

Annual Report 2021



2010 1 Tbps



10,8 Tbps 2021

AMS-IX – Annual Report 2021

Connecting you to everyone and everything

Development peak traffic

2010 1 Tbps



10.8 Tbps **2021**

Contents

6	Word from the CEO	58	Word from the
12	AMS-IX in 2021		Sales Director
14	Board statement	62	World map
20	Board report	64	Word from the Public
24	2021 in numbers		Affairs Officer
28	Word from the CFO	70	Word from the AMS-IX.me
34	Report of the		development team
	independent auditor	74	Word from the IT
36	2021 in pictures		support team
40	Word from the CTO	78	Zooming in on
46	Word from the Manager		MORE-IP 2021
	Delivery and Operations	82	Colophon
52	Word from the CCO		



6



24



46



64



78



Peter van Burgel
Chief Executive Officer

Word from the CEO

AMS-IX CEO Peter van Burgel shares his experiences as head of AMS-IX.

"As I write this, the world is trying to recover from the global Covid pandemic with restrictions still in place in various countries, resulting in supply chain problems and shortages driving up prices. At the same time, a war has started in Europe with Russia invading Ukraine, resulting in more uncertainty and sanctions against the Russian government and organizations. Fair to say we are not just living in a time of change, but in changing times.

The internet in a time of crisis

For many years, the internet has been a utility. The pandemic and the war in Ukraine are both underlining its importance. During the pandemic, the internet proved its value by allowing people to work from home, or remotely, and stay connected with family and friends, as it was practically impossible to travel. The robustness of the internet allowed this shift to happen

almost overnight without major problems. Of course, the increased traffic requires additional investments, but in the early days of the pandemic the internet at large was coping quite well with the increased demand. Conversely, the lockdowns also showed the importance of real-life social interaction within organizations, companies, and schools as well as in everyday life. This touches on how we interact with each other through social media, but also how we respond to fake news and malicious content, laying bare some of the challenges society must find the answers to.

As the world is getting to grips with Covid, Russia invaded Ukraine. In doing so, Russia not only attacked a sovereign state but also challenged international legislation, treaties and agreements. The global community responded with heavy sanctions on Russia and support for the Ukraine.



“Because we care about the internet, AMS-IX increased its efforts to address some of the flaws and challenges we see today.”

More than anything, this is another human tragedy in a short space of time. Like many industry organizations, AMS-IX has people from Ukraine and neighboring countries on its team, who have friends and relatives in Ukraine and Russia. AMS-IX condemns war, and our thoughts are with the victims, while we try to help our employees and their families as best we can. AMS-IX also supports humanitarian programs to help the victims of the conflict.

Again, the internet is an important utility and a source of unfiltered, practically unlimited information. Throughout the short history of the internet, this has proven to be an invaluable (re)source in times of conflict, and this is true again now. The flipside is the possibility of fake news and so-called Cyber warfare. This, in turn sparks debate around blocking certain parties or even entire nations from accessing the internet. AMS-IX believes that simply stopping parties or entire nations from accessing the internet is the wrong thing to do.

Do we care?

At the start of 2021, most of us felt Covid would disappear at some point during the year. Unfortunately, we were proven wrong and Covid was with us for the entire year. During that period, we started discussing our purpose and 'story'. We care about the internet and stand for neutral and open internet, but what does that mean?

Internet should be available and accessible to everybody, wherever you live or happen to be. Moreover, we're committed to protecting the governance of the internet and making sure that no single entity (or just a few entities) can dictate the way in which the internet develops. For almost 30 years, the decentralized nature of the internet enabled tremendous innovation. One could argue it is the best invention ever. A place where the world can meet and exchange ideas freely. Unfortunately, there will always be forces that want to abuse the technology or open nature of the internet and do harm, or influence or drive market dominance.

Because we care about the internet, AMS-IX increased its efforts to address some of the flaws and challenges we see today. We care about an open and neutral internet, we care about a safe internet and we care about the increasing ecological

footprint of the machinery that makes up the internet. We do not have all the answers, nor the means to fix it all, but we do have the resolve to join in public discussions and initiatives to protect the original values of the internet, while hardening it against bad actors and developing solutions to address the sustainability concerns.

Two examples from last year showing our commitment to join in the public debate on what a responsible internet should look like are AMS-IX joining EuroISPA and AMS-IX developing an 'argumentenkaart' (debate overview) about the use of encryption by OTT-providers. The 'argumentenkaart' was presented to representatives of Dutch parliament during the ECP-congress and received a great deal of positive attention. Every party that mattered participated in the creation of the 'argumentenkaart' which boosted the quality of the discussions and the final document. Moreover, the overview triggered debate about the use of encryption on many levels, and how authorities can fight crime, without having to tap into encrypted communication. AMS-IX will continue to develop more of these overviews in partnership with ECP to help the open and constructive debate on important internet-related topics.

Developments

Looking back at business developments in 2021, total traffic volume grew by 18% compared to 2020, with traffic peaks approaching 11 Tbps. For the first time in AMS-IX history, two new Dutch POPs were opened outside Amsterdam, one in Rotterdam and one in Naaldwijk. Internationally, AMS-IX continues to build on existing partnerships like HGC in the United States and Sify in India. The partnership with Batelco has resulted in numerous traffic peaks during the year and Manama-IX becoming the largest and fastest growing Internet Exchange in the Middle East.

As part of investments in innovation, AMS-IX is one of the founding members of the Amsterdam Data Exchange – AMdEX. In this innovation field lab, parties collaborate to develop and test trusted, fair and scalable technologies to support the emergence of data markets in which its members can freely decide with whom to interact and under which conditions.

Lockdowns and travel bans made it difficult to interact with customers and partners, specifically new ones. AMS-IX participated in many virtual events and organized the first fully virtual MORE-IP event in June, which was well received. As a result, a number of new customers joined the platform.

We are looking forward to meeting many of our customers and partners in person again in the months to come.

AMS-IX CTO

With Henk Steenman retiring in January the search for a new CTO began. In March 2021, Ruben van den Brink joined AMS-IX and the Management Team as the AMS-IX CTO. Ruben joins AMS-IX from Surf and brings a wealth of experience in developing technical teams, specifically in a fast-changing market with many stakeholders. In a short space of time, Ruben established himself in the role as AMS-IX CTO, bringing new energy internally and externally and focusing on developing AMS-IX technology stack and solutions which are underpinning the services we provide and will develop in the future.

Results

Despite the pandemic continuing, 2021 was a successful year in terms of financial results. However, several underlying trends remain a cause for concern. Revenue was up by 10% on the back of strong public peering business, but gross margin was slightly lower, underpinning the trend of prices dropping. Competition is strong, with multiple alternative solutions and providers in the market, but also with changing traffic patterns as a result of

investments in sea cables in the South of Europe and Southern hemisphere. With The Netherlands and Amsterdam as the strongest market, there is concern about the Dutch government's 'Digital Strategy' showing a growing negative sentiment towards Datacenters, whilst aiming to drive innovation with quantum technology and AI.

The continued pandemic also meant travel and events were minimal for another year, resulting in lower costs than budgeted. The additional effort going into the Digital Transformation combined with an increase in staff and temporary support resulted in higher personnel cost and other operational cost.

Finally, accounting for the deferred tax asset of € 0.8 million as a result of losses incurred in the (liquidated) subsidiary AMS-IX, Inc. increased the net result by that same amount. So, a strong financial performance, providing the means for continuing our strategy to Innovate, Optimize and Grow.

I would like to thank our members, customers and partners for the continued support and trust in AMS-IX. Furthermore, a big thank you to the AMS-IX team and AMS-IX Board for continuing to provide a high-quality service in difficult circumstances.

 **Peter van Burgei**
CEO



AMS-IX in 2021

Corporate Governance

AMS-IX places great value on its corporate governance structure. This provides the organisation with a significant degree of independence and neutrality, which contributes to our growth, continuity and global expansion. In this section, the corporate governance structure is explained in greater detail.

Governance Structure

AMS-IX consists of two separate legal entities: the AMS-IX Association and the AMS-IX Limited Company (in Dutch, Besloten Vennootschap or B.V.). The AMS-IX Association is the single shareholder of the Limited Company and the organisation and its staff are incorporated in the Company. The Executive Board of the Association consists of five people and also acts as the Supervisory Board of the Company.

AMS-IX B.V.

AMS-IX B.V. is empowered to take the majority of the decisions, within the boundaries set by annual and long-term plans approved by the Association and/or Supervisory Board. During quarterly board meetings, the Supervisory Board validates whether plans have been executed according to budget and business plan and approves the annual plans and budgets as well as items outside the scope of management control. The Company Management Team reports to the Supervisory Board on a quarterly basis.

Chief Executive Officer of the Company is Peter van Burgel. Mr. van Burgel chairs the Management Team, which further consists of a CTO, CCO and CFO. In addition, the Company consists of technology, commercial and financial departments, as well as human resources and support staff. Next to operating the Internet Exchange in Amsterdam, the AMS-IX Company also operates AMS-IX Caribbean in Curaçao, AMS-IX Mumbai in India, AMS-IX Chicago and Bay Area in the United States and AMS-IX Hong Kong.

AMS-IX organisation structure

AMS-IX bodies	Association	Corporation
Meeting acts as	General Assembly	Shareholders meeting
Board acts as	Executive Board	Supervisory Board
Management acts as		Management



A professional portrait of Bart van der Sloot, a middle-aged man with a shaved head and a beard, wearing glasses, a blue blazer over a striped shirt, and jeans. He is standing in an office setting with large windows in the background. A white callout box with an orange dot contains his name.

Bart van der Sloot
Chair

Board statement

An ongoing balancing act

The year 2021 was a balancing act for AMS-IX. AMS-IX Chair Bart van der Sloot reflects on the Board's perspective during 2021.

2021 was a balancing act, because we had to find middle ground for multiple dilemma's. Should we intensify face-to-face contacts? Or keep the team safe during the ongoing COVID-19 pandemic and focus on online? Work in the office or at home? Accelerate cost reduction for members or invest in growth and innovation (and/or grow financial reserves)? What should we develop internally and what should we outsource? Should we connect every network or stay away from known 'bad networks'?

