£10 per day Peering and the Cheapest 10 Gigabit Ethernet Ports Now Available from LINX See Page 1 for further details

In this issue of HotLINX...

Up Front 2 3 After looking back over LINX’s first 15 years in HotLINX20, John Souter looks to the future with reference to new LINX staff, a new website and a brand new head office.

Membership 4 5 6 On page 4 we focus on the new LINX pricing structure which now makes it possible to peer for under £10 per day. We also profile Bhutan Telecom and LINX from Anywhere.

Engineering 6 LINX Network Engineer Gary King takes us through the factors LINX considered when choosing its new test kit and the benefits of the hardware finally chosen.

Industry News 7 9 10 In addition to our regular articles from ISOC and the RIPE NCC, we are delighted to introduce a new feature focusing on IPv6 and IPv4 depletion. Andy Davidson takes up the story.

Public Affairs 8 9 In an expanded regulation section Malcolm Hutty explains the issues surrounding the Digital Economy Bill and the changes at the EU Commission.

Events 10 11 12 GPF5.0 and the LINX67 and 68 member meetings are all covered in our industry events section. Check our calendar to see where you can meet LINX staff around the world.

In the Spotlight 15 In our “In the Spotlight” section we speak with former LINX Board member, Clive Feather, who was presented with the ‘Conspicuous Contribution to LINX Award’ at LINX67.

Entering a New Era It’s In with the New at LINX in 2010
A New Year Revolution!
By LINX Chief Executive Officer, John Souter

In the last issue of HotLINX we celebrated the 15th anniversary of LINX and it seemed the right time for me to reflect on how far the exchange has come since 1994. With the advent of the new year it is now appropriate for me to write about the present and what the future holds for LINX in 2010.

This year has already seen a number of significant developments, the details of which you can read elsewhere in this issue. Most importantly from a member perspective, is that we’ve again reduced our prices. This continues a trend of annual cuts going back a decade or more.

In addition we have relocated our administrative headquarters in Peterborough, recruited three new staff members, which is always exciting (for them and us!), and are in the process of significantly renewing the look and feel of our website.

From a technical standpoint we’ve also implemented new route servers using a product called BIRD which has been developed by fellow Internet exchange, NIX.CZ, based in Prague.

We are planning many more changes this year so that LINX can stay ahead, and continue to provide excellent service for our members. I am proud of the fact that we are starting the new year off with a bang. Watch this space!

May I welcome you all to issue 21 of the LINX membership magazine, HotLINX.

Those with an eye for the final detail will notice that one particular word appears more than most in this edition. That word is ‘new’ and it has been used with very good reason. LINX is setting new records in a host of different ways such as offering the lowest 10GigE port prices of any comparable exchange as part of a new fees structure and by being the first IXP to be represented in over 50 territories. Also, if you glance to the page opposite you will see that we have relocated to a new office in Peterborough, welcomed new staff as well as launching a re-designed website. It’s all go!

On the subject of new staff I am delighted to welcome Megan-Kate Nisbet to the LINX Sales & Marketing team as Marketing & Communications Executive. Megan will be assisting in the publication of HotLINX, social networking and looking into developing stronger relationships between LINX and our members’ marketing departments.

One of the most important additions to the content in this issue is that of a new IPv6 column. This is sure to be of great interest to readers as the number of available IPv4 addresses continues to fall at a rapid pace. Andy Davidson, NetSumo’s Technical Director, provides his view on page 9.

The IPv6 feature is just one of many new innovations that we are looking at implementing during this coming year. It is still too early to say exactly what form these improvements will take, but be sure to look out for announcements on the LINX social networking sites as they happen.

Please contact myself and Megan with your stories and feedback by emailing us at hotlinx@linx.net. You can also use this address if you would like to request any additions to the mailing list.

Jeremy Orbell
HotLINX editor
Tel: +44 (0)1733 207705
A New Office, New Staff and a Brand New Website

Big Changes Instore for LINX in 2010

2010 is now well underway and it is a period of dramatic change at LINX. On page 4 of this issue we cover the new LINX pricing structure and how it is now possible to peer at the exchange for less than £10 a day. LINX has also employed a number of new staff, relocated to a new head office in Peterborough and is about to launch a brand new website.

New Staff

In recent months LINX has welcomed three additional staff members to the Engineering and Sales & Marketing teams. Tim Preston and Colin Silcock have joined as Network Engineers in London while Megan-Kate Nisbet has been employed as a Marketing & Communications Executive in Peterborough.

The next issue of HotLINX will feature introductory articles from Tim, Colin and Megan as well as an overview of the LINX organisational structure.

New Head Office

LINX’s new administrative headquarters is located in the centre of Peterborough, some 80 miles North of London. This replaces its former Peterborough head office which had been LINX’s base since the late 1990s.

The decision to move premises was taken so that LINX had the capacity to accommodate rising staff numbers employed to meet the needs of a growing and increasingly diverse membership. It also meant that LINX had the space available to test technical equipment and stage larger meetings with the flexibility for further expansion in the future.

LINX Chief Executive, John Souter, said: “With 350 members from 50 countries, LINX now has more connected members than any other Internet Exchange Point. We see this move as an important step in ensuring we have the best facilities available that enable us to serve those members with the excellent service they have come to expect.”

Operations at the new office began on Monday 1 February and follows a similar move to larger premises for London engineering and public affairs staff in 2007. The new LINX Head Office address is as follows:

London Internet Exchange Limited
Trinity Court, Trinity Street
Peterborough, United Kingdom PE1 1DA

Full contact details for all LINX locations can be found on the LINX website: www.linx.net/about/contact-us.html

New Website

Over the past few months LINX has been busily developing a brand new website which is now about to go into a final phase of testing before a launch in early Spring.

