE ports in last year
- Very high amount of traffic / peer at Netnod
 - 2-2.5 Gbps / peer today
 - (Average in Europe around 0.5 Gbps)

Other news

- Router infrastructure upgrade to support 10G
- Investigating WDM options to lower cost of connecting to Stockholm
 - To reduce the fiber cost part of connecting included in fee
 - Currently fixed by fiber monopoly
- IPv6 enabled on all services
 - Infrastructure enabled
- IPv6 workshop organised in Stockholm
 - Good response

And we organised a social :)



Questions?

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