Another year, another challenge

At the time of writing this statement (March 2022), the world around us has changed considerably. Where the (finally decreasing...?) impact of COVID-19 dominated large parts of our private and business life over the past two years, we are now confronted with a violent invasion of the Ukraine and the threat of war. Organizations and individuals are evaluating how they can help those who are at risk and whether they can contribute to restricting the impact of the aggressors, and if so, how.

With the internet playing a vital role, distributing legitimate as well as fake information and facilitating contact between people worldwide, Internet Exchanges are suddenly confronted with the question whether they ought to exclude certain networks or content. Quite a different challenge to what we were facing in 2021.

2021 was another year that showed healthy financial results and continued strong progress in all three areas of the strategy - Innovate, Optimize and Grow - despite challenging circumstances. Growth in connected capacity

and traffic continued during 2021 and IX-as-a-Service found its way to more new customers in new geographies. The Digital Transformation program (the successor of 'Fix the Basics') continued, now not only delivering efficiency results internally but also providing an updated community portal to a first set of customers. New services and initiatives were developed, such as the Amsterdam Data Exchange (AMdEX), implementing AMS-IX's neutrality and governance structure in areas adjacent to the traditional 'IP interconnection' activities.

A stable team

2021 was also a year of stabilization in the AMS-IX organization and Management Team. Ruben van de Brink joined in March, accepting the challenge of replacing CTO Hen Steenman - one of the founding fathers of AMS-IX – who retired in January 2021.

During the ongoing pandemic, the vast majority of the AMS-IX team continued to work at home. The AMS-IX Management Team took numerous well received measures to protect and keep engaging the team.

Recruiting and retaining talent is an ongoing challenge for any technology company these days, but we believe AMS-IX activities, culture (embracing

- "2021 was another year that showed healthy financial results and continued strong progress in all three areas of the strategy."



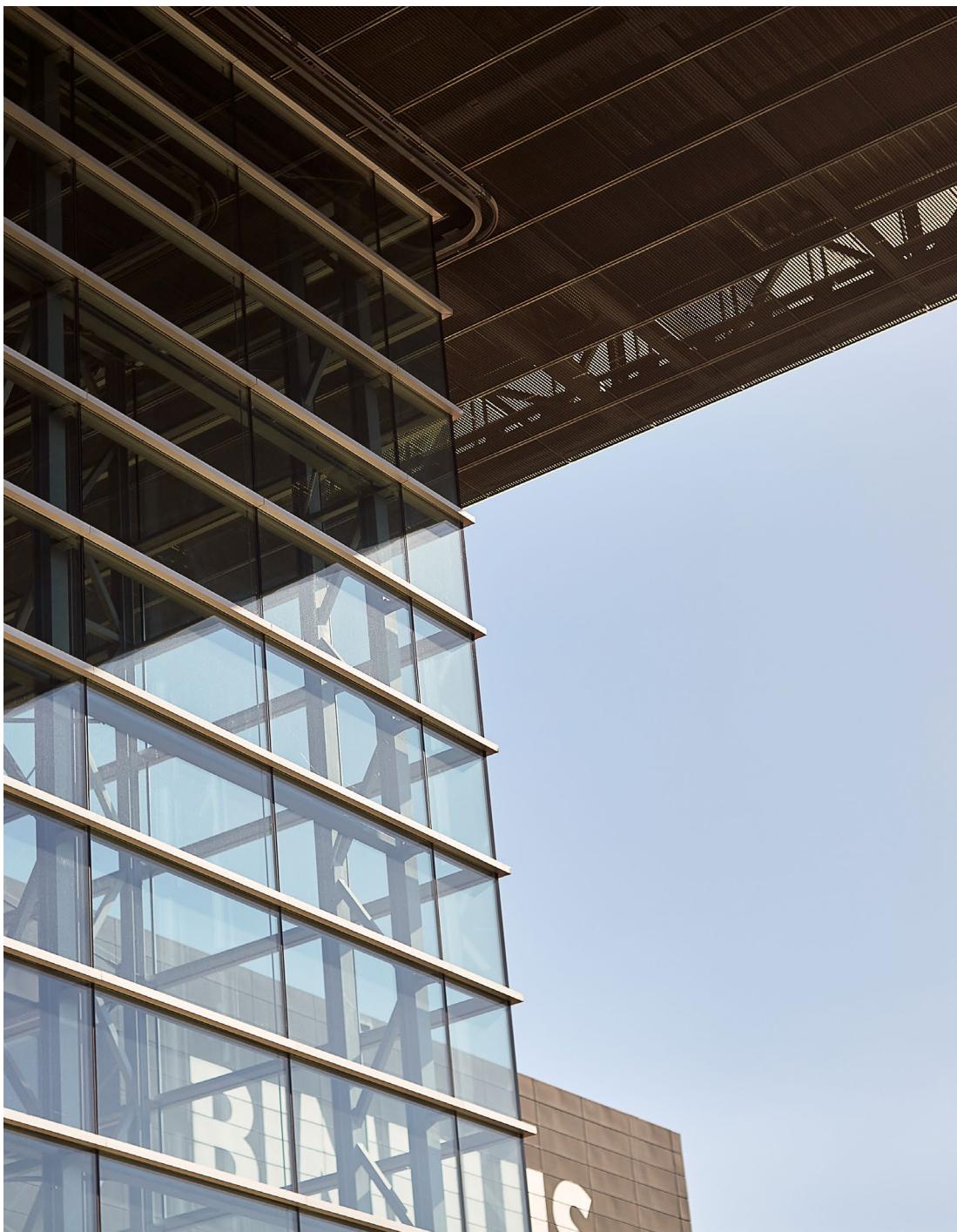
diversity and inclusion) and brand, in combination with competitive employment conditions, will enable the AMS-IX team to thrive in the years ahead.

Our markets

In 2021, the IP interconnection market in the Netherlands continued to change, driven by factors such as continued steep price decline in alternative interconnection services (especially IP Transit), alternative locations growing as an interconnection hub (e.g. Marseille), consolidation in access networks (where large

networks increasingly tend to avoid IXes) and concentration of content traffic into fewer than 10 content providers (driving migration from IX services to Private Network Interconnects – PNIs).

These trends bring threats as well as opportunities: high volume traffic streams between large players may move to PNIs, but upcoming new players (including enterprises and government organizations) see the value of a proven, trusted and neutral internet exchange to exchange traffic with their business partners



– adding to the ‘long tail’ of connected parties and to the ecosystem. AMS-IX continues to be a key element in the Netherlands’ value as an international digital hub, where many global players decide to establish their cloud infrastructure.

Outside the Netherlands, we have seen healthy growth in opportunities to support organizations in establishing and managing an Internet Exchange in their country through the AMS-IX IX-as-a-Service offering. These activities will grow the scale of AMS-IX Development and Operations teams – enabling a lower cost base per exchange and more innovation on the long term – as well as contribute to a better internet in those geographies.

Build a better internet to contribute to a better society

In 2021 the AMS-IX vision was refined to “Build a better internet to contribute to a better society”. This sparked discussion regarding the extent to which AMS-IX should be concerned about the content exchanged through its IX-es and if (and how) AMS-IX should play an active role in fighting, for example, child pornography. To exchange best practices and align policies with those of related organizations, the AMS-IX Association joined EuroISPA, the Pan-European association of

Internet Services Providers Associations (with a combined membership of over 2700 ISP’s and IX-es).

Looking ahead

I have great confidence in AMS-IX’ ability to create long term value for its members and other stakeholders. We have a seasoned and energetic management team, which is well aligned and has a constructive relationship with its employees and with the Board. We have a talented and enthusiastic pool of employees, a solid strategy, and healthy financials.

As we have seen in various growth and innovation initiatives, we should not underestimate the importance of AMS-IX’ neutrality and transparency, which have always been at the heart of AMS-IX. This really sets AMS-IX apart from other parties and enables us to move into markets where such a governance structure is of importance to build trust and acceptance. In all my dealings with the AMS-IX team, I fully recognize these values – which will contribute to driving our success in the future.

On behalf of the Board,

 **Bart J.R. van der Sloot**
Chair

Composition of the board



Eric Loos

BICS

Board member since
20 Dec 2016
Next re-election
Dec 2022*
End term of office
Dec 2028*



Bernhard Pusch

Telstra

Board member since
12 Dec 2019
Next re-election
Dec 2022*
End term of office
Dec 2031*



Michael Ourabah

BSO Network

Board member since
14 Dec 2018
Next re-election
Jun 2024
End term of office
Jun 2030*



Bart van der Sloot

Leaseweb

Board member since
20 Dec 2016
Next re-election
Dec 2022*
End term of office
Dec 2028*



Jan Thielemans

Arcadiz Telecom

Board member since
12 Dec 2019
Next re-election
Dec 2022*
End term of office
Jun 2031*

* To align the timing of membership of the Board of the AMS-IX Association and the AMS-IX B.V. Supervisory Board, Michael Ourabah stepped down as Association Board Member six months before the end of his term – during GM55 in May 2021. He was re-elected for a new three-year term during the same GM. All other Board Members intend to do the same during 2022.

Board report

The 'AMS-IX Board' is the Executive Board of the AMS-IX Association. The AMS-IX Board manages the association's business and is also appointed as the General Shareholder Meeting and Supervisory Board of AMS-IX B.V. (the "AMS-IX Company").

In its role of Supervisory Board, it appoints and supervises the CEO and ensures the AMS-IX B.V. Management Team (MT) executes an agreed strategy to create long term value, while ensuring proper controls are in place to manage the business (including financials and risks).



In 2021 there were six Board Meetings, all joined by all Board members, with a mix of remote and in person participation (due to COVID-19 restrictions). The AMS-IX B.V. Management Team is also present at these meetings, typically to present the results of the previous quarter in their area of responsibility (in the quarterly Management Report) and to present or discuss plans.

In addition to these formal Board meetings, Board members and MT members are regularly in contact to discuss specific topics. These are typically covered in the 'Finance Committee', 'Governance and Compliance Committee' and the 'Compensation Committee'. The goal of these informal conversations is to ensure the Board remains well informed of the AMS-IX B.V. operations.

The Chair of the Board and the CEO of the MT share updates and review progress in a biweekly call.

Board developments

There were no changes to the Board in 2021 (no new members, no changes in committees).

