Virtual PoPs

Connection to LINX is made even simpler by the introduction of the vPoPs programme.

See pages 10 and 11 for our special feature article.

No souvenir LINX coaster on the cover?

Turn to page 18 to find out how you can obtain one.

What’s New?

In terms of presentation pretty much everything is new in this issue of HotLINX! All your favourite features are still here however plus an expanded LINX stats section.

Up Front p03

In his regular intro article John Souter talks about how LINX’s Olympic experiences are already being used to help future games hosts Sochi and Rio de Janeiro in 2014 and 2016.

Ask the Expert p18

Do you have a question that you would like to ask LINX? Maybe you’d like to comment on a particular industry story. Turn to page 18 to find out how you can get involved.
Contents

Face Off

LINX News p06
At LINX79 there was recognition of Raza Rizvi’s Conspicuous Contribution to LINX in his 10 years on the Board

Public Affairs p08
The draft Communications Bill and the WCIT conference in Dubai are two of the topics covered in our Public Affairs section

LINX Meetings p16
Kurtis Lindqvist of LINX Associate member Netnod spoke at LINX79 on the subject of regional peering

In the Spotlight p17
Alex Cruz Farmer of LINX Partner NetSumo talks about his career to date and how he came to be involved with LINX

Inside Stories

In your smaller yet bigger than ever HotLINX we have a multitude of LINX community and industry news stories for you.

On page 4 we look at the results of ISOC’s recent survey of over 10,000 Internet users, while on page 5 the RIPE NCC analyse how skydiver Felix Baumgartner’s record-breaking leap from 39km was followed online.

In LINX News on pages 6 and 7 we have coverage of the recent LINX79 EGM where a resolution was passed on a new pricing structure for 2013 while Derek Cobb also talks about LINX’s Operational Support Systems.

We have a round up of the latest industry events on page 15 in a hectic period which saw LINX staff visit five continents in just three months. News from LINX Associate members is covered on pages 16 and 17 and on the back page we take a look at all the latest LINX member and technical statistics.

All in all there should be something for everyone.

Internet Industry Tweets

Below are just a few of the Internet and LINX community related updates we’ve spotted on Twitter recently.

tref @tre
t A funny thing happened on my way to #LINX79 http://tinyurl.com/cs88h6u

CRN UK @CRN_UK
Enta staff party helps Severn Hospice: Christmas celebration raises funds for local charities http://bit.ly/10NWDOL

Steve Wright @wright_s
Happy to announce that @pulsantuk have acquired @scolocate taking us to 10 DC’s and further strengthening our services and business!

Internet Society @internetsociety
This New Year’s Day also marks the 30th anniversary of a major milestone for the Internet http://bit.ly/YSpq2x

Martin Levy @mahtin
African IXPs are going to be big news in 2013 and beyond! @wanjiku wrote http://bit.ly/VohCzo @internetsociety helping - good stuff!

Nominet @Nominet

LINX on Twitter

Keep up to date with LINX on Twitter using @LINX_Network

Do you follow?
You can also get LINX news on LinkedIn and Facebook via the quick links below:
www.linx.net/LNC/linkedin
www.linx.net/LNC/facebook
Looking Back for the Future

LINX’s Olympic experiences are guiding network operators in Brazil and Russia

For LINX, 2012 was a remarkable year but we are not, and cannot, be an organisation that dwells on its past. That said, we are very happy with what we achieved over the last 12 months and the network enhancements made for the recent Olympic games have given us a great platform for growth in 2013.

Since the last issue of HotLINX in October, staff have attended industry events on five continents on behalf of the membership. As well as conferences we attend regularly in the USA (NANOG) and Europe (Euro-IX), we were also present at Africa.com in Cape Town and Capacity Asia in Bangkok. In addition to these, LINX Chief Technical Officer, Derek Cobb, and I visited countries that will be following in the UK’s footsteps as Olympic hosts.

My trip to Sao Paulo in Brazil for the PTT Forum was certainly a great success.

It was interesting to note that in the same week that I was speaking on LINX’s Olympic experiences in South America, Derek was doing the same at the MSK-IX Peering Forum in Moscow. These talks were always going to be popular as Sochi in Russia and Rio de Janeiro in Brazil will be hosting the upcoming winter and summer games in 2014 and 2016.

South America has traditionally been seen as ‘off the radar’ for European exchanges but that might be about to change. I was pleased to talk to a number of prospects at the PTT Forum event and our Marketing & Business Development team are keen to follow up on these. It’s looking like an exciting year ahead.

By John Souter
LINX CEO

Editorial

A New Style for HotLINX for a New Year
By Jeremy Orbell
HotLINX Editor

Well, this is a bit different isn’t it – HotLINX has clearly made a new year resolution to have a makeover!

I’ve been working on HotLINX in one form or another since issue 8 and it has certainly seen some changes. Originally launched as an A4 eight page member only publication in the year 2000, it is now into its third redesign having effectively doubled in size.

Our previous style had been around since the summer of 2008. It started as a 12 pager and that particular issue focused on the new LINX PoPs at Equinix, Telecity and Intercxion. That’s the best part of five years ago and so much has happened since then.

Over the last 12 months alone LINX has introduced the ConneXions reseller and vPoP programmes, the latter you can read more about in the centre pages of this issue.

