Netnod Internet Exchange

SIG-IX presentation
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History

- Netnod was formed from then D-GIX at KTH-NOC in 1996 / 1997

- Reason for creating Netnod was to create an independent and resilient exchange infrastructure

- Early on focus was on redundant systems

  - Also from a national infrastructure point-of-view

History

- At the time of creation

    - Government report that cited Internet as critical national infrastructure

    - That some of that infrastructure was more important than other

- Design of Netnod was influenced by the view on national security

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Physical separation / redundancy

- Early on it was decided that the exchange of traffic had to work even in times of national crisis

  - Stockholm would not be a focus point

  - Any backup site had to survive on it's own

- Search for suitable locations started

  - And turned out to be a fairly complex process

Locating sites

Criteria that had to be met

- Population / Traffic volume
- "Carrier capacity"
  - It had to be fairly easy to get to
  - Preferably most where already present
  - Was probably the hardest criteria to meet….
- Somewhat spread across the country
- Existing telecommunication bunkers

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Other effects of the diversity

- Early on local exchange of traffic was seen as a possible "Good thing™"

  - However turned out to be somewhat harder than first thought

  - Until around 1999 traffic was still sent through Stockholm even for ISPs connected to Gothenburg

- This slowly changed

- Today a lot of traffic is exchanged locally

  - Gives overall better performance

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Connecting to Netnod

- In Stockholm the charges for connecting to Netnod includes the cost for two separately routed fiber pairs.
  - One to each bunker
  - The bunkers are not interconnected
- In the other cities, the ISP have to find a fiber provider themselves
  - Co-ordination needed to patch through to us
- The cities are not interconnected

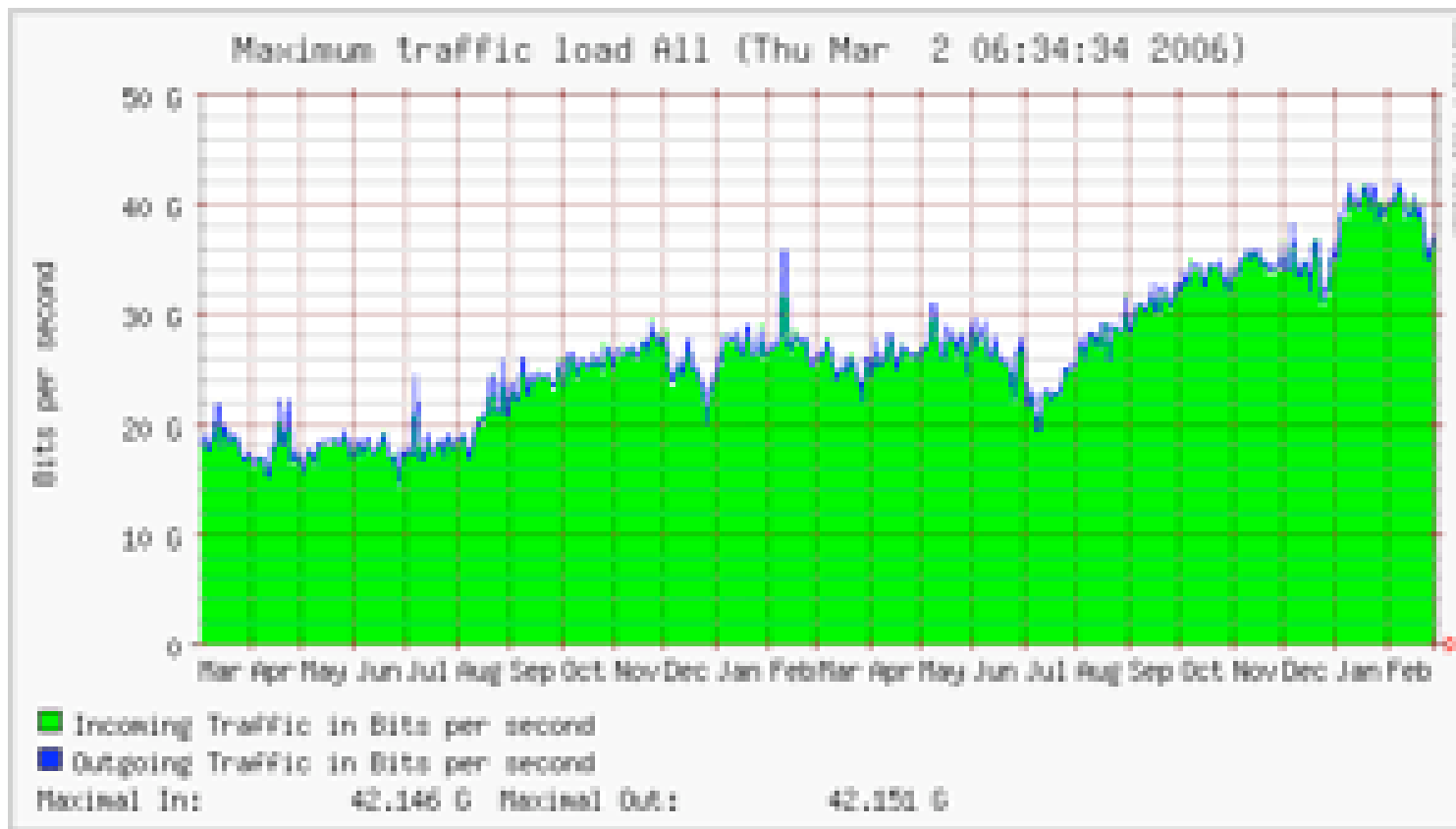2006-03-02

Critical infrastructure

- It was decided that is was of importance to locate some of the critical common Internet infrastructure at the Exchange points as well

