Five years ago the web was in its infancy. The bulk of internet traffic was e-mail and software downloads and the few web sites were mainly academic. Most people had never heard of the Internet.

In the UK, we had fewer than 50 Service Providers and only five of these connected to the rest of the world. Globally, internet exchange points were a novelty which you could count on your fingers.

Back then, the idea of ISPs co-operating to run shared infrastructure was novel but had clear gains if it could be made to work. So a small group of people decided that LINX should be formed to connect five domestic ISPs together to enable efficient exchange of internet traffic in the UK. We made two decisions at the time which would turn out to be key later on:

- **LINX should be neutral to its members**
- **LINX should be independent of any one co-location provider**

The first traffic flowed across LINX in November 1994, less than two months after conception. There were no contracts, lawyers or paperwork - we just got the kit together and made it work. I am pleased to say that this spirit of co-operation between competitors is still very much alive at LINX.

Today, nearly one person in five in the UK has Internet access and there are nearly 300 ISPs. LINX handles as much as 3 Gigabits of traffic during each busy second, more than 25 times its original total capacity! The web is everywhere and its economic and social impacts are with us to stay.

By having the luck to make some right decisions at the right times, we now have the largest Internet exchange not just in Europe but anywhere outside the USA - we have the most members, the most traffic, the most co-location sites and the most staff. With a €3.25M turnover, we are now one of the top five Internet exchanges out of several hundred across the world.

We have pioneered innovations such as gigabit ethernet - which even the big US exchanges are only now following - and diversifying to multiple sites.

We were the first to link two sites using gigabit ethernet over dark fibre and, in the first half of this year, we purchased our own dark fibre ring. We will soon increase our exchange's network from three to seven sites, another world first.

LINX’s leading-edge gigabit switch technology ensures the fastest possible connections across the UK Internet backbone. This will become increasingly important as consumers' expectations are fired up by much faster ADSL access.

Our early decision to be independent of any one co-location provider means we now enable efficient exchange of Internet traffic in the UK not merely between ISPs but between co-location providers too.

It is an exciting and challenging time for e-commerce. It is clear that the current e-boom is partly a genuine underlying change in how people do business and partly overstated hype. A lot of fortunes are still to be made or lost in finding exactly where that boundary lies. It is clear that the winners are going to include the players who provide the quality infrastructure that others can build their successes upon.
LINX supports the Internet Watch Foundation (IWF) on behalf of our members and their customers. In this article David Kerr, Chief Executive of IWF, explains some of its work.

IWF was created in 1996 to work with the police and government on dealing with criminal and potentially harmful web content. Since then we have helped the industry to build good relations with the UK government and police and fostered the idea of partnership in the regulation of Internet content around the world.

We run a hotline for the public to report suspected illegal content and notify member ISPs when they are at risk of hosting it. We also pass reports to law enforcement agencies for investigation of originators of child porn.

We work worldwide to promote labelling and filtering systems for content that may be harmful to children. We have just published a report funded by the European Commission and have been instrumental in setting up and running the Internet Content Rating Association (ICRA). We are currently working on a guide to Internet safety, which will be launched this autumn.

**What it costs**

With costs spread across the industry the benefits of IWF membership come very cheap!

Our new structure matches the PR benefits to the scale of your operations. Our new constitution allows anyone who meets minimum

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**For history of IWF see http://www.iwf.org.uk/about/about.html**

**For press coverage of government support see http://www.iwf.org.uk/press/archives/p250100.html**

**For IWF hotline information see http://www.iwf.org.uk/hotline/next.html**

**For information on EC report see http://www.incore.org/final_report.html**

**For information on ICRA see http://www.icra.org**

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**HOTLINX LINKS**

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**HOT LINX FAQS**

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In this first of a regular series of articles in HotLINX we tackle the issue of membership transfers.

**Question:** Is LINX membership transferable when the ownership of a member company changes?

**Answer:** Yes - but we do have a procedure which needs to be followed.

LINX membership belongs to the 'legal entity' - ie, the company - named on the membership form. It cannot be bought or sold but it can be transferred to another legal entity in the event of a takeover, merger, sale or creation of a subsidiary company, etc.

To make the transfer, the old legal entity must submit a letter, on its headed paper and signed by a director or other authorised signatory, requesting transfer of membership to the new legal entity.

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The growth in membership has brought with it a necessary increase in formality when dealing with issues such as membership transfers. Whilst striving to avoid needless bureaucracy we do need to establish clear and consistent procedures.
NDATION?
criteria to join - and get a voice and vote on the
Funding Council - for a contribution of £1,000 or
more.

We offer a 'silver' membership for large
organisations that want to be acknowledged as
leading members.