The Governance and Compliance Committee, together with the CEO, CFO and AMS-IX Legal Counsel, have started working on various documents to further improve AMS-IX' governance, including a Code of Conduct, Sanctions Policy and Service Agreement between the Association and AMS-IX B.V. (outlining the services that AMS-IX B.V. provides to the Association to manage the activities of the Association). These are expected to be finalized in 2022.

To further professionalize governance and ensure compliance with applicable law and regulation, it was decided that the Board, CEO and CFO will join a Governance Education program in 2022.

Remuneration

Participation on the Board is voluntary. There is no monetary remuneration or compensation for the activities. Travel and hotel expenses are covered by the AMS-IX B.V.

Closing

The Board would like to express its respect and thank the AMS-IX MT and all employees for a great 2021.

Amsterdam, March 23, 2022.

 **Bart J.R. van der Sloot**
Chair

Meetings and Activities of the Board in 2021



Board Meeting



General Meeting

2021 in numbers

Peak Traffic

10.8
Tbps

10.8 Tbps
corresponds to

 2M simultaneous HD streams

 264M typed A4 pages

 234,308 volumes of “the complete works of William Shakespeare”

Connected Networks



100G Active Ports

383

+15%
Growth

Internet Data Volume



GRX Peak Traffic

206
Gbps



Number of POPs

16

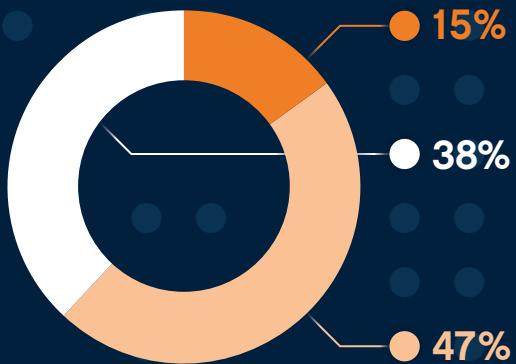
Metro Amsterdam

Capacity

48.6 Tbps

+15% Growth

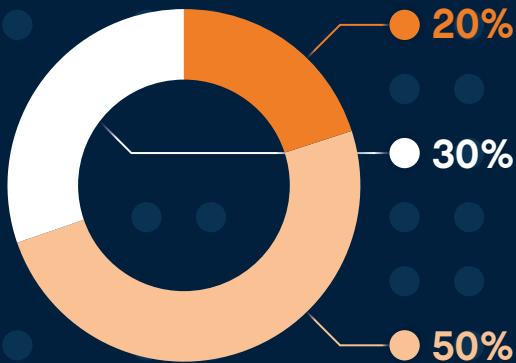
New Customers



Connection Method



Total customers



EasyAcces Customers



The growth of Internet traffic in 2021 comes from the **ongoing digitalisation of society.**

People continue to click, swipe, app, game and stream driving the Internet to continue to grow with 20% on a yearly basis.

Peter Burgel, CEO



Iris Vonk
Chief Financial Officer

Word from the CFO

CFO Iris Vonk attended to the finances of AMS-IX in 2021. She has captured her experiences and insights from the year in a few financial statements.

Net Revenues increased by €2.0 million (10%) to €22.5 million. Growth is primarily driven by the public peering business, with the total number of 100GE ports increasing over 15% to 383. The total number of connected parties (ASNs) increased from 1072 to 1074 at the end of 2021. Gross margin declined slightly to 89.9% (2020: 90.9%) following the write-off of buying commitments in 2021.

Personnel costs (including outsourced personnel) increased by 7% (€0.5 million) to €7.7 million. The increase is mainly due to hiring temporary outsourced personnel to support the implementation of our CRM and ERP tooling and an increase in salary and employee-related costs.

The number of AMS-IX employees at the end of 2021 increased to 61.4 full-time equivalent staff (2020: 59.1). In 2021, total investments in fixed assets amounted to €1.0 million (2020: €1.2 million) - this mainly comprised switches and equipment. The depreciation cost amounted to €3.2 million, a decrease of €0.7 million compared to 2020. The decrease is driven by fully depreciated equipment from 2016 which was depreciated in 5 years as well as the relatively low level of investments in 2020 (€1.2 million) and 2021 (€1.0 million).

Other operating expenses increased by €1.0 million following additional spend on development support for the CRM / ERP project and spend on innovation projects, in part compensated by reduced spend on marketing and travel because of continuing Covid-19 related travel restrictions in 2021.

Financial income in 2021 includes interest paid on financial lease contracts, bank fees and exchange rate differences.

As per December 31, 2021 we have accounted for a Deferred Tax Asset of €0.8 million (December 31, 2020: €0.3 million), resulting from the losses incurred in our subsidiary AMS-IX USA Inc. The subsidiary was dissolved as per December 31, 2020 and Management believes compensation for tax purposes of part of the losses is likely.

● Iris Vink
CFO



Company balance sheet

Assets

21

20

Non-current assets

Fixed assets	3.082.247	5.634.658
Financial assets	853.844	203.779
	—	—
	3.936.091	5.838.437

Current assets

Accounts receivable	1.236.384	1.180.434
Taxes receivables	921.234	788.734
Other receivables	1.089.000	1.020.026
Accrued income	1.626.298	1.787.353
Cash & cash equivalents	13.667.893	7.638.450
	—	—
	18.540.809	12.414.997

Total assets

22.476.900

18.253.434

Equity and liabilities

21

20

Equity

Share capital	41.500	41.500
Share premium	385.779	385.779
Legal reserves	–	–
Other reserves	14.068.507	9.569.905
Retained earnings	6.010.794	4.498.602
	20.506.580	14.495.786
Provisions	–	–
Non-current liabilities	–	–
	20.506.580	14.495.786

Current liabilities

Financial lease obligations	–	64.996
Trade payables	740.144	1.495.738
Taxes and social premiums	–	340.459
Other payables	1.230.176	1.856.455
	1.970.320	3.757.648

Total Equity and liabilities

22.476.900

18.253.434

Company income statement

	21	20
Net Revenue	22.515.301	20.494.329
External operating costs	2.266.211-	1.860.665-
Gross Margin	20.249.090	18.633.664
	89,9%	90,9%
Other operating costs		
Personnel costs	7.753.112	7.243.419
Depreciation of tangible fixed assets	3.241.878	3.961.976
Other operating expenses	4.237.789	3.178.160
Total other operating costs	15.232.779	14.383.555
Operating result	5.016.311	4.250.109
Financial income and expense	9.153	2.776
Result before tax	5.025.464	4.252.885
Income tax expense	985.330	203.779
Share in results of subsidiaries and participating interests	-	41.938
Result after tax	6.010.794	4.498.602

Report of the Independent auditor

To: Stakeholders of Amsterdam Internet Exchange B.V.

Opinion

The Summary of Accounts 2021 of Amsterdam Internet Exchange B.V., based in Amsterdam is derived from the audited financial statements 2021 of Amsterdam Internet Exchange B.V. In our opinion the accompanying Summary of Accounts 2021 are consistent, in all material respects, with the audited financial statements 2021 of Amsterdam Internet Exchange B.V. on the basis described on page 31 to page 33.

The Summary of Accounts 2021 comprise of:

- Company Balance Sheet
- Equity and liabilities
- Company Income Statement

Summary of Accounts

The summary of Accounts do not contain all the disclosures required by Part 9 of Book 2 of the Dutch

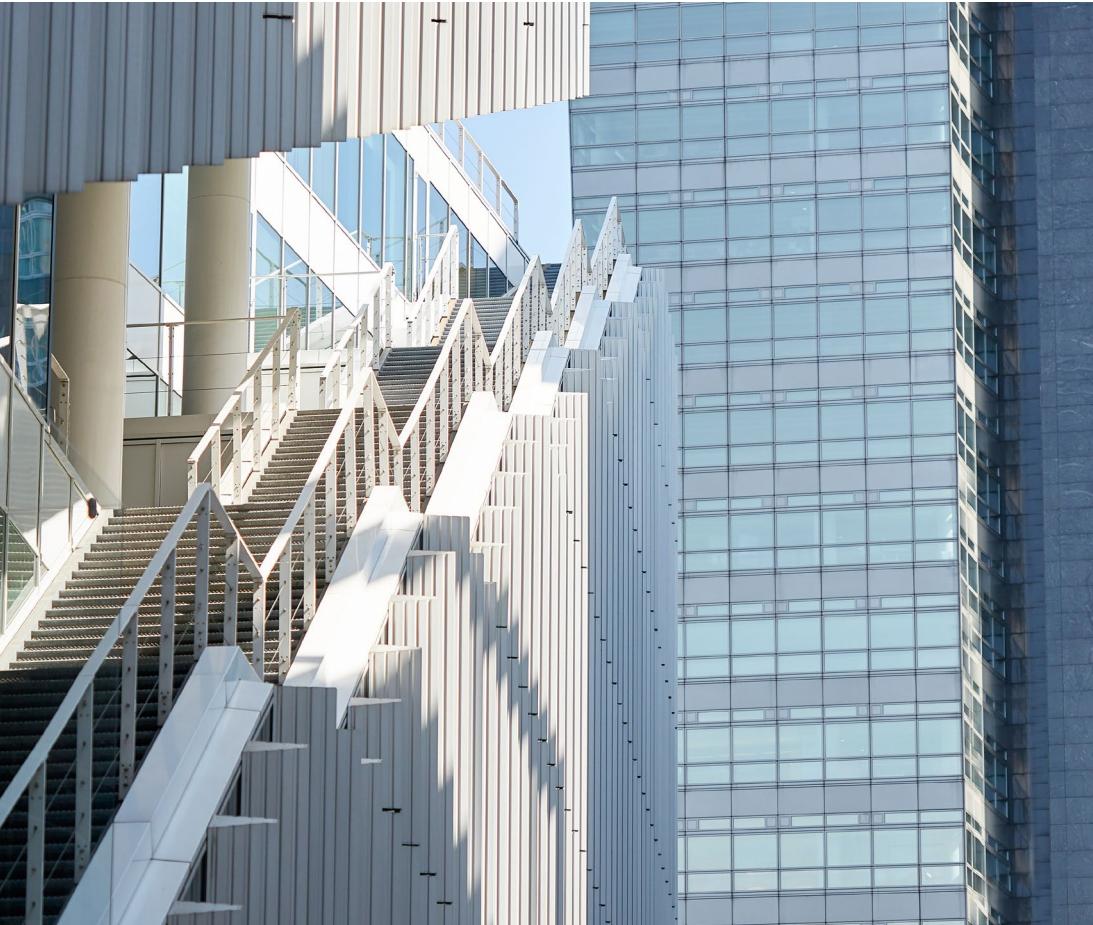
Civil Code. Reading the Summary of Accounts and our report thereon, therefore, is not a substitute for reading the audited financial statements of Amsterdam Internet Exchange B.V. and our auditor's report thereon. The Summary of Accounts and the audited financial statements do not reflect the effects of events that occurred subsequent to the date of our auditor's report on those financial statements of May 17th, 2022.

