

Annual Report 2019

London Internet Exchange





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Messages from the Board

Review of 2019 by Simon Woodhead

In my time on the Board, LINX has gone through massive change. Not all of it will be obvious, but I passionately believe it moves the business forward to the benefit of all members.

In 2018 you approved the appointment of more Executive Directors (EDs) to the LINX Board which has been the single biggest change in improving Board performance over the year under review. I'm proud of all the EDs and how they've taken this new challenge in their stride. The Board is more collegiate and frankly better informed, leading to improved clarity and ultimately better decisions.

I took over as Chair when Murray Steele stepped down in February. At that time the Board knew of John Souter's intended retirement. My priorities were therefore CEO succession and the search for an independent Chair. I am happy to report that both were successfully accomplished.

John Souter so ably led LINX as CEO for 19 years. He exhibited a passion for mutuality and a commitment to the membership that inspired and runs through LINX, but also a steadiness that instilled in LINX the calm commitment to quality and resilience so vital for a world-class IXP.

LINX grew and matured enormously under his leadership, and he leaves a legacy of a strong culture and a tremendously capable team. On behalf of the entire LINX community, I would like to extend the warmest thanks and best wishes to him.

It is from the great team that John assembled that we were able to find several very capable candidates for CEO internally. I'd like to personally thank them all for engaging with the process and I, hand on heart, believe any one of them could have done the job commendably. Most significantly I'd like to thank them for the professional way they've behaved since.

Ultimately Kurtis Lindqvist was chosen and along with John Souter made a seamless transition very easy. Kurtis is enormously capable and experienced and I'm confident he'll take LINX to new heights.

With a new CEO in place, we were able to conclude the selection of a new Chair. Again we were flattered by the calibre of candidates attracted to LINX. We ultimately selected Pieter Knook who combines a perfect blend of sector gravitas and high-level experience. It has been a pleasure serving on the Board with him since he took over and I'm confident he will both mentor and support Kurtis going forwards, as well as leading the wider Board.

I am honoured and grateful to have played my part in such significant change at LINX and am very confident LINX is in the very best of hands to focus on the not insubstantial challenges and opportunities ahead.



Simon Woodhead
LINX Chairman (Jan-Dec 2019)



Messages from the Board

Looking Ahead to 2020 by Pieter Knook

Stepping into the role of Chair towards the end of the reporting year, I would like to thank Simon for a thorough handover and for his service as my predecessor on the Board. I was attracted to LINX by the very capable people and the interesting position the company holds as a member-led organisation, and I look forward to contributing to fulfilling LINX's potential in the future.

Simon has described significant change in the company's leadership: we will now need to focus on further change in how the company operates to continue to deliver the value members will need in an increasingly competitive commercial environment.

LINX faces continuing steep erosion in port prices – indeed, being able to reduce the price of interconnection for members is part of our raison d'être. Members' expectations on the type and breath of services LINX offers is also evolving and we need to ensure LINX can continue to meet these in the future. In order to continue to prosper in such circumstances, LINX will need to achieve new economies of scale and significant reductions in unit cost. As Chair it is part of my role to support the Board as it adopts a strategy for meeting this challenge and oversees its execution. I hope over time to expose more of the strategic thinking to the LINX membership as a whole.

I would also like to take this opportunity to congratulate Malcolm Holt, CFO, on his appointment as an Executive Director and Bekki Dube on her appointment as Company Secretary. The LINX membership is served by a Board with deep technical expertise, and these non-technical appointments help round out the skills and experience available to the Board.



Pieter Knook
LINX Chairman

CEO's Report

New Leadership, same Focus on the Needs of the Membership

Celebrating 25 years of Working for the Good of the Internet

“I would like to start my first report as CEO by adding my voice to Simon’s in paying tribute to John Souter. He has left an incredible legacy, and I am humbled by the responsibility of filling his shoes. Fortunately, I have inherited from him an excellent team, at every level of the company. Together, I am sure we can go on to do great things.”

