A Brief Overview…

Vanessa Evans

LINX

LINX Then…

- Established Oct 1994 by 5 member ISPs

- Objective to keep UK traffic in UK

- Encourage co-operation amongst competitors

- Housed in external independent facilities

  - Telehouse North (TFM6)

- (something of a closed club)

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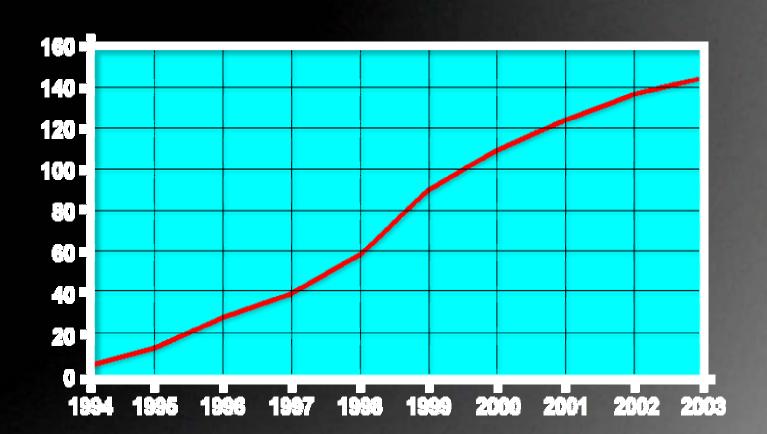
LINX Today…..

- Completely open, the only rules are technical ones

- Maintained mutual model
  - Not open to Capture

- 144 members, steady linear growth
  - Increase in GigE, decreasing 100M
  - Sharp increase in avg. traffic on GE late 2003
  - Still some consolidation, but strong new member prospects
  - 22 members participating in managed PI
  - 18 members participating on Route Server

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Membership Growth

2002-2003 Growth

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No. of Members

- 127 — Membership at the start of October 2002
- +21 — New members added during the year to end of September 2003
- -11 — Members lost due to consolidation, business failure or termination
- 137 — Closing membership position at the end of September 2003

Factors influencing Growth

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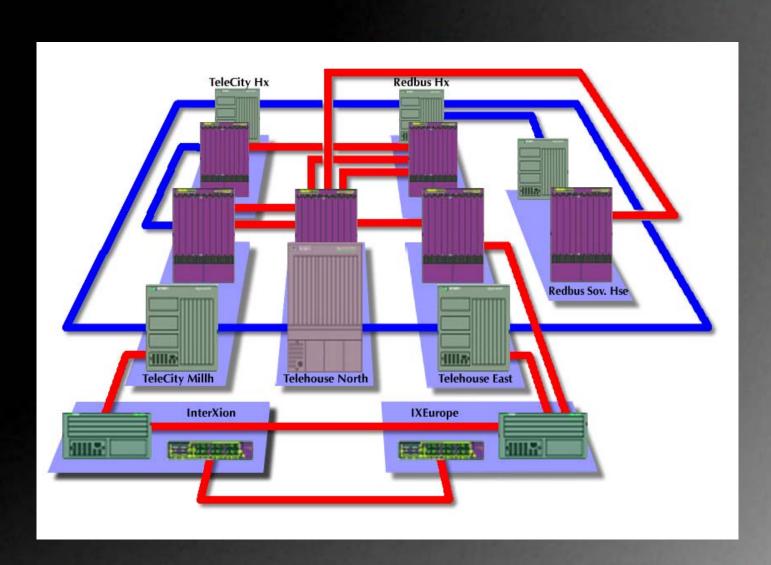**Update**

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LINX Today…

- Head Office in Peterborough, equipment and subsidiary office in London
- Still committed to providing resilience and redundancy
  - Dual LAN architecture with dual switch vendors (Foundry and Extreme)
  - Own dark fibre with multiple diverse routing between sites
  - PoPs in 8 sites in Docklands & City
- Conservative approach to engineering configuration, backed up by roadmap look-ahead

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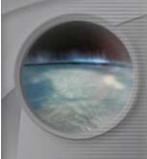**Malaysia**

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Network Architecture

Traffic

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Good of the Internet Activities

- K-ROOT

- Housing for Nominet - .uk master

- RIPE NCC Routing Information Service Collector

- Packet Clearing House support cluster

- Slave ccTLD nameservers
  - Austrian and Belgium

- I-ROOT Cluster (NetNod)

- routeviews.org BGP stats collector

- Team Cymru Bogon route server

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LINX Training Programme

- **LINX Accredited Internet Technical (LAIT)**
  - ➤ Launched in 2000 to help address the critical shortage of skilled Internet engineers and technicians being experienced by ISPs
  - ➤ Assists in raising the skills of those involved in installing, operating and maintaining Internet hardware and software
  - ➤ Delivered by LINX commercial partner Systems & Network Training
    - Project is therefore financially self sufficient

