London Internet Exchange

Annual Report 2022

linx

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Group Strategic Report

For the Period Ended 31st December 2022

The company is a membership organisation whose principal activity is to provide Internet Exchange Points for the mutual benefit of its members, to promote the interests of its members, and to represent its members in matters of public interest.

LINX's reach is wide and in our services sector we are a very significant player. We continue to attract new worldwide members who are based in Europe, the Middle East, Asia, Africa, the Americas, and Australasia.

The London Internet Exchange is a group of five companies. London Internet Exchange Ltd (LINX) established in 1994, and London Internet Exchange Trading Ltd (LINX Trading) established in 2013, are the two UK companies in the group in respect of which audited accounts are filed at Companies House.

The group also comprises three overseas companies: LINX USA Inc and LINX America Inc registered in the United States. LINX USA was established in 2013 as the operational vehicle for LINX NoVA, our Internet exchange point in North Virginia, while LINX America was established in 2014 to support the promotion of LINX NoVA. The results of these companies are included in this consolidated report and accompanying financial statements.

LINX Kenya was established in 2022 as the operational vehicle for the LINX Nairobi Internet Exchange as announced in 2022. LINX Kenya is included in this consolidated report and accompanying financial statements.

This report therefore covers both LINX and the consolidation of the group as a whole. This report was approved by the board on 18th April 2023 and signed on its behalf.

Kurt Erik Lindqvist
LINX Chief Executive Officer

CEO's Report

Business Review

The impact of the COVID pandemic affected work in early 2022, however as restrictions were lifted staff returned to a hybrid working environment. Demand for Internet communications, which drives the need for the company's wholesale products, remained high with the company seeing new traffic peaks several times across all its operating platforms. Peak traffic grew from 6.571Tbps to 7.424Tbps during 2022. The pandemic had initially accelerated the need for bandwidth and interconnection services, which held up into the second half of the year.

The outcome of 2022 demonstrates the directors' view is justified as connected capacity also continued to grow. In 2022 it grew as in previous years by 40% to 51.71Tbps (37Tbps in 2021). Performance metrics remained high with network availability over 99.998% across all services; and member satisfaction and Net Promoter Scores very positive.

Despite the high growth in edge capacity sales fell slightly short of budget estimates. The economic uncertainty in the second half of 2022 contributed to a slowdown in growth versus budget expectations. The introduction of the new pricing model and new intermediate step bandwidth services also contributed to budgeting and forecasting uncertainty as there was no historical data to base expectations on. This was mitigated by lower costs which led to a better than budgeted result close to breakeven for the full year.

As we ended 2022, an increase in inflation, and the risk of a recession led to considerable uncertainty in the market. The Internet and interconnection industry has not seen a high-interest rate and recession environment since the mid-90s so the impact on service demand is hard to estimate. We believe that a conservative approach is justified in this situation and we have for the first time in over 15 years not decreased prices across the board for 2023. We estimate that higher inflation will have a significant impact on staff costs, but also on our direct costs, which among other things includes electricity consumption where higher energy prices will have a negative impact.

Budgeting for 2023 and 2024 assumes a small loss in 2023 and recovery to a small profit in 2024, maintaining a zero budget over the two years. Management and the Board will increase reforecasting cycles for 2023 to ensure corrective action can be taken early enough if needed.

CEO's Report

Business Review (cont.)

During 2022 LINX maintained both its ISO27001 and FSQS certifications, both important for our ongoing security and compliance needs. Work on automation and member self-service also progressed during 2022, with the introduction of many new portal features allowing for members to directly configure and order services themselves without coordination or work from LINX staff. This enables a better member experience and customer journey as well allowing for better scaling of services for LINX.

Also in 2022, we saw an increase in demand for 400G ports across several LANs. We further announced the agreement to expand the managed IXP service we provide STC to include Riyad and Dammam.

The start of 2023 has been in line with expectation for revenue. Due to increasing inflation some direct costs have been higher than anticipated but within a manageable level with effects around 1% of turn-over for the first quarter. Some anticipated CAPEX spend has been shifted to earlier in 2023 leaving CAPEX spend to be higher than expected, but this is also expected to raise revenue later in 2023.

Our available cash reserves remain strong and at a higher level than 2021 due to the lower than anticipated spend and CAPEX in 2022. This leaves us well placed for the investments planned for 2023 as well as any challenging trading conditions.

Principal Risks and Uncertainties

The business regularly reviews a wide range of risk factors across all areas of the business. A comprehensive risk register, that encompasses both operational and financial risks, is regularly updated and discussed at a senior management level, and twice a year at Board level.

The interconnection market remains very competitive, which also can be seen in the slowdown in new membership applications during this period. Our membership continued to grow with 67 new member applications received during 2022 (95 in 2021). The LINX membership totalled 891 at the end of the year (890 in 2020), and these were widespread across 80 countries.

There continued to be price pressure on peering port services. Taking into account our 5% price reduction at the start of 2022, a sales campaign during the first half of the year, as well as the uncertainty from the new pricing model, port revenue budget came in 6% below budget. Port revenue makes up 78% of total revenue.

Providing excellent levels of service is an important factor in retaining existing and gaining new revenue streams. Our network availability and resilience remained very high and our close relationship with our members enabled us to satisfy their demands, with resulting positive feedback in our membership surveys.

A shortage of components in 2022 was an issue for the wider telecom industry with increasing lead times for new equipment. We worked with our existing vendors to secure the supplies we need which meant projects were mostly not severely impacted. This primarily affected the expansion to any new sites, and to a lesser extent our ability to provision new customers at existing sites. We also brought a new vendor on board to ensure we had a wider choice. Planning is now also based on longer time frames to ensure we can give detailed forecasts of our coming needs to our vendors. This allows them to reserve equipment for us.