The audited financial statements and our auditor's report thereon

We expressed an unmodified audit opinion on the audited financial statements 2020 of Amsterdam Internet Exchange B.V. in our auditor's report of May 17th, 2022.

Management's Responsibility

Management is responsible for the preparation and fair presentation of the Summary of Accounts in accordance with the applied criteria.



The board is responsible for overseeing the company's financial reporting process.

Our responsibilities

Our responsibility is to express an opinion on whether summary financial statements are consistent, in all material respects, with the audited financial statements based on our procedures, which we conducted in accordance with Dutch law,

including the Dutch Standard 810 'Opdrachten om te rapporteren betreffende samengevatte financiële overzichten' (Engagements to report on summary financial statements).

Bunnik, May 17th, 2022
The Audit Generation B.V.

 Signed by:
A.M. van Diermen RA

2021 in pictures

Feb



9

New CTO of AMS-IX

During the first week of February Ruben van den Brink (42) was onboarded as AMS-IX Chief Technology Officer (CTO), succeeding AMS-IX founder Henk Steenman who went on retirement January 1st 2021.

Mar



16

Kick off RSSF

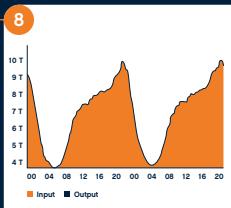
The world's largest Internet Exchanges (IXs) AMS-IX, DE-CIX, LINX, and Netnod joined forces in the newly founded Route Server Support Foundation (RSSF). The RSSF aims to tackle the lack of open source software suitable for high-end mission critical Route Server deployments. Niels Raijer and Job Snijders are the main developers behind the initiative.

22



Four new Exchanges in India

AMS-IX and Sify announced their plans to launch four new Internet Exchanges in India. The new interconnection hubs are to be situated in Kolkata, Noida, Hyderabad and Chennai.

Apr

10Tbit/s peak traffic in Amsterdam

Due to all the Corona measures in various countries in Europe during the winter of 2020 - 2021, AMS-IX reached a new traffic milestone.



Kick off AMDEx

AMS-IX, dexes, SURF, the Amsterdam Economic Board and the University of Amsterdam began developing the new Amsterdam Data Exchange (AMDEx): a neutral, non-commercial, digital infrastructure, which will allow participants to share data in a controlled and secure way under their own terms and conditions.

May

May to June – Moving the core

In the summer of 2021 AMS-IX successfully migrated one of its core nodes to a new location. We installed 11 new, fully redundant and diverse dark fibers and 56 campus cross-connects. 196 100Gbit ports and 68 DCI Modules were migrated. Almost 4 million configuration lines changed! Safe to say that this was the biggest project in the history of AMS-IX.

July

13

New PoPs in Rotterdam and Naaldwijk

AMS-IX announced the building of two new Points of Presence (PoP) in the datacentres of Smartdc in Rotterdam and Greenhouse Data Centers in Naaldwijk. The new PoPs went live in November later that year. This is the first time in AMS-IX's history of PoPs connecting to the exchange in Amsterdam outside the Amsterdam metro area.



25

26

MORE-IP 2021

Like in 2020, we were unable to organise a live MORE-IP event due to the pandemic. So MORE-IP 2021 was set up as a television show, supported by virtual spaces where attendees could ask questions and network with virtual visitors. Besides this, we held our 55th GM.



3

300 GE peak for Manama-IX

Manama-IX was the best performing IX outside Europe in 2021. Early May Manama-IX reached a new traffic peak of over 300 GE. Data traffic growth compared to previous year was 20-fold.

Oct**AMS-IX and HGC expand collaborations in the US**

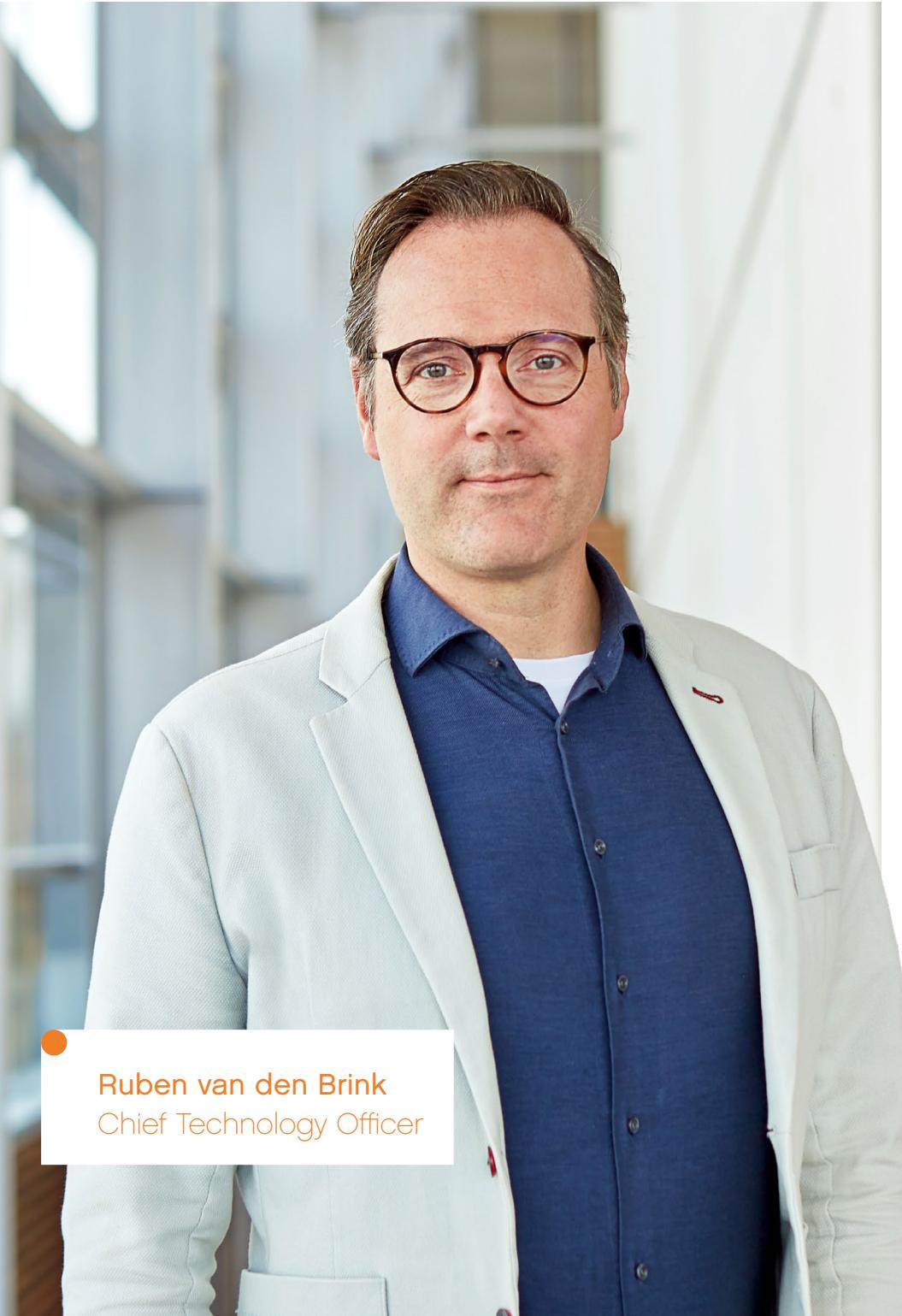
At the end of October, AMS-IX and HGC expanded their partnership with HGC for both AMS-IX Bay Area and AMS-IX Chicago in the US, taking over the commercial partner role previously held by Epsilon.

Nov**Debate overview on encryption by OTT providers**

AMS-IX and ECPI platform voor de Informatie-Samenleving published a neutral, complete debate overview with arguments for and against the use of end-to-end encryption by over-the-top service providers. The debate overview was handed over by our CEO Peter van Burgel to member of parliament Queeny Rajkowsky during the ECP Jaarfestival.

Dec**New 100 GE and 10 GE port fees for 2022**

AMS-IX announces new prices for 10GE and 100GE customer ports at our Internet Exchange in Amsterdam.



Ruben van den Brink
Chief Technology Officer

Word from the CTO

In March of 2021, Ruben van den Brink took over as CTO from Henk Steenman, one of the founding fathers of AMS-IX. Throughout the year, Ruben guided the technical team through a digital transformation process.

Peering will remain an essential part of the internet infrastructure, but we need to keep up with the world around us, invest wisely and expand our knowledge and expertise. This is one of the most important challenges that we face as an Internet Exchange, and this has an impact on technical department as well.

Last year, we have been working on our technology roadmap, based on a clear technology vision. To this end, we have mapped out our legacy and challenges. This way, we ensure that everyone at AMS-IX knows where the focus lies and where the dependencies between projects lie. As in previous years, the activities and projects of

the technical department all revolve around the pillars 'Growth', 'Innovation' and 'Optimisation'. Our resources were mainly invested in projects with the Optimisation label.

The platform in Amsterdam

We did of course many maintenance and optimisation projects for the platform in Amsterdam last year, but I think two projects were especially notable and have a big impact for the long term. The first project was an ongoing RFP for a new switch platform. Our current vendor is going to stop support for the line of switches that we currently use, so we were looking for a new solution.

When I started to work at AMS-IX the RFP for the new switches was already well underway. To make sure that the new equipment has the capabilities that we require, we had to test the hardware of multiple vendors extensively. The first proof of concept took two months, the second took six weeks. After a careful evaluation, we decided to go with Juniper. In 2022, we expect to start upgrading our platform with the new switches.

Migration of the entire Amsterdam platform will take several years.

