



annual report

2017

2017

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AMS-IX at a glance

In the early nineties, AMS-IX is established in Amsterdam, the Netherlands, to facilitate exchange of Internet traffic between IP networks, or 'peering'. This enables networks to offer stable, fast and cost-effective Internet services to end-users and business customers.

AMS-IX serves a diverse, unique customer mix: ISPs, mobile operators, content providers, hosting and cloud companies, application providers, TV broadcasters, gaming companies, content delivery networks, over-the-top players and other Internet-related companies.

AMS-IX is a not-for-profit organisation, independent of third parties and the government. We are as open and transparent as possible, and fully accountable to our members.

AMS-IX believes strongly in the collaborative model that governs our work with other industry parties. For over twenty years, this model has enabled us to strengthen digital infrastructure in the Netherlands and around the world, positively impacting billions of people.

Goodbye Job Witteman

CEO and co-founder Job Witteman left AMS-IX in October 2017. Under his leadership, AMS-IX became the world's largest internet exchange, currently serving more than 900 customers and operating seven internet exchanges worldwide.



Job Witteman
FORMER CEO AND CO-FOUNDER

Job Witteman says: "After 17 and a half years of helping build AMS-IX, it is time for me to seek new challenges and see where I can add value with my knowledge and experience. I can do this with full confidence, knowing that the company is in top condition. I am very proud of what we have achieved over the past years. I have seen the internet grow from its infancy, to people having access on their mobile phones and not being able to imagine a world without it. Of course, I am very proud that I have been able to contribute to this success and development and confident AMS-IX will keep its leading position for many years to come."

Welcome Peter van Burgel

When Job announced that he was leaving, we evaluated the leadership structure. We then decided to start recruiting a new CEO. As of February 1st 2018 Peter van Burgel was appointed as the new CEO.

Peter comes from Westcon, where he was responsible for driving digital transformation. Van Burgel will execute the renewed strategy and continue to ensure that AMS-IX maintains its role as a global leaders at the core of the internet.

"Joining this organization with its global footprint and impressive reputation is very exciting," says Peter van Burgel. "I look forward to working with the team and continuing to develop and expand the strong market position of AMS-IX." Sylvie LaPerrière, Chair of the Supervisory Board, adds: "Peter brings a wealth of business and leadership experience to the table."

Throughout his 20 year career within the IT, Telecommunications, and Internet industries, he has been a driving force behind global business transformation initiatives spanning people, processes, and technology. His broad international experience will greatly assist AMS-IX as 80% of our customers are from abroad."



Peter van Burgel
CEO

The Way The Web Works



IT firms in the seventies and eighties were right: investing in a computer increases your productivity, efficiency and scope of possibilities enormously. Joining computers in Wide and Local Area Networks boosted those advantages exponentially. In the nineties, universities and governments told us that linking those networks would bring endless possibilities. The result: the Internet turned out to be a unique phenomenon in human history, changing business, education, society and daily life...





The Internet is a network of networks, based on a set of rules: the Internet Protocol (IP). As long as everyone sticks to these rules, we can keep adding devices and innovating. Currently, some 50,000 unique IP networks form the internet. Each network offers functions in the area of content, end-user access, transport, storage, web hosting or applications.

Putting the pieces together

Messages sent over the Internet don't travel as a single block. They are divided into tiny data packets, sometimes taking different paths. To get data from point A to point B, networks have three options: the simplest is a direct connection between networks. For example: when an email is sent, the sender's Internet Service Provider (ISP) connects directly to the receiver's ISP and relays the message.

This works within a single country, but if a wider geography needs to be covered, data has to pass through multiple networks. This leads to the second option: buying connectivity from transit providers, allowing data to reach and return from particular destinations.

Option three simplifies this: both networks link to an Internet Exchange, where the data packet is transferred. A direct connection between sender and receiver is not necessary. The exchange might link a local ISP to a major carrier, such as an international telecom provider, which delivers the data package as closely to its final destination as possible. The receiver's ISP picks it up from that point.

Internet Exchange Points

At Internet Exchanges, such as AMS-IX, networks interconnect and directly exchange traffic. Each network connected to AMS-IX may peer with any other connected network. This 'peering' is mostly done without any money changing hands. It is based on mutual benefits for both parties involved. Peering makes the Internet more affordable and faster. An exchange operator, such as AMS-IX, only exchanges data within its own metropolitan area. AMS-IX in Amsterdam doesn't link directly to its locations in Hong Kong, India, Curaçao, Chicago, New York and San Francisco. Its customers take care of this themselves.

AMS-IX partners and resellers can link to exchanges by providing ports wherever they have a network available. End users don't connect directly to Internet Exchanges. Instead, they rely on the services of Internet Service Providers (ISPs) or telecom companies to do that for them.

In summary....

Accessing multiple networks directly at the Internet Exchange, instead of making several network 'hops' through other parties, improves network performance. Peering allows parties to decrease network costs, improve network performance, be more autonomous and make their network more redundant.

“The Internet turned out to be a unique phenomenon in human history, changing business, education, society and daily life...”

Highlights 2017

Growth continues in the Netherlands, albeit at a slightly slower than in recent years. We opened two new POPs in the Amsterdam metro area (at The Datacenter Group (TDCG) and the Digital Realty datatower) and began selling Cloud Interconnections to cloud platforms, including Google Cloud, Microsoft Azure, and Amazon Web Services (AWS).



Jesse Robbers
CCO

Across Europe, our partners such as EvoSwitch and Megaport have been successfully adding a significant number of new customers.

In Hong Kong, we have seen an increase in the number of 100G ports and continue to grow as we add more partners and realized new traffic peaks.