Discussions have been taking place with LINX members, both individually and collectively, at LINX member meetings, to look at what specific improvements and services they wanted to see implemented in the new site. The suggestions made have been introduced where possible and now play an important role in the overall site design and functionality. Amongst the changes will be an enhanced member and support areas as well as a redesigned Public Affairs section.

Please look out for announcements and information on the launch of the new website in due course.
LINX is pleased to announce that it is now possible to peer at the exchange for less than £10 per day following a series of new year price cuts.

With effect from 1 January 2010, the LINX membership fee has been cut by 16.67% to only £1500 per year with 1GigE and 10GigE port fees also reduced by 5% on the Brocade LAN. These changes to the LINX pricing structure ultimately mean that a member taking two 100Mb ports, one of which is provided free by LINX, can connect to the exchange for as little as £9.37 per day.

LINX Chief Executive Officer, John Souter, said: “This is the second round of price cuts in the last six months following the 20% reduction in the membership fee and cuts in port prices back in July. Every member benefits from the changes without any alteration to their membership agreement. Offering membership for less than £10 per day gives LINX a lower entry level for networks seeking to peer at an international IXP.”

Mr Souter continued: “LINX has a very strong belief in the importance of the member-owned Internet exchange model and strives to make peering as cost-effective as possible for all its members. Reducing our fees is just one of the ways that LINX is helping build a stronger and more resilient Internet for everyone.”

**Latest Price Cuts Reduce the Cost of Peering at LINX to Under £10 Per Day**

<table>
<thead>
<tr>
<th>Membership Fees</th>
<th>2010 Prices</th>
<th>Annual Saving</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Membership Fees</strong></td>
<td>£1500 per year</td>
<td>£300 (16.67% reduction)</td>
</tr>
<tr>
<td><strong>100Mb Ports</strong></td>
<td>£160 per port per month</td>
<td>Remains Unchanged</td>
</tr>
<tr>
<td>100BASE-TX and 100BASE-FX ports are connected to LINX Brocade and Extreme switched public peering LANs. LINX will provide IPv4 and/or IPv6 addresses for each interface. Note that LINX does not offer link aggregated 100Mb ports. A member’s first 100Mb port on the Extreme switched LAN is free of charge.</td>
<td></td>
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</tr>
<tr>
<td><strong>1GigE Ports</strong></td>
<td>Brocade £391 per port per month, Extreme £335 per port per month</td>
<td>Brocade £252 (5% reduction), Extreme Remains Unchanged</td>
</tr>
<tr>
<td>1000BASE-LX and 1000BASE-T ports are connected to LINX Brocade and Extreme switched public peering LANs. LINX will provide IPv4 and/or IPv6 addresses for each interface. 1GigE ports may be link aggregated in groups of 2x, 4x or 8x as shown in the availability matrix: <a href="http://www.linx.net/govern/servicesfees">www.linx.net/govern/servicesfees</a></td>
<td></td>
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<tr>
<td><strong>10GigE Ports</strong></td>
<td>Brocade £1463 per port per month, Extreme £1250 per port per month</td>
<td>Brocade £924 (5% reduction), Extreme Remains Unchanged</td>
</tr>
<tr>
<td>10GBASE-LR and 10GBASE-ER* are connected to LINX Brocade and Extreme switched public peering LANs. LINX will provide IPv4 and/or IPv6 addresses for each interface. 10GigE ports may be link aggregated as shown in the availability matrix.</td>
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* Note that 10GBASE-ER ports carry a £3000 installation surcharge.

Please note that for public exchange ports, all members must connect their first port to the LINX Brocade switched public peering LAN. Members are encouraged to take two or more ports with at least one of these on the Extreme switched public peering LAN to provide resilient connection.

The full LINX fee structure can viewed here: www.linx.net/govern/servicesfees

Over the last decade all LINX prices have dropped by anything from 20 to 80% with the LINX joining fee and traffic charges being abolished altogether.

These price cuts emphasises LINX’s commitment to lowering peering costs for all its members.
Global Peering

Over 50 members are using LINX from Anywhere service

LINX from Anywhere is a service that enables peering connections to be made at LINX via layer 2 carriers from around the globe. Over 50 members are currently using this method to connect to LINX from nearly 100 different locations.

Through LINX from Anywhere, existing LINX members and partners can offer other networks private point-to-point layer 2 connections on their UK and international networks. The service allows connections to terminate in a dedicated Ethernet port, with an individual IP address controlled by the customer network, on the carrier’s equipment at a LINX PoP.

The customer network is provided with a tunneled connection into LINX with totally secure communications, and a physical presence, via the carrier’s hardware. This in turn creates the ability to make a connection with other LINX members.

Networks based many miles from London have connected to the exchange using LINX from Anywhere. There are potentially high expenses in establishing a physical presence in the UK because of the costs involved in deploying staff to install and maintain hardware. However, with this service, they can connect to LINX from any point on the globe where participating LINX members have a presence.

Here is a list of current LINX from Anywhere providers: Abovenet, Belgacom, Connexions 4 London, Cogent, Dotshop, Deutsche Telekom, Eurotransit, Fused Networks, Global aura, Global Crossing, Interoute, IX Reach, Hibermia, KPN, Lambdanet, Level 3, Neo Telecoms, NTT, Packet Exchange, P&T Luxembourg, Telaink, Reliance Globalcom, TATA Communications, Telecom Italia Sparkle, Tinnet, TeliaSonera, UK Grid and UK Solutions.