Kurtis Lindqvist
LINX Chief Executive Officer

As well as the transition in leadership, 2019 also marked LINX’s 25th anniversary. That was an opportunity to reflect on what LINX has achieved over the years, the value it has delivered to members and the importance of our culture and core values in guiding our strategy and actions so that everything we do serves our members’ interests.

I am pleased to note that the end of 2019 saw a record uptake in 100GE ports, supported by a promotion scheme that has proven very popular. It is the first time I recall a pricing initiative really driving additional demand for IXP ports.





LINX Member Conferences

We also entered the Saudi market, opening a new line of business supporting a previously underserved market. Commercially, this will benefit members not only in fees earned but by opening peering opportunities in a new economy. Operationally, delivering JEDIX has led us to develop systems and processes that can be reused elsewhere, further driving the network automation agenda.

On the Public Affairs side, for most of the year UK policy was largely dominated by the Brexit debate. A new European Commission and Parliament announced a plan for a major revision to the framework for Internet content regulation in the EU, while the UK government mulled over its own separate plans. Either of these or both could have a significant impact on members' responsibilities. Additionally, the UK government's increasingly close attention to operators' cybersecurity is leading to new regulatory obligations for LINX itself. It seems no year passes without demonstrating once again how everyone in this sector needs a voice when the government is taking regulatory decisions, but seeing LINX become a directly regulated entity for the first time really drives this home.

LINX member conferences have formed the backbone of LINX community activities since 1994 with well over 100 meetings having taken place so far. These events provide a forum for members to meet, to share expertise and also to be updated on the latest technical and regulatory issues. The LINX AGM and Board elections are held in May with an EGM staged in November to formally approve the following year's budget. In each case members vote on resolutions that directly affect the governance of the Exchange.

LINX104 - February

The first member conference of the year was held at the Park Plaza Victoria in London. Among the topics covered on the main agenda were peering economics, fire suppression systems in datacentres, multihoming, 5G technologies and TechVets, an initiative that places ex-servicemen and women in roles within the tech industry. There was also a guest IXP talk by Johar Alam of the Indonesian Internet Exchange (IIX).

LINX105 & AGM - May

Another well attended event saw 191 registrants from nearly 100 different organisations. The programme included presentations on peering security, artificial intelligence and the European IXP market. In the AGM session the annual Board elections took place with Neil McRae of BT was elected and Simon Woodhead of Simwood was re-elected to the Board.

LINX106 - August

LINX's summer conference was held in the Welsh capital Cardiff. There was a definite local flavour to the agenda with superfast broadband and the digital strategy for Wales covered by Michael Groves of the Welsh Government. The LINX Technology team had much to share with membership including the proposed evolution of the LON1 and LON2 networks and the integration of EVPN technologies. Also covered was progress on the external IX-API project and a technical overview of the JEDIX exchange in Saudi Arabia.


LINX107 & EGM - November

LINX celebrated its 25th anniversary at LINX107. In addition to the regular operational updates there were reflections on the past 25 years of LINX by John Souter and Paul Thornton. Other topics covered included the Bird Route Server project, 5G, DDoS protection, trends in 400G optics, GDPR and an introduction to RPKI. A record 300 signed up for the conference and celebratory evening social which welcomed representatives from over 25 different international Internet exchanges.

The Year Ahead

Commitment to Build on the Strong Foundations of Success

The LINX team are committed to providing excellent services for its members and to be ready for future challenges.



As an Internet exchange operator, and as a voice on behalf of its members in public affairs, LINX has occupied a special place in the UK market and the global network operator community. Looking to the future, our task is to build on this and strive for more, taking pride in past achievements but also recognising that there are market challenges ahead.

We cannot depend on natural growth in traffic demand and ever larger port sizes to replace the revenue lost to port price reductions. To bear down on unit cost, LINX will need to aggressively increase automation and efficiency improvements, while enhancing service especially in areas that contribute toward those savings, such as self-service. At an operational level, that will mean less time spent on basic network engineering work, and more time spent on high value systems development work. With regard to personnel, it will mean a lot of pressure to build and acquire exceptional skills and competencies, including competing for candidates in high demand.