The year saw a large rise in inflation with CPIH peaking at 9.6% in October. A high inflation affects our SGandA costs, but also our COGS as support contracts and power costs tend to be linked to inflation indexes. We have also seen other costs start to rise. LINX itself has not raised prices following the inflation rise, but instead not followed our usual price cuts to ensure stability through this period. The OBR inflation forecast from December 2022 forecasted that inflation would peak in 2022 Q4 and that inflation would fall back to 2% at the end of the forecast period.

While inflation started to fall at the beginning of 2023, by February it began to rise again, indicating that inflation is still a risk and volatile. At the same time a more permanent rise in inflation might take pressure off pricing, but this is uncertain. Activities to reach greater economies of scale combined with forecasted growth will still see us generate a financial net surplus in current budgeting.

This section was approved by the LINX Board on 18th April 2023.

CEO's Report

Financial Key Performance Indicators

At the beginning of 2022 we introduced a restructured set of member services. Without any past performance upon which to base our projections we were cautious in our estimated financial projections. In these circumstances, together with the general challenging economic backdrop, we are pleased to report a surplus of £282K which considerably exceeded our expectations.

With our plan of absorbing cost inflationary pressures, without increasing our prices, we expect 2023 to be a challenging year. We have decided to take into account the projected results for 2024 into our planning, and the anticipated deficit in 2023 is aimed at being absorbed by the positive results in 2024, giving an overall breakeven position.

The balancing of retaining a strong financial position, alongside a policy of holding our prices despite inflationary pressures, is becoming an increasing challenge and LINX directors pay close and regular attention to ongoing financial results. This approach is supported by the continuing increase in demand for our services, and our expanding membership who endorse this as an appropriate policy.

Future Outlook

In March 2023 the LINX Board adopted the 2023-2025 strategy. This is built on three pillars:

2023 - 2025 STRATEGY: The Three Pillars

| SUSTAIN | OPTIMISE | GROW |

Pillar 1: Sustain

Where **Sustain** sees us work to sustain the leadership position in the markets we operate in; and to sustain the value in our core products for all members by increasing reach and sustaining revenue levels.

Pillar 2: Optimise

Optimise is focused on gaining further economies of scale, and improved working capital usage. We expect to continue to invest in automation and tooling, including member facing self-service features in the portal. This will speed up service delivery and provide greater economies of scale.

Pillar 3: Grow

As the interconnection market evolves, members have increasing needs of services in emerging adjacent markets and segments to where LINX operates today. These adjacent services are often very similar to what LINX already provides, or could be built on existing LINX platforms. To ensure future relevance and value for members, LINX will use the **Grow** pillar to further research how to best provide value in these markets for its members.

We expect to announce additional partnerships for managed IXPs in 2023, as well as expand our Marketplace platform which allows member-to-member sale of services across our network. We further expect to extend the reach of our product portfolio and make more products available at the non-LINX IXPs. This will both widen LINX's interconnect offering and provide additional value for existing members and prospects.

Pieter Knook

LINX Chair

Chairman's Report

In the first months of 2022, the Board spent time analysing the case for LINX Nairobi, our first geographical expansion by ourselves in a few years. Understanding the risk in a new market, the route to market and the value creation for members was key to reaching a decision and the announcement of LINX Nairobi.

The start of the year also saw the UK, EU and the US introduce sanctions following the escalation of the Russian invasion of Ukraine. The sanctions have affected LINX and LINX members in a variety of ways throughout the year, and the board has discussed the course of action and ensured LINX has remained compliant as the sanctions have evolved.

Rising inflation and the uncertainty about the impact on LINX led the board to implement more frequent analysis of financial performance as well as deeper analysis of the economic environment ahead of the 2023 budgeting.

The Board proposed a change to the Articles and the MoU at the May AGM. This change provided two technical improvements. The first clarified who chairs the General Meetings, and the second provides for a power of temporary adjournment of the General Meeting. Both changes were approved by the members.

The May AGM also saw an election for two Board seats where Neil McRae and Peter Stevens were reelected to the board.

The Board provides oversight of operations through the review of departmental road maps and company objectives that are reviewed throughout the year.

During 2022 the board held eleven board meetings.

Pieter Knook
LINX Chairman

LINX Board and
Governance

LINX Board and Governance

Corporate Governance Report

As part of our commitment to deliver our strategy, maintain positive stakeholder engagement, and create long-term sustainable value for our members, the Board upholds the highest standards of corporate governance across the group.

How the Board Operates

The Board is comprised of an Independent Chairman, six Non-Executive Directors, the Chief Executive and three Executive Directors.

The Board is collectively responsible for ensuring leadership through effective oversight and review; and is accountable for the long-term success of the company. The Board sets the strategic direction and monitors management's performance against those objectives in a way that enables sustainable long-term growth, while maintaining a balanced approach to risk. Our robust governance framework is also instrumental in ensuring our strategy is delivered successfully.

Board and Sub-committee Meetings

The Board meets formally on a regular basis, including a two-day annual strategy review session in the spring. Additional ad-hoc meetings are also scheduled for the Board to consider and decide important emerging issues outside of the scheduled meetings. Additionally, and in line with the UK Corporate Governance Code, the Chairman holds meetings with the Non-Executive Directors before each Board meeting, without the Executive Directors present. Board meetings are structured to allow open discussions, where the Board considers business performance, strategic proposals, members' interests, and other matters relating to risk, corporate governance, culture and staff wellbeing.