A quick look at our expanded stats section on page 20 also tells us just how much LINX has developed over the years and will undoubtedly continue to do so.

A Happy New Year to you all!
Industry News

Survey results provide insight into views of Internet users around the world

The Internet Society has announced the results of a worldwide survey of more than 10,000 Internet users in 20 countries on a broad range of topics.

Unlike other global studies that focus on Internet infrastructure or traffic, the Global Internet User Survey (GIUS) asked Internet users about their attitudes on key issues facing the Internet, and their behaviours online. The survey covered areas such as how users manage personal information online, attitudes toward the Internet and human rights, censorship, and the potential for the Internet to address issues such as economic development and education.

Among other findings, GIUS results reveal that 83 percent of respondents agreed or agreed strongly that access to the Internet should be considered a basic human right. In addition, 89 percent agreed or agreed strongly that Internet access allows freedom of expression on all subjects, and 86 percent agreed or agreed strongly that freedom of expression should be guaranteed.

Also, interestingly, connection speed (73 percent) and reliability (69 percent) ranked above more affordable monthly fees (68 percent) among factors that would increase Internet usage.

Additional findings, the complete set of data from the survey, and more information about the countries surveyed and methodology used are available at: www.internetsociety.org/survey

With no power to implement IPv6 adoption
6UK’s board resigns

6UK, a not-for-profit membership organisation founded with funding from the Government’s Department of Business Innovation & Skills (BIS), was set up to help the UK and UK organisations secure every competitive advantage available from the adoption of the IPv6 protocol.

At its AGM in December the 6UK board determined that it was unable to fulfil its purpose it was set up for and therefore the directors, all volunteers, resigned without seeking re-election. In the absence of nominations to the board, 6UK is to be wound up in accordance with its articles of association.

Founding 6UK board member Nigel Titley said: “6UK tried every possible means of continuing to raise awareness of IPv6 in the UK but despite approaches to DCMS, the CBI, the IOD and many other bodies we failed to make any headway. We were disappointed in particular by the unwillingness of the Government to help us continue in our work of publicising the need for the UK to move forward in rolling out IPv6 if it is to maintain a competitive advantage in today’s internet centric world. Not a single government website is available on IPv6 and IPv6 is still not a mandatory part of government procurement policies”.

Industry News

In Brief

TeleGeography launch interactive Internet Exchange Map

TeleGeography have announced the release of a free interactive Internet Exchange Map. The online map depicts over 300 active Internet exchanges located in more than 500 buildings around the world.

To find out more please visit: www.telegeography.com/products/commsupdate
RIPE Labs takes a look at the Stratos Skydive

When Austrian skydiver Felix Baumgartner made his record breaking leap from 39 kilometres above sea level, millions tuned-in to view the spectacle online. The RIPE NCC was also following the event, though we were more interested in the level of traffic created by people watching the event online.

In collaboration with Euro-IX and various Internet Exchange Points (IXPs), the RIPE NCC collected traffic statistics for several weeks. By comparing the traffic volumes for each IXP during the event with those before and after, they were able to see how traffic levels changed during this high-profile event. The RIPE NCC found a number of interesting results, some of which seemed counter-intuitive at first glance. Most notably, and maybe not surprising, was the huge increase at the Vienna Internet Exchange (VIX):

You can find a summary of the RIPE NCC study of the Stratos Skydive on the RIPE Labs website at: http://labs.ripe.net/Members/fergalc/ixp-traffic-during-stratos-skydive

On RIPE Labs there are previously published studies of IXP traffic levels surrounding the London Olympics and the European Football Championship, as well as the impact of Hurricane Sandy. You can find all of this in greater detail here: https://labs.ripe.net.
New LINX Fees Structure and MoU Changes Approved at LINX79 EGM

Following approval at the LINX79 EGM in November, LINX has implemented considerable price cuts amounting to £1.9 million over the coming year.

The new prices took effect from the 1st January 2013. LINX members can now enjoy reduced port fees on the two London peering LANs, as well as continued free 100Mb and 1G ports on the Manchester peering LAN.

John Souter said: “These price reductions reflect our commitment to lowering peering costs for LINX members. They also reflect the advantages of our mutual, not-for-profit business model. As a mutual, our customers are also our shareholders, which means that our entire focus is on improving the network and providing better value for our members.”

Full details of the new fee structure can be found on the LINX website: www.linx.net/govern/servicesfees

MoU Changes
Following a consultation at LINX78 it was proposed that the MoU was updated in relation to the ConneXions reseller programme. Previously, members joining LINX through the programme needed to agree to an extra “ConneXions Appendix”. This ensured that LINX’s liability was specifically limited if LINX needed to take action against a ConneXions Partner which was in breach of the ConneXions Agreement. It means LINX can act quickly and in the interests of all LINX members in the event of such a breach. The proposal was passed and the change incorporated into the main MoU.

Raza Rizvi Presented with Conspicuous Contribution to LINX Award at LINX79

The LINX Conspicuous Contribution Award, a prize presented to an individual who has shown steadfast and continuous support in the development and growth of LINX, was presented to Raza Rizvi by LINX Chairman, Grahame Davies, in November.