I recognise that this is not a new development; LINX has been embarked on this path for some time. However, the urgency of this is only going to increase, and I look forward to picking up the pace on this in the year to come.

We also need to push for faster growth, to bring in the total revenues that allow us to invest to achieve such improved efficiencies. This will require continued development on the technical side to be matched by innovation on the commercial side. That seems a suitable point at which to congratulate Jennifer Holmes, who joined the senior management team as Chief Commercial Officer. Jennifer is a long-time staff member and I am especially proud that we promoted someone internal to the senior management team.

“As I look ahead, it is clear that 2020 will have its own, unique challenges. My team and I face them confidently, with the energy and ideas to develop new products and processes, built on the strong foundation I have inherited. We are ready to meet the new year.”

Kurtis Lindqvist
LINX Chief Executive Officer

2020 UPDATE Coronavirus (Covid-19)

Since the beginning of 2020 the Coronavirus has spread rapidly around the world with increasingly drastic effects on society and the economy. At the time of writing the full consequences are impossible to foresee, and new restraining actions are being developed on a day to day basis. Whilst the general effects on the economy and society are negative, we have assessed that, as far as can be known, the short-term financial impact of the virus on LINX's business is likely to be minimal.

We base this assessment on the following factors:

- LINX's core interconnect services are communications infrastructure serving businesses operating Internet networks. As such we are not exposed to the same immediate-term consumer demand reduction as, for example, a hotel or retailer.
- We estimate that the Coronavirus will likely not materially affect demand for LINX's interconnect services in the short to medium term, and that if it does it would be likely to stimulate additional demand, rather than depress it.
- LINX can implement work from home policies, with very limited access to the premises for only essential work, and in doing so we can continue ordinary business operations, with minimal disruption to routine work. A work from home policy is now already in place.
- LINX can continue all essential services, on which our core revenues depend, without any access to the premises except for essential maintenance to rectify faults.
- LINX can continue all essential services without interruption even should a substantial portion of the staff be unavailable due to being sick.

We also recognise longer term impacts, including:

- Overall LINX cannot continue to be shielded from the negative impacts of the Coronavirus.
- While routine business operations can continue in a work from home scenario, such working conditions will hinder the delivery of projects designed to improve overall efficiency and productivity, and will significantly impede new business development.
- If the outcome of the Coronavirus causes significant economic damage in the wider economy, that could, in the long run, reduce demand for our services and may also weaken the cashflow, creditworthiness and viability of our members.

LINX Technology

Evolution, Expansion and Network Collaboration

In 2019 LINX focussed on the development of the LON1 platform, the launch of a new IXP in Jeddah and a collaborative project to develop an application programming interface.

“Looking back over the year we have delivered successfully against many of our strategic objectives as set out by the technology leadership. The first was on the evolution of LON1 and 100GE growth, the second was on geographical expansion where appropriate and third was on a richer set of products.”

Richard Petrie
LINX Chief Technical Officer

The positive evolution of LON1 manifested itself in a number of areas such as the 100GE membership connections growing to over 200 for the year; expansion into Telehouse North 2's new facility; and in augmenting the core network away from the legacy Juniper PTX5000 platform to the newer MX10K family. This objective involved proving the technology, delivering 100GE density, managing costs and driving efficiencies in power, space and cooling needs.

Geographical expansion focussed on the partnership with Saudi Telecoms Company (STC) and the new exchange point (IXP) in Jeddah - here JEDIX was launched. We took this opportunity to deploy a simplified disaggregated Edgecore Networks peering platform solution with a new route server and systems architecture, fully automated and remotely managed - a proof point that will bode well for other new sites, allowing us to deploy IXPs in a rapid, repeatable and cost-effective way.