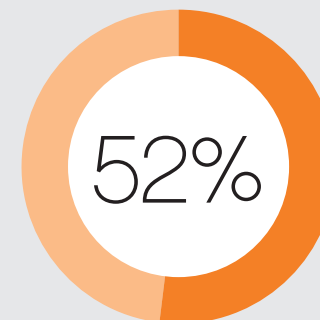
Expanding to India

We started AMS-IX India, in collaboration with Sify, where there has been plenty of interest from parties wishing to connect to us, including smaller local networks. Our local partner Sify, one of India's largest integrated ICT Solutions and Services companies, is focusing on the needs of local clients, from mobile networks to access providers and local internet players. We, in turn, are working to bring in high-volume content parties, many of which we serve in other regions. An emerging and promising market, which does present some challenges. Starting up AMS-IX India required more time and effort than originally expected but the operation is now fully operational and growing.

However, this slow but steady growth is in line with local market developments. In 2018, we will add the Mumbai GPX data centre, which will help add local and international players.

AMS-IX Caribbean

Curaçao, where we have been expanding existing relations with our local partners, also showed slow but steady growth. Our presence brings opportunities for regional connections in the future, thanks to capacity on existing sea cables to South America and Cuba as well as new sea cables, which will be installed in coming years.



Increase of 100GE ports in
AMS-IX Amsterdam



AMS-IX US: extending our reach

An interesting development in 2017 was our new partnership with PacketFabric. This allows us to connect to 150 additional locations across the USA. We can now offer coverage in all main locations and more easily connect users to our US Exchanges.

70Gbps peak traffic

10Gbps

An increase of 600%

Chicago

In Chicago, we went from 10Gbps to 70Gbps peak traffic in six months.

“In 2018, we will add the Mumbai GPX data centre, which will help add local players.”



International Presence



900+
connected parties

7
IXPs

50+
partners

350+
cities

500+
colocations

Business developments

Amsterdam

Hong Kong

India

Amsterdam

Looking back at 2017

Once again, AMS-IX Amsterdam showed good growth in total capacity connected. This increased from 22 Tbps in 2016 to 26.1 Tbps in 2017. Furthermore, we reached a new peak of 5.5 Tbps. Of the 118 applications we received, 83 went in production, resulting in a total of 819 total connected parties by year end. We saw that nearly half of the new connected parties were direct customers.

This is a change from previous years, when 30% were direct customers. Best performing partner with regard to new customers was Megaport and best performing partner in the area of new capacity was EvoSwitch.

Outlook for 2018

For 2018, we expect continued growth for new capacity, as a result of new customers and upgrades to (multiple) 100GE ports. In addition to traditional growth of new customers, we expect a boost from new targeted customer segments and the introduction of new services such as 'EasyAccess'. This service bundles IP transport and the AMS-IX peering port into one pre-negotiated, cost-efficient and robust package.

Hong Kong

AMS-IX Hong Kong showed healthy growth in all aspects and we reached a new peak of 39 Gbps with total capacity connected increasing from 183 Gbps to 403 Gbps. IPX was one of the new services added to the platform and 3 IPX providers have already connected in 2017.

For 2018, we expect continued growth and we look forward to our continued partnership with HGC.

India

AMS-IX India was launched in 2017, together with our partner Sify, and the first customers were connected. We realize it takes time to launch a new IXP and we are confident that 2018 will show good results in connected capacity and new customers.

FROM LEFT TO RIGHT:

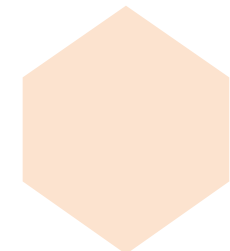
Onno Bos
SALES DIRECTOR

Aleksandar Mitrov
BUSINESS DEVELOPMENT MANAGER

Erik Verhoef
BUSINESS DEVELOPMENT MANAGER



Business developments Caribbean



Caribbean

Looking back over 2017

Traffic continued to grow, reaching a 35% increase in 2017, which is above the Cisco VNI Latin-American traffic growth projections. In 2017, Worldstream was added to the ecosystem in Curaçao. New markets and low latency submarine cables are being targeted together with reseller partners, to improve connectivity in the Caribbean and South America.

Continuous consolidation of regional carriers and data centers is leading to increased local market competition, lower bandwidth rates and direct interconnects between the ISP's and Content Providers. Being part of the Latin-American community we co-sponsored and participated in the LACNIC, Latin American Peering Forum, LAC-IX and Caribbean Peering Forum events. Nico Scheper from AMS-IX Caribbean is Vice Chair of the LAC-IX board.

“A second AMS-IX Caribbean POP (Point of Presence) will be deployed at the Blue Nap Americas data centre in Curaçao facilitating further growth of the traffic and customer base.”

Outlook for 2018

In the 2018, outlook we foresee continuous traffic growth of some 25%. We also foresee further migration from 1G to 10G ports and a slight revenue increase.

Continuing to add value to the existing value proposition, the Google caching servers will be upgraded from a 1G to a 10G platform. The existing Akamai platform will also be upgraded. Both upgrades will facilitate further traffic growth. As a result of the Google and Akamai platforms upgrade and the customer migration to 10G ports, the existing AMS-IX Caribbean platform will be upgraded.

A second AMS-IX Caribbean POP (Point of Presence) will be deployed at the Blue Nap Americas data centre in Curaçao facilitating further growth of the traffic and customer base. This will create opportunities to expand to new markets and access lower-latency submarine cable systems.

In terms of events, we will continue to position AMS-IX in the Latin American Region by participating in events such as Capacity Caribbean, LACNIC, LAC-IX, Latin American Peering Forum and the Caribbean Peering Forum.

Nico Scheper
BUSINESS DEVELOPMENT MANAGER



Business developments US

Looking back over 2017 and forward towards 2018

AMS-IX USA is proud to say that 2017 was a positive and successful year, particularly in the Chicago and San Francisco Bay Area markets. Traffic at AMS-IX Chicago peaked at over 70Gbps, almost doubling our greatest traffic of volumes at this location in 2016. Furthermore, our Bay Area exchange nearly tripled in peak traffic volume over 2016 at just under 30Gbps. Momentum for attracting and connecting new ASNs in both markets is strong as we head into 2018 with positive anticipation of further up and to the right traffic volumes.