LINX Non-Executive Directors

Pieter Knook
LINX Chairman

Mike Blanche
Google

Lee Hetherington
Meta

Seb Lahtinen
NetConnex

Neil McRae
BT

Alex Bloor
Andrews and Arnold

Pete Stevens
Mythic Beasts

LINX Executive Directors

Kurt Erik Lindqvist
LINX Chief Executive
Officer

Richard Petrie
LINX Chief Technical
Officer

Malcolm Hutty
LINX Director of
Legal and Policy

Malcolm Holt
LINX Chief Finance
Officer

LINX Board and Governance

Finance, Risk and Security Sub-committee (FRS)

The role of the FRS continues to be to deliver oversight of the external audit as well as the prudence of financial reporting and controls operating within. Additionally, the FRS reviews the effectiveness of LINX's internal risk management processes and controls to ensure that these respond appropriately to developments, regulatory demands, and external risks.

The Company Secretary acts as Secretary of the Committee. Other key invitees include the CEO, CFO, Director of Legal and Policy, Finance Manager and Treasury and Finance Systems Development Manager.

Governance Sub-committee (Govco)

The Govco continues to ensure that the Board is effective in discharging its responsibilities and in having oversight of all matters relating to corporate governance. It oversees the company's governance arrangements (processes and documents) on behalf of the Board to ensure they are in line with best practice. This includes reviewing matters for consultation with the members, including proposed resolutions.

The Company Secretary acts as Secretary of the Committee. Other key invitees include the CEO and Director of Legal and Policy.

Remuneration Sub-committee (Remco)

The Remco recommends remuneration structures and policies to the Board, that enable LINX to meet its strategic and operational targets. In doing so it reviews and proposes performance measurement mechanisms, pension contributions, pay policy, bonus opportunity, employment terms, etc.

Each year Remco reviews and approves the specific remuneration, terms and performance of senior staff including the CEO, for its relevance and appropriateness. 'Senior staff' means any member of the Senior Management Team, a key employee, or any employee with a full-time equivalent base salary exceeding £95,000 gross annual salary, before any salary sacrifice. This threshold is increased every year based on CPIH.

The Company Secretary acts as Secretary of the Committee. Other key invitees include the CEO and HR Manager.

LINX Board and Governance

Board and Committee Meeting Attendance During 2022

The following table shows the number of Board and sub-committee meetings held in 2022, including ad-hoc meetings held.

	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022
Board	•		• •	•	•		•	•	•	•	•	•
FRS	•		•				•		•	•		
Govco	•			•		•						•
Remco							•		•		•	

Key:
- • Scheduled meeting
- • Ad-hoc meeting

The table below details the Board and sub-committee meeting attendance during 2022. The number of attendances is shown next to the maximum number of meetings the Board member was entitled to attend.

NAME	BOARD	FRS	GOVCO	REMCO
Chairman and Non Executive Directors				
Pieter Knook (Chair)	11/11	5/5	-	3/3
Mike Blanche (Vice Chair)	10/11	-	4/4	3/3
Seb Lahtinen	10/11	-	4/4	3/3
Neil McRae	10/11	2/2[1]	1/2[2]	-
Pete Stevens	11/11	5/5	2/4	-
Lee Hetherington	4/11[3]	-	3/4[4]	1/3[5]
Alex Bloor	9/11	5/5	-	3/3
Executive Directors				
Kurt Erik Lindqvist	11/11	5/5	4/4	3/3
Malcolm Hutty	11/11	5/5	4/4	-
Malcolm Holt	10/11	5/5	-	-
Richard Petrie	9/11	-	-	-

Note:
1. Stepped down from FRS on 31 May 2022.
2. Joined Govco 1 June 2022.
3/4/5. Absences were due to NED relocating, and being in a different timezone. NED continued to receive meeting papers in advance of the meeting and have the opportunity to provide input to meeting Chairs prior to meetings, and receive briefings post meeting.

At LINX116 members celebrated the tenth anniversary of LINX's first regional exchange, LINX Manchester.

LINX Membership Meetings

The LINX member meetings are an integral part of the LINX calendar. The final meeting of 2021 was the first in nearly two years to be able to be held in person. However, due to an increase of cases of COVID-19 at the beginning of 2022, it was decided to make the February event online only. Subsequent meetings, LINX116 and LINX117, were both able to be staged in Manchester and London as planned.

LINX115
Tuesday 22nd February 2022 (Virtual Event)

LINX115 was a scaled down two-hour event with 106 watchers online. The programme focused on LINX operational talks covering the 2022 LINX strategy and pricing, as well as network investments and member portal innovations. Also featured was a regulatory update from the Public Affairs team, and the second LINX ConneXions Reseller Awards.

LINX116, AGM and Board Elections
Thursday 26th and Friday 27th May 2022

There were 184 registrants for LINX116 in May from 91 different organisations. Amongst the presentations were talks on Internet governance, route servers, content delivery network traffic, plus a panel on AltNets.

LINX116 also witnessed the first LINX in-person annual general meeting and Board election for three years. Two seats on the Board were being contested and following voting, Neil McRae (BT) and Pete Stevens (Mythic Beasts), were both re-elected for three year terms.

LINX117 and EGM
Wednesday 23rd and Thursday 24th November 2022

The final event of the year saw 207 registrants from 92 different organisations sign up. The EGM session included a vote to approve the 2023 services and fees, plus approval of Board remuneration.