Our drive to service a richer set of products came through in the form of 'private VLAN' services, 'IXP Reseller' and the 'IX-API' service offering. With network centric deployments of member services running on our Network Configuration Automation platform (NCA) we delivered the ability to build and deploy private VLAN services. This product will not only offer services to members directly but will also be used as a component in enabling other overlay services as part of our marketplace service offering as this matures. It allowed us to also launch the IXP reseller service, linking remote members on partnering IXPs the opportunity to connect into LINX's London IXPs as well as giving LINX members remote access to international IXPs.



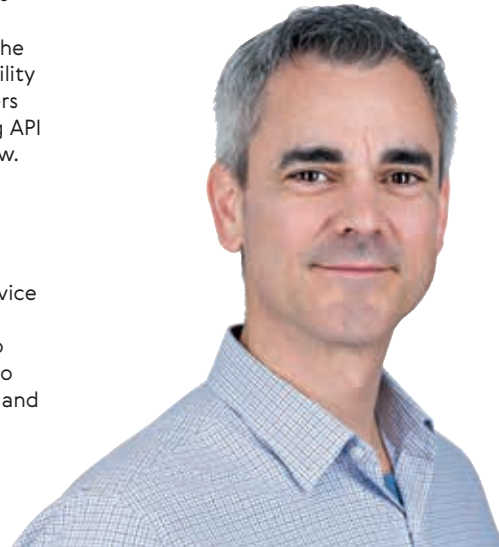
In addition to these two new services we worked in close collaboration with AMS-IX and DE-CIX on a joint API initiative to build a standard external API for consumption of peering services. This effort was developed in partnership with Epsilon and Interxion as pilot partners, allowing them to advertise our IXP services with their customers via their portals and giving a digital interface and consumption model to their customers. The ambition is three fold; to expand the accessibility of IXPs through partners, to allow our members to develop directly against a standard peering API and to promote the model for all IXPs to follow.

2020 Goals

Following our end of year strategic review we will further evolve the automation efforts to give full digitalisation of our products and service offerings. We are also looking to grow the IXP footprint effectively and economically, and to deliver more tools and performance insights to the LINX membership and improve the portal and engagement experience.

“With the challenges of 2019 met and the cost management of our operations in a healthy place, we set out at the end of the year on new strategic goals. These will help us to further evolve the automation and digitalisation of our products and service offerings.”

Richard Petrie
LINX Chief Technical Officer



UK Exchanges

Keeping Network Traffic Local

LINX's regional exchange programme continues to go from strength to strength. 2019 saw strong growth at the Manchester network in particular and a new regional platform go live in Jeddah, Saudi Arabia.

“LINX are often asked if we have any intention of connecting our local exchanges to London or to each other. The answer is simply ‘No’. The main function of a regional exchange is to keep the traffic flowing within the local area.”

Jo Fereday
LINX Product
Manager



LINX Manchester

Once again LINX Manchester generated a considerable amount of activity and opportunity in the local area for interested parties to meet and exchange information on the local peering scene. LINX sponsored a social before the UKNOF meeting held annually in Manchester, which provides a great platform for our members.

Traffic continues to grow, and peak traffic is now consistently above 60GE. Datacentre space is always an issue in the city and LINX are regularly approached by potential new providers asking if we would be willing to build a new point of presence at their location. In 2019 LINX were able to make a business case to expand to Teledata in Wythenshawe and the site is now available for members to connect to the Exchange.

LINX Scotland

Whilst the volume of traffic at LINX Scotland is low compared to the other exchanges it is consistent. It is interesting to consider whether this is a reflection on the amount of traffic in Scotland as the population is small compared with that of the rest of the UK, and its high concentration in a few hub areas.

LINX Cardiff

2019 was a year of planning for LINX Cardiff. The exchange has been renamed LINX Wales to reflect the changes planned for 2020.

LINX NoVA

LINX Nova saw good traffic growth in 2019 with the peak traffic rising by 50% over the course of the year.

August 2019: Traffic passes across the JEDIX exchange in Jeddah for the first time



JEDIX

An Internet Exchange for Saudi Arabia

In December 2018 LINX and Saudi Telecom Company (STC) entered into a strategic partnership to form a new Internet exchange point in Jeddah called JEDIX.