AMS-IX New York was a difficult market for us in 2016 and our strategy for 2017 to scale back and go out of less productive

data centers in New York while concentrating on the strengths of our business partners like Megaport was limited, but encouraging! Anticipated migrations from Megaport's MEGA-IX exchanges were helpful to our cause but new Megaport sales were lacking and below projected levels. AMS-IX USA is enthusiastic about our results from 2017 and we feel confident about our opportunities for growth in 2018!

Phil Matte
PEERING FACILITATOR



Chair's Statement

Change: an opportunity to grow

AMS-IX remains a leading Internet Exchange with an established global presence. We're seeing growth in the US and expansion in India, where we were asked to help 'jump start' the IXP sector. However, our ecosystem is changing fast. Becoming more competitive.

In the past, someone might have chosen peering to reduce the cost of transit. But now the cost of transit has fallen, we're seeing competition on price. Intense consolidation means there are fewer players, but they are more formidable than before.

More than ever, exchanges need to prove their value to their membership. Now that cost and technology are no longer key differentiators, we need to determine and communicate our added value. Competition is welcome because it keeps us flexible and agile and forces us to innovate.

The diversity of our membership – from content players to financial services – means we need to stay flexible and can't stand still. Some customers will simply want connectivity, whereas others will want completely new services. That means we need to rethink the IXP model going forward.

**"You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete."
- Buckminster Fuller**



2017: A pivotal year

The highlight of 2017 was our strategy development. Innovative and creative consultants helped us expand our thinking and look at different business models. Sometimes, you don't realize you're doing things a certain way and working with external people challenged us. We want to continue challenging our thinking.

The entire team's response has been overwhelmingly positive. We have the skill and talent, as well as the energy and the good ideas on board. In 2018 we'll be focusing on developing our software and tools, taking my.ams-ix further and staying in the lead. This will help transform our business and make it easier for third parties to connect, helping them find an aggregator where necessary.

“We have made a number of decisions that will ensure IXP’s remain successful in the future, in the face of many changes to come.”

Welcome Peter van Burgel

After 17 and a half years, CEO and co-founder Job Witteman left AMS-IX this year. We are grateful for his contribution to AMS-IX: with a fantastic team, he built a strong organisation that plays a significant role in the global digital economy and internet infrastructure.

Through an executive search we found Peter van Burgel, a successor who can support strategy development and implementation for the coming years, together with the Management Team. Peter brings a wealth of business and leadership experience to the table. Throughout his 20-year career within the IT, Telecommunications, and Internet industries, he has been a driving force behind global business transformation initiatives spanning people, processes, and technology. This expertise in digital transformation and business models is exactly what AMS-IX needs today.

Board developments

At the end of 2016, we continued to count on Alex Bik's experience and we welcomed three new board members: Mark Cooper (Megaport) Eric Loos (BICS) and Bart van der Sloot (LeaseWeb).

Their onboarding went very smoothly – all three were very familiar with IXPs and AMS-IX in particular. This is my sixth and last year on the board as my term ends in December. It has been an extremely rewarding experience to work with a dedicated board and a collaborative Management Team.

We have always worked to stay in touch with what's happening in the market, and this will become even more important in 2018. We remain intent on anticipating our customers and members' needs and offering them cost-effective and adapted solutions. Our vision, strategy, technology and know-how are coming together and I am very confident about the future of AMS-IX. We have made a number of decisions that will ensure IXPs remain successful in the future, in the face of many changes to come.

On behalf of the Executive Board of the Association,

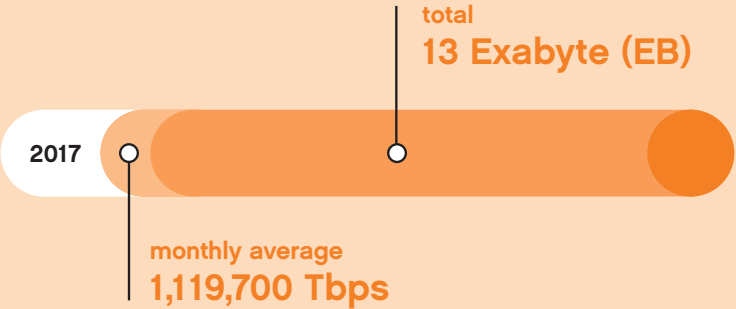
Sylvie LaPerrière
CHAIR SUPERVISORY BOARD



Word from the CTO

Early in 2017, we started the long-awaited and prepared migration from Brocade MLXe-based hardware to Extreme SLX 9850 (formerly Brocade SLX 9850). This platform allows significantly higher port density, helps reduce power consumption and cost, and is vital to further scaling the platform.

Yearly internet traffic volume



Initial implementation in the spine (core) of the network in Q1 went smoothly. Throughout the remainder of 2017, we worked with Brocade/ Extreme on preparing the software for replacement of the platform’s access switches, Migration started in Q4.

Huawei DWDM equipment
Implementation of Huawei OSN902 DWDM transmission equipment in our Amsterdam platform, which started in 2016, was completed during 2017. A vast amount of 100GE over dark fiber connections was replaced by 200Gbps waves. This significantly reduces operational expenses and offers a fast, efficient method for upgrading backbone capacity when and where needed.

2 new POP’s
We opened two new points of presence in the Amsterdam Metro area, bringing the total to 14. The first POP in Digital Realty’s 72-metre high Amsterdam Data Tower allows AMS-IX to connect to over 200 networks. The second POP is at The Datacenter Group (TDCG) in Amsterdam. Which also offers its customers in Delft the connectivity to connect remotely to AMS-IX.