Raza, an immensely likeable and highly respected member of the LINX community, had served on the LINX Board for 10 years, five of which as Vice Chairman, before stepping down at the LINX’s AGM in May. One of his biggest contributions to LINX was the project management of the 2008 new PoPs programme which saw the sites at Equinix, Intercxion and TelecityGroup’s Powergate all become part of the LINX network.

Previous recipients of the award include Nigel Titley, Dr Richard Clayton and Clive Feather. Also recognised have been NIX.CZ and CZ.NIC for their work on the BIRD route server project.

LINX Recruitment

Craig Nicholson
IT Systems Administrator

Craig Nicholson recently joined LINX as a Systems Administrator. His role involves managing current IT infrastructure and writing scripts to help reinforce systems and future development.

Prior to coming to LINX he worked for Positive Internet where he managed and repaired Linux servers, building and managing server infrastructure for websites and providing technical support.

Craig told HotLINX: “I wanted to work for a not for profit company that works for the good of the Internet. The role is certainly challenging with lots to learn but it has been great fun too.”

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LINX Engineering: Strategic OSS Programme

By Derek Cobb,
LINX Chief Technical Officer

The work to specify, select, design and replace LINX’s current Operational Support Systems began during the Olympic Games change freeze. Using virtual teams combining Engineering and Information Technology groups the first stage was definition of layer 1 and layer 2 processes, based on core ITIL version 3 processes, adapted to the LINX environment. The adapted ITIL processes mapped on to 3 core LINX processes: Plan and Build, Provide and Assure.

Detailed requirements and user case tests were developed, based on the process definitions, and executed against a reference network, using test servers provided by LINX IT. A long-list of potential systems was reduced to a short-list by structured evaluation with final system selections achieved in early November.

Low-level design and integration testing is being carried from November, December and January, against a design test configuration, comprising the reference network and Business Support Systems (BSS) that need to interface to the new OSS system stack.

The identified processes and selected systems are as follows:

<table>
<thead>
<tr>
<th>LINX Process</th>
<th>ITILv3 Process</th>
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<tbody>
<tr>
<td>Plan &amp; Build</td>
<td>Capacity Management</td>
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<td>Plan &amp; Build</td>
<td>Inventory &amp; Asset Management</td>
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<tr>
<td>Provide</td>
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<td>Assure</td>
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<td>Incident Management</td>
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<tr>
<td>Assure</td>
<td>Problem Management</td>
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OSS Next Steps

A full definition of the OSS design, systems, interfaces, process support and benefits will be documented through the low-level design process. Business owners will then be defined for each core system to ensure structured and controlled life cycle management and evolution.

A high-level deployment plan has been published and will be further developed, based on low-level design and testing milestones. The current high-level plan aims to complete deployment and migration of all legacy platforms and implementation of all the new end to end functional systems by the end of 2013 based on a quarterly based milestone delivery.

Part of the implementation strategy will include periods of dual running to ensure successful data migration, integration and configuration of core functionality before legacy systems are retired from the production environment.

The hosting architecture will be part of a detailed design review to ensure the new platforms will scale and support LINX business requirements for the next 3-5 years. This platform will deliver simplified systems management, enhanced resilience and business continuity.

For further information please contact LINX CTO, Derek Cobb: derek@linx.net

LINX Membership Survey

LINX is your organisation and your feedback helps shape its future. If you are a member then please complete the online form via the link below - it should take less than five minutes.

www.surveymonkey.com/s/linxmembersurvey

Survey closes on Friday 8 February 2013
The Joint Parliamentary Committee on the Draft Communications Data Bill published a highly critical report in November, creating a new political barrier to Home Office plans. The Committee said the draft Bill, which the press has dubbed the “Snooper’s Charter”, pays “insufficient attention to the duty to respect the right to privacy, and goes much further than it need or should”. It went on to call the government’s estimates of the costs and benefits “fanciful and misleading”.

LINX’s evidence is cited eight times in the Committee’s report.

Lord Blencathra, Chair of the Joint Committee, said “There needs to be some substantial re-writing of the Bill before it is brought before Parliament as we feel that there is a case for legislation, but only if it strikes a better balance between the needs of law enforcement and other agencies and the right to privacy. The breadth of the draft Bill as it stands appears to be overkill and is much wider than the specific needs identified by the law enforcement agencies. We urge the Government to reconsider its zeal to future-proof legislation and concentrate on getting the immediate necessities right.”

The Home Office will now have to consider whether to drop the most ambitious parts of their plans or try to force the draft Bill through Parliament with few changes, in the face of considered opposition from a cross-party Committee. A third option would be to delay and prevaricate until the next election, and hope for a government with a Parliamentary majority.

In another development, the Austrian Supreme Court ruled in December that the Data Retention Directive was incompatible with European law protecting fundamental rights to privacy, and referred the Directive to the European Court for confirmation of its opinion. If the European Court upholds the Austrian view, the Communications Data Bill will almost certainly fall with it.
WCIT12 Conference

UK and 54 other countries refuse to sign Treaty for International Telecommunications Regulations

55 countries refused to sign the new Treaty for International Telecommunications Regulations (ITRs) negotiated at the World Conference on International Telecommunications (WCIT) in Dubai last month. This dealt a serious blow to those who, like Vladimir Putin, wanted the ITRs to “[establish] international control over the Internet using the monitoring and supervisory capability of the International Telecommunications Union.”