Under normal circumstances the member pays the carrier for the transport service and LINX for its standard fees though some carriers may bundle LINX fees as well.

If you would like more details about LINX from Anywhere or any of the carriers listed here please visit: www.linx.net/join/linxanywhere or contact sales@linx.net

Connection to LINX Leads to Significant Growth for Bhutan Telecom

In 2008 Bhutan Telecom (BTL) announced that it was the first company from that country ever to provide international access using optical fibre cable. The commissioning of this international fibre link extending from Phuentsholing to a PoP at Telehouse East in London via Mumbai was considered a landmark achievement compared to their first international telecommunication link through a satellite system in the early 1990s.

Having access to the International optical fibre link is equivalent to Bhutan having access to a sea port (the country is land locked) and opens a wide range of opportunities in the ICT sector. Without this link, planning any ICT based activities in the country would have been meaningless. To help overcome these issues BTL took the decision to join LINX.

To begin with BTL used a DS-3 (45 Mbps) link to the exchange and have since expanded this capacity to STM-1 (155 Mbps) with effect from January 2010. BTL now has an established PoP upgraded capacity and connection to LINX providers while also availing IP Transit Services from the Tier 1 ISP.

In addition to the 310 Mbps bandwidth on fibre, BTL has about 10 Mbps of Satellite bandwidth. Bhutan has a population of just 690,000, but with some 40,000 Internet users, it means it has a bit rate per inhabitant of 464 bits per person. For Internet users this grows to 8 Kbps per person.

With the international bandwidth expansion completed, BTL are focusing on its DSL broadband operations. Their DSL service was first established at the beginning of 2008 with the commissioning of fibre link to LINX. As of today, Bhutan Telecom has installed DSL broadband in 28 locations across the country covering 16 of the country’s 20 districts.

Tshering Norbu of Bhutan Telecom said: “Our connection to LINX means we are now able to provide an overall bandwidth total of 320 Mbps for international Internet links. Considering Bhutan’s size and population it means the country potentially has one of the highest international Internet bandwidth levels per inhabitant and Internet user in the world.”

Bhutan Telecom CEO, Thinley Dorji, added: “Having access to the Internet over the global fibre network is of the utmost importance to the whole country. We talk of promoting IT Parks, Call Centers and other IT related industries in our country as possible providers of employment to our youth. Our upgraded capacity and connection to LINX will play an important part in making this a reality.”

LINX Chief Executive Officer, John Souter, added: “With over 50 countries represented at the exchange and membership covering so many differing network types, LINX can justly claim to have widest reach of any exchange point anywhere. It is gratifying to see that our members are benefiting greatly from connecting at LINX and we hope many more organizations can see the benefits of doing likewise.”

For more information on Bhutan Telecom please visit: www.druknet.bt
Specifications

With an ever growing number of Dense Wave Division Multiplexed channels on the LINX inter-switch links and with the addition of the Transmode platform (Intersite PI), a need emerged for test kit to be acquired to enable LINX to effectively commission and fault-find this equipment.

LINX Network Engineer, Gary King, looks at the factors LINX considered in choosing its test kit and the benefits of the hardware chosen.

LINX Requirements

An Optical Spectrum Analyser (OSA) for commissioning and fault finding DWDM systems as used for various inter-site switch ISLs and the Transmode DWDM platform.

1. Modular platform capable of housing an Optical Spectrum Analyser (OSA) module together with an Optical Time Domain Reflectometer (OTDR) module
2. OSA to cover wavelengths from bands 'O' through to 'L' (1250nm to 1650nm)
3. Tri-Wavelength OTDR module (1310nm, 1550nm and 1625nm)
4. 12" colour touch screen
5. Remote controlled via VNC through the unit’s Ethernet port or built-in wireless adapter
6. Generation of detailed test results as pdf reports

Modular Design
We exclusively considered systems of modular design to enable the upgrading of specific modules to keep pace with industry developments. The unit chosen was an EXFO-FTB500 which was available in four and eight slot variants. The OSA module occupies two slots and the OTDR is a single slot module. This leaves a spare slot that could perhaps be occupied by an Ethernet test module in the future.

The FTB500 base unit is the very latest unit from EXFO and is compatible with all the modules produced for this range over the last 10 years of production.

The 12" touch colour screen makes setting up tests and analysing results in the field an extremely quick and straightforward process for us. It’s also possible to run simultaneous testing with the OSA and OTDR modules and applications.

OSA
The optical spectrum analyser covers a wide range from 1250nm to 1650nm with a >90dB dynamic range covering all channel spacing from 50Ghz DWDM to CWDM.

Capability to test to 25Ghz
The unit exhibits a high Optical rejection ratio (ORR) enabling this unit to measure extremely accurately the optical signal to noise ratio (OSNR).

OTDR
The optical time domain reflectometer module is a tri-band unit covering 1310nm, 1550nm and 1625nm wavelengths. The addition of the 1625nm wavelength should enable us to identify specific fibre problems such as microbending, issues that may not be apparent when testing at 1310 or 1550.

Testing DWDM Installations

The OSA is typically used to test new DWDM installations such as this trace from an 8 X 10G ISL. A new software update will enable us to soak test DWDM links and to monitor various parameters for each channel including frequency drift over a set period of time to ensure stability before placing into service.
The possibility of the Internet’s impending collapse due to the explosive growth in Internet bandwidth use is a recurring high-profile theme in the popular media. However, the reality of measuring and understanding Internet bandwidth growth and its implications at macro-scales is complex.