Full NOC integration with Quanza
Our 24-hour NOC supported by Quanza, which became operational in Q4 2015, is now fully integrated with AMS-IX operations and running smoothly.

“This platform allows significantly higher port density, helps reduce power consumption and cost, and is vital to further scaling the platform.”



5.5 Tbps peak traffic

7 Internet Exchanges

In 2017, we built AMS-IX India with our partner Sify, using a new franchise-like operational model: Sify owns and operates the Exchange and AMS-IX provides the brand and operations. The Mumbai-based exchange is up and running and focusing on growth. With this addition, AMS-IX is now running seven Internet Exchanges worldwide, connecting over 900 networks with a total port capacity of 27.7 Tbps.

Falcon route servers

The Falcon route servers, which had been operational next to the production route server for some time, were made the default route servers. The Falcons' main additional functionality is that by default all invalid routes based on RPKI or IRRDB route objects are dropped. This policy, which differs from the original AMS-IX applied policy of just tagging the invalid routes, resulted from discussion with the membership.

ISO certification

Considerable efforts were made to prepare the company for ISO27001 certification. The audit took place in Q4 2017, resulting in certification in March 2018.

Software Development

A great deal of work went into enhancing the software platform, my.ams-ix and the reseller API. Specifically, we developed the API for operational interaction with the PacketFabric portal. PacketFabric customers can order an AMS-IX connection through this portal. A connection through the PacketFabric is automatically provisioned and terminates at a virtual connection on one of the AMS-IX USA POPs.

Looking back

In 2017, bandwidth demand increased, reflected by the uptake of 100GE ports (+52%) in Amsterdam. GRX peak traffic reached 82 Gbps (+193%). We had predicted this would happen in June 2017, when new European roaming regulations became effective, forcing Mobile Network Operators to abolish retail roaming charges in the EU.

Henk Steenman
CTO



“This significantly reduces operational expenses and offers a fast, efficient method for upgrading backbone capacity when and where needed.”

2018 focus: making things easier

With a peak traffic of 5.5 Terabits per second (Tbps) and a total yearly traffic volume of 13 Exabytes (EB), AMS-IX Amsterdam continues to be one of the world's leading Internet Exchanges. We're pleased to report that we are still growing.

In 2018, we are focusing on further implementation of Brocade/ Extreme SLX and developing and reworking our automation platform. This will be more modular and accessible for clients and partners, making connection easier and faster. We are also working on obtaining a presence in more data centers in the Netherlands.

900+ connected networks

ISO 27001 certification: demonstrating our lead in information security



Aris Lambrianidis,
INFORMATION SECURITY MANAGER

In March 2018, AMS-IX received ISO 27001:2013 certification which specifically deals with information security. Aris Lambrianidis, Information Security Manager, shares some insights into the implications and procedures. “This certification instantly makes it clear to everyone that AMS-IX has a well-rounded, highly systematic approach to information security. Internet Exchange Providers are not well understood; our methods of operation aren’t clear to everyone.

That’s why it is important that we can demonstrate we’re taking all the right steps - especially because we’re classified as critical infrastructure. What’s more, we can also show that we are compliant with new and old EU regulations.”

The entire process started in 2016 and took almost two years to complete. Together with all stakeholders, a wide variety of procedures were developed, refined and documented. Following this, a number of processes required by the standard were introduced, including risk assessments, internal auditing and management reviews. A number of critical controls have also been implemented, such as deployment of Endpoint Protection, centralized user identity management and two-factor authentication for crucial services.



The finance department, NOC and Engineering already had very structured operational methodologies, which were a good starting point.

“We were helped by the fact that a great deal of up-to-date documentation was readily available. ISO auditors don’t necessarily require inordinate amounts, the standard itself is pretty specific about this – but it’s smart to document most processes in detail for one’s own benefit! This also helps ensure everyone is on the same page and working with the same information, which is essential to obtaining certification.

It was interesting to see that many of the required (technical) controls and policies were already in place for our core business, simply because staff had decided to implement them some time ago.”

“Of course, ISO certification isn’t a ‘one-off’, but a continued process, which requires ongoing awareness and vigilance. We will keep working hard in order to maintain our current security standards.”

“This certification instantly makes it clear to everyone that AMS-IX has a well-rounded, highly systematic approach to information security.”

Regulatory & Public Affairs

In 2017, we saw some concrete results of a trend that was also prevalent in 2016: commercial and political interests affecting the workings of the Internet and the way in which online services are provided and used. This is one of the reasons that collaboration remained a focus point for us throughout 2017. We're still closely involved with DINL (Stichting Digitale Infrastructuur Nederland / Dutch Digital Infrastructure Foundation), which focuses on the importance of a well-functioning digital infrastructure, security, education and acts as spokesperson for Dutch and EU government. We engaged in discussions with the newly elected Dutch government and we're pleased to see that sector-wide efforts contributed to increased attention and budgets. We will continue to lobby for a proactive approach in making the internet even more robust and safe.

Essential vital infrastructure

Although its direct contribution to the economy is seemingly limited in terms of revenue and employment, the digital infrastructure layer is absolutely essential to companies that large-scale create jobs, wealth and value.

When it comes to attracting these businesses and accommodating developments, such as 5G and Internet of Things, global competition is increasing. Governments need to carefully consider regulatory and financial stimuli for infrastructure and connectivity.

In 2017, AMS-IX was officially recognized as 'vital infrastructure' by the government. Over the past year we've been examining how this affects our ways of working, partnerships and relationships with regulatory authorities. Furthermore, the Network Information Security Directive entered into force in August 2016 which needs to be transposed into Dutch law. This legislation places Internet Exchanges - including AMS-IX - in the 'Operators of Essential Services (OES)' category. As a result, we will be overseen in a way comparable to the financial and energy sectors, which are also critical to the functioning of societies and economies. We have been discussing and introducing technical as well as organisational solutions that allow us to meet requirements.