The 55 countries refusing include the main slice of that part of the world with the most highly developed telecoms markets: the European Union, the USA, Canada, Australia and New Zealand, Israel, Japan and India. Three African countries, Kenya, Gambia and Malawi, joined those saying No. A complete list, which also indicates those that have not yet decided, has been published and can be viewed here: http://tinyurl.com/aemybst

EuroISPA has made a statement in support of the EU position, giving the Internet industry’s view that the blame for the failure of the WCIT lies with non-European governments.

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www.euroispa.org/component/content/article?id=81

Further details, including the initial response from the UK government, can be found on the LINX Public Affairs’ blog: https://publicaffairs.linx.net/news/?p=9371

ICANN new gTLDs: Government warnings published

Following the conclusion of the first round of applications for new generic Top Level Domains (gTLDs), ICANN has published “Early Warnings” of objections from governments.

The greatest number of objections were from Australia, which objected to a suite of generic names on the grounds that a private entity should not be able to gain exclusive control of a generic term for commercial gain.

Other Early Warnings include objections to .gov in Chinese characters (Hong Kong), to .islam and .halal (UAE), to .sarl (France) and .gmbh (Germany).

OECD praises IXPs and cautions against unnecessary regulation

The Organisation for Economic Co-operation and Development (OECD) has released a report praising the “multi-stakeholder, market driven nature of the Internet”, and Internet Exchange Points (IXPs) in particular, while cautioning against unnecessary Internet regulation.

Internet Exchange Points are singled out for particular praise, both for their role as “the source of nearly all Internet bandwidth”, and as a living example of the multi-stakeholder model, in which “thousands of networks simultaneously co-operate to produce bandwidth and compete to sell it to consumers.”

Ofcom releases findings on UK copyright infringement

Ofcom has released its first report on the extent of online copyright infringement among UK consumers. The survey adds to the growing body of evidence suggesting that some of the greatest infringers are also the entertainment industry’s best customers.

Convenience, availability and speed of access were found to play a large part in explaining infringing behaviour, suggesting that there is significant scope for combating piracy via better business models.
There have been many technological advancements in the peering industry in recent years. Having completed major network upgrades on both LANs in the last 18 months LINX is now starting to roll out new products and services on these platforms.

With LINX from Anywhere and the ConneXions reseller programme it has never been easier to connect to LINX and with the introduction of a new Virtual PoP scheme, the range of connection options is now even greater.

LINX’s most recent major PoP expansion added additional London sites at Equinix in Slough, Telecity Powergate in Acton and InteXion in central London. That was back in 2008 and all were arranged with full risk sharing at those sites with the understanding that they would bring additional members to the exchange. All three sites broke even ahead of the forecast three years from launch and have been part of the recent investment in the network.

LINX’s PoP strategy has now evolved and the intention is to only build a full PoP where there is proof of demand. The vPoP programme will not only give partners additional marketing value, but will also give colocation providers the opportunity to prove demand at their facility.

A LINX virtual PoP could be located anywhere in the world where LINX has a member and there’s a potential for more. There are a number business and technical conditions which determine the type of PoP.

There are three different ways a data centre could become a LINX PoP; Switching PoP, Transmission PoP and also as a PoP Partner.

**Switching PoP**
A Switching PoP is a full PoP based at a neutral data centre which operates within a defined geographic reach of the existing core network. It must be resiliently connected and fully redundant.

**Transmission PoP**
A Transmission PoP is again based at a neutral data centre operating within defined range but packets are not switched there but sent to a switching PoP instead.

**PoP Partner**
The basic vPoP solution is a neutral data centre but with no defined range. The data centre has full responsibility over the member connection but there is no resiliency available.

**Virtual PoPs**

**The Basics**
What Next?
The vPoPs programme means that LINX has a sales channel for the carrier and data centre markets. It presents a global message for the exchange and provides an agreed set of requirements for a new PoP on any LINX LAN. It certainly looks like it will have a positive impact on the network in the months and years to come.

If you’d like to know more about the LINX vPoP programme please email channel@linx.net.

Establishing the footprint for vPoP geography

In order to become a full switching PoP several conditions will apply, especially ones of physical geography. Therefore most partners will always be one of the three forms of virtual PoP.

As we expand the number of IXPs we operate, the possible geo-locations of a transmission PoP or a switching PoP will grow with it. For example, a data centre operator in Manchester may be a valid case to become a transmission PoP there, with a view to being a switching PoP. They can still market themselves as a branded virtual PoP connecting customers back down to the London LANs.

In order to support our core mission of keeping traffic local, one of the conditions of being a branded PoP is that the operator promotes and connects customers to their nearest LINX PoP.

The maximum distance from the LINX core to a transmission or switching PoP is closely aligned to the reach of fibre optics. Full details are available on request.

Your 5 Step PoP Plan

So you want to become a LINX vPoP? Follow these five simple steps:

1. Find out how close you are to any LINX switching PoP
2. Work out how many Layer 2 providers take you there
3. Establish how many customers or prospective customers might benefit from connection to LINX
4. Contact LINX Business Development to discuss the PoP options
5. Start promoting your datacenter as a LINX vPoP

To find out more information please contact channel@linx.net.