The other big project was the migration of one of our core nodes to a new location: Digital Realty AMS17, the data tower in the Amsterdam Science Park. The project was carefully planned in three phases. Phase one of this core migration was the most complex:

moving the core switch from one datacentre to another, including all connectivity. That meant migrating and testing every single connection. The project was a difficult job, but the engineering team prepared everything extremely well and managed to carry it out flawlessly without any downtime. A truly great success for which I would like to offer my praises to the team.

Software development

AMS-IX is currently working on several automation projects, most notably the development of a new community portal called AMS-IX.me that we are building in Salesforce. In 2021, we made some improvements in the way we have organised our software development which in the end helped us to develop, test, and deliver software more quickly. First of all, we improved our Scrum and Agile skills. Investing in these capabilities, in which Magdalena played a big part, resulted in far more efficient operation of the team and greater autonomy. Performance has significantly improved because of these efforts. Whereas two years ago we deployed one or two releases, last year there were five. We are also seeing that the rest of AMS-IX organises itself more easily around this approach. The creation of stories has improved, our backlog is continuously refined and therefore developed in a more reliable way.

● “The project was a difficult job, but the engineering team prepared everything extremely well and managed to carry it out flawlessly.”





Also, there has been really good progress in the software development team. We are working with Codetribe developers from Serbia, with a dedicated product owner from AMS-IX, which keeps the speed up. In total, there are now three Scrum teams that coordinate their activities so that developments around Salesforce and the technology reinforce each other.

Innovation

The projects described above are largely related to optimisation, but we've also been working on several innovation projects. For example, we are participating in the Route Server Support Foundation (RSFF), the aim of which is to develop a new, scalable route server that can be used by large internet exchanges.

The other participating internet exchanges are DE-CIX in Frankfurt, LINX in London and Netnod in Sweden. Together, we are promoting open standards and greater diversity in route server software, which is essential for the functioning of the internet. In this way, we hope to reduce dependence on a limited number of route servers. The project is going well, and the OpenBGPD software (open source) has become available to us to start testing.

We also continued to work on IX-API, which provides an interface for provisioning services at Internet Exchanges. This supports end-to-end automated processes and enables networks to configure, change and cancel services at IX's. Version 1 is currently live and version 2 is going into production. We're also preparing specifications for version 3, which will focus on providing monitoring and statistics.

Finally, AMS-IX, together with University of Amsterdam, Amsterdam Economic Board, SURF, Waag and deXes, is currently participating as one of the founding partners of the AMdEX project. AMdEX was launched in April of 2021 with the goal to build a neutral infrastructure that facilitates the exchange of data in a way that is consistent with the wishes of the data

owner. AMdEX aims to give the data owner control over how data is used and monetized. AMS-IX has the role of secretary of the project and plays an important role in setting up partnerships. In 2021 several usecases for the AMdEX project were worked out in detail. In 2022 the AMdEX team wants to translate the defined architectures of the usecases into actual workable proof of concepts.

Looking ahead

In 2022 and beyond, we will continue to improve our agility. We will continue to engage with stakeholders and execute our technology roadmap. We think it is important to become the leading exchange of a responsible internet. This means we not only want to be big in terms of peak traffic, but also address the important challenges our society is facing as a result of digitization, like online safety and sustainability. For this, we are open to collaborate with many different partners. As an independent exchange, we're ready to take up our role in this exciting emerging landscape, for the good of the internet. As I like to say: "Be the exchange you want to see in this world!"

 **Ruben van den Brink**
Chief Technology Officer



Tim Vriend
Manager Delivery
and Operations

Word from the

Manager Delivery & Operations

"I think it goes without saying that the beginning of the year was marked by the retirement of our CTO and Founder, Henk Steenman. We knew the day would come, but once it became reality, it was a hot topic for many of us. This changed with the announcement and start of our new CTO, Ruben van den Brink. Ruben picked up speed quickly, provided valuable input, made positive changes, and took several important decisions soon after his arrival.

The platform

2021 saw many notable milestones. First and foremost, we selected a new vendor to supply us with switches for our main platforms. Due to unexpected changes in the current switching platform roadmap, which would limit our growth capabilities, we made the decision to look for a new vendor that could support us in our ambitions for many years to come.

We also took a step into the future, once again, by developing photonic cross-connect. Over the last few years, our Engineer Maxx Cherevko has been working on the development of a Photonic Cross-Connect which is perfectly suited to our needs. As soon as we received word that our current vendor was filing for bankruptcy, we sped up development and signed a contract with a company capable of producing the new system. We expect to receive the first prototype in the summer of 2022, after which the production company will need a few months to finalise the system.

The final major achievement last year was moving of one of our core nodes. This was, by far, the biggest project in AMS-IX history, involving a vast amount of preparation and facing many challenges on its path. I invite you to read the article on our website about this beast of a project to get a grasp of what it took to complete.

In addition to these big projects, we carried out a large number of small interventions that helped increase the quality and stability of our platform. In many ways, this has been the main trend for the Technical Team during 2021. Moreover, our team was closely involved in the development and implementation of a new Learning Management System for internal use, and in the migration project towards Microsoft 365. The optimisation of many internal processes indirectly has a positive effect on our external-facing products and services.

Traffic growth

Last year, I wrote about the significant effect of the pandemic on our technical department, mainly in terms of keeping up with the sudden explosive growth during the first and second set of lockdowns. Looking at the numbers for 2021, we can see that this has stabilized to some extent but remains relatively high.

For example, the connected customer port capacity increased by nearly 6 Tbit, a little lower than last year (8 Tbit increase), but nearly double compared to the pre-pandemic situation (3.5 Tbit). Our backbone capacity in Amsterdam grew with 7.8 Tbit, a little bit more than last year (7.4 Tbit), and a lot more than “normal” years (2.1 Tbit). (Part of the 2021

backbone increase was carried over from 2020.)

Besides the additional ports and backbones, we also expanded our Netherlands-based operations with the implementation of SmartDC and Greenhouse, both located in the province of South-Holland, expanding our reach to Rotterdam and its surroundings.

In addition to our platform in the Netherlands, we also operate international platforms with local partners. During 2021, we saw some positive performance increases at these Exchanges. These included peak traffic more than doubling at Batelco's IXaaS deployment in Manama, from just over 200 Gbps in 2020 to 435 Gbps in 2021, and a port count increase of almost 20% at the Hong Kong Exchange. We also expanded our international reach again with new Exchanges in Kolkata (2 locations), Hyderabad (2 locations), Egypt (1 location) and Singapore (1 location). At the time of writing, we are nearing the final stages of implementation, and the RFS for all of these locations are scheduled to take place in the first quarter of 2022.



● “The final major achievement last year was moving of one of our core nodes. **This was, by far, the biggest project in AMS-IX history.**”

Looking ahead at 2022

This year, we have a great deal of work ahead of us, starting with the implementation of the new switches. The first orders have been placed. However, owing to the global chip shortage, delivery has been extended to Q4 in 2022, after which we will initiate the first migrations. While we wait for delivery, we will start the training required to make our engineers familiar with the new equipment and prepare the automation necessary for our provisioning systems. On top of this, we will soon also start creating

the documentation needed to perform the migrations. Once this has been completed, we will pinpoint the first locations and start migrating to the new switches. This is expected to start in the second half of 2022. We are also looking into several further international expansions, and still have quite a few optimizations up our sleeve. For a more detailed update on all of the activities described, don't forget to register for MORE-IP, scheduled 1-2 June 2022!

● **Tim Vriend**

Manager Delivery and Operations







 **Mike Baron**
Chief Commercial Officer

Word from the CCO

2021 saw great progress in the digital transformation of AMS-IX. CCO Mike Baron explains what has been achieved by the Commercial Team in 2021 and what the plans are going forward into 2022.

The driving force behind change in the peering market today comes from hyperscalers like Google, Meta, Amazon and Microsoft. Their investments in cloud, digital infrastructure and internet sea cables have a huge effect on the market. We see different effects in different areas of the world though. In the parts of the world with a well-developed connectivity market, we see market consolidation. Transit prices continue to go down and port prices for public peering are under pressure, which is a challenge for an Internet Exchange like AMS-IX. In markets with a lesser-developed internet there is a lot of market opportunity, especially in those markets where hyperscalers tend

to invest. In these markets there is a growing demand for Internet Exchanges. Governments in these parts of the world amplify this demand as they take measures to make their country attractive as a regional digital hub. They want to be less depended on fossil fuel and 'old' industry and view digital as the new pillar of their economy.

As commercial department of AMS-IX, we have the challenge to act on these developments. We see a changing demand of our existing customers and new demand of new customers. At the beginning of 2021, the AMS-IX commercial department gave itself five strategic goals. We wanted to grow our ecosystem in Amsterdam.

We wanted to grow our international footprint. We wanted to enhance our way of working. We wanted to optimise products and services. And we wanted to increase customer loyalty. All these goals are rooted in the AMS-IX general strategy of Innovate, Optimise and Grow.

Amsterdam

In Amsterdam we achieved mixed results in 2021. Our platform in Amsterdam saw stable development with regards of the number of ASNs that we managed to connect (a little above 880 connected networks). At the same time though, the capacity of our connected customers in Amsterdam grew considerably. This was in a large part due to the new pricing strategy that we introduced at the end of 2020, giving volume-based discounts on port prices.

Next to commercial results, we also expanded the datacenter footprint of the Amsterdam Internet Exchange to the datacenters of Smartdc in Rotterdam and Greenhouse in Naaldwijk. This boosts the connectivity of the Rotterdam Metro, gives local ASNs access to the Internet Exchange and allows us to offer new products and services to a new clientele in the future. We have plans to expand the footprint of the Internet Exchange in Amsterdam also to other regions in the Netherlands coming years.

International growth

In terms of international growth, we can consider 2021 a building year. We did a lot of preparation work (also in terms of process) which will bear fruit during 2022 and beyond. An important change of strategy is that we have decided on a more pro-active course for our international expansion. We're not only offering just IXaaS, but we are also looking to expand to regions ourselves when we feel we can contribute to the development of the internet in a positive manner.