During the 76th Internet Engineering Task Force (IETF) meeting in Hiroshima, Japan in November, the Internet Society (ISOC) hosted a technical panel session, “Internet Bandwidth Growth: Dealing With Reality,” to help shed light on the realities of bandwidth growth, operator responses to a changing landscape, and new, relevant IETF work.

Panel moderator, Leslie Daigle (ISOC’s Chief Internet Technology Officer), explained the importance of discussions such as this one in exploring the parameters of Internet bandwidth growth and management, because these have implications for both network-neutrality debates and business decisions based on predictions of growth and usage.

Kenjiro Cho, a senior researcher at Internet Initiative Japan, presented data from his multi-year study of several ISPs in Japan, where the majority of households enjoy high-bandwidth fibre connections. Cho reported overall network growth of approximately 40 percent per annum since 2005, well within the observed growth in network capacity of around 50 percent per annum. In this environment, Cho-san also measured changes in the ratio of inbound-to-outbound traffic, which suggests a shift away from peer-to-peer (P2P) services to streamed content services.

Danny McPherson, chief security officer at Arbor Networks, presented the results of the ATLAS Internet Observatory, which provide several important insights about the consolidation of content around so-called hypergiants—the 30 companies that now account for 30 percent of all Internet traffic. Among other observations, the ATLAS study also found similar growth rates and an apparent shift from P2P to streaming.

Both Richard Woundy, senior vice president at Comcast, and Lars Eggert, principal scientist at Nokia Research Center and Transport Area director at the IETF, were able to explain more about the role of the IETF and its current work on several fronts.

Woundy provided some background to Comcast’s experience in congestion management, balancing the needs of customers with the broader Internet community, regulators, and others. He also outlined the involvement of Comcast engineers in IETF working groups and BoFs.

Finally, Eggert reviewed the architectural principles of the Internet and observed that the widespread adoption of broadband access technologies is creating a need for network operators to intervene in some cases. This is a rapidly evolving area in need of new solutions. Accordingly, IETF work is proceeding on several different fronts, including the ledbat, mptcp, and alto working groups and the conex and homegate BoFs.

A more comprehensive report of the Internet Bandwidth Growth panel appears in the latest issue of the IETF Journal (vol.5, issue 3): www.isoc.org/tools/blogs/ietfjournal

A full archive of the event, including presentations, audio, and a transcript are all available from the ISOC web site: http://isoc.org/bandwidth
DNS Protected
LINX has succeeded in persuading the government to limit powers in the Digital Economy Bill to commandeer domain name registries. The government wanted reserve powers to take control of Nominet, following a boardroom battle at the registry operator last year. However a drafting error in the Bill left almost every Internet company exposed to having its Board of Directors replaced by Ministerial edict.

Ministers want to be able to secure the integrity and operation of the .uk domain, considered vital to Britain’s interests. Although the boardroom dispute has been resolved, and despite Nominet efforts to reform its own governance, Ministers still want the power to replace Nominet’s Board if the need arises.

LINX noticed that the wording of the Bill was based on a misunderstanding of the hierarchical nature of the DNS. Following a meeting between LINX and the Department for Business, government Minister Lord Young tabled amendments in Parliament to fix this problem, saying:

“Following representations made by the industry, the Government realised that the scope of the domain name provisions in the Bill could have unintended consequences. Specifically, the definitions in Clause 18 as currently drafted would bring any organisation or company in the UK that runs its own name server within the scope of the powers that was not intended. Similarly the UK-based domain name registry operations of some third countries are also caught. Again, that is not what the Government had in mind when they proposed this draft legislation.”

Copyright Rules Threaten Internet
The Digital Economy Bill includes new powers to force ISPs to police copyright infringement online, apparently abandoned in January 2009 following industry consultation, but resurrected when Secretary of State Lord Mandelson made supporting the copyright lobby his personal priority.

A scheme requiring ISPs to send warning letters to customers accused of infringing copyright by rights holders is only the mildest first step in the Bill. Customers accused on multiple occasions could face disconnection under a so-called “three strikes” regime. ISPs could also be forced to introduce technical measures intended to impede file sharing.

LINX has been lobbying Parliamentarians to place safeguards on these dangerous powers, which threaten the “end-to-end principle” that underpins the Internet. But deference by the House of Lords to the elected government, and vigorous whipping of the government majority in the Commons, make outright reversal of settled government policy unlikely.

The Digital Economy Bill
LINX claims victory on domain registries, but problems linger on copyright

LINX has suggested thirteen amendments that would mitigate the harm; all have been tabled by members of the House of Lords, many by the Opposition Front Benches.

At the time HotLINX went to press, Westminster-watchers were divided on whether the Bill would actually become law. An election expected in May, coupled with a Parliamentary recess for an early Easter, means the government risks running out of time. But Lord Mandelson has made pushing this Bill through one of the government’s top priorities.

More details on the provisions of the Bill are available on http://publicaffairs.linx.net/news
To coordinate with LINX your own lobbying efforts on the Bill, please contact Malcolm Hutty, Head of Public Affairs
	malcolm@linx.net
New EU Commission

A new slate of European Commissioners takes office in 2010. The President of the Commission, José Manuel Barroso, announced his new College of Commissioners in November 2009: the appointees faced public hearings in the European Parliament in January 2010, before a final confirmation vote on the 9th February. Although the Parliament only rarely rejects an appointment, the hearings can provide an insight into Commissioners’ views and priorities.