LINX PoP Options

In addition to geographic and local demand considerations, the following technical and business requirements will need to be met to be considered as a LINX vPoP

Switching PoP
Requirements:
- LINX switches and routers on site
- Resilient dark fibre connection to at least two other core PoPs
- Connected to both LINX LANs with dual fibre paths on each
- Provision of necessary space, power and smart hands at no charge to LINX
- To enter into a risk sharing agreement until the PoP reaches viability

Transmission PoP
Requirements:
- Onsite ODF
- Optical transport layer to the identified LINX LANs
- Transport paid on a sliding scale based on the members present but caveats present to manage existing port revenues

PoP Partner
Requirements:
- Connectivity to a full LINX PoP via an authorised third party LINX Partner
- No space or power requirements
- Commitment to marketing activity and anticipated performance levels

Here’s how a LINX Virtual PoP world map could look:
At Extreme Networks we have always taken pride in delivering exceptional bang for the buck for our customers with our high performance and open networks – great performance at a very reasonable price. We’re able to back up this pride with feedback from the marketplace. We have been recognized for our innovations and our 10GbE revenue grew at twice the industry rate last year according to the Dell’Oro Group.

With pundits talking about next generation technologies, 40GbE, 100GbE and in some cases even terabit Ethernet, the world of networking is certainly a fast and exciting place. However, the place where the real business will be done will be 10GbE network deployments by 2015. With products like our award-winning BlackDiamond® X8 and Summit® X670 Open Fabric switches, we feel our customers will be well positioned for this transition.

Perhaps even more interesting than incremental increases in speeds and feeds for the industry is the steady migration to the cloud. While many organizations will certainly maintain their own private Clouds, outsourced multi-tenant Clouds of hosting companies are also fundamentally changing not only how IT is done but also how IT is purchased and who does the buying.

Yesterday’s Local Area Network (LAN) is rapidly becoming a distributed cloud of applications and services. Naturally, cloud networks are driving consolidation in the data center. Per the Dell’Oro Group, public cloud deployments are resulting in fewer, but larger data centers.

Furthermore, cloud deployments are driving demand for equipment more capable of dealing with network abstraction, VM mobility and the east/west flow pattern of data that virtualized environments create. These changes are swinging the pendulum away from “good enough” commodity network technology to more specialized Fabric solutions, with networks designed and engineered for the new data center; such as the BlackDiamond X8 and the Summit X670 switches.

However, to meet the requirements for this migration to centralized resources and applications from the cloud, the data center network has also had to respond to change too. Demands are increasing, not only in terms of raw speed but also in scale and the use of virtualisation.

Where once a single image on a single physical server fed a connection, now there are multiple virtual systems (virtual machines (VMs) on that same physical host, creating demand for the ability to support hundreds of thousands of routes, addresses and flows. The result is much greater efficiency from the network with more optimized use of resources. Extreme Networks is playing a central role in enabling the evolved data center and cloud with our Ethernet technology and ExtremeXOS® modular operating system, which allows for the convergence of storage, disaster recovery and replication networks onto a single converged infrastructure, delivering better performance at a lower cost.

Ethernet and software provide a solid foundation for cloud deployments. Specifically, enhanced management and control capabilities of converged networks is evolving with the introduction of Software Defined Networks (SDN), with OpenFlow and OpenStack Quantum, creating networked systems that are more flexible, automated and scalable. Extreme Networks supports advanced applications with our partner Big Switch Networks, which recently introduced Big Tap for centralized visibility and monitoring and Big Virtual Switch (BVS) for virtualization and policy.

We at Extreme Networks have recently announced the evolution of the Open Fabric having unveiled 100G and 40G Ethernet modules to scale the network as well as SDN application support.
Cloud-Scale Networking.

Evolve your data center with virtualization-aware, open, automated solutions.

Planning for the Future

Extreme Networks’ new 100/40G XL modules are designed to help scale BlackDiamond X8 networks for virtualized multi-tenant cloud data centers, Internet Exchanges and data center core deployments. They are capable of scaling to 1 million route entries, and hundreds of thousands of addresses and flows. This makes the network truly capable of the cloud and SDN.

For more information on Extreme Networks or any of the subjects in this article please contact Kim Tee at ktee@extremenetworks.com
Regional Peering

Regional peering has been a hot topic in the industry in recent months. Earlier this year LINX established its first regional exchange at IXManchester with the aim of keeping traffic local. This site now has 30 members connected passing over 2Gb/s in traffic.

For an international view on regional peering, LINX asked Kurtis Lindqvist, CEO of Swedish IXP Netnod, to speak at LINX79 to explain how it was established and works there.

In the first instance, it was decided that the exchange of traffic had to work even in times of national crisis, and that the capital city Stockholm would not be the focus point. Any backup site had to be able to survive on its own. In locating new sites, specific criteria needed to be met including a sizeable local population, substantial traffic volumes and sufficient carrier capacity. It also had to be accessible with a group of networks close by.

Today, in addition to its Stockholm bunker, Netnod has peering points in Malmo, Gothenburg, Sundsvall and Luleå.