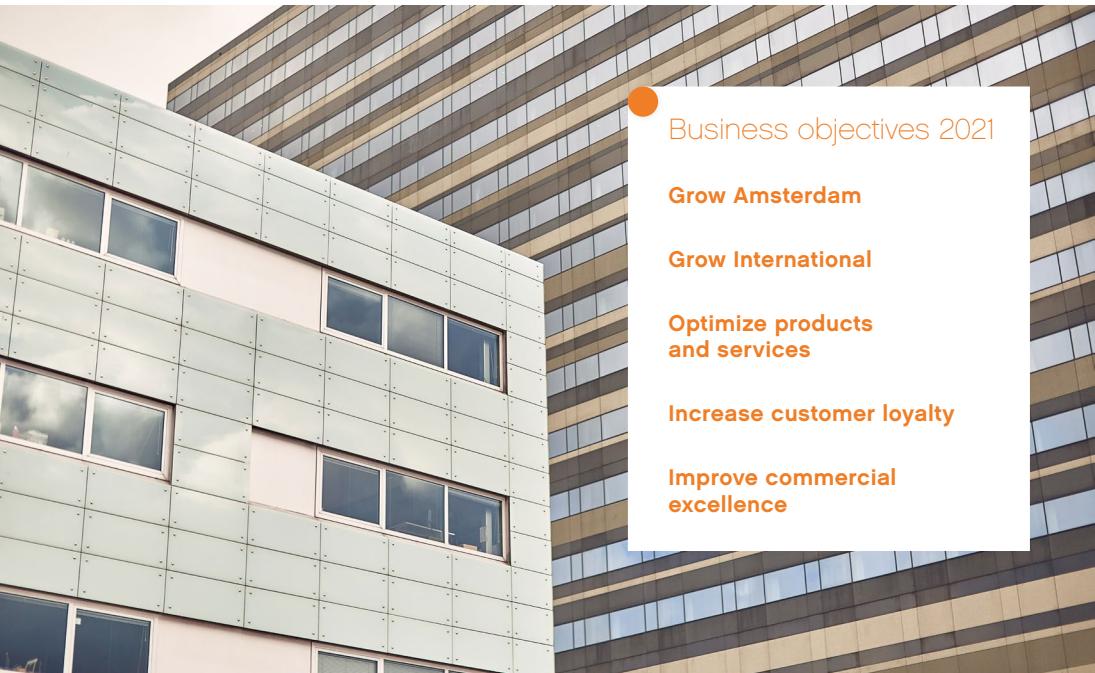
We have a healthy pipeline for the launch of new Internet Exchanges in several spots of the world. In India we agreed with our partner Sify to launch new Internet Exchanges in Hyderabad, Kolkata, Nodia and Chennai. And at the end of 2020 we started a strategic partnership with Telecom Egypt to launch an Internet Exchange in Cairo. And we have intensified our partnership with HGC, also with the goal of setting up new Internet Exchanges in key strategic areas of the world.

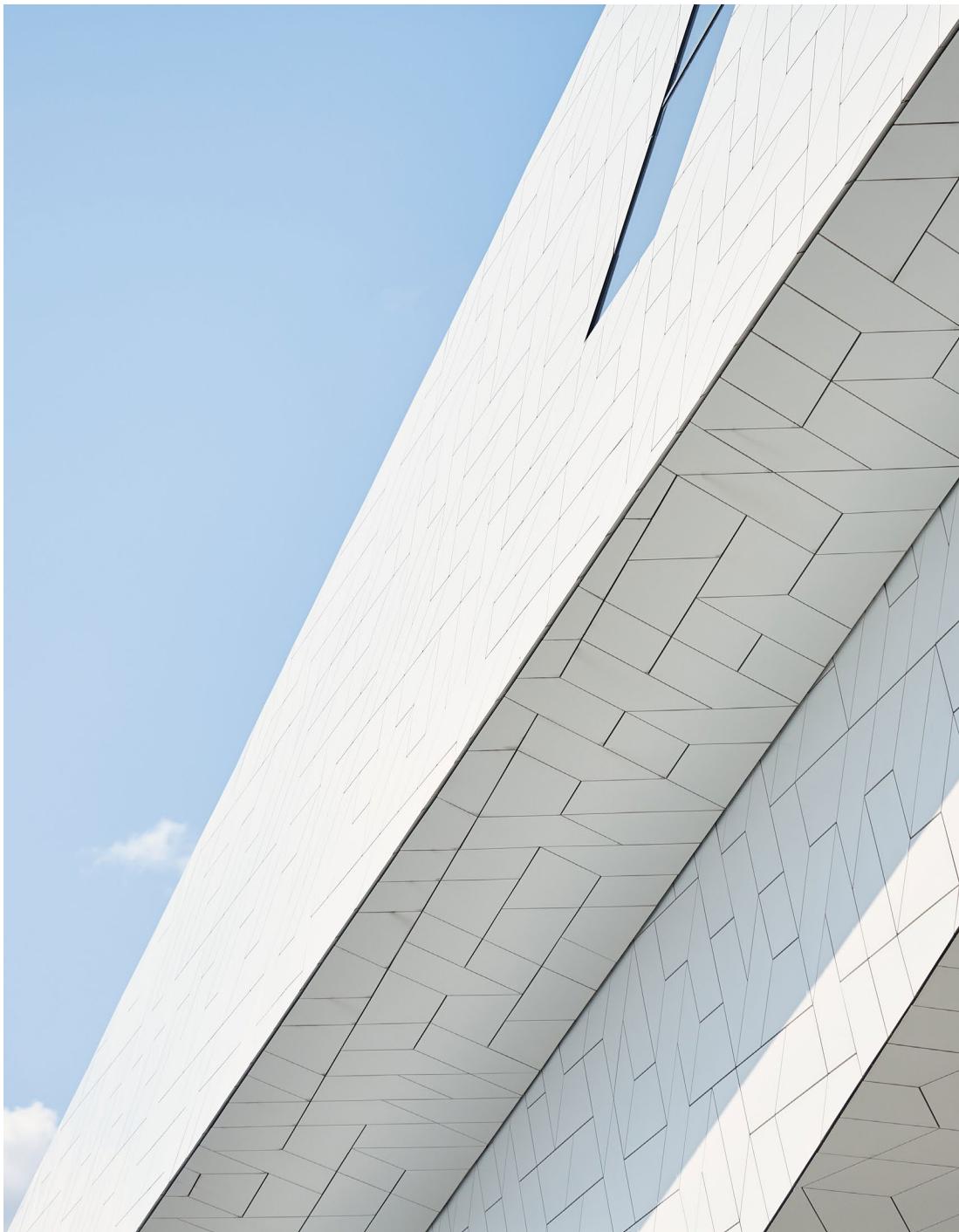
Most of our existing international exchanges (Hong Kong, Mumbai, Curacao, Bay Area and Chicago) saw stable development with regards to the number of connected ASNs, with the exception of Manama-IX where our partner Batelco realised

a lot of growth in 2021. An important change with regards to our existing Internet Exchanges is the fact that HGC has taken over the role of Epsilon as commercial partner for AMS-IX Chicago and AMS-IX Bay Area. Epsilon ended the partnership due to new strategic priorities on their part. With HGC onboard, we have a partner that has a similar growth strategy as us.

Optimise

The AMS-IX commercial department spent a lot of effort in 2021 in developing AMS-IX.me, our new community portal that is set to replace my.AMS-IX. Although the new portal shows great promise, most of our customers still use my.AMS-IX, since AMS-IX.me doesn't have all the functionality yet.





This is of course not an ideal situation as our support teams must work with two portals simultaneously. I'm therefore very proud that we managed to get excellent feedback in the 2021 customer survey, despite the digital transformation that we're currently facing.

For 2022 we will continue to work on AMS-IX.me and we strive to migrate all our existing customers to the new portal. Due to our focus on AMS-IX.me, we made limited progress with regards to optimising our products and services and expanding our products and services portfolio. We made a plan though to bring more focus to product and service management and we expect the results of this in 2022.

Our marketing team also had to deal with a bit of a digital transformation last couple of years. The marketing team used to support the sales team during their visits to events, but the pandemic had changed this dynamic. Throughout 2021 we therefore hosted webinars with EURO-IX and visited virtual events. We invested significantly in digital marketing and transformed MORE-IP into a television show that you can enjoy from the comfort of your own home. The new format for the event was very well received by our partners, customers and members and we will surely take some of our learned digital marketing knowledge into the future

as the pandemic slowly loosens its grip on event planners.

Innovate

In 2021 AMS-IX helped to launch AMdEX. The AMdEX project is a cooperation between Surf, UvA, AMS-IX, deXes and Amsterdam Economic board with the goal of building a neutral infrastructure for fair and controlled exchange of data. We believe that there is a lot of demand for these kinds of services, and we are planning to experiment with a proof of concept for a data exchange for healthcare companies in 2022.

I would like to thank our members, customers, and partners for exchanging their internet traffic on our platforms and grow with us and continue to build a better internet. Last, I would like to give compliments to my commercial team. We navigated our way through two lockdowns and in the midst of a digital transformation. I'm proud on the results that we managed to achieve under these difficult circumstances. On to the future!



Mike Baron

Chief Commercial Officer



Onno Bos
Sales director



Word from the Sales Director

The focus of the AMS-IX sales team remains threefold: develop national and international interest for peering, support the rollout of new exchanges and introduce new services and products to generate new business. Sales Director Onno Bos shares his insights on the progress in 2021 with regards to international expansion.

The peering landscape is changing quickly. First of all, there is a new type of client active on the connectivity market. Typical exchange clients used to be ISPs, hosting companies, or content providers, but nowadays, large enterprises also have huge dependence on the internet. These new clients have different needs than our traditional peering clientele. A huge offering of ASNs is not necessarily of interest to them. They want for example direct access to the cloud (for example Azure or AWS). More importantly, they want to be able to share data among a specific group of peers to enable

the development of applications. Data sharing access is becoming more important than ever, which is driven by applications in which many different stakeholders require insight into data. For us, the challenge is to meet an ever-wider range of technical and usage needs while safeguarding accessibility, privacy and security.

We see that the internet is becoming more mature in many parts of the world. The large content players of today host content more closely to the user and they build their own datacenters and telecom infrastructure to do this.