Our recent ISO 27001 certification plays an important part in demonstrating to regulatory authorities that we are on track.

Data privacy regulation

The General Data Protection Regulation (GDPR), effective for all EU states, will be coming into force in 2018. This requires all parties collecting or processing personal data to justify why they are doing so and to implement specific security measures to protect these data. Of course, AMS-IX also processes personal customer, supplier and employee data. As such, the regulation impacts our operations. We have informed our customers of any additional measures we have taken.

Combating cybercrime

In our opinion, cybercrime needs to be tackled through collaboration between industry and the government.

One action we have taken ourselves is to place DDoS mitigation for critical infrastructure on the agenda. In 2017, we saw several attacks on critical infrastructure, such as Dutch banks, which resulted in increased attention to this topic.

On the one hand, we are actively linking customers that work with critical data and systems to other connected parties that can help prevent or mitigate attacks. We are also working to revitalize the cooperation between Dutch access providers and content providers to create a common framework to ward off DDoS attacks.

Keep it collaborative

As in previous years, we will keep striving to preserve a stable, trustworthy regulatory environment in which innovation and freedom are not stifled. The focus should be on making the most of the opportunities connectivity brings for society at large, instead of on top-down legislation.

Bastiaan Goslings
REGULATORY & PUBLIC AFFAIRS OFFICER



8.7

OVERALL PERFORMANCE This year's overall performance score was an 8.7. The highest score of the past 4 years.

8

NOC The Network Operations Centre (NOC) received an 8 or higher in all aspects, including maintenance announcements and speed of response to requests.

9

AMS-IX SERVICES Looking at the different AMS-IX services, the Unicast VLAN was rated highest (9), followed by MMS Data Exchange (8.9) and Private Interconnect (8.8).

9

CUSTOMER SERVICE The various departments within AMS-IX also scored very well, especially the Customer Service department which received an overall rating of 9 out of 10 - the highest scores being given to order process efficiency and general support.

2017 AMS-IX annual results: we received a sterling 8.7!

Every year, we conduct a customer survey to receive feedback in order to improve our services where needed.

This year's overall performance score was an 8.7 out of 10 (where 1 is poor and 10 is excellent), which is the highest score of the past 4 years. Looking at the different AMS-IX services, the Unicast VLAN was rated highest (9), followed by MMS Data Exchange (8.9) and Private Interconnect (8.8).

The various departments within AMS-IX also scored very well, especially the Customer Service department which received an overall rating of 9 out of 10 - the highest score

being given to order process efficiency and general support.

The Network Operations Centre (NOC) also scored very well, receiving an 8 or higher in all aspects, including maintenance announcements and speed of response to requests.

We are happy to see our customer base becoming increasingly diverse. This is, of course, in line with AMS-IX continuously growing international character. As in previous years, the number of connected parties, number of routes and reliability of the platform are the three main reasons that customers connect to AMS-IX.

To summarise, our members and customers continue to express a positive attitude about AMS-IX. **We are, once again, proud of our received scores and promise to strive for the best when it comes to dealing with our members and customers in 2018!**

Customer Service: Looking back

In Amsterdam, cloud interconnection services were launched in October, enabling direct customers and customers via resellers to order Microsoft Azure, Amazon and Google Cloud on their physical ports. We improved the Customer Experience Order Flow on my.ams-ix.net, implemented API changes to our portal in cooperation with the Web Dev team, sent out announcements about the new service, updated our website and documentation and prepared a Q&A. With the legal team, we worked on Terms and Conditions for the cloud services, which are presented in the user interface.

Workshops for interested AMS-IX customers were held in cooperation with Microsoft Azure and Megaport. Port provisioning was tested at two new POPs: The Datacenter Group and Digital Realty AMS01 Amsterdam.

Developments in AMS-IX U.S.
In the USA, we began work with Packet Fabric, making AMS-IX accessible from 150 new locations. Terms and Conditions were drafted with input from different teams and customer contracts were prepared. We also conducted a pre-flight and end-to-end testing of the process of adding a new customer, tested

notifications, documented the new order workflow and worked on the API integration between the my.ams-ix.net and Packet Fabric portals. We decommissioned the DuPont Fabros and 325 Hudson colocations and worked on the related customer migrations. Last year we also continuously supported the migration of the customers of our partner Megaport from Mega IX to AMS-IX Hong Kong and AMS-IX USA.

Supporting AMS-IX India
In India, we developed an end-to-end order placement solution at the Rabale data center together with local partner Sify. Furthermore, Sify also opened a second colocation: LSVB. We provided my.ams-ix.net user portal guidelines to Sify, focusing on functionalities available to Sify customers. With the NOC and Finance teams, we clarified a wide range of topics, from port provisioning logic to billing.

Other activities
A report on downgrades and disconnections and the duration of contract termination, including related reasons, was prepared.

The team has been looking into automating contract management, which will reduce paper contracts and allow faster port activation. An in-house legal research was carried out into electronic signature legislation (in EU and USA). Steps were also taken to simplify and streamline the customer application and order process by removing redundant pre-verification steps.

We began work on JIRA issue tracking software in September, with workshops and sessions to define ticketing workflow and service desk actions. We established integration touch points between my.ams-ix.net and JIRA projects, JIRA behaviour of various notifications triggered by my.ams-ix.net, internal collaboration and automated escalations between us and other teams, documentation, etc. This is being followed by a soft transition to JIRA.

Port prices were adjusted (prior to January 1st, 2018), as is the case each year, and customers were notified.

KPI research brought some interesting findings, including the positive fact that the median order resolution time (from order created to order activated) for physical ports is only 22 minutes.

Looking ahead
In 2018, we will continue work on improving and shortening the time required for orders and contract management for our customers.

This will be most probably done within the framework of a new Enterprise Resource Planning (ERP) system. We will be involved in a cross-company project on EasyAccess. In addition, we will be examining the effects of the new GDPR data privacy registration legislation and ensuring we conform to the standards. A survey about Customer Service and NOC will also be held.