LINX members can view the LINX and Netnod regional peering presentations on the LINX website: www.linx.net/linx79

Record Turnout at LINX79

Registrations Top 200 for the First Time Ever!

The recent LINX79 member meeting was a big success and welcomed more first time attendees than ever before. There was also a big international audience with members arriving from the Republic of Ireland, Sweden, Holland and the USA. The breadth of different members and network types is why this event continues to grow year-on-year.

Sponsored by Juniper Networks, Arista Networks and IX Reach with Ask4, LINX79 had another packed agenda. In addition to regular LINX operational and regulatory presentations, Colin Whittaker of Amazon covered Cooperative Network Debugging with the NLNOGRing, while Nick Hilliard of INEX gave a technical talk on the subject of Remotely Triggered Black Holes. There were also updates on the RIPE NCC by Nigel Titley.

The peering personal sessions of new members and first time attendees proved popular and we are keen to continue with them at future meetings. If you have something you want to say to the membership, then let us know and we will do our best to accommodate you.

LINX79 was also an EGM with four resolutions all discussed and passed during voting. These covered MoU changes, the 2013 budget, LINX fees and Board remuneration.

LINX members can access the presentation archive on the LINX website: www.linx.net/linx79
Around the World in Many Ways

From Europe to the Americas, Africa to the Middle East and Asia, LINX visits 5 continents in 3 months!

In an interconnected world it’s never been easier to keep in touch and do business. However, this is an industry that still puts tremendous value in face-to-face meetings as a way of exchanging ideas, forging partnerships and making plans for the future. In this respect LINX has never been busier and over the last quarter has travelled many thousands of miles to meet with people all over the world.

The tour of duty began in Dallas, Texas at NANOG56 in October. NANOG is a regular event on the LINX calendar and will continue to be so as it offers the opportunity to meet so many North American members all in one place.

November was a particularly hectic time for LINX. We had staff in both Sweden and The Netherlands at the same time for the Euro-IX and Capacity Europe events with LINX Head of Marketing & Business Development, Ben Hedges, then flying out of Stockholm to Cape Town for the conference at Africa.com.

Asia then beckoned with another Capacity event, this time in Bangkok in Thailand. This was a particularly useful trip as LINX shared a stand with Intervion and fellow European exchange, DE-CIX. This cross organisation co-operation is another key aspect of the industry’s success.

Completing the continental set was John Souter’s visit to Brazil in December where he presented at the PTT Forum in Sao Paulo. This coincided with CTO Derek Cobb’s speaking engagement at MSK-IX in Moscow and Malcolm Hutty’s attendance of the World Conference on International Telecommunications conference in Dubai.

LINX Events

New Member Events

LINX are going to be embarking on a number of events during 2013 with the aim of encouraging more face-to-face interaction with the membership.

A key aspect is raising awareness of LINX activities with departments and employees at member companies, who do not usually deal directly with LINX. By doing this we are hoping for a better understanding of the importance of LINX to member organisations, whilst also raising sponsorship money for charitable causes.

Already confirmed for this year is the entry of a LINX team in the British 10K, a road run around central London. Members are welcome to sign up too and become part of ‘Team LINX’. We will provide you with a team t-shirt and any donations you raise can be donated to the nominated LINX charity.

Another event close to being confirmed is a LINX five-a-side football competition. There will be Northern and Southern sections, held in Manchester and London respectively, with the top two in each qualifying for the four team final tournament in Birmingham later in the year.

Other gatherings planned include Go-Kart races in the Midlands and a Golf Day in the South East. Dates for all events will be publicised soon but are all planned to take place during the summer months.
Netnod

Swedish exchange and fellow EPF sponsor Netnod have had a very successful year. Here are some of their key milestones:

- Peak traffic of 450 Gbps
- Launch of Netnod 100 GE ports
- Three resellers now on the Netnod Reach programme
- Worked with DENIC on .de name service enhancement using DNSNODE
- Hosted the EuroDIG meeting and the 21st Euro-IX forum in Stockholm

OCCAID

To further IPv6 development in the Middle-East, a series of workshops (“IPv6 Roadshows”) were organised by RIPE NCC and MENOG. OCCAID was able to support these workshops by providing IPv6 connectivity to ISPs where their current providers were unable to. Seven ISPs have now been able to announce their IPv6 space for the first time, with new ISPs still looking to connect.

www.occaid.org

Renesys

In October Hurricane Sandy hit the East Coast of the USA devastating parts of New Jersey and New York. Renesys, specialists in Internet monitoring and analysis, noted that following the storm, there were extensive Internet outages impacting domestic and international communications. Network operators were quick to reroute traffic around affected areas, and while local business continuity plans were certainly tested, the impacts on the global Internet were relatively limited.
Hi Alex. Please tell our readers a little about yourself and your career to date
Sure. I started in the industry in 2002 working on small webhosting providers and then for a service provider who was doing web hosting. From there I went on to work with BGP and learnt more about networking and systems before starting my own business, NetSumo. This was with dedicated servers and I built and ran networks and encouraged customers to peer because of the cost savings involved and the expansion opportunities it offered them.