Neelie Kroes, former Commissioner for Competition, becomes the Commissioner for the “Digital Agenda”, taking over the responsibilities of the previous Commissioner for the Information Society, Viviane Reding. Mrs Reding completed the passage of the package of Telecoms Directives, but Ms. Kroes said she wanted to do more to extend broadband access and encourage investment, aiming to provide an insight into Commissioners’ views and priorities.

We are now into February, but IPv4, the Internet’s core addressing protocol still has a nasty new year hangover, and all signs are pointing to 2010 being a bad year for the protocol.

Since January 1st, a few key milestones have passed, indicating how urgent the IPv4 rundown problem has become. Firms that rely on Internet connectivity must take urgent action in light of the events:

- The allocation last week of two further /8s (blocks of IPv4 addresses with the same number before the first dot) to APNIC mean that for the first time, less than just ten percent of the IPv4 unallocated pool is available to be assigned. At current utilisation rates, this pool will be exhausted in only 600 days.

- The allocation of 1.0.0.0/8 is the assignment of the first really ‘dirty’ block of addresses, signalling that we really are in the run-down period. Bad network design decisions in the past have meant that networks have ‘borrowed’ the use of addresses starting 1.0.0.0/8 to ‘run down’ policy which will mean that organisations requesting space will only be able to cater for their growth requirements for a very short amount of time.

RIPE members should thoroughly audit their address space so that they can ensure that their records are accurate, because RIPE are more likely to ensure that address space is assigned to your end users in line with the community’s policies.

Organisations who rely on Internet connectivity for their products should ensure their providers have an IPv6 migration plan in place. Otherwise end-to-end connectivity for home or office users is unlikely to be available beyond the runout period. Companies hosting network services, for example a website, should enquire what their host’s IPv6 plans are, and start to enable their services via IPv6.

There is real traction to ensure IPv6 support appears in both the hardware and services you need to connect to the Internet. It is easier today than ever before to find help making your services available via IPv6. The alternatives – patchy connectivity via nested stacks of IPv4 islands, or connectivity via nested stacks of IPv4 islands, or no more end-to-end connectivity (so that your Internet service is a walled garden), have much worse consequences than learning to roll IPv6.

For more information, see the RIPE NCC’s information site, www.ipv6actnow.org

2010 Will Be A Bad Year for IPv4
Says NetSumo’s Technical Director, Andy Davidson

We are now into February, but IPv4, the Internet’s core addressing protocol still has a nasty new year hangover, and all signs are pointing to 2010 being a bad year for the protocol.

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- The allocation of 1.0.0.0/8 is the assignment of the first really ‘dirty’ block of addresses, signalling that we really are in the run-down period. Bad network design decisions in the past have meant that networks have ‘borrowed’ the use of addresses starting 1.0.0.0/8 to trigger hotspot logout, but a handful of examples appear across this address range.

RIPE NCC, the organisation which assign addresses to networks in and around Europe have this month implemented their ‘run down’ policy which will mean that organisations requesting space will only be able to cater for their growth requirements for a very short amount of time.

Andy Davidson (left) speaks with Mike Hughes and John Souter at the LINX IPv6 workshop held in March 2009.
RIPE NCC Update

RIPE Labs Project Development Continues Apace

The RIPE NCC update in Issue 20 of HotLINX discussed the launch of RIPE Labs, a new web platform for the Internet community to showcase and discuss innovative Internet-related tools, ideas and analysis. A lot has happened on RIPE Labs since its launch last September. Here are a few quick snapshots of ongoing discussions on the site:

IPv6 Measurements - A Compilation
Many people contributed to an article compiling a wide range of IPv6 measurements currently being performed by various organisations and individuals. The article includes a short description of the methodology and the results, along with a link to the original pages of those performing the measurements.

If you have any comments or if you would like to see any type of measurement that is not yet done, please let RIPE Labs know.

Preparing K-root for a Signed Root Zone
Another topic which was well received and prompted a fair amount of discussion was an article describing the RIPE NCC’s intention to deploy DNSSEC on K-root, the root name server maintained by the RIPE NCC.

In addition, the RIPE NCC developed a small tool that can determine the maximum size of DNS response packets that a specific resolver can handle. It is available on RIPE Labs and can be downloaded from there (see the article entitled “Testing your resolver for DNS reply size issues”).

We are currently working on a new structure and design for the RIPE Labs website, incorporating more social networking elements to make it easier for people to contribute and participate in the discussions. So stay tuned, we’ve got plenty more to come!

The RIPE Labs project website features a host of useful information including regular news and blog updates, separate tools and ideas sections plus a special discussion forum. For further details please visit: http://labs.ripe.net

GPF 5.0 Agenda

IPv6 High on the Agenda for Fifth Global Peering Forum

The GPF 5.0 will leave Miami for a peering cruise to Key West and Grand Cayman. The main peering forum will be held shipboard on Wednesday 14 and Friday 16 April while at sea. Among the topics covered on Wednesday are carrier Ethernet exchanges, GRX to IPX Transition and IPv6 application enablement. Also discussed will be effects of going transit-free, net neutrality and peering as well as DNS security extensions.

On the final day there will be a panel discussion on IPv6 deployment, an update on 100Gbps peering plus sessions on building better IP backbones and new undersea fibre builds. Also covered will be cloud computing and its traffic patterns as well as a debate on what the Internet community is looking for from its colocation operators.

LINX, Equinix, Switch and Data, Terremark, AMSIX, DE-CIX and JPNAP have joined forces to create a twice yearly peering forum.

Attendees will be joined by over 175 global peering coordinators for a multi-day forum that will enhance their technical knowledge and all-important social connections.