For the really big players, and for those ISPs
which support other household name 'virtual
ISPs', we have created a 'gold' membership
which includes the facility to 're-sell'
membership to your customer organisations.

Contribution levels are by negotiation.

We are also looking for separate sponsorship of
our Safe Internet campaign over the coming 12
months, with or without membership - talk to us
about it!

Contact David Kerr, Chief Executive, at
chief@iwf.org.uk, or phone 01223 237700 or see:
http://www.iwf.org.uk

The RIP Bill
Neither Dead Nor Buried

As this issue of HotLINX was being written, the
government's Regulation of Investigatory
Powers Bill - the RIP Bill - was in the final
stages of its passage through Parliament.

The bill will give government the power to
listen to or read various forms of private
communication, including e-mails. It is fairly
widely accepted that in order to combat
crime the authorities need to gather evidence
in this way. It is the balance between the
powers of the state and the rights of citizens
that has been at the heart of the civil liberties
aspects of the debate about the bill.

LINX has been lobbying hard to minimise the
negative impact some parts of the legislation
might have on ISPs. We have had meetings
with civil servants, MPs and ministers -
including Charles Clarke MP, the Minister of
State at the Home Office responsible for the
RIP Bill.

Roland Perry, our regulation expert, says:
"Even before the draft bill was published, we
were talking to government about issues
affecting ISPs - including areas where
legislation might lead customers to lose
confidence in our ability to keep their data
secure in the UK."

Apart from this issue of confidence, and the
danger that e-commerce will be driven off-
shore to ISPs which are not subject to this
legislation, it is the cost of the government's
proposals which has been our main concern.

Roland says: "If all ISPs had to have an
interception capability at all times it would
needlessly add to costs. If ISPs had to install
equipment on demand in order to intercept a
particular traffic stream it would be an unfair
and anti-competitive 'tax' on individual
businesses."

LINX has been lobbying for the cost of
hardware and software to be borne by the
government - but has stressed the
willingness of ISPs to provide technical
assistance.

Roland says: "ISPs want to help tackle
serious crime. It is as much in our interests
as anyone else's that the rule of law should
prevail. The way this is achieved, however,
has to be technically and economically
feasible and has to respect the civil rights of
the public.

"Within the past few days the government
has tabled amendments to the bill which have
gone some way to meeting our objections.

We continue to work towards achieving
the best possible outcome for
our members, including
consultation on the codes of
practice.

"We also welcome the
government's acceptance of
our suggested
technical advisory board
to oversee the
implementation of measures
at communications providers
not covered by the existing
Interception of
Communications Act."
The story of co-location is inextricably intertwined with the formation and growth of LINX. In this first issue of HotLINX we explore these close ties with a profile of TeleCity and Telehouse - the two leading co-location companies which have sponsored this newsletter.

The principle of co-location for ISPs is an easy one to explain. It is far less easy to design and maintain the commercial and technical infrastructure needed to make it a successful reality.

In principle each ISP which operates a 'backbone' for data transmission will have some part of that backbone coming into a central (co-location) facility. A high speed local area network can then link all these backbones together, making the transfer of data between them (relatively) easy and inexpensive.

LINX was involved with co-location from its inception. The organisation started in 1994 at Telehouse in the London Docklands.

**Telehouse**

The Telehouse building was originally designed to provide mainframe computer users with a secure disaster-recovery facility. Its potential as a co-location facility was immediately obvious to the founding members of LINX - it is geographically well positioned, is purpose built for computers, IT and telecommunications links and has a high level of physical security. So Telehouse provided us with our first co-location facility.

Kengo Miyoshi of Telehouse Europe says: "We were - and are - a highly secure data centre. That was the first description of the first co-location facility.

"Telehouse was the first purpose-built centre for systems and telecommunications in Europe when it opened more than ten years ago. At that time the UK was waiting for the de-regulation of the telecommunications industry. We designed and built a facility where people could enjoy a high standard building with networking opportunities.

"The concept of IT housing - or co-location as it is now known - was always part of the plan. The facility was built for multiple telecoms carriers, providing disaster resilience through its own emergency generating equipment, air conditioning, fire suppression and physical security.

"The rise of the new communication medium - the Internet - allowed this co-location concept to be taken to the next stage.

"LINX started in Telehouse and we are proud that our neutrality and our business have been welcomed by the major original member companies. Since then we have always tried to support the activities of LINX because we know its importance in the Internet world."