Jeddah is one of the main landing stations for African and Asian cable routes and so is a prime location for an IXP. Saudi Arabia has many ASNs which would benefit from joining JEDIX and keeping traffic local.

“STC’s ambition is to develop JEDIX into the leading internet and data hub in the MENA region. In LINX we have a global leading IX partner who will help accelerate the delivery of this ambition and create a thriving interconnection eco system in the Kingdom.”



Alan Whelan
Advisor to CEO at STC

STC’s terrestrial fibre network provides direct, high reliability access to nine Middle Eastern countries making them a great partner for LINX in the region. 2019 has seen the LINX and STC teams working very closely and efficiently together to share ideas and make the project a success.

Here at LINX we were able to use our existing connections with some of our international members to secure the first port orders for JEDIX in 2019. Traffic began to flow on the peering LAN in August 2019 and we ended the year with a number of orders from both existing LINX members and new customers to JEDIX. These are progressing through the next stages of provisioning.

We have a healthy pipeline for the new JEDIX exchange and we are collaborating very well with the STC team to make this regional LAN a success both for our existing members and new ASNs alike.

Exchange Growth

Jennifer Holmes
LINX Chief Commercial Officer



Consistent Growth Building Confidence in the Peering Community

“2019 was a great year for connected new ports and exchange growth in general across all of the LINX LANs. We ended 2019 ahead of target for connected ports on LON1, LON2 and LINX Manchester. We increased our number of connected 100GE ports to a total of 203 across all our network platforms by the end of the year, which is a great achievement.”

100GE Success Story

32 new 100GEs were connected on LON1, and ten at LINX Manchester which exceeded our expectations for connections on that LAN for 2019. We expect LINX Manchester to have another great year in 2020 with the addition of a brand new site, Teledata. We also saw a growth of 58 10GE ports across all the LANs.

LINX received 98 applications for new membership throughout 2019 which exceeds 2018's figures. There were 76 new member connections across the year which is a great result. We are pleased to see that LINX is still attracting a significant amount of new members each year.

We also saw a slight dip in the number of members cancelling or merging, 5.34% of the total membership compared with slightly higher figures in the previous three years.

844 LINX Members

903 Member ASNs

81 Member Countries

97 New applications in 2019

4.303 Terabits per second peak traffic on the public exchange

1981 Connected member ports

989 Member-facing 10GE ports

203 Member-facing 100GE ports

30.572 Terrabits of connected capacity

646155 Routes peered at LINX (average)

766011 Global routing table routes (average)

84.35% Percentage of global routes available at LINX

Products and Services by end of 2019

LINX Products

- **Public Peering**
Network traffic exchange over a shared network
- **Private Interconnect**
Member point-to-point connections
- **ConneXions Partners**
LINX connection via vLAN
- **ConneXions Access Points**
 - Datacentres with a LINX PoP
 - Datacentres with LINX transmission equipment
 - Datacentres with access to LINX via an approved Layer 2 carrier
- **Member Rack space**
Rack space at PoPs available directly through LINX
- **IXP Reseller**
LINX connection from an existing (mutual or non-profit) Internet exchange
- **Bi-Directional Optical Transceivers**
Bi-Di transceivers allow the transmitting and receiving of data on a single fibre
- **Private VLAN**
New product launched in 2018 to allow members to connect to other members from LINX over a single port

LINX Local Exchanges

- **LINX Manchester**
Peering LAN in North West England
- **LINX NoVA**
Peering LAN in Northern Virginia, USA
- **LINX Scotland**
Peering LAN in Edinburgh and Glasgow in central Scotland
- **LINX Cardiff**
Peering LAN in Cardiff, Wales
- **JEDIX**
Peering LAN in Jeddah, Saudi Arabia

LINX Services

- **Public Affairs**
Membership representation on matters of public policy
- **Route Servers**
Free peering service of member advertised routes
- **Time Servers**
LINX time servers distribute high accuracy time