Content players play a key role in the peering landscape and there are many opportunities to set up local Internet Exchanges as many content players see the presence of an Internet Exchange as a requirement for their local presence. In India we continue to work closely with our partner Sify, whose exchange we manage. We started out in 2017 by founding a neutral and independent Internet Exchange in Mumbai, significantly enhancing internet connections. In March this year we announced an expansion to four new cities: Kolkata, Noida (New Delhi), Hyderabad and Chennai. Covid led to many delays, but at the start of 2022, Kolkata and Hyderabad became fully operational. Chennai is scheduled for Q3/Q4, Noida for 2023.

AMS-IX also has plans to expand in Southeast Asia with our partner HGC. We signed a contract with HGC to build an Internet Exchange in Singapore. Our equipment is on site and the exchange should will go live shortly. Singapore is very important, partly because it allows us to expand in to other areas in the region as well, for example to Thailand and the Philippines. Moreover an Exchange in Singapore provides a platform for parties that want an unmonitored connection. Next to Singapore we are looking into many other locations in Southeast Asia.

At the end of 2020, we also signed an agreement in Central-Asia with SNS to set up a new Internet Exchange in Uzbekistan. The equipment has been shipped, but we're facing some administrative delays. We hope to make significant progress soon!

Middle East

In Egypt, we entered into a strategic partnership at the end of 2020 with Telecom Egypt to build an Internet Exchange in Cairo. Originally, this was to go live at the end of 2021, but this had to be rescheduled to 2022. All the equipment has been delivered and we're ready to go. The exchange will be managed using AMS-IX solution IX-as-a-Service.

In 2020, the Manama-IX exchange of the Kingdom of Bahrain was launched and progress goes very well in this region. Manama-IX reached a peak traffic of 450 GE in 2021 and became the largest exchange in the middle east looking at the traffic exchanged. Manama-IX links directly to AMS-IX, which enables customers to exchange traffic with networks connected to AMS-IX. A recently finalised new service at Manama-IX is a reseller module, which makes it possible for regional ISPs to resell Manama-IX ports. AMS-IX and Manama-IX are busy expanding services on the IX, such as managed interconnect and mobile peering.

- “For us, the challenge is to meet an ever-wider range of technical and usage needs while **safeguarding accessibility, privacy and security.**

USA

In the USA, we expanded our partnership with HGC to handle the exclusive global sales and marketing for AMS-IX Chicago and AMS-IX Bay Area. HGC took over the role previously fulfilled by Epsilon, whose partnership role became vacant due to shifting strategic priorities within their company. Our existing partner in Hong Kong, HGC, was the right choice to become our new commercial partner in the US. We'd worked together for ten years and we're very happy to now have them on board in Chicago and the Bay Area. The fact that we'd always worked very well together and that we had found HGC to be highly reliable was decisive. They also have a local presence, which was important to us.

The new partnership brings a fresh new approach in the USA and we're expecting a considerable influx of new

customers. A variety of promotional activities have been scheduled, too and we'll be looking into joining other DCs in the cities where we're located.

Europe

Though not really international (although some might consider extension to Rotterdam international) in October 2021 we added Points of Presence (PoP) in the Smartdc Data centre in Rotterdam and Greenhouse Data Centers in Naaldwijk. These are the first connections to the Amsterdam exchange located outside the Amsterdam metro area. It provides regions outside this area, including the south of the Netherlands, with fast access to our platform. We're currently approaching potential peering customers with these partners.

● **Onno Bos**
Sales director

AMS-IX around the world

① Amsterdam

Connected networks **880+**
Peak traffic **10.8 Tbps**

3

② Bay Area

Connected networks **24**
Peak traffic **36 Gbps**

2

4

③ Chicago

Connected networks **24**
Peak traffic **155 Gbps**

④ Caribbean

Connected networks **12**
Peak traffic **28 Gbps**

⑥ Mumbai

Connected networks **48**
Peak traffic **92 Gbps**

⑤ Hong Kong

Connected networks **64**
Peak traffic **84 Gbps**

⑦ Manama

Connected networks **19**
Peak traffic **436 Gbps**



● AMS-IX Location

● Powered by AMS-IX



Alex de Joode
Public Affairs Officer

Word from the Public Affairs Officer

Over the years, AMS-IX has always been a topic of discussion in the media and government circles. But although many people spoke about AMS-IX, people weren't always speaking with AMS-IX, or understanding its views.

Alex de Joode explains how a clear strategy and activities are remedying this, allowing AMS-IX to help develop the internet and society further.

The Management Team and I believe we need to keep working on our visibility - when people talk about AMS-IX, we want to engage in discussions with them, and we want to inform stakeholders about topics related to the internet and its role in society. We've been doing this through a number of projects.

Digitale Binnenhof Academy (Digital Academy for Parliament)

First of all, we participated in the Digitale Binnenhof Academy, an initiative led by eight digital sector organizations, which aims to transfer unbiased, reliable, and factual knowledge about the operation of the digital society to politicians. The aim is to support informed public debate about the Netherlands' digital future.

In the Dutch parliament, a number of prominent members of parliament involved in digital issues have left, since the most recent elections.

Quite a few newcomers are not from the digital world. We think it is vital that the parliament has access to relevant, up-to-date knowledge on key digital topics. For this reason, we joined forces with several parties to give MPs and their policy staff the opportunity to follow 'classes' on certain subjects. These are given by independent experts. This is not a lobbying tool for us, it's purely meant for sharing know-how. The initiative has been warmly welcomed and is proving very successful.

Digital Services ACT

This EU Directive sets out requirements on mandatory consumer information, steps to follow in online contracting and rules on commercial communications. It also stipulates that hosting providers and carriers can't be held liable for content that their clients make available on the internet. One of our focus points is to participate in discussions around this, to ensure that our members can retain their legal position. From the proposals now going through the European Parliament it seems that this has been successfully achieved.

AMdEX Amsterdam Data Exchange

AMS-IX is a neutral association. Data that our members exchange over our fabric may be of interest to third parties, but we do will never look into these packages. In the AMdEX project AMS-IX together with SURF, deXes, Amsterdam Economic Board and UvA are looking to set up a data exchange that enables users to share their data and at the same time remain in charge of their data. Our platform ensures third parties can only access your data if they meet the conditions you set. An extremely interesting project.

AMdEX is co-funded by the European Regional Development Fund. We are looking to duplicate the AMS-IX ecosystem and Governance Code, and working with business cases, in order to find a solution to a very real question.

This project is very much in line with the European Gaia-X project, which we're also part of. In this, representatives from business, science and politics are creating a proposal an open, transparent and secure digital ecosystem, where data and services can be made available, collated and shared in an environment of trust.



There are also parallels with the work of the Internet Systems Consortium which develops and distributes opensource internet networking software packages.

Encryption Argumentation Document (Encryptiekaart)

An internet without encryption would simply be unsafe. So, for us it is important that encryption remains allowed. We're worried about a rumored legal decryption obligation. The moment a bill like that is passed, it doesn't take much to further weaken encryption. As we are only at the beginning of digitalization, I feel my kids will never reclaim any rights that we give up now.

In our discussions with stakeholders, we found out that there was insufficient knowledge. That led us to get in touch with the 'Argumentenfabriek' agency and create an overview of well-argued pros and cons. Together with ECP, Platform for the Information Society, we developed a neutral overview of arguments for and against legal mandatory decryption. Politicians and policymakers can use this to read up on the issues and form a viewpoint. Such as the police, who are concerned about end-to-end encryption used by WhatsApp or Signal, which service providers cannot decrypt. We invited the entire digital community to take part, as well as the government,

NGOs, academics, and the business community. Facts and arguments listed are rational, devised by proponents as well as opponents.

We wanted to build a foundation for discussion, so nobody makes decisions based on gut feelings. We do this 'for the good of the internet'. Politicians and policymakers make better decisions once they have more knowledge and backgrounds. Ultimately that is also good for our clients. We have agreed with ECP that we will rework this document, which was handed over to the Digital Committee of the parliament, every two years.

Industry associations and cooperations

It is important for us to develop solid cooperation across the industry, nationally and internationally. That's why AMS-IX joined EuroISPA, the representative body of Internet Services Providers, across the European continent as a new Council member. With the other leading exchanges, we can help shape European policy as it is being developed in Brussels and enter into alliances.

Looking forward

In 2022, we will further expand on the position we have built up. The National Cyber Security Centre last visited us five years ago, and we're now renewing



“Innovation, leadership, and truly informed discussions and policies are **more important than ever.**”

that acquaintance, for example. Hopefully, we'll be able to hold more and more face-to-face meetings. There's still a great deal to be done, as all of the discussions we're involved in are highly dynamic and keep changing. We also can't sufficiently emphasise the importance of digital development for the Dutch and European economy and competitive position. Innovation, leadership, and truly informed discussions and policies are more important than ever.



Alex de Joode

Public Affairs Officer



A professional portrait of Magdalena Jarosińska. She is a woman with long, straight, light brown hair, wearing dark blue-rimmed glasses. She is dressed in a white button-down shirt featuring a dense, colorful floral and leaf print. The background is a bright, modern interior space with large windows and architectural steel beams.

Magdalena Jarosińska
Senior Product Owner

Word from the AMS-IX.me development team

In 2021, significant energy went into the development of a new community portal for our customers and partners. Magdalena Jarosińska shares insights into the development and rollout.

Today, many companies are going through a digital transformation. For customers, ease of interaction is very much the main priority. They like to be independent, log in quickly, shop around, make small changes themselves, try out features, and make their own decisions while still having the option to get support. This is what ams-ix.me - the new AMS-IX portal - offers. It is fully focused around

Customer Self Service. The benefits of the portal are broad, not only for our customers, but also for AMS-IX.

We're moving away from a custom-built in-house platform. The backbone for the new portal is provided by Salesforce CRM: this is state of the art, extremely highly regarded for over 20 years, offers all the functionality we need, and is easier to manage.

The CPQ ('Configure, Price, Quote') package running on top allows us to manage most requests by configuring what's already there. It doesn't require a separate team of developers to hard code everything. We can configure the product portfolio in any way and quickly provide customers with a very accurate, easy to read quote, which is the best possible match for their request.

Customers AMS-IX internal teams are offered a great deal of functionality in the backend and the portal is integrated with our provisioning layer. You can provision the top services end-to-end processes for our top products, such as internet peering or anti DDoS, with automation removing a great deal of manual work. With this platform, we are more flexible than ever. We can



“A big advantage of our Agile approach is the fact that **we inspect and adapt non-stop.**”

decouple certain features that were previously only part of a bundle, for example.