The first Telehouse building - sited in London's East India Dock - has helped to rejuvenate this rundown area. Once a thriving centre of world trade, when Telehouse moved in it was only the roads - Security has always been paramount at all Telehouse Europe sites -

Telehouse Europe's "highly secure data centre" in London named after oriental spices - that carried a reminder of the great days of the 17th century when the docks were the starting and finishing point of the Asian trade routes. Three centuries later, the docks were in decline - but Telehouse and others have helped to create a turn-around and the area is once again thriving as a centre of a very different form of international trade and commerce.

Kengo Miyoshi adds: "Internet business has seen a considerable rise since the early days of LINX. As the Internet has grown it has created a new e-commerce and e-culture era. Telehouse Europe was there at the start and still helps the new media to flourish."

It was this tremendous growth in Internet traffic which persuaded LINX that we should look for an additional co-location facility.

Keith Mitchell, executive chairman of LINX, recalls: "In 1996 it looked like Telehouse was running out of space to accommodate further equipment. We needed to have a separate site to protect against a few doomsday scenarios that even a building as secure as Telehouse cannot be entirely sure of surviving - such as an aeroplane crashing into it or a terrorist bomb, for example.

We drew up a specification and asked potential co-location facility providers to submit tenders. Eight organisations responded.
TELECITY

Our choice for a second co-location facility was TeleCity's first London site.

TeleCity was co-founded by its current chief executive, Mike Kelly. He started his career at CERN, the nuclear particle accelerator at Geneva, and there he used the first embryonic Internet nearly twenty years ago.

Prior to establishing TeleCity he was employed by Manchester University's computing department to attract commercial users for the newly dug metropolitan fibre link which connected Manchester's academic institutions. It was during this period that he developed his in-depth understanding of the UK Internet market and the needs of the ISPs.

With this experience in hand, Mike Kelly and colleagues founded TeleCity. With funding from 3i they created a TIX (TeleCity Internet Exchange) in Manchester which began trading in April 1998. Additional funding for expansion of the business has since been provided by both 3i and the Bank of Scotland.

Mike Kelly says: “TeleCity Internet Exchanges and their associated services address the growing need for carrier-independent, resilient and secure infrastructure services - especially at a time when the Internet community is experiencing rapid growth.”

The decision of LINX to move to a second London site coincided with TeleCity's plans to open its second TIX. The company purchased a building in the London Docklands which LINX had already identified as being potentially suitable for the purpose and gutted and equipped it from scratch so that it could support high quality telecoms. It became operational early in 1999.

The two London co-location facilities are connected with gigabit Ethernet dark fibre cabling to provide high quality, high speed links between them.

Since the launch of LINX's second switch the TeleCity network has continued to grow. There are now seven TIXs (Dublin, Amsterdam, Edinburgh, Stockholm, two sites in London and the original in Manchester) with an estimated total saleable capacity when fitted out of approximately 190,000 square feet.

As well as housing one of LINX's switches these buildings provide similar facilities for the Amsterdam Internet Exchange (AMS-IX), the Manchester Network Access Point (MaNAP) and the Scottish Internet Exchange (SCOTIX).

TeleCity is currently fitting out two further TIX - one in Amsterdam and one in Frankfurt - and extensions to existing TIXs in London and Manchester.

TeleCity intends to continue its 'roll out' across Europe and to have 12 TIXs fully or partially operational by the end of this year. A further 30 locations throughout Europe have been identified as targets for the establishment of new TIXs.

TeleCity also plans to develop more specialised, high value, systems engineering and additional services in order to provide its customers with greater opportunities to outsource the servicing of their Internet operations housed within the TIXs.

In June of this year TeleCity floated on the London Stock Exchange, raising approximately £116 million.

This issue of HotLINX has been jointly sponsored by TeleCity and Telehouse Europe.

LINX AT G8 SUMMIT

A recent G8 meeting in Paris brought together senior government officials and industry leaders from the world's eight most powerful economies to talk about 'cyber-crime'.

Roland Perry, our regulation expert, led a UK delegation of 20 business representatives at the three-day conference which looked at issues related to exploitation of the Internet for criminal purposes. Roland was one of two British speakers at the conference - the other was a senior civil servant from the Home Office who headed the UK government delegation.

It was the first time that industry and governments had come together in this type of international forum to tackle issues including public confidence in cyberspace and measures required to fight high-tech crime.

Roland says: “Dealing with these types of problem is going to require world-wide cooperation involving both industry and government. ISPs are ready to play their part whilst also recognising the need to meet legitimate concerns about privacy and data security.”

LINX is now helping to plan a further G8 meeting to be held later this year.

NEW FACES

We have appointed Martyn Ranger as support co-ordinator for LINX. His role will be to monitor and 'progress' support queries, manage ordering and purchasing functions for the engineering team and provide first-line technical support to members.