Agenda topics included a powerful session on keeping Ukraine connected, peering with AWS, and a WomenTechConnect panel. There was also a keynote speech by two-time Olympic swimmer, Chris Cook.

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LINX Network

LINX Network

2022 Goals

For 2022, the LINX and technology teams' goals focused on service availability, digital transformation, and the building of new IXPs.

It also targeted adding more interconnection products to our service offering and work within the IX community on standardisation projects.

LINX Technology Report

As we have seen over the last few years, 2022 saw our technology footprint expand geographically and our product portfolio widen.

Service and Quality

We maintained a high standard of service availability across all our exchanges and the peering products. The LON1 network remains the exchange platform with the largest member base and traffic volume.

With this exchange, we met our 99.999% availability metric for the year as well as meeting all delivery targets and service quality key performance indicators. This was done on what is now a multi-vendor platform, running both Juniper and Nokia devices, configured on a common EVPN architecture.

Our international and regional exchanges also met the expected service availability targets.

Geographical Expansion and Product Development

The technology team supports the company-wide geographic expansion and product development, through planning, project management, software development and technical build.

In 2022 we reached agreements on new builds in Dammam and Riyadh in Saudi Arabia, as well as Nairobi in Kenya.

Product development saw the launch of the Microsoft Azure Peering Service (MAPS) as well as growth of the 400 Gigabit Ethernet member port service.

LINX Network

LINX Technology Report (cont.)

Digital Transformation

Our ability to grow in both reach and product depth is enabled by our digital transformation drive. We launched the new LINX member portal service in late 2021 and soon after, at the start of 2022, we released the first of a wave of member self-service functions.

Through the new portal, we have provided LINX members with access to digital order forms, inventory tracking, real-time dynamic service quotes and order management visibility, as well as self-service change functionality.

The first self-service feature we released was that of the 'MAC address change' feature, so members running their own maintenances, could self-configure their peering devices MAC address and avoid the need to plan and co-ordinate with LINX staff.

All self-service features link into and drive the network configuration tooling, so as to make real time network changes as needed by the member.

For 2023, we will build on the foundational work to add in full lifecycle management of all non-physical services, and even those services with a physical aspect will utilise the digital workflow tooling in a hybrid mode.

Community Collaboration

Within the IXP community LINX and our technology team contribution remained high. We completed the test, approval, and release of the OpenBGPD route server for our Wales and Scotland exchanges. This included work on configuration automation looking glass add-in and member statistics.

We also collaborated with partner Internet exchanges on version 2.4 of the IX-API, to add statistics to the API standard, as well as a modulisation approach to allow other IXPs an easier path to IX-API implementation.

Chief Technical Officer Summary

"Looking ahead to 2023 we have a busy year planned, with new builds in the Middle East and Africa as well as technology refresh projects for North America, Scotland, and Wales. The increasing need to analyse our own network, systems, and application data, along with our commitment to improve network insight and observability, will see us refresh our events and monitor tooling to give our teams and members greater insight into network health and performance."

Richard Petrie
LINX Chief Technology Officer

LINX Network

UK Local Internet Exchanges

LINX Manchester

Manchester was recently confirmed as the biggest tech hub outside of London with tech companies raising a record £532 million of funding in 2022. This is a 50% increase on 2021, and more than many major European cities including Rome, Brussels, Warsaw and Lisbon.

This has driven local colocation providers Equinix, to extend their footprint with the recently opened MA5 facility and also growth of Teledata who recently announced expansion plans as part of their acquisition by Datum. Having previously built out in Teledata and recently announced expansion into MA5, LINX Manchester is in good shape to continue to grow into 2023.

LINX Scotland

LINX Scotland continues to experience noticeable growth and has attracted important new members such as major telco providers as well as local AltNets. Not only has the average traffic throughput increased to reach 5Gbps, but a new peak was experienced in February 2023 of nearly 21Gbps. Only a year ago, the average traffic was 2.3Gbps.

This continued heightened interest in the exchange has been built around wide engagements with both local businesses and not-for-profit bodies such as Scottish Futures Trust (SFT), with whom we have engaged in a variety of events including some sponsored activity. We continue to enjoy a solid relationship with the SFT team to promote Scotland as a place with the depth of Internet connectivity that a growing digital economy requires. In addition, the members of the LINX Scotland steering committee have proven invaluable in opening conversations with potential new members.

LINX Wales

LINX Wales continues to receive support from its steering committee, local businesses, and the Welsh Government team, including the Public Sector Broadband Aggregation (PSBA). Some local personnel have changed with a resulting slow down in activity within the PSBA remit; and the LINX team has engaged with their new personnel to ensure that support is provided whilst additional recruitment activity is undertaken to backfill posts.

There are clear plans prepared to grow LINX Wales and repeat the successes we have had with other local exchanges in the coming year.

International Local Internet Exchanges

LINX NoVA

The strategic location of LINX's first overseas exchange, LINX NoVA, is based within the Northern Virginia region of the USA, where it is estimated that 70% of the world's Internet traffic flows daily. The exchange has maintained strong traffic levels over the last twelve months as LINX continued a concentrated effort to develop the exchange. Activity included engaging and connecting eyeball networks, encouraging traffic growth from existing members and collaboration with our partners within the region. Local interest in connecting to an IXP in the Ashburn area remained high, in part due to power costs in the area being lower than the national average.

In general, 2022 was spent improving LINX NoVA's overall proposition and build on the exchange's success into 2023. LINX reviewed the LINX NoVA infrastructure, determining changes were required in hardware and redundancy. Planning took place with a view to deploying a new leaf/spine architecture and hardware to enable 400GE port connectivity. A new contractual agreement with Equinix will allow direct connectivity to install hardware within Ashburn - further improving capability, reliability and redundancy.