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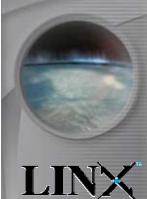**Kuala Lumpur,**
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LAIT Pass Rate

LAIT Level	Exams Taken	Exams Passed	Percent
LAIT I	88	49	56%
LAIT II	26	16	62%
LAIT III	20	9	45%

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Management Structure

Engineering News

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Next Gen Switches

- November 2003 down to two contenders (Foundry & Cisco)

- Requirements finalised and lab evals completed:
  - High-speed, high-density 10GE switch
  - AC Power
  - Must support 10G and 1G ethernet interfaces
  - XENPAC 10G optics
  - Either GBIC or SFP 1G optics
  - Redundant management modules
  - Field replaceable switch fabric(s)
  - Field replaceable, hot-swappable line cards
  - If no hitless failover today, roadmap commitment for CY 2004
  - Port density of at least:
    - 2x 10GE ports per linecard
    - 20x GE ports per linecard
    - at least 50 ports of GE and 4 ports of 10GE, with at least 2 empty linecard slots
  - Line rate ports, at 10G and 1G
  - 64-bit interface counters
  - Jumbo-frame support

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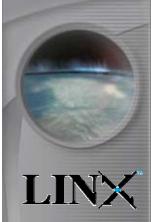**Malaysia**

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And the winner is

- Foundry MG8

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Initial Deployment Outline

- ## February/March

  - Software upgrades on existing platform
  - Enable MRP, to allow rapid failover

- ## Late March/Early April

  - Install one MG8 at Telehouse North and insert into 10GE ring (traffic will transit the switch)
  - Ability to take "beta" 10GE customers
  - Phased migration of switch1 GigE customers to MG8

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Further Deployment

- ## Then upgrade existing BigIron modules

  - ### Phased rollout of JetCore modules across other 10GE LINX locations

  - ### Then take beta customers for trunked GE (as required)

- ## Install second BigIron MG8

  - ### Location to be decided

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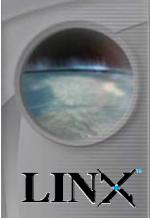**Update**

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Deployment Methodology

- We'll adopt our usual approach to this
  - A "slow start", making gradual changes
  - Control the amount of risk presented at any one time
  - Monitor the first deployments carefully
  - If everything seems stable increase the rate of work
  - Change control freezes where applicable

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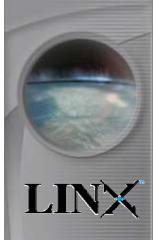**Malaysia**

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Future Developments

- ## The new hardware will support Sflow

  - Add an Sflow collector, allow us to spot trends and anomalies in traffic patterns

- ## Possibility to double ring bandwidth to 20G

  - New 2 port 10GE card for JetCore

  - Transit through 10G at line rate, can add/drop 8G

- ## BI4000s in IX and InterXion not upgraded at this time
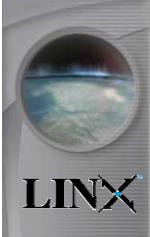
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Pricing and Services

Fees

- Flat fee structure changed to Traffic Based Charging System

  - Fairer on all Members

  - As costs are split between Members

  - New Members means greater distribution of costs which means lower fees for everyone

- Initiatives consistently undertaken to reduce fees

  - 20% reduction in all port fees for last 6 months of last year

  - Fees lower this year than any other year

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Services

- Current
  - 100Mb/1Gb ports
    - Multicast and/or IPv6 and/or IPv4
  - Provision of Rack Space in LINX own space
  - Route Server
  - BENTO
  - Private Interconnect (intrasite and intersite)
    - Between all LINX sites
  - Basic level of support
- Planned
  - DDOS Protection
  - DNS Caching
  - Trunked 1Gb ports
  - 10Gb

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"LINX from Anywhere"

- Organise marketing efforts with draft-martini ethernet carriers
- Link up prospects who don't want to fully build out into London with a suitable carrier
  - No need to deploy equipment locally
- Provide a means for IXP to IXP connections
- After three months
  - 7 providers, covering 184 locations in 34 countries

  http://www.linx.net/joining/linx-anywhere/
- Enables LINX to establish "Virtual Sites"

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In Asia…

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BENTO

- # Network Monitoring and Analysis tool

- # Prospecting

  - ## Set up BGP session with server

  - ## Obtain report on

    - In a perfect world, how much traffic can be offloaded at the Exchange

    - Cross referenced against "Peering Slut" list and those members connected to Route Server

Looking Ahead

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Looking Ahead

- Maintain critical mass and continue to provide value
  - Continue efforts to reduce fees and maintain a fair pricing system
  - Attract and secure new members
    - Offer new peering opportunities
    - Lower fees
- Deploy appropriate next generation switch technology
  - Deal with port capacity issues
  - Offer both 10 GigE and/or trunked ports to members
- Act on the results of the second member survey

Questions

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