How did NetSumo come to be involved at the exchange as a LINX Partner?
We had a number of small customers who had the impression that LINX was a difficult organisation to join and that it was a historic big boys club. There was also the argument between transit costs and peering. We approached LINX to offer to work with them to help remove that perception. LINX actually offers a lot more than just routes, it’s also the community aspect where people work together and a lot of business is done at events such as LINX member meetings.

How does attending events such as member meetings benefit NetSumo?
LINX meetings are important to us as a business but also as an information generator for our clients. Thanks to the work of the Public Affairs team we have a very good idea what the government think about networking and we also get to know about the challenges for ISPs and how they are overcoming them. LINX is passing a lot of traffic and are pushing equipment and the vendors harder than anyone else in the world. We therefore get a good idea what the limitations are of any hardware which could benefit our clients too.

You’ve been an active support of the LINX meeting Programme Committee for many years. Does being a non-member help provide a different perspective?
I was a founding participant of the programme committee and at that time NetSumo had over 10 clients who were LINX members. They gave us a variety of feedback of what they expected at meetings so we could offer LINX a more generalised view. That was really valuable.

How do you see LINX developing long term?
The regional peering project is a very interesting growth area. IXManchester with its links from the city to the US and Europe is also an affordable way for smaller networks to get peering. This can act as a stepping stone for their business.

What next for NetSumo?
NetSumo has just relocated its office to Canary Wharf and plans are in place to expand our service range. We’ll be focusing on how we can assist providers with their colocation needs in terms of remote hands so it’s going to be a busy year ahead.

RIPE NCC
Friday 14 September 2012 was a key moment for the RIPE NCC and for the Internet, as it started to allocate IPv4 addresses from the last /8 in the RIPE NCC service region. This highlights the need for stakeholders to deploy IPv6 across networks to ensure services continue to operate smoothly, and to safeguard the future growth of the Internet. Dual-stacking will be a big focus for the near future as the world migrates to IPv6. While the RIPE NCC have seen some efforts to trade or sell IPv4 address space, these are only short-term measures as the supply of IPv4 is finite. The accelerated development of Internet-connected devices means that additional IP address space is vital. It is of critical importance that stakeholders develop and implement an IPv6 deployment plan for the long-term rather than looking at short-term solutions.

www.ripe.net

RouteViews
RouteViews is a not-for-profit global routing data collection project, and is part of the Advanced Network Technology Center located at the University of Oregon. LINX has supported the project by hosting a RouteViews collector/looking-glass on the LINX Exchange since 2004. The RouteViews collector currently has 29 active IPv4 peers, and 24 active IPv6 peers. For more information, please visit www.routeviews.org
How to...
Start a New HotLINX Feature

In your new and improved HotLINX we will be introducing a new section where you can ‘Ask the Expert’ about a particular aspect of LINX membership. Our staff has a wealth of industry knowledge and experience and we would be delighted to share it with you.

Maybe you have a technical query that needs the advice of the Engineering team or it could be a question about billing methods. Some readers might like to know about the best way of dealing with new Internet legislation, in which case our Public Affairs team could assist you. Remember that LINX is run for the benefit of its members so if you have a query you only have to ask. Our Member Relations teams are always on hand so please email either Katrina Readshaw or Emuobor Dafimu via mr@linx.net or call on +44 1733 207777.

Ask the Expert

Here are some example questions which come up from time-to-time on our Member Relations and Support lists.

- How do I go about updating our contact details?
- How do I get a log-in for the LINX website?
- Where can I find information about routeservers?
- How do I establish peering with other members?

For more questions there is also an FAQ area on the LINX website: www.linx.net/join/joinfaq

Emuobor and Katrina
LINX Member Relations

The best question or email we receive in each issue will win an exclusive HotLINX mug!

Please contact us using hotlinx@linx.net

Get Your LINX Coaster
“While Stocks Last!”

LINX had a great year in 2012 so to celebrate we have produced a souvenir LINX coaster. If you would like one sent to you please contact us with your ASN on marketing@linx.net.

Have a question?
Send us your queries and comments to either the HotLINX or Member Relations teams hotlinx@linx.net / mr@linx.net

LINX FAQs

Why adjacency matters
By Trefor Davies, Timico

People think of the internet as one big network. In a sense it is, because the man in the street rarely gets to look under the bonnet at its engine and all the good work of network techies everywhere makes it seem so. In reality the internet is made up of over 60,000 “Autonomous Networks” (ASNs) from all around the world.

With the fourth most ASNs the UK is an important place to be on the internet and this is reflected in the size of the membership of LINX. Most of our peers are content providers, or other network providers of similar magnitude of size, where it’s mutually beneficial to peer between our networks to reduce cost of global backbone transit connectivity. Organisations with large global backbones will tend to be lower in the list of ‘most connected’ peers as they will usually be more restrictive (than completely open), and only peer with other operators who pass comparatively large amounts of traffic.

You can read Trefor’s ‘Adjacency’ article in full on the Timico website: www.timico.co.uk/blog/2012/12/11/why-adjacency-matters
Volta Data Centres

Volta’s high specification data centre is located on Great Sutton Street, Clerkenwell, in immediate proximity to the City of London and is well known in the financial sector as the former Reuters facility and more recently was part of BT Radianz.