We will be happy to welcome input about focus areas such as satisfaction with Customer Service, the NOC and user interface performance. Of course, many other plans are being developed!

Mariya Andonova
TEAM LEAD CUSTOMER SERVICE



AMS-IX values its corporate governance structure as this provides the organisation with a significant degree of independence and neutrality, thereby contributing to their growth, continuity and global expansion.

AMS-IX consists of three separate legal entities: the AMS-IX Association, the AMS-IX limited Company (Besloten Vennootschap or B.V. in Dutch) and its subsidiary AMS-IX USA Inc. The Association is the single shareholder of the 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.

The Executive Board of the Association is appointed as the Supervisory Board of the AMS-IX Company. The Supervisory Board supervises and advises the CEO & Management Team whilst also ensuring the AMS-IX Company follows the general course of affairs as set out in the annual and long-term strategic plans.

The Company takes the majority of the decisions, within the boundaries set by bylaws, annual and long-term plans approved by the (executive board of the) Association and/or Supervisory Board. During board meetings, the Supervisory Board 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. He holds this position since February 1st 2018. He chairs the Management Team, which further consists of a CTO, CCO and CFO. The Company consists of technology, commercial and financial departments, as well as human resource, front office, catering and executive support staff.

“The general meeting (GM) was held twice in 2017. One during MORE-IP on 31 May and 1 June. The other one, virtually on 7 December.”

Executive Board of the association & Supervisory Board of the company

Members can influence the direction of the organisation and the decision-making process with regard to the Company's strategy and operations. Therefore, the Board should be a well-balanced representation of our member community. Board members are elected from member organisations at which they must be employed at the time of appointment. They are, however, elected in a personal capacity. Board members can be re-appointed once every three years. They may stay on for the full duration of their appointment, should they join another company before their term has ended. If they join a non-member company, resignation is in order if a re-election is held.

General Meeting (GM)

The GM consists of the General Assembly meeting of the Association and the Shareholder meeting of the limited Company. GMs are organised at least once a year in Amsterdam. The GM in 2017 was organised during our annual MORE-IP event, which takes place in May and a remote GM was held in December. During every GM, a number of compulsory topics are placed on the agenda. The GM also provides a platform for members to meet and socialise.

Personal GM attendance is not mandatory for members, who can vote and follow presentations and discussions remotely. The meeting is broadcasted on the Internet as a webcast, and the online voting facility is open to members for a 24-hour period. In addition to this, we provide a chat channel to answer remote attendees' questions in real time.

AMS-IX ORGANISATION STRUCTURE

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

The 47th AMS-IX General Meeting was held during MORE-IP on May 31 and June 1, 2017 at Pakhuis de Zwijger in Amsterdam. During this meeting, AMS-IX members approved the minutes of the 46th GM, the Annual Accounts 2016 of the Association, the discharge of the Board members and the Long Term Strategy (LTCS) 2016 – 2019.

The 48th GM was virtually held on December 7, 2017. In this meeting, the minutes of the 47th GM were approved and an update on the LTS was presented.

Board Report

The Executive Board of the Association manages the Association's business and is also appointed as the Supervisory Board of the AMS-IX organisation. The Supervisory Board supervises and advises the CEO & Management Team whilst also ensuring the AMS-IX Company follows the general course of affairs as set out in the annual and long-term strategic plans.

COMPOSITION OF THE BOARD

Name	Organisation	Association Board member since	Next re-election	End term of office as a Board member of the Association	Term of office as a Supervisory Board member ends* no later then:
Alex Bik	BIT	24 Nov 2010	Nov 2019	Nov 2022	March 2021
Sylvie LaPerrière	Google	21 Nov 2012	Nov 2018	Nov 2024	March 2021
Mark Cooper	Megaport	20 Dec 2016	Dec 2019	Dec 2028	March 2021
Eric Loos	BICS	20 Dec 2016	Dec 2019	Dec 2028	March 2021
Bart van der Sloot	Leaseweb	20 Dec 2016	Dec 2019	Dec 2028	March 2021

* If appointed as Supervisory Board member at 8 February 2018.



Bart van der Sloot, Sylvie LaPerrière, Eric Loos, Mark Cooper and Alex Bik

In 2017, the Board held 7 meetings, 6 of which were attended in person by all members of the Board and one remotely. Besides these meetings, the members of the Board and Management Team members of the Company are in contact regularly to discuss specific topics. The goal of these informal conversations is to ensure the Board remains well informed with regard to the running of the Company's operations.

During Board meetings, the members of the Board reviewed and discussed matters concerning AMS-IX's activities, business results, plans and strategy. Among other activities, the Board focused on reviewing the long-term annual plans and partner agreements as well offering advice on how to react to a changing peering and interconnection market.

In the first half of 2017 Mr. Job Witterman, CEO and co-founder, notified the Board of his intention to step down, and his resignation became effective at October 1. The CTO, CFO and CCO were respectively appointed as Board of Directors of the Company on August 1, to discharge the CEO responsibilities during the interim period necessary to evaluate the leadership structure, to recruit a new CEO and to define a strategy for AMS-IX.



MEETINGS AND ACTIVITIES OF THE BOARD

Number of Board Meetings	Date	In person/ Remote
111	15 & 16 March 2017	In person
112	30 May 2017	In person
113	24 August 2017	In person
114	27 September 2017	In person
115	26 October 2017	In person
116	29 November 2017	Remote
117	6 December 2017	In person

These exceptional circumstances lead to intensified teamwork within the Board, within the Management Team and more importantly accelerated collaboration between the Board and Management Team. In relation to this topic board resolutions were presented and approved in 4 additional board meetings, which are not listed in the table on previous page.

Attendance
Board members attended every Board meeting in 2017. All Board members made sufficient time available for AMS-IX-related matters. Board members had an increased workload imposed by exceptional circumstances.