JEDIX

LINX's first Middle Eastern exchange, JEDIX, in Jeddah, Saudi Arabia, is built on a fully redundant switching platform located in a neutral secure STC data centre, known as MG1 (MENA Gateway). Traffic levels have risen steadily in recent years with a peak of 197Gbps achieved by year end. New exchanges planned for Riyadh and Dammam will further strengthen the local ecosystem as we move into 2023.
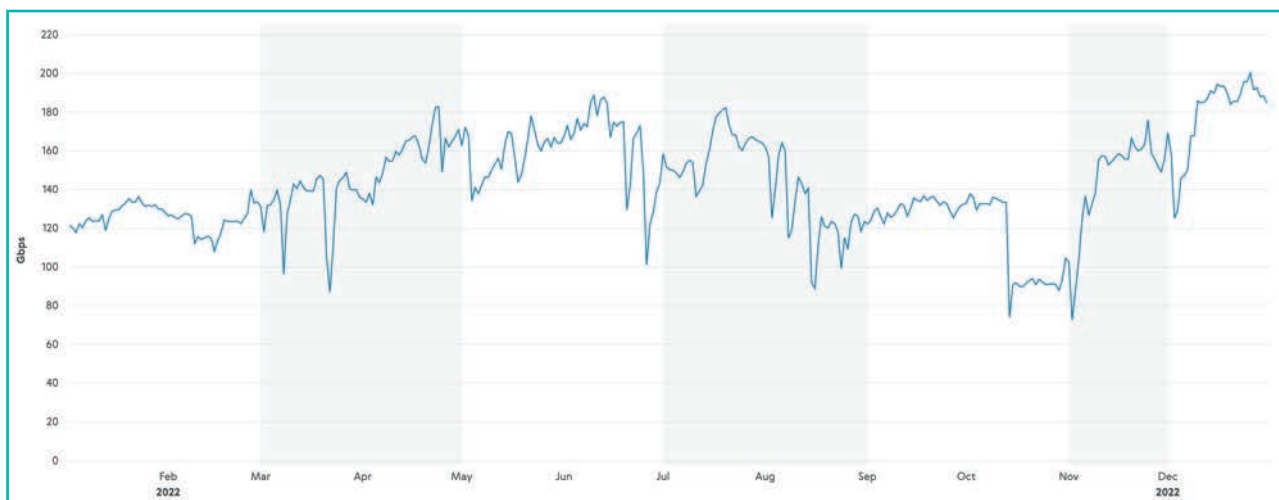
JEDIX Traffic growth in 2022

LINX Network

Member Applications

LINX had another strong year for new member applications receiving a total of 67 new applications for membership.

Exchange Growth

2022 was certainly a year of growth across all areas of LINX's business. The end of year saw the eagerly anticipated World Cup which brought record traffic levels across the LINX LANs. The first game was live online during normal working hours in the UK and subsequently LINX experienced a new all time maximum traffic peak of 7.3Tbps across the network.

The LINX teams were hard at work speaking with members who were connected on direct 1GE ports - this service is being discontinued at the end of 2022. There was a campaign across the year to upgrade members for no extra charge, to 10GE direct ports, from 1Gbps, 2Gbps, 5Gbps or 10Gbps peering services. We had a total conversion of 37% of direct 1GE ports into direct 10GE ports by the end of the year.

Over the twelve months we received a large number of orders for new and upgraded services from the membership. These orders included 76 x 100GE peering services, 141 x 10GE peering services ports, and a further 3 x 400GE peering services across all the LINX LANs. This contributed to an overall connected capacity of 53.03Tb by the end of the year.

There were also a healthy number of new applications for membership, some from as far afield as Cambodia, Singapore, Australia, Canada and Kenya. 2022 also saw more members joining at the higher 100GE peering speeds than ever before.
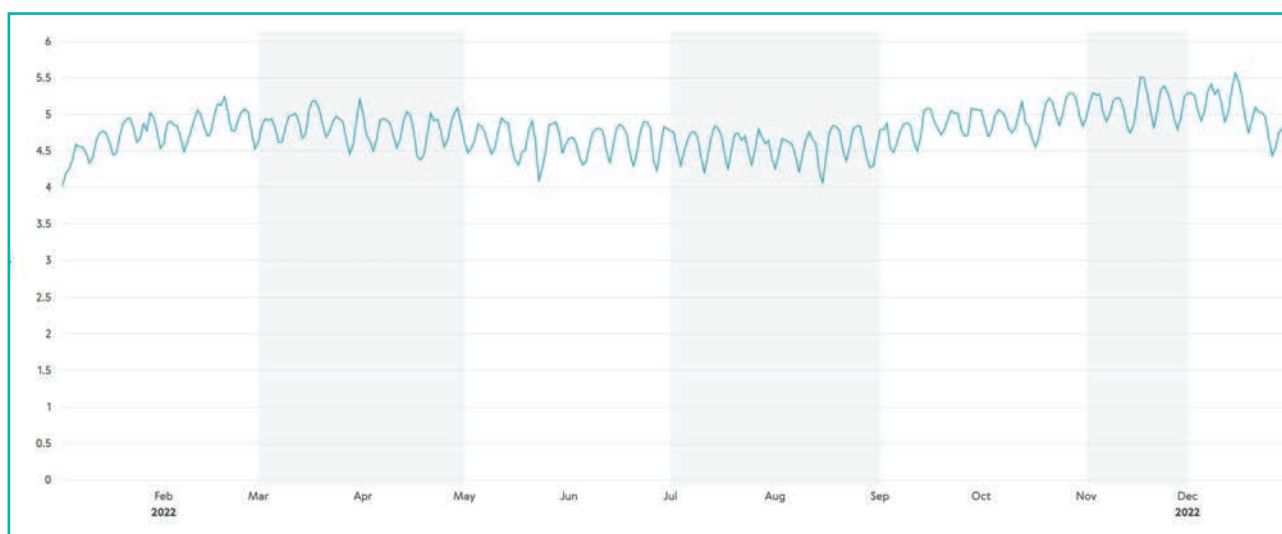
Average aggregate traffic for 2022