Overview of portal developments

Currently, the new portal is only available to new customers. It was opened up to direct customers in December 2020 and to resellers in November 2021.

A current key objective is to phase out our legacy my.amsix portal and move all customers to the new portal. A high impact exercise which requires a great deal of analysis, and we are making sure we are well prepared.

Collecting user feedback and requests for functionalities so we can build our planning around this is easier than ever. The reason we first launched to new customers is because they are unbiased and can give us honest feedback. The portal's UI is light, easy to navigate, and features flows that aim to take the customer by the hand, ensuring they're making all of the steps required and finding the information they need without consulting a manual. That's what people have come to expect.

I joined AMS-IX in March 2021 but previously worked on Salesforce implementations for six years. Staying in the lead requires constant questioning. A big advantage of our Agile approach is the fact that we

inspect and adapt with set cadence. That gives us the flexibility to incorporate feedback and features quickly while still creating focus around the planning. Apart from opening up the portal to resellers in November, we also added some top requested features in December's release – with Flow statistics being one of them.

Looking ahead

We have matured as a development team and have become more professional in the way we operate. If an impediment is stopping us from doing a good job, it can be removed if we give honest feedback. Agile way of working means that our activities are transparent and releasing new functionality has become more predictable. We are gathering customer feedback directly and hear a lot from business owners, but we also have plans to host workshops with customers this year, to hear their honest opinions! This year will bring more next services, more improvements to the UI, and more dedicated efforts to bring in existing AMS-IX customers. Our Salesforce scrum teams are committed to provide value, so these are only some of the things that you can expect from us in the foreseeable future.

 **Magdalena Jarosińska**
Senior Product Owner



Rob Tijdink
IT manager



Word from the IT support team

The IT Support team is responsible for office automation, from taking care of laptops and applications to access management. Rob Tijdink, IT manager at AMS-IX and in charge of the IT support team, shares his experience of the past year and looks ahead.

One of the key AMS-IX milestones of 2021 was the fact that we greatly expanded the responsibilities of the IT support Team. I was hired to lead this team when I started in October of 2019.

For a long time, AMS-IX had just one person working on internal IT support. However, since we had more responsibilities and a growing workload, we reinforced the department with new staff. At the end of 2020 the IT Support team was reinforced with MacOS support engineer Harald and in 2021 we had the pleasure to add IT support engineer Scott to the team. In 2021, they designed and implemented a number of processes to ensure fast and efficient handling of requests.

In the past, all our files were distributed across multiple applications, based on people's personal preferences and habits. We adopted a new centralized approach that enables us to store files in a limited set of environments. We're now in the final phases of adopting a Microsoft Cloud solution. That had quite an impact on the organisation. For example, we're now all using Teams. Not everyone was enthusiastic about the new application at first, as everyone had his or her own preference, but today things are running smoothly.

We faced a few implementation-related challenges. There was no standard way of doing things, and no overview of who was accessing and sharing what data. People needed to adopt a new way of working to make sure this became transparent. We made sure that our communications were clear and consistent, to help realize the transition to this new way of working in the smoothest possible way.

2022 and beyond

In 2022, we'll be focusing on implementation of role-based access control, which is based on individuals' roles and privileges. We now need to work through 25 years of history and determine which levels of access will be assigned to each employee. We're also implementing the ITIL service management framework approach.

ITIL is a framework of best practices for delivering IT services and handling tickets and change management. This is another major efficiency step. Because we're using more applications, we see the need for greater bandwidth, and we need to start updating our Wi-Fi access points.

IT support is becoming more important to businesses and organizations worldwide as dependence on IT processes grows, and AMS-IX is no exception. A key advantage of having a dedicated IT Support team is the fact that we can respond faster and more efficient to incidents and requests. At the same time, we also have better insights into how the network is used, and which equipment and supplies we need to have in stock. In future, whenever anyone has an IT-related question, they should always be able to approach us right away. That also means we need to ensure all of our existing and new processes are fully optimized. Ideally, nobody at AMS-IX will notice what we're doing in the background - they'll simply reap the benefits.

 **Rob Tijdink**
IT manager



A professional headshot of a woman with blonde hair, smiling. She is wearing a light-colored, ribbed, high-collared sweater over a white collared shirt.

Petra Wensing
Marketing & Communications
Manager

Zooming in on MORE-IP 2021

Looking back at 2021, we can say this was another challenging year, where Covid-19 played an important role, since we could go less often to the office and couldn't travel anywhere.

In addition to a special focus on internal communications, we continued to invest in virtual events and other digital activities. We participated in several webinars and organized webinars with partners such as EURO-IX to increase our brand awareness. One of the highlights for our department was the organization of our first virtual MORE-IP event. Petra Wensing, head of Marketing, Communications and Events explains:

"MORE-IP is always the highlight of the year for our department. This event brings a great deal of energy and we all have our own tasks that help make the event a success: event branding of the event, the program, logistics, lunch, dinner etc. AMS-IX organized its first MORE-IP 11 years ago and this has grown out to be a leading industry event for the Netherlands and abroad.

The event brings together professionals and decision-makers from the IP interconnection industry. Attending MORE-IP offers people the opportunity to further grow their business, connect to new parties and strengthen existing business relationships. Knowledge sharing and learning about new developments remain high on the agenda. MORE-IP is a perfect opportunity for us to meet our members, customers, vendors and business relations face to face. Furthermore, our General Meeting is always part of the program.

For the second year in row, we had to make the decision to organize the event virtually, due to the Covid-19 pandemic.

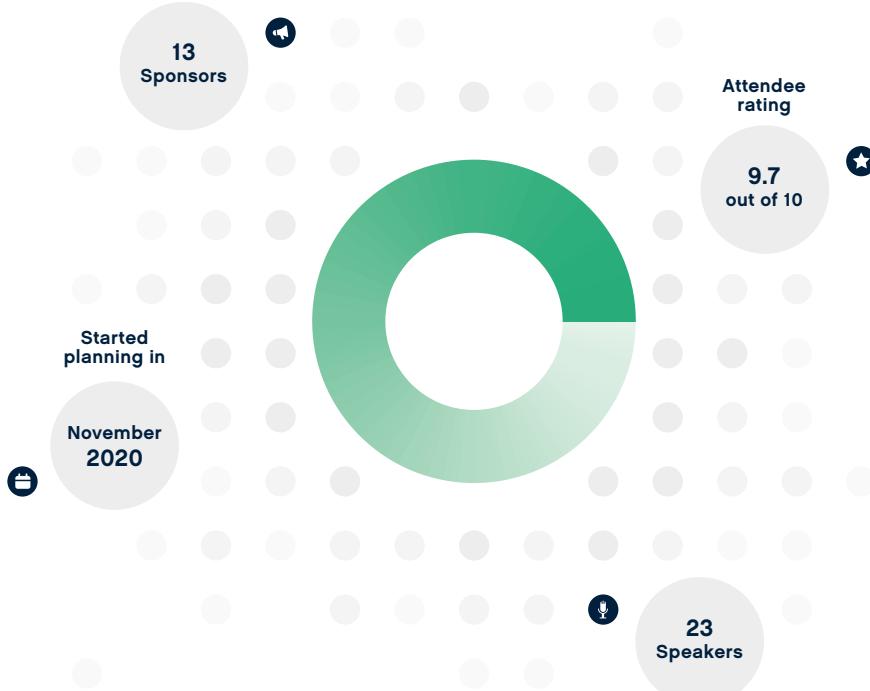
As the pandemic had already been going on for a long time, event locations had gained much more experience in organizing virtual events. People were also more used to attending web-based events. We contacted the location where we always organize our physical event, Pakhuis de Zwijger in Amsterdam, and started working with them on the biggest virtual event we have ever done. MORE-IP became a TV production, in which the speakers visited the venue and presented their segment, while virtual participants logged in to a special platform to follow the presentations live, asked the speakers questions, and could chat with fellow attendees. Via this tool, people were also able to set up meetings and we integrated the social tool Spatial Chat where people could meet each other in an informal way.



For this virtual edition, we managed to put together a varied agenda with interesting speakers. We always try to bring one topic which is far removed of our business. In 2021, former medical aid worker Arjan Erkel shared the story of how he was kidnapped and held hostage in Russia for two years while he was working for a charity organization. However, he managed to move on afterwards and made use of the experience to grow as a human being. A very impressive story.

Other interesting topics came from Lucien Engelen (author and strategist) who talked about the future of Healthcare, Jonas Vermeulen (Business Development Manager at Nokia) discussed mitigation of DDoS attacks in the 400G era and Dr Joshua Slater (QTech scientist) provided an update on the status of Quantum technology, reminding us that it won't replace the internet we know today, but will supplement it.

Organizing a virtual event still costs a great deal of money, so we contacted sponsors to support us. We were very happy to see that a large number of sponsors saw the benefit of organizing this event and were willing to support us. The advantage of these virtual events is the fact that content is recorded and can be shared through various communication channels.



Therefore, I'm happy to announce that our next MORE-IP event (2022) will be a live event taking place on June 1st and 2nd at our familiar Amsterdam location. After a long period of

lockdowns and travel bans, we finally see light at the end of the tunnel - at least here in the Netherlands and the countries around us. We hope things will continue to improve.

We are very much looking forward to seeing everybody in person again. Until then stay safe!”

Petra Wensing

Marketing & Communications
Manager

Colophon

Coordination

Bram Semeijn

Support

**Petra Wensing, Julia Lechien,
Henrica Kranendonk**

Copywriting

**John Edwards, Bram Semeijn,
Katerina Karagianni**

Interviews and texts

**Peter van Burgel, Bart van der Sloot,
Iris Vonk, Mike Baron, Onno Bos,
Ruben van den Brink, Tim Vriend,
Rob Tijdink, Petra Wensing, Alex de
Joode en Magdalena Jarosińska**

Photography

Michael Fischer, Rogier Bos

Concept and design

**Studio Piraat – studiopiraat.nl
The Hague, The Netherlands**

Print

**Drukkerij Van Deventer,
's-Gravenzande, The Netherlands**

© 2022 AMS-IX

AMS-IX

Frederiksplein 42
1017 XN Amsterdam
The Netherlands

info@ams-ix.net
T +31 (0)20 305 89 99

ams-ix.net



ams-ix.net