Remuneration
Participation on the Board is voluntary. There is no remuneration or compensation for this service. Only travel and hotel expenses are covered by the Company.

Conclusion
The Board would like to thank the AMS-IX Association for the trust they have placed in the Company and its Management Team. The Board recognizes the unusual challenge of 2017 and takes this opportunity to express its deepest appreciation for the Management Team and its gratitude for each and every AMS-IX employee’s contribution.

Amsterdam, March 27th 2018

Mrs. S. LaPerrière
Chair Supervisory Board

Financial developments 2017

AMS-IX further developed in its home market Amsterdam and international expansion through existing Points of Presence (PoPs). Our Internet Exchange in the Caribbean delivers a positive cash flow, whilst Hong Kong is performing at break even. It has become clear that establishing a successful, cash flow generating Internet Exchange outside our home market, like in the USA, takes more time dependent on required level of investment by AMS-IX.

During 2017 net revenue and operational cash flow for AMS-IX USA Inc. have improved, and internet exchanges have shown increasing connected parties and traffic.

However, our again modest revenue growth in 2017 led to the believe we need multiple years more than expected, therefor we have taken a provision of EUR 1.5M on our deferred tax asset based on the principle of fair value and prudence.

AMS-IX Amsterdam has shown steady growth, and although the revenue did not meet expectations as projected in budget, a positive financial performance before tax is secured due to active monitoring of spend, savings related to implementation of DWDM equipment and renegotiating supplier contracts. As a result, a significant portion of required investments to extend the ecosystem are financed by positive cash flow generated in AMS-IX’s home market.

OVERVIEW OF ACTIVITIES

	2017	2016
Member count	405	442



These developments led to a consolidated financial profit before tax of EUR 1.1 million for the year 2017. This profit shows improvement compared to the profit before tax of EUR 0.2 million in 2016 and about the same as the budgeted profit before tax for 2017 of EUR 1.0 million. As mentioned stringent (cost) control, governance, forward looking capabilities and renegotiation of existing contracts have contributed to this result. The consolidated results after taxes ends up in a loss of EUR 1.5 million for the year 2017 (2016: EUR 0.1 million). Our equity ratio of 2017 has decreased to 36.7% (2016: 39.9%), which represents a healthy financial position.

Overall, the business continues to grow and remains adequately funded.

56
employees

AMS-IX number of employees increased from 51 to 56 (46.3 to 51.4 FTE).

Financial Statements

Gross revenue increased by EUR 1.3 million (+6,6%) to approximately EUR 21.3 million. External operating cost further decreased with EUR 0.7 million to EUR 3.9 million. This was mainly caused by cost savings for colocations and infrastructure and lower sales-related costs, such as discounts and provisioning related to service level agreements.

AMS-IX number of employees increased from 51 to 56 (46.3 to 51.4 FTE). Personnel cost increased overall by 10,7% to EUR 6.0 million. Next to increased FTEs, increase is mainly due to growing pension costs due to low interest rates, but also recruiting required staff is more expensive due to challenging labour market circumstance.

Although total investment in 2017 of EUR 6.5 million is 1.9 million lower than in 2016 (2016: 8.4 million EUR), the depreciation cost grew to a total of approximately EUR 7.1 million, an increase of EUR 0.9 million compared to 2016. Increase is driven by higher investments in the past, which are depreciated in 5 years.

Other operational costs decreased slightly from EUR 2.8 million in 2016 to EUR 2.6 million in 2017, mainly due to cost control measures, which are not impacting growth and stability of AMS-IX business.

Financial results have improved compared to 2016, interest of finance lease obligations is stable (2017: 0.5 million, 2016: 0.5 million) but exchange rate effects USD/EUR are significantly favourable compared to 2016 (2017: 0.0 million, 2016: 0.2 million negative).

Tax results are negatively impacted by recent changes in USA tax laws leading to a lower benefit when compensating losses from previous years with future profits, and also due to the decision not to value the deferred tax asset for AMS-IX Inc. activities in USA anymore, which led to 1.5 million euro additional tax losses.

Saskia Poelman
CHIEF FINANCIAL OFFICER



CONSOLIDATED BALANCE SHEET As at 31 December

Assets	2017	2016
Property, plant and equipment		
Equipment	€ 18,088,320	€ 18,765,976
Other assets	€ 553,043	€ 593,457
Financial Fixed Assets		
Deferred tax	€ 0	€ 1,821,780
Fixed Assets	€ 0	€ 1,821,780
Current Assets		
Accounts receivable	€ 267,530	€ 529,584
Taxes receivable	€ 222,325	€ 197,968
Other receivables and prepaid expenses	€ 598,032	€ 716,134
Cash and cash equivalents	€ 2,275,443	€ 1,463,721
Current Assets	€ 3,363,330	€ 2,907,407
Total Assets	€ 22,004,693	€ 24,088,620

EQUITY AND LIABILITIES

	2017	2016
Shareholder's equity	€ 8,082,024	€ 9,603,633
Provisions		
Other liabilities	€ 111,975	€ 119,125
Long-term liabilities		
Financial Lease liabilities	€ 5,818,208	€ 6,431,238
Non-current liabilities	€ 5,930,183	€ 6,550,363
Current liabilities		
Accounts payable	€ 899,296	€ 2,223,063
Taxes and social premiums	€ 1,049,276	€ 963,482
Other payables	€ 6,043,914	€ 4,748,079
Current liabilities	€ 7,992,486	€ 7,934,624
Total Equity and liabilities	€ 22,004,693	€ 24,088,620