Martyn comes from NTL with experience of project implementation and the installation and configuration of routers and cabling.

Rob Holland has joined LINX as webmaster, to start the long overdue restructuring of our website. Since leaving college Rob has been working for a design company where he is system administrator and involved in website design and management.
THE FUTURE OF MULTICAST

Delegates from many ISPs joined academics, equipment vendors and engineers at the Peterborough offices of LINX to review progress on our multicast project. The two-day event in July covered past and current technology developments, addressing, address mapping, inter-provider issues and the MBone. Speakers also dealt with issues such as making multicast attractive and selling multicast services to prospective clients. Dinner at the end of the first day was kindly sponsored by Foundry Networks.

LINX has been involved with multicast for some time - we launched our multicast webpage in August 1999 - and we are keeping pace with technical and commercial developments to ensure we can meet all our members’ present and future needs.

Multicast project network engineer Steve Walker says: “We currently have a Cisco 4500 router and Foundry FastIron Workgroup switch at the heart of our multicast interconnect project. We are working with hardware vendors to start testing inter-site and cross-vendor compatibility across all of our core sites.”

ABUSE SEMINAR

More than 40 delegates from the police, pressure groups, ISPs, telecoms companies and LINX came together in July for a LINX-organised seminar on cyber-abuse.

Speakers included Nigel Jones from the ACPO Computer Crime Working Group, Malcolm Hutton from the Campaign Against Censorship of the Internet in Britain, Deri Jones from NTA-Monitor and Keith Mitchell and Roland Perry of LINX.

Keith Mitchell, executive chairman of LINX, says: “In this constantly evolving industry that now affects every facet of life, the Internet’s success brings with it a responsibility for self-regulation of potential misuse. This event brought together the main players within the Internet industry involved in the control and reporting of cyber-abuse and cyber-crime.”

The seminar helped those involved in similar work at different industry organisations to see their common goal and enabled the sharing of information and techniques.

It also served to promote the best common practices and identify the tools for dealing with various types of crime and abuse and to

MULTICAST TECHNOLOGY

Multicast provides opportunities for one-to-many (or many-to-many) delivery of large or continuous data streams such as video far more efficiently than current ‘unicast’ one-to-one delivery systems.

Video streaming uses much more bandwidth than e-mail. Because video files are so large, video at 30 frames per second requires bandwidth of 128 kbps or more. Multicasting enables transmission of a single copy of a piece of video or other content to ‘multicast enabled’ routers which then send copies of the file to users who have requested them. The technology substantially reduces the volume of traffic on the Internet and makes viable the delivery of some services which could not be achieved with conventional unicast systems.

Although the technology has been discussed for some years it has only recently become of real commercial and technical interest. It has proved to be well suited to corporate intranets, with present commercial applications encompassing corporate announcements and training. Now there is a requirement to extend these types of applications across the Internet.

Much recent focus has been on developing the inter-provider multicast routing protocols and the ‘intelligent’ hardware that will be needed if multicasting is to become a viable Internet technology. LINX is involved with both these issues and with future development of the MBone (the multicast backbone) which is already a multicasting intersection for 4,400 of the 77,000 networks on the Internet.

Left to right: Delegates at the multicast seminar - Steve Walker (LINX), Chris Fletcher (LINX), Brandon Butterworth (BBC), Simon Lockhart (BBC); seated - Keith Mitchell (LINX), Steve Simio (Cisco Systems).

YOU CAN HELP

ICANN - the organisation with overall responsibility for administering Internet domain names and numbers - is trying to boost its European recruitment with just weeks to go before the election of new board members.

The September elections are intended to help ICANN (Internet Corporation for Assigned Names and Numbers) tackle criticisms of elitism and US bias.

Its ‘At Large’ membership scheme is designed to encourage more ‘ordinary’ Internet users to register as voting members of the organisation. ICANN has set up a Membership Information Task Force (MITF) to promote the participative process and to raise awareness of its importance.
determine what measures we as an industry can take to identify the threats and form solutions.

Keith Mitchell adds: "We hope the seminar will help ISPs to share their understanding of when it is time to hand matters to law enforcement agencies and how much authority they have as ISPs."

The event was sponsored by solicitors Manches and was held at Manches' offices in Aldwych, London.

Richard Francis of Manches says: "The UK is leading the international charge for e-government. LINX, as Europe's largest Internet exchange point, should be applauded for its programme of debate about key policy issues affecting all ISPs.

"Manches, as a leading law firm in the field of e-commerce, was delighted to participate in the seminar and hopes that this will be the first in a series of industry-led events."