For more information please visit: www.peeringforum.com. You can also direct any questions or comments to info@peeringforum.com.
Since the summer of 2005 LINX has staged nearly all of its quarterly member meetings at the Goodenough College in London. This is likely to change during 2010 as the number registering to attend these events continues to grow so look out for details regarding changes to the LINX meeting venue in the near future.

LINX staff attend a number of industry events around the world every year. Please take a look at the list below to see where you can meet with LINX representatives over the coming months.

LINX68
15/16 February 2010
London, United Kingdom
Attended by: LINX staff & Board
www.linx.net/members/events/meetings/L68/LINX68

NANOG48
21-24 February 2010
Austin, Texas (USA)
Attended by: Mike Hughes, Jennifer Atherton
www.nanog.org/meetings/nanog48

GPF5.0
12-17 April 2010
Miami, Key West, and Grand Cayman
Attended by: Patrick Gilmore (LINX Board)
www.peeringforum.com

RIPE60
3-7 May 2010
Prague, Czech Republic
Attended by: TBC
www.ripe.net/ripe/meetings/ripe-60

LINX69
17/19 May 2010
London, United Kingdom
Attended by: LINX staff & Board
www.linx.net/members/events/meetings/L69/LINX69
Web page will be available in April 2010

LINX70
16/17 August 2010
London, United Kingdom
Attended by: LINX staff & Board
www.linx.net/members/events/meetings/L70/LINX70
Web page will be available in July 2010

LINX may well have been saying goodbye to the Goodenough College as a venue for LINX member meetings this February. The London location, which was first used at LINX50 in August 2005, has served the company well over the years but as the membership expands we have found that we are beginning to outgrow the facilities available. The venue for LINX69 is in the process of being finalised so look out for announcements in due course.

There was another full agenda set for LINX68 with lots of great content for the delegates and webcast viewers.

Day One (Monday February 15)
Included in the agenda on the first day were presentations from gold and silver sponsors Cable & Wireless and Telehouse plus discussions between various members on the tools they used within the ISP community. FranceIX were the guest IXP.

Day Two (Tuesday February 16)
The second day saw sessions on the topics of IPv6, public affairs and engineering as well talks from Carphone Warehouse and LINX68 silver sponsor, Extreme Networks.

The full LINX68 agenda details can be seen here:
www.linx.net/members/events/meetings/L68/LINX68

LINX technical and sales staff were present at NANOGs, MENOGs RIPEs and peering forums in the United States, Lebanon, Dominican Republic, Portugal, Russia, The Netherlands, Denmark and Bahrain during 2009. LINX also took the time to visit members in Rochdale, Fareham, Leeds and Bath in the UK and Paris in France through a series of smaller scale member outreach events for those unable to make the quarterly LINX member meetings.

This year is already stacking up to be a busy one for LINX staff. We are looking at a number of industry events in such diverse locations as Bhutan, Central America, Saudi Arabia, Belgium, Turkey, Romania and the Czech Republic amongst others.

Making Contact with Members from Around the World

As the LINX membership continues to grow, we recognise the importance of making and developing personal contact between members, prospects, vendors and industry stakeholders around the world. We believe that this is a key part of understanding our members’ peering needs and helps us to direct our efforts into creating a bigger and better exchange point.

To accompany this move into new territories we are looking to issue yet more foreign language editions of the LINX membership guide. Russian and Polish versions have already been printed for the events PLNOG and the RIPE NCC regional meeting in Moscow last Autumn and these are available to download from the LINX website: www.linx.net/join

If there is an event that you feel would be beneficial for LINX to be attending please email us at sales@linx.net
Repsole, a leading supplier of datacom and telecom products, attended the LINX67 member meeting as silver sponsors back in November. The company has been trading since 2003, mainly installing and maintaining fibre networks, in and around London and in parts of the UK. In 2006, a ‘divine intervention’ resulted in a competitor approaching Repsole with a plea for help: “We have a major fibre problem and I cannot find any product locally nor nationally that is available in 24 hours…”

In January 2008 Repsole opened the doors to its Data Product Trade Counter along with a state of the art e-commerce web site: repsole.com

Purposely situated in the Heart Of London Docklands Data Centres, the Trade Counter hit it off straight away. Being only 542 metres away from Europe’s busiest Data Centre, Telehouse, it has managed to gradually increase its brand name and reputation in the industry.

Repsole Services

- Unrivalled Service - 7.00am - 6.00pm Opening (Repsole can also be open on weekends at short notice if you’re really stuck!)
- Extensive product based knowledge
- Major brand product portfolio (TYCO / AMP, Huber & Suhner and many more)
- Free same day delivery in the E1 London postcode area
- Vast stock holding of fibre, copper, power and consumables at competitive prices!
- And of course superb bi-monthly network parties!

Repsole’s, David Jones, said: “Our goal from the start was simply to be the preferred supplier of datacom, telecom and service products in the UK. We decided to sponsor the LINX event to increase our brand name awareness and to enable us to advertise our locality even more than before. This helped us not only reach those who were not aware of Repsole but also encouraged word of mouth promotion between engineers and anyone who may at some point require our services. We were pleased to hear that most of the LINX staff knew of us and had already ordered product from the trade counter. Why not let us help you too?”

LINX67 was an extremely well attended meeting with many guests from LINX’s past joining in with the celebrations at the evening social event. Compering proceedings was LINX Board member Raza Rizvi.

Michelle Reid from Telehouse Europe was also on hand to present a gift of a bottle champagne and a special birthday cake to the LINX team.