Membership Statistics

880	LINX Members
897	Member ASNs
80	Member Countries
67	New applications in 2022
8	LINX LANs
7.424	Terabits per second peak traffic on the public exchange
1772	Connected member ports
400	Member-facing 100GE ports
4	Member-facing 400GE ports
53.03	Terabits of connected capacity

LINX Network

LINX Products and Services

It has been an exciting and productive year for us as we continue evolving the products and services we provide our members.

We continue to see our members making good use of our Private VLAN and Closed User Group products in many scenarios that help them meet their connectivity requirements. We have also continued to release improvements to these products, including the support of QinQ encapsulation for Private VLAN services.

The Microsoft Azure Peering Service (MAPS) has also witnessed great interest from our members. It provides a quick and easy way to establish direct peering with Microsoft through a simple but secure setup.

Making it easier for our members to order and manage our services, we are also putting considerable effort into continuing to improve our member portal. The primary focus was on the order processes and self-service capabilities for all services. This work will continue into 2023 and covers the portal, and will also bring these services to IX-API.

We have also launched the first phase of the LINX Marketplace. It allows our partners and members to showcase their services, focusing on services that can be delivered through our network fabrics. By the end of the year, we already had over twenty partners and members offering their services.

"We have exciting plans for the next phase, of LINX Marketplace which will include much deeper integration with our order processes and the order process of the Marketplace participants. Once completed, we can provide a seamless and quick way for our members to consume services from other members or partners."

Mike Hellers
LINX Product Manager

Products and Services by end of 2022

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**
  - Data centres with a LINX PoP
  - Data centres with LINX transmission equipment
  - Data centres with access to LINX via an approved Layer 2 carrier

- **Colocation**
  Rackspace at many of our locations, available directly through LINX

- **IXP Reseller**
  LINX connection from an existing Internet exchange

- **Private VLAN**
  Allows members to connect to other members from LINX over a single port

- **Closed User Group**
  A private Layer 2 domain for a group of members

- **Cloud Connect**
  Direct Layer 2 connections to a number of Cloud Service Providers

- **Microsoft Azure Peering Service**
  Managed direct public peering with Microsoft

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 Wales**
  Peering LAN in South Wales

- **JEDIX**
  Internet Exchange Point for the Middle East, supported by our strategic partner STC

- **ManxIX**
  Internet Exchange Point for the Isle of Man, supported by Bluewave Communications

LINX Services

- **Public Affairs**
  Membership representation on matters of public policy

- **Route Servers**
  Free peering service of member advertised routes

- **Time Servers**
  LINX NTP (Stratum 1) time servers

Finance Report and Statutory Accounts

Finance Report and Statutory Accounts

Chief Financial Officer Summary

We previously reported that, in 2020 and 2021, we had adapted well to the changed operating conditions resulting from the COVID-19 pandemic. In exiting strongly from those circumstances, we are faced with new challenges from high inflation and turmoil caused by the ongoing conflict in Ukraine.

We are pleased to report that our results for 2022, at a surplus of £283k, were much better than we had originally projected.

We recognised that current conditions put considerable pressure on our members and consequently, despite the general level of rising costs, we decided in general to hold our 2023 prices at existing levels, and reduce them for certain specific services. In doing so we took account of the strength of our reserves and we will absorb the expected deficit in 2023. Our 2024 projections then foresee surpluses nullifying this negative position.

Malcolm Holt
Chief Financial Officer

Finance Report and Statutory Accounts

Financial Summary

Our 2022 net result of a surplus of £0.3M was not as high as the exceptional result from last year. It was, however, considerably higher than the small deficit we expected after taking into account the reduced and restructured pricing of our services, the difficult economic conditions together with rising inflation and the additional costs of our activities returning a more usual level after the COVID-19 pandemic associated restrictions.

The high inflation economic outlook continues into 2023 and we are expecting another challenging year. We are forecasting a small deficit in 2023 which we expect will be negated by a larger surplus in 2024, as demand for our services continues to grow. Consistent with recent years we are holding a sufficient level of reserves to withstand these current uncertain times.

Last year's annual report went into some detail regarding our reserves policy. The results this year show our liquid funds have marginally decreased, but are still strong. Our approach towards reserves is vindicated by our ability to absorb short-term fluctuations in trading results at the same time as holding our prices despite considerable pressure from rising costs.