Financial Report

Statement of Income and Retained Earnings	2019 (£)	2018 (£)
Turnover	15,185,614	15,827,050
Distribution costs	(4,073,402)	(3,828,680)
Administrative expenses	(11,732,975)	(12,070,319)
Other operating income	104,151	195,607
Operating surplus	(516,612)	123,658
Interest receivable	48,805	19,240
Surplus / (deficit) before taxation	(467,807)	142,898
Tax on surplus from non-core activities	(16,529)	(5,632)
Surplus/ (deficit) after taxation	(484,336)	137,266
Retained earnings at beginning of year	11,971,791	11,834,525
Retained earnings at end of year	11,487,455	11,971,791

Income and Retained Earnings Overview

We advised members in last year's annual report that the significant price cuts made at the beginning of 2019 would result in a planned deficit. The funding of such was through use of available reserves. The overall financial performance for the year was much better than expected and although we still reported a deficit, it was almost 40% lower than had been predicted. Our revenue targets were missed by 4%, but the steps taken to reduce expenditure resulted in overall costs being 6% lower than budgeted.

Our available reserves were considerably improved by capital expenditure being at almost half the planned level. This followed a revised approach towards managing, supporting and building our networks. The recent trend of making price cuts has been maintained, and on 1st January 2020 further cuts were made. We are, however, expecting to make a small surplus in 2020. Membership grew by 3%, connected capacity by 19%, 100GE high capacity ports by 32% and network reliability, together with member satisfaction, continues to be at high levels. Good financial results supported by good operational results, underpin our pricing decisions and our confidence in the future.

Balance Sheet	2019 (£)	2018 (£)
Fixed assets	3,594,692	4,704,820
Current assets	9,571,682	8,853,752
Current liabilities	(1,674,935)	(1,586,781)
Net assets	11,491,439	11,971,791

Balance Sheet Summary

Our lower current levels of capital expenditure has resulted in the net book value of fixed assets decreasing as depreciation charges exceed new expenditure. New expenditure has increased the cost of assets deployed by £1.7M to a total cost of £23.5M.

Our net current assets have increased by over £600k, and we remain in a healthy position.

Cash Flow	2019 (£)	2018 (£)
Cash and equivalents at beginning of year	6,103,989	4,881,183
Operating surplus/(deficit) for the year	(467,807)	142,898
Add-back depreciation charge	2,863,194	3,662,302
Add-back movement in debtors/creditors	1,036,046	(1,703,888)
Taxation paid	(16,703)	(2,632)
Cash flow from operating activities	3,414,730	2,098,680
Purchase of fixed assets	(1,745,913)	(875,874)
Overall cash flow for the year	1,668,817	1,222,806
Cash and equivalents at end of year	7,772,806	6,103,989

Cash Flow Analysis

Depreciation on higher levels of past capital expenditure has resulted in a positive cash flow effect, when current levels of capital expenditure are taken into account. Additionally certain large technical support contracts were agreed and paid for, before the end of 2018, whereas this year the payments have fallen into 2020.

Our level of liquid funds has increased by £1.7m, compared to the end of 2018, and this puts the company in a strong financial position.



Purchase of Fixed Assets	2019 (£)	2018 (£)
Network assets	1,648,544	812,307
Leasehold property improvements	21,057	2,697
Computer equipment	76,312	60,870
Total fixed assets purchased	1,745,913	875,874

Summary of Fixed Assets

Capital expenditure during 2019 was higher than in 2018. This was partly due to a carry-over of some capital projects from 2018, linked to the extended testing of related equipment. With a revised approach towards building and running our networks, we expect that capital expenditure will continue to be at lower levels than in our recent past.

“Following the 1st January 2019 service price cuts, using our available funds, we budgeted for a sizeable deficit this year. In the event the year-end results of a net £484k deficit were almost 40% better than expected. This supported us being able to offer more value to our members by implementing further service price cuts on 1st January 2020.”