(Photos courtesy of Mo Shivji)
Equinix were pleased to be the Gold Sponsor at the LINX67 meeting and 15 year anniversary evening party in November 2009. Equinix is an active player in the Internet Exchange community and as such we like to support key events and activities throughout the market not only with our colocation offerings but also helping organisations with their capacity planning for the future.

Equinix London-4 and London-5 Campus

At the meeting Equinix updated attendees on the Equinix network neutral Data Center Campus on the outskirts of Greater London. This offers the best of all worlds for premium colocation and interconnection featuring a state-of-the-art operating environment with an impressive array of low-latency connectivity. Equinix London-4 and London-5 (LD4 and LD5) are there to meet and exceed requirements for business critical outsourced data center colocation.

In addition to the existing 13,500m² LD4 facility offering 24 MVA of fully diverse power, Equinix announced the opening of phase 1 of our new 21,000m² LD5 facility in Spring 2010. This purpose-built data center will feature 40 MVA of critical power on completion and has been specified from the ground up by Equinix.

Equinix Carrier Ethernet Exchange

The new Equinix Carrier Ethernet Exchange will provide a wide array of benefits and is designed to solve the carrier interconnect challenges for Layer 2 Ethernet services.

The primary benefit of the Equinix Carrier Ethernet Exchange is the ability to create “many to many” interconnections via one switch fabric and to translate a variety of Ethernet service parameters between carriers. Additionally, it enables carriers to quickly extend their service reach beyond their existing coverage area while reducing the time and cost to deploy multiple interconnections.

Today, Equinix facilities provide a marketplace housing many Carriers offering Ethernet services. The deployment of the Equinix Carrier Ethernet Exchange will provide immediate and scalable connectivity to a broad range of service providers, creating a standards-based platform that effectively blends and translates global, regional and local offerings for Ethernet Layer 2 services.

Third party offerings available at Equinix, such as LINX, will enjoy the benefits of increased carrier density that the new Equinix Carrier Ethernet Exchange will bring - more diversity and more interconnection opportunities.

This project marks Equinix’s ongoing commitment to driving innovation and leadership within the market, while providing neutrality and compliance with industry standards.

Currently Equinix has engaged with multiple carriers representing a mix of international, regional, metro and long-haul providers in the development program. If you would like to participate in, or learn more about our project, please contact us at linx@eu.equinix.com.

For further information visit ix.equinix.com/linx, email linx@eu.equinix.com or call +44(0)7870 577907 to speak to Julia Upton, UK Peering & Carrier Manager.

Equinix Announces New London-4 and London-5 Campus and Equinix Carrier Ethernet Exchange
Clive Feather
The Third Conspicuous Contribution to LINX Award

What was your reaction to being presented with the Conspicuous Contribution to LINX Award?
I was absolutely flabbergasted. John had said that he needed some help with something during the evening, and “it wouldn’t hurt much”. It was about half way through the introduction that I realized it was me that they were talking about, and I sort of shrunk down with embarrassment. Thankfully, the bit with the moustaches amused me so much that I was able to get to the front to receive the award without panicking. And I still have a fake moustache sitting on the award itself on my desk.

I’m still grateful for and humbled by the recognition the award implies.

And what of the future for Clive Feather?
Like I said, I’ve returned to my first love - computer programming - and to working in Cambridge, a place I’ve never escaped and probably never will. I’m enjoying it immensely, even though it’s a very different sort of life. I may return to regulatory work one day, but don’t count on it.

In August I finished my dissertation, and a couple of weeks after the award I went up to Edinburgh to receive something else I’m proud of: a Masters degree in Innovation, Technology, and the Law. So I’m now officially Clive Douglas Woon Feather M.A. LL.M.

Finally, now that our children are growing up (the youngest is 14), my wife and I have qualified as foster carers.

If you measure network latency with a yardstick, the shortest path would win the prize. Publications from the New York Times to WIRED have been touting financial companies’ “need for speed” on their network. But ‘latency’ or delay is not just relevant to financial companies, it’s what makes a communications network capable of handling voice, video, content and more. Each network within the global telecom space has been measuring its latency and selling on these numbers for years. It’s no different today except now, latency has gone mainstream and grown more competitive from milliseconds to ultra-milliseconds.

Hibernia Atlantic’s cable system, built as a backbone for global wholesale and IP providers, is engineered to provide diversity and security by bypassing traditionally congested routes, like around the New York and London waterways. Hibernia offers fast connections, with the lowest latency routing, such as 65 milliseconds round trip from Boston to Dublin. This network footprint is the basis for the company’s Global Financial Network (GFN), which launched in late 2008 and also ties into LINX.

The GFN is layered over Hibernia’s current diverse footprint in key financial cities including Toronto, Montreal, Chicago, Boston, Philadelphia, Stamford, Weehawken, Newark, White Plains, New York, Reading and of course London. It was designed to specifically meet the demanding performance and reliability requirements of the financial community, including point-to-point connections to major financial centers, trading platforms, financial exchanges, clearing firms and Electronic Communications Networks (ECNs). Built over Hibernia’s dedicated, layer 2 Ethernet platform, GFN ensures customers true, dedicated high bandwidth connectivity services with a 5-day guaranteed turn up.