Statement of Income and Retained Earnings	2022 (£)	2021 (£)
Turnover	**16,815,998**	**16,635,214**
Cost of sales - direct and distribution costs	(4,654,241)	(4,005,713)
Staff costs	(6,468,219)	(6,210,356)
Operating lease rentals	(458,503)	(441,849)
Depreciation of fixed assets	(2,363,715)	(1,995,372)
Other administration costs	(2,629,872)	(2,120,382)
Other operating income	0	3,375
Operating surplus	**241,448**	**1,864,917**
Net interest receivable	92,265	9,468
Surplus before taxation	**333,713**	**1,874,385**
Tax on surplus from non-core activities	(50,873)	(86,406)
Surplus after taxation	**282,840**	**1,787,979**
Retained earnings at beginning of year	14,547,891	12,759,912
Retained earnings at end of year	**14,830,731**	**14,547,891**

Balance Sheet	2022 (£)	2021 (£)
Fixed Assets		
At Cost - 1st January	28,289,491	25,717,633
Additions During Year	2,882,467	2,571,858
At Cost - 31st December	**31,171,958**	**28,289,491**
Accumulated Depreciation – 1st January	(24,278,629)	(22,283,257)
Depreciation – Charged During Year	(2,363,715)	(1,995,372)
Accumulated Depreciation – 31st December	**(26,642,344)**	**(24,278,629)**
Net Book Value - 31st December	4,529,613	4,010,862
Investments	103,200	103,723
Total Fixed Assets	**4,632,813**	**4,114,585**
Current Assets		
Trade and Other Debtors	478,845	537,792
Prepayments and Accrued Income	2,840,841	2,683,171
Cash At Bank	9,360,919	9,694,661
Total Current Assets	**12,680,605**	**12,915,624**
Current Liabilities		
Trade and Other Creditors	(637,713)	(588,068)
Taxation and Related Creditors	(22,715)	(10,553)
Accruals and Deferred Income	(1,860,478)	(1,866,685)
Total Current Liabilities	**(2,520,906)**	**(2,465,306)**
Net Current Assets	**10,159,699**	**10,450,318**
Foreign Exchange Reserve	38,219	(17,012)
Net Assets and Members' Funds	**14,830,731**	**14,547,891**

Public Policy and
Internet Regulation

Public Policy and Internet Regulation

Legal and Policy Review

Legislating the Online Safety Bill

The Online Safety Bill was finally introduced to Parliament in March 2022, a policy originally launched as the Online Harms White Paper back in April 2019.

The Bill aims to reduce illegal content and protect children from inappropriate content by making providers of all "user-to-user" online services take responsibility for policing content. While the duties to be laid upon providers of online services are far too complicated to explain here accurately, broadly speaking providers will have extensive and detailed duties to conduct "risk assessments" that their service might contain either one of numerous categories of illegal content, or content deemed harmful to children – and then another set of duties to "mitigate" those risks.

The Bill invests Ofcom with broad powers to set out in "Codes of Practice" activities such services must undertake, and systems they must have in place, towards these ends. Failure to follow these Codes of Practice will expose providers to threat of enforcement action, that in some cases will include personal criminal liability. Ofcom will be able to describe what kinds of content it considers harmful in these Codes of Practice.

The scope of operators covered by the Bill is very broad. While the political argument is directed at very large platform services like Facebook, Twitter and YouTube, any provider of a "user-to-user" online service at the application layer is regulated, with few exceptions. This includes web sites with forums or chat facilities, mobile phone apps and computer games. Internet access providers are not expected to regulate the content they carry, but are also implicated as one of the potential enforcement mechanisms, who might be called upon to block access to non-compliant foreign services.

Working on Behalf of Members on Matters of Public Policy

LINX regularly monitors its work in the public affairs arena to ensure it not only meets, but also that it is able to demonstrate that we have met the more stringent security practices the industry expects us to follow. This involves a broad team effort, including senior management and Board level input, Legal and Public Affairs, and a substantial portion of our technical staff members.

Public Policy and Internet Regulation

Legal and Policy Review

Legislating the Online Safety Bill (continued)

Politically, the Bill has had an interesting ride. It is not really the subject of party-political controversy, but generates strong feeling both amongst those outraged at Internet content, and amongst those concerned to protect freedom of speech. In Parliamentary debates, the bulk of criticism has been directed at online platforms, as legislators express frustration at companies' inability to limit abusive speech, harassment of politicians and other public figures, or the bullying of children – and, as ever, the Bill has become a focus for those appalled at the ready availability of pornography in modern society. Tragic cases including child suicides, are cited to demand ever tougher action against service providers.

It was only when the Bill entered the Committee stage in the House of Commons, and began detailed scrutiny, that some media outlets and commentators began to notice the radical implications for democratic discourse inherent in granting Ofcom, an "independent regulator", powers to determine what speech it considers "harmful".

The Online Harms White Paper had been championed by a succession of Tory Secretaries of State motivated mainly by the child protection argument, with little sympathy for concerns about fundamental rights, under the leadership of Theresa May, a Prime Minister who never quite grew out of her long-held Home Office perspective. When Boris Johnson, a former journalist and controversialist became Prime Minister, some hoped that the constitutional importance granting to an "independent regulator" the power to determine what kinds of writing are permitted would gain more attention. But first Brexit, then Covid-19, took all Johnson's attention, and the policy languished with neither the scrutiny it needed nor the prioritisation to either review or deliver it. It was only after Boris fell that the Bill became subject to significant political debate, when Conservative Party leadership hopeful Kemi Badenoch declared it not fit for purpose. Liz Truss, in her short-lived premiership, decided that the Bill needed "tweaks" to protect freedom of expression, but remained committed to the Bill. Once she was ousted in favour of Establishment favourite Rishi Sunak, the Bill started moving forward again. The new PM has remained largely silent on the subject, but his generally technocratic approach to politics suggests he is unlikely to have the fundamental concerns of constitutional principle raised by

Badenoch, or even Truss.