THE ANTI-SPAM DIRECTIVE -
THE NECESSITY OF OPTING FOR 'OPT IN'

The UK government is shortly due to bring forward regulations to implement the European Union directive on 'distance selling'.

Originally conceived to deal with problems of consumer protection the directive also includes measures to deal with the issue of 'spam' - unsolicited e-mails.

The government has been considering the merits of two different approaches to legislation:

1. An 'opt out' scheme, similar to the one operated by the direct marketing industry in which people who do not wish to receive unsolicited telephone calls place their name on a central register which companies running telephone sales campaigns are obliged to consult.

2. An 'opt in' scheme in which people must give consent to be e-mailed.

LINX has been lobbying the government to adopt the 'opt in' principle. Our regulation expert Roland Perry has had meetings with civil servants and Patricia Hewitt MP, the government minister responsible for drawing up any legislation in this area, to press our case. He says:

"All the evidence suggests that an 'opt out' list will be unpopular with Internet users and it will certainly be difficult and expensive to maintain."

Most ISPs include in their acceptable use policies (AUPs) a prohibition of the sending of unsolicited e-mails. Users who persist in sending them will lose their accounts.

Because the Internet is an international medium and these AUPs are fairly standard on an international basis, it makes no sense for the UK to legislate for a different system.

Roland points out: "There is no 'right' to send e-mail over the Internet. ISPs only connect to the wider Internet by mutual agreement. British ISPs will have to continue to operate the current AUPs if they are to fulfill their contractual obligations to overseas ISPs."

LINX believes that, in any event, spamming is a breach of the UK's own Data Protection Act when the e-mail addresses can be used to identify individuals - as is usually the case - because they are then 'personal data' under the terms of the act.

Current indications are that the Department of Trade & Industry - the government ministry responsible for drafting legislation to implement the distance selling directive - is aligning itself with this point of view. It is, however, likely to insist on there being a strong self-regulatory regime to prevent spamming if statutory regulation is to be avoided.

As part of the self-regulation system, LINX is to co-ordinate the production of guidelines to best practice for both ISPs and Internet users.
The growth of LINX and our continued dedication to providing world class Internet exchange services has resulted in a restructuring of the engineering roles within our organisation.

Previously, all engineering roles came under a single operations unit. The need to invest more dedicated manpower in development of new services has created new areas of responsibility. The engineering team will therefore now be divided into two parts - Operations and Development.

Kieron Thorpe will head the Operations area and will be responsible for engineering team management and all day-to-day operational activities, including 24x7 engineering cover for the infrastructure and internal and external IT support.

The Development area will be jointly managed by Mike Hughes and Chris Fletcher. Mike will take responsibility for the design and maintenance of the core network infrastructure. Among the planned developments within this area are 10 Gigabits Ethernet and WDM (wave division multiplexing). Chris will take responsibility for developing new services such as Multicast and IPv6.

Chris and Mike will also work on large infrastructure projects and key vendor relationships and increase LINX's profile in technical forums such as RIPE, NANOS and IETF.

David Morgan, chief operating officer of LINX, says: "The new organisation has a flatter management structure than is perhaps traditional, with several members of the engineering team reporting to me directly. These changes will allow the engineers to focus more closely not only on critical developments but also on maintaining the exceptionally high level of support for our members which has been vital in making LINX successful."

Former head of engineering Nic Lewis has left LINX to take a job elsewhere in the Internet industry. David Morgan comments: "Nic's career move provided the catalyst and the opportunity to make changes in the engineering structure."

Meeting to plan new budget

The next meeting of members of LINX - to be held at the Tara Cophorne Hotel on 21 and 22 August 2000 - will concentrate on setting a budget for the next financial year.

Key issues to be tackled will include:

- Changes to services. Although the Basic Services package remains virtually unchanged the provision of co-location services in LINX rack space has been completely unbundled into Additional Services, as only a minority of members enjoy this service. We propose moving to an 'a la carte menu system' where each service option has its own price and you pay for exactly what you get. This is in line with practice at most other Internet Exchange Points and we think this change will make life a lot simpler for members.

- Due to necessary evolution of the switch architecture, FDDI and 'blocking' gigabit ethernet ports will no longer be available for new connections, although we will continue to support them for existing member connections.

- Setting the Basic and Additional Service fees. The fees will be presented as two or more fee schedule documents, so that members will have the choice of voting between different scales and consequent budget options.

- Renewal of the four existing non-core activities - there have been some minor changes to these as a result of consultation with the NCAP sub-committees.

- Approval of a new fifth training non-core activity - a LINX-promoted network engineer training scheme.

- Review and re-start of LAHC changes to the Memorandum of Understanding process.