Security Through Diversity:
The Financial Trading Community isn’t the only Network Operator Requiring Low Latency and Rapid Installation Intervals

Security Through Diversity
sales@hiberniatlantic.com
www.hiberniatlantic.com

Comment
“Other providers are entering the marketplace of offering low latency services on a leased circuit or two. Hibernia Atlantic is leading the charge by offering its customers a guaranteed 5 business day turn up, coupled with diverse and redundant routes on its own customized private network,” stated Fergus Innes, VP of Sales, EMEA for Hibernia Atlantic. “Hibernia owns the equipment down to the fibre. Our network is monitored from multiple, round-the-clock, 365-day NOCs, located in Europe and North America.”

“Hibernia has strategically selected its Points of Presence to be in or as close to these critical financial centers, wherever possible,” continued Mr. Innes. “This ensures our customers the lowest possible latency for end-to-end communication services.”

For more information, please visit: www.hiberniatlantic.com or email sales@hiberniatlantic.com.
Hi Clive. Please tell me about your background and career to date?

Well, I grew up in Southend-on-Sea and at 11, won a scholarship to Felsted School which was a minor public school in Essex. I first read about computer programming at around this time and was absolutely hooked by the idea. I read everything I could on the topic, though it was three or four years before I first got the chance to actually run a program on a computer. From there I moved on to Trinity College Cambridge, where I read Mathematics and Computer Science.

My first real job was in my gap year, writing software for a firm of actuaries. After graduating, I worked for five years at a computer manufacturer called Torch Computers in Cambridge, then six months at Root Business Systems in London. Later a former colleague contacted me and we set up a company called IXI, developing graphical user interfaces for Unix systems. Over the next five years we built this into a multi-million pound business employing 40 staff and with offices in Cambridge, Berkeley, and Tokyo. In 1993 we sold the company to the Santa Cruz Operation (SCO) and later that year I moved to work in their Strategic Development department.

When the department was abolished in 1995, I chose redundancy rather than moving to California.

A few months later Cliff Stanford hired me to work at Demon Internet and my first job was twofold where I was employed to run both the software development and business sales departments. However, after about six weeks Cliff bought another ISP in Cambridge (Cityscape) and sent me off to run that. This led to me attending political and regulatory meetings, and when we folded Cityscape back into the Demon Internet operations, I carried on doing this type of work as well as running Development, often attending the same meetings as Keith Mitchell.

In 1997 Cliff sold Demon Internet to Scottish Telecom and almost the last thing he did was to offer my services to LINX on secondment for six months. This was to handle some of the regulatory matters on Keith's behalf and if the arrangement worked out, LINX would look at having its own full-time Regulatory Officer. As you know, it did: we hired first Roland Perry and then, when he left, Malcolm Hutty.

From then on I picked up more and more of the regulatory work at what become THUS plc, and after a while this became my full-time job. In the meantime, Keith suggested that I would be an asset on the LINX board and, with my manager's blessing, I successfully stood for election. A year or so later I also stood for the ISPA board and the Nominet PAB, both of which I served on for some years.

When THUS were taken over some time later it was felt that there wasn’t the need for as many regulatory staff so I took redundancy soon afterwards. After a break I decided to return to my first love – computer programming. At the end of September I started at Cambridge Silicon Radio, designing and writing firmware for Bluetooth chips. It’s somewhat of a change from dealing with politicians, but I don’t regret the move at all.

Demon Internet were one of the original members of LINX back in 1994. How do you remember those early days now?

Well, I didn’t start at Demon until 1995, and I don’t think I attended my first LINX meeting until 1996. There were only about 20 members in those days, and there were serious technical and organisational restrictions on membership. For that reason we didn’t grow very fast. At the meetings we all sat round one big table and talked. There were precious few laptops to be seen, and of course no WiFi at all! I think there were something like three meetings in a row when the exchange broke just after it started, so the one member of staff not attending the meeting had to run around in a panic. Of course, we only had the one suite of equipment then, in Telehouse, and the one office, in Peterborough.

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You spent many years as a member of the LINX Council. What do you consider to be the key decisions taken during that period?

The biggest one has to have been the rejection of demutualisation and the overwhelming support of the membership for the mutual approach. It was a very rough couple of months. It cost us half the board – including Keith – and several good employees. But we also gained out of it, notably in John’s appointment as CEO and Neil’s election to the board. It was also around that time that we really expanded from effectively being a switch at a single site to today’s network connecting several data centres around London.

What challenges do you see ahead for LINX and how do you see the company developing in the future?

I expect LINX to weather the present financial crisis with little change, though I wouldn’t be surprised to find the membership numbers finally peaking and perhaps even declining a bit as the industry consolidates.

Far more serious is the regulatory side, which is traditionally something that the members haven’t paid much attention to (partly because Roland and Malcolm have done such a good job in keeping it mostly under control).

The Internet is now a mainstream industry and firmly in the limelight. We’ve had proposals for censorship arrangements in the past, and these are only going to get worse. Expect proposals to require LINX to monitor traffic for illegal downloads or to run a blacklist of customers forbidden to have Internet service.

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SABAM v Scarlet has been referred to the European Court of Justice by the Belgian Court of Appeals. SABAM is the only known case where an ISP has been ordered to install network filtering to prevent copyright infringement by peer-to-peer file sharing. The European Court will be asked to decide whether the protections for “mere conduits” in the Electronic Commerce Directive preclude such an injunction.

Meanwhile Australia’s third largest ISP iNet, has won a stunning legal victory. In Roadshow Films, the whole Hollywood legal apparatus lined up to demand ISPs be forced to disconnect their customers on an allegation of infringement under a “three strikes” model. The copyright lobby also wanted the right to force ISPs to block access to web sites it chose. The Federal Court dismissed the petition in an exceptionally thorough 200 page judgment that robustly defends the moral and legal legitimacy of uncensored Internet access provision.