Malcolm Holt
LINX Chief Finance Officer

Public Policy

Government Plans Major Content Regulation Extension

“In the UK, public policy was again dominated in 2019 by the Brexit debate. Theresa May struggled on in minority government through some of the largest Parliamentary defeats in history, before finally being replaced as Prime Minister by Boris Johnson in July. The minority regime he inherited proved equally incapable of passing legislation, and the whole tortuous affair was only finally resolved by a General Election in December that the Conservatives won with a resounding 80 seat majority. This seemed certain to ensure Johnson would no longer face any difficulty enacting his policy in 2020.”

Malcolm Hutton
LINX Head of Public Affairs

Online Harms

Despite the May government’s difficulty in passing legislation, and the capacity for the Brexit debate seemingly to smother all other policy discussion, her administration did in April publish a consultation on a radical extension of regulation of Internet content. Currently, while Ofcom regulates broadcasters, Internet content is simply subject to the ordinary criminal law, just like print publishing and the spoken word. An “Online Harms” White Paper proposed severely restricting this freedom, making Internet services that carried “user generated content” subject to a new regulatory regime.

“Online Harms” proposed that regulated entities – which would extend to anyone that ran a website that allowed comments or discussion – would become subject to a general duty to prevent “harm” using their service. However, the legislation would not define the harm to be prevented, nor the steps that must be taken to discharge the duty: instead, the duty would act as a legal mechanism to enforce compliance with Codes of Practice issued by an Internet content regulator. That regulator would therefore assume the power to determine both what is considered harmful, and what companies must do to restrict access to harmful content.



This is a draconian extension of State power over online speech and publishing. Whereas previously only Parliament could declare that certain content so offended public morals that it could not be tolerated in a democratic society, this power would henceforth be exercised by an independent regulator (probably Ofcom), that is answerable neither to the electorate, nor even directly to Ministerial control. Similarly, that regulator would be able to co-opt private business in the suppression of content that it deems harmful (whether or not proscribed by criminal law), with few limits on the techniques it could command to be used or the expense to be incurred. Companies that failed to comply were threatened with a range of strict sanctions, including heavy fines and possibly personal liability for directors and senior managers, coupled with disruption of Internet access to online sites based outside the UK that declined to recognise this new censorship regime.

Amongst the London-based regulatory community there was a sharp reaction to these proposals, with critical replies to the consultation not only from the Internet sector but also from some organisations more concerned with misuse of the Internet than civil liberties. There was, however, little national debate as the political meltdown over Brexit eclipsed all else. Opponents had to hope that Boris Johnson, who had very recently worked as not just a journalist, but specifically a polemicist and controversialist, would be less sympathetic to such State control of lawful free expression than the temperamentally censorious former Home Secretary, Theresa May. During 2019, though, Boris had other things on his mind.

Security

Security was another area for further regulation, prompted in part by the passage in 2018 of the UK implementation of the Network and Information Systems Directive. That legislation saw LINX become a directly regulated operator for the first time, being designated an Operator

of an Essential Service as a critical part of the UK's telecommunications infrastructure. Ofcom took on the role of cybersecurity regulator under that legislation, mirroring its existing duties in respect of network operators, but Ofcom's technical advisor the National Cyber Security Centre became root source for the security standards to be met.

Though the UK was planning to leave the EU, probably, it seemed likely that EU policy would continue to be at least influential in the UK post-Brexit, at least if the government could be persuaded to think again about the Online Harms regime. It was therefore highly significant that after a new European Parliament was elected in May, and a new Commission installed over the summer, there was an early commitment to a new "Digital Services Act" that would potentially overhaul the E-Commerce Directive 2000, the lynchpin of protection from liability for network operators and hosting providers. Major reform to such significant legislation will likely keep European policymakers and lobbyists busy for several years.

LINX in the Wider World

Partners, Associates and Supporting Organisations

LINX has enjoyed a supportive and collaborative relationship with its community partners over many years.

It is through these relationships within the Internet community that LINX is able to provide members representation at a global level, the opportunity to benchmark performance, and offer a role in helping make the Internet a safer and more trusted space. There is also the opportunity for members to influence policies and procedures in the UK and overseas.