CONSOLIDATED INCOME STATEMENT

	2017	2016
Revenues		
Gross revenues	€ 21,250,898	€ 19,934,187
External operating costs	€ -3,923,332	€ -4,613,799
Net revenues	€ 17,327,566	€ 15,320,388
Other operating costs		
Personnel costs	€ 6,017,432	€ 5,433,184
Depreciation property, plant and equipment	€ 7,136,939	€ 6,210,074
Other operational costs	€ 2,557,230	€ 2,783,101
Total other operating costs	€ 15,711,601	€ 14,426,359
Net operating income	€ 1,615,965	€ 894,029
Financial results	€ -525,222	€ -718,348
Result before taxes	€ 1,090,743	€ 175,681
Corporate income tax	€ -2,556,194	€ -323,402
Net result	€ -1,465,451	€ -147,721

Auditor's Report on the Summary of Accounts

The accompanying Summary of Accounts (2017 Developments, Financial Statements, Key Figures, Consolidated Cash Flow Summary, Consolidated Profit and Loss Account, Consolidated Balance Sheet), as presented on page 41 to page 44 of this report is taken from the financial statements for the year ending December 31st, 2017 of Amsterdam Internet Exchange B.V. in Amsterdam in accordance with Part 9 of Book 2 of the Dutch Civil Code. We have issued an unqualified independent auditor's report dated March 27, 2018 on these financial statements.

The Summary of Accounts does not contain all the disclosures required for full annual accounts according to Part 9 of Book 2 of the Dutch Civil Code. Therefore, reading the Summary of Accounts is not a substitute for reading the audited financial statements.

Management's Responsibility

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

Auditor's Responsibility

Our responsibility is to express an opinion on the Summary of Accounts based on our audit. We conducted our audit in accordance with applicable law, including the Standard 810 on 'Engagements to report on summary financial information'.

Opinion with Respect to the Summary of Accounts

In our opinion, the Summary of Accounts in all material aspects is consistent with the financial statements for the year ending December 31st, 2017 of Amsterdam Internet Exchange B.V. in Amsterdam, on which we have issued an unqualified independent auditor's report dated March 27, 2018.

Zaandam, May 31, 2018
Vork en van Prooijen B.V.

C. van Prooijen RA

Marketing & Communications

The past year was another busy one, with several highlights. One of the biggest highlight was the opening of AMS-IX India in February. This was our first exchange in South-Asia. Other highlights were the two POPs added in the Amsterdam metro area, our brand consolidation and much more...

We are always looking for partners to work with in order to grow our business. Our new partnership with PacketFabric in the USA, fully in line with our aim to develop new services and approaches, was covered widely.

National coverage about mobile peering

In June 2017, we saw an 82 Gbps (+193%) traffic peak on the GRX. This was the result of new EU regulations that led to abolishment of mobile roaming charges.

As a result, travellers and holidaymakers began consuming considerably more mobile bandwidth. Several journalists covering this subject contacted us for clarification and background information and CTO Henk Steenman appeared on national TV.

The AMS-IX GRX Peering Exchange is the main mobile peering service worldwide, providing scalable peering for interconnection of roaming networks.

Back to one colour

One important change in the area of brand architecture last year was the harmonization of sub-brands. Previously, different logos and colors were used in different regions. However, we decided that the AMS-IX logo was to become the same worldwide. This brand consolidation will be extended to our websites – previously, each exchange had a separate section. We're currently working on a new site that will go live in 2018, on which all exchanges are consistently represented within a single framework.

Collaboration and events

Collaboration remains one of our core values and we organized events together with various partners; various partners to further reinforce the ecosystem and show the added value of AMS-IX: together with RETN, together with RETN, we organized an event in Krakow. With Evoswitch, we hosted a social gathering before iCU Amsterdam, and we did the same with BICS at Telecom Asia, and with HGC (formerly Hutchison) in Hong Kong.

As in previous years, organizing events was a vital part of marketing, helping maintain and develop new relationships within the local and global peering community.

The seventh MORE-IP event was held in Amsterdam, attracting more than 200 visitors during two days. We also organized the Global Peering Forum (GPF) and European Peering Forum (EPF) and were involved in several other community events such as RIPE, APRICOT and the first ever Peering Asia Forum held in Japan.

We will continue to claim thought leadership in key areas and keep communicating directly through our communication channels, such as social media and blogs. As a new feature, we will be adding vlogs to create a better understanding of certain subjects. Furthermore, we will continue to support AMS-IX new strategy with marketing and communications activities.

“The Marketing and Communications department’s primary focus for 2018 is to position AMS-IX as the world’s leading Internet Exchange and further endorse the AMS-IX values of reliable, innovative, independent and collaborative.”

Growing footprint, greater flexibility



The trend towards making interconnection easier that we saw in 2017 is set to continue. AMS-IX is playing an active part in this, helping partners offer flexible services to their customers.

Introducing the 3rd party transport concept

In 2017 we interconnected the AMS-IX Internet Exchanges in the Bay Area, Chicago, and New York to PacketFabric's network, enabling access to AMS-IX from 150 additional locations. This gives us a far broader US footprint without investing in additional infrastructure.

PacketFabric customers simply request a connection to AMS-IX through the PacketFabric portal and can take advantage of all of our internet exchange services. This is a great way to accelerate growth and expand geographical reach, and an excellent test case for a similar project with DCSpine in the Netherlands.

PacketFabric didn't need to develop a new product from scratch, as the AMS-IX virtual interconnect served their purpose nicely.

“We aim to further improve automation of service provisioning, making it easier to order and use any combination of our services.”

This is a great example of our 'third party transport provider' concept: third parties can act as facilitators without having to set up dedicated service and billing activities. AMS-IX has a contract with the end-user and invoices them directly. These end-users can also become AMS-IX members, unlike 'traditional' reseller customers.

2017 also saw the start of AMS-IX India, where implementation was relatively smooth. Provisioning and setting up contracts in the Mumbai region is not always straightforward, but fortunately our local partner Sify is experienced in dealing with the challenges that everyone in the area faces.

Future-proofing the network

The latest switch models offer more features and allow easier automation, which is becoming increasingly important.