At the time of writing in Spring 2023, the Bill has reached Committee Stage in the House of Lords. It did not arrive there unscathed. A chunk of the original Bill, which sought to regulate legal content considered likely to be "harmful to adults" has been removed, although given presumption that all Internet content is available to children and the high bar the Bill sets for proving that a particular service is not, this may have less effect on practical outcomes than politicians imagine. In the other direction, the Bill's enforcement powers were strengthened with personal criminal liability for senior managers in some circumstances in which their employer is found to be in breach of its obligations. This will undoubtedly force operators of user-to-user services to pay far greater attention to the risk that Ofcom might deem them insufficiently zealous in suppressing allegedly unlawful content or material deemed inappropriate for children of some ages, and far less respect to some supposedly balancing protections for free expression contained in the Bill.

The Bill may yet be changed further before it reaches the statute book. Some amendments pending include proposals that "health misinformation" be added to the list of types of content Ofcom should seek to suppress. That may not make it this time, but the Bill does contain powers for Ministers to direct Ofcom in how it writes its Codes of Practice "on the grounds of public policy", so a Minister in a future government may be tempted. Certainly, the very suggestion indicates the significance of the regulatory model being adopted.

When this Bill finally becomes law it will be a landmark in Internet content regulation. For operators of online services, the legal risks involved in carrying user-generated content will have sharply increased, and the need to incorporate legal compliance at every stage of product design and operations will surely break the business case for many services. For UK citizens and parents, Ofcom will be invested with huge discretion to determine which kinds of content are "harmful to children" and which are harmless or even positive and life-affirming, including in areas that are hotly disputed. Ofcom, not Parliament, may end up picking winners in the culture wars.

Public Policy and Internet Regulation

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.

LINX in the Wider World

Euro-IX

Euro-IX, the European Internet Exchange Association, currently has over 80 member IXPs from around the world. LINX is a founding member of Euro-IX and LINX's Nurani Nimpuno serves as Vice Chair on the Board. 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.

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 Hutty, LINX's Director Legal and Policy, served as President of the association for five years. He is currently chair of the International Affairs 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".

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.

Working Life at LINX

Working Life at LINX

Company Culture

Working Life at LINX

We pride ourselves on our progressive and supporting approach to staff, and want to be as good an employer as we can be, consistent with our mission and values.

We understand that it is a **two way thing** – we want our staff to give of their best in what they do at work, and at the same time we want them to enjoy it, and feel that it is a place where they can develop their capabilities and talents.

We offer many benefits that not many other organisations do. As well as the more obvious elements, one key aspect of working at LINX is flexible working.

In return, we expect staff to take responsibility for what they do in the work context. We also expect staff to be flexible too – the last thing we want is for employees to think that their performance is judged by the time they spend and the hours they keep.

The LINX culture forms an integral part of working at LINX and this is an important factor in the employee life cycle. This starts with how we engage with candidates and new starters when recruiting and onboarding, with both hiring managers and HR setting the scene of what the cultural values are, what the candidates can expect and what is expected in return.

We also engage with some education providers to encourage new talent through areas such as internships. This has been successful, with two interns joining LINX as permanent employees.

By carrying out annual staff surveys we measure both staff satisfaction and organisational culture trends. Both surveys include specific questions regarding the company culture. Along with excellent results, the response rates were good at, 75% and 84% respectively. The results and actions are discussed and worked on with staff.

Our appraisal process, which includes a development plan for all staff, also includes a 360 degree element, where questions include staff being asked to give feedback on how their colleagues embody the cultural values. This gives useful feedback to staff and also gives line managers a way of helping staff to reach their goals and identify any areas for development.

Another important part of the LINX culture is the recognition of staff both formally and informally and this is done in various ways. We give regular reminders to staff on how to recommend their colleagues for recognition.

And finally, when it comes to a member of staff leaving the company, during their exit interview, in order to gain more insight, we ask them to give feedback on working at LINX, what worked well, and also how we can improve.

LINX's Core Values

Excellence In line with our mission to provide "world leading IXPs"	**Neutrality between members**
Open membership and ethical selling	**Transparency to members**
Mutuality and mutual ownership / governance model	

The LINX Vision

LINX is an open community of network operators, interconnecting and passing traffic to maintain and grow an 'Internet for everyone', all without interference.

Our Mission

- To provide world-leading internet exchange points for the mutual benefit of members, that provide increasing performance and value for members;

- To represent the interests of its members in matters of public interest; and

- To promote the interests of its members;

  ...all as a membership organisation

Specifically, the LINX Core Values are:

- **Excellence** – we believe in providing world-class engineering and products, top-tier reliability and resilience, brilliant communications and services. "Good enough" is not good enough.

- **Openness** – we welcome anyone who would benefit from LINX membership.

- **Transparency** – we aim to be as transparent as possible with our members.

- **Mutuality** – we are owned and governed by our members.

- **Neutrality** – we treat all members fairly, and avoid privileging particular members, groups or business models.

linx

Staff Cultural Values

Integrity
Have integrity and demand it of others

Empowerment
Encourage and support others

Teamwork
Be inclusive, work together, be supportive

Excellence
Be the very best you can be

Respect
Be respectful to your colleagues, our company, and yourself

Passion
Believe in what we are doing

Rationality & Transparency
Decisions are to be rational and justified

Flexibility
Go the extra mile to achieve our collective goals

LINX's Staff Charter reflects our cultural values

This is our LINX Staff Charter which reflects our staff cultural values which we commit to and likewise we expect staff to commit to them.

We expect staff to uphold them in others and to challenge those around them, to do so too.

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