Euro-IX

Euro-IX, the European Internet Exchange Association, currently has 80 member IXPs from around the world. LINX is a founding member of Euro-IX. LINX CEO Kurtis

Lindqvist served as the chairman of the board until October 2019. LINX regularly meets with the IXP community at Euro-IX conferences to discuss and share ideas and experiences for the mutual advantage of the membership. This is done via technical meetings, mailing lists and online resources.

Euro-IX also gathers information on regulatory issues affecting member exchanges that could potentially impact the membership from within the European region, and other jurisdictions, in the future.

The logo for Euro-IX, featuring the text "euro-IX" in a lowercase, blue, sans-serif font.

EuroISPA

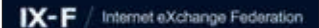
A key partner for LINX is EuroISPA, the pan-European association for organisations representing the ISP industry.

Working with EuroISPA allows us to influence policy and legislation at the EU level, which it has done efficiently and effectively for many years. Malcolm Hutton, LINX's Head of Public Affairs, served as President of the association for five years. He is currently chair of the Intermediary Liability Committee.



Internet Exchange Federation

IX-F, the Internet Exchange Federation, is a global platform for associated Internet Exchange Point Associations, including Euro-IX. Its goal is for exchanges to collaborate "to build a global IXP community and help the development of IXPs throughout the world".

The logo for the Internet Exchange Federation (IX-F), featuring the text "IX-F / Internet eXchange Federation" in white on a dark blue background.

Internet Watch Foundation

LINX played a pivotal role in the creation and start-up of the Internet Watch Foundation (IWF). One of the roles of the organisation is to assist hosting providers identify and remove child abuse images hosted on their servers. When the IWF was founded in 1996, the UK hosted 18% of the world's known online child sexual abuse material. Today, it hosts just 0.2%.



Internet Society

The policy and international engagement activities of the Internet Society (ISOC) are rooted in the organisation's fundamental belief that the Internet is for everyone and should be available to people everywhere. ISOC works with governments, national and international bodies, civil society organisations, the private sector, and other stakeholders to reach decisions about the Internet that conform to its core values.



ISOC's mission to preserve and protect the open, collaborative, distributed, multi stakeholder model is strongly supported by LINX and its stance has defined the successful development of the Internet for many years. As an "Organisational Member" of the Internet Society, membership enables LINX to influence Internet policy on a global stage, through international forums such as the IGF, the ITU and ICANN.



Make life easier and peering more convenient
IXO API
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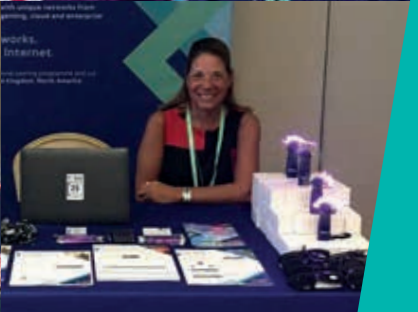
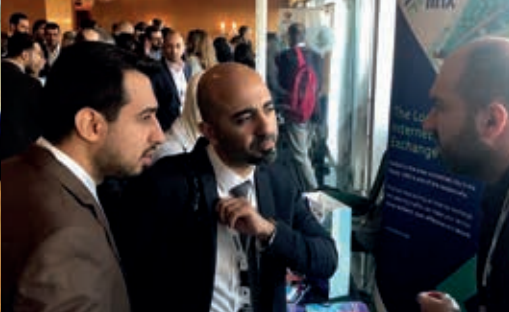
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A final word on 2019 has been kindly provided by the retiring Chief Executive, John Souter, who stood down at the end of the year.

“It has been a great privilege and pleasure working for LINX for all these years. LINX is in a much stronger position than when I took over as CEO, and I’m really confident that under my successor, Kurtis Lindqvist, it will go from strength to strength. I would also like to thank the members for making this such a fantastic experience. LINX has flourished as a membership organisation, and long may it continue to do so.”

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