The site benefits from two diverse 33kV power supplies of 9.6MW from two independent grid substations, and give it a level of resilience that no other Central London data centre can match. Volta will offer single or multiple racks of 4kW or more, and for an added level of security, private cages from 50kW upwards that can offer an environment designed specifically to meet your requirements.

Volta already has seven major carriers on site, including Zayo, BT, Cable & Wireless, Colt, euNetworks, Verizon and Geo UK. As a carrier neutral operator Volta’s clients can make their own network choices and this carrier list is set to grow. The range of carriers provides diversity and resilience, and allows the facility to offer sub-millisecond latency to many of the key trading venues. This makes it ideally placed for financial services, high-frequency trading firms, hedge funds, brokers and banks in the City, as well as new media and content providers in Shoreditch and the West End.

Volta Great Sutton is a highly secure stand alone facility offering 24 hour security. Previously operating as a data centre for twenty-five years, the 91,000 sq ft site has been completely redesigned and will be refitted, featuring containment with in-aisle cooling systems which will make Volta Great Sutton Street one of the most energy efficient data centres in Central London.

This new facility is scheduled to open in April 2013.
Here is an alphabetical list of all the LINX members, plus their ASN and peering contact details, that have connected at the exchange since the beginning of October. Please refer to the map to see where each one is based.

AFNIC AS2484 peering@nic.fr
CCP Games AS35834 peering@ccpgames.com
Datatech UK AS47622 peering@datatechuk.com
Epsilon Telecomms AS44356 smc@epslontel.com
Fastinet International AS12519 peering@fastinet.co.uk
Hong Kong Broadband AS9269 nocsn_router@hkbn.com.hk
Intuitiv AS16174 peering@intuitiv.net
Jaguar Networks AS30781 peering@as30781.net
Main One Cable Company AS37282 peering@mainonecable.com
Microtalk UK AS1823 peering@microtalk.co.uk
Next Connex AS51048 peering@nextconnex.com
MacAce.net AS199204 hostmaster@macace.net
Ping Networks AS47264 simon.chamberlain@pingnetworks.co.uk
Produban Servicios Informaticos Generales (UK) AS2134 peering@produban.co.uk
PT Telekom Indonesia AS7713 peering@telin.co.id
Serverel AS50245 peering@serverel.com
Telecom Malagasy AS37054 alain.samsoudine@telma.mg
Triple-T Internet AS45758 peering@jastel.co.th
Wirehive AS56730 peering@wirehive.net
Zajil International Telecom AS6412 peering@zajil.com

Our member map shows where LINX already has members and where new members have joined from over the last three months.

- Countries with LINX members
- Countries with new LINX members since October 2012

**Stats Update**

**447** Over 1.612 Tbs of peak traffic

**6,235** Terabytes of connected capacity

**92** New LINX applications in 2012

**56 Countries**

**578 Member-facing 10GigE Ports**

**1,058 Connected member ports**

**5 Members**

**447 Members**

**56 Countries**

**New LINX Members**

**Middle East & Asia**

- **Indonesia**
  - PT Telekom Indonesia

- **China**
  - Hong Kong Broadband Network

- **Kuwait**
  - Zajil International Telecom

- **Thailand**
  - Triple-T Internet

**Europe**

- **France**
  - AFINIC, Jaguar Networks

- **Iceland**
  - CCP Games

- **United Kingdom**
  - Datatech UK, Epsilon Telecomms, FastNet International, Intuitiv, Microtalk UK, Next Connex, MacAce.net, Ping Networks, Produpan Servicios Informaticos Generales (UK), Wirehive

**Americas**

- **United States of America**
  - Serverel

**Africa**

- **Madagascar**
  - Telecom Malagasy

- **Nigeria**
  - Main One Cable Company

**Over 1.612 Tbs of peak traffic**

**6,235 Terabytes of connected capacity**

**92 New LINX applications in 2012**

**1 Member-facing 100GigE port**

**92 Connected member ports**

**447 Members**

**56 Countries**

**578 Member-facing 10GigE Ports**

**1,058 Connected member ports**

**AFNIC AS2484 peering@nic.fr**

**CCP Games AS35834 peering@ccpgames.com**

**Datatech UK AS47622 peering@datatechuk.com**

**Epsilon Telecomms AS44356 smc@epslontel.com**

**Fastinet International AS12519 peering@fastinet.co.uk**

**Hong Kong Broadband AS9269 nocsn_router@hkbn.com.hk**

**Intuitiv AS16174 peering@intuitiv.net**

**Jaguar Networks AS30781 peering@as30781.net**

**Main One Cable Company AS37282 peering@mainonecable.com**

**Microtalk UK AS1823 peering@microtalk.co.uk**

**Next Connex AS51048 peering@nextconnex.com**

**MacAce.net AS199204 hostmaster@macace.net**

**Ping Networks AS47264 simon.chamberlain@pingnetworks.co.uk**

**Produban Servicios Informaticos Generales (UK) AS2134 peering@produban.co.uk**

**PT Telekom Indonesia AS7713 peering@telin.co.id**

**Serverel AS50245 peering@serverel.com**

**Telecom Malagasy AS37054 alain.samsoudine@telma.mg**

**Triple-T Internet AS45758 peering@jastel.co.th**

**Wirehive AS56730 peering@wirehive.net**

**Zajil International Telecom AS6412 peering@zajil.com**