- Netnod have tried to develop the amount of services available at the exchanges
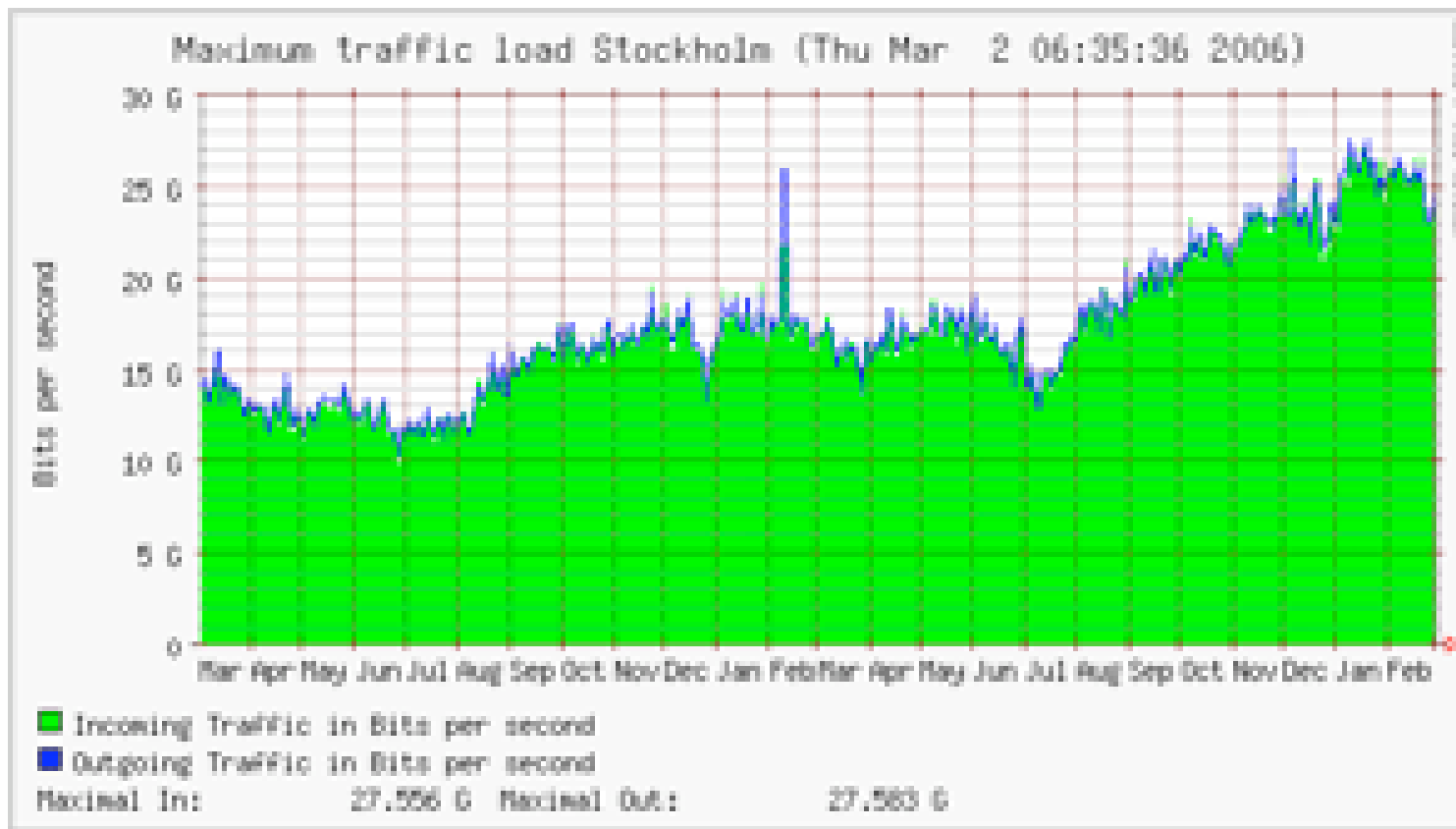
Common Services

- Official Swedish time through NTP

  - In Malmö, Sundsvall, Gothenburg and one cave in Stockholm

- i.root-servers.net

  - Location in Sweden not disclosed

  - Can also be run from all caves

- .SE TLD-service

  - Stockholm, Gothenburg, Sundsvall

- A number of TLDs in Stockholm

  - Among others Verisign's .com and .net

Connected customers

City	Customer
Stockholm	36
Gothenburg	12
Malmö	14
Sundsvall	8
Luleå	3

Maximum traffic load All (Thu Mar 2 06:34:34 2006)

Incoming Traffic in Bits per second
Outgoing Traffic in Bits per second
Maximal In: 42.146 G   Maximal Out: 42.151 G

2006-03-02

Maximum traffic load Stockholm (Thu Mar 2 06:35:36 2006)

Incoming Traffic in Bits per second
Outgoing Traffic in Bits per second
Maximal In: 27.556 G Maximal Out: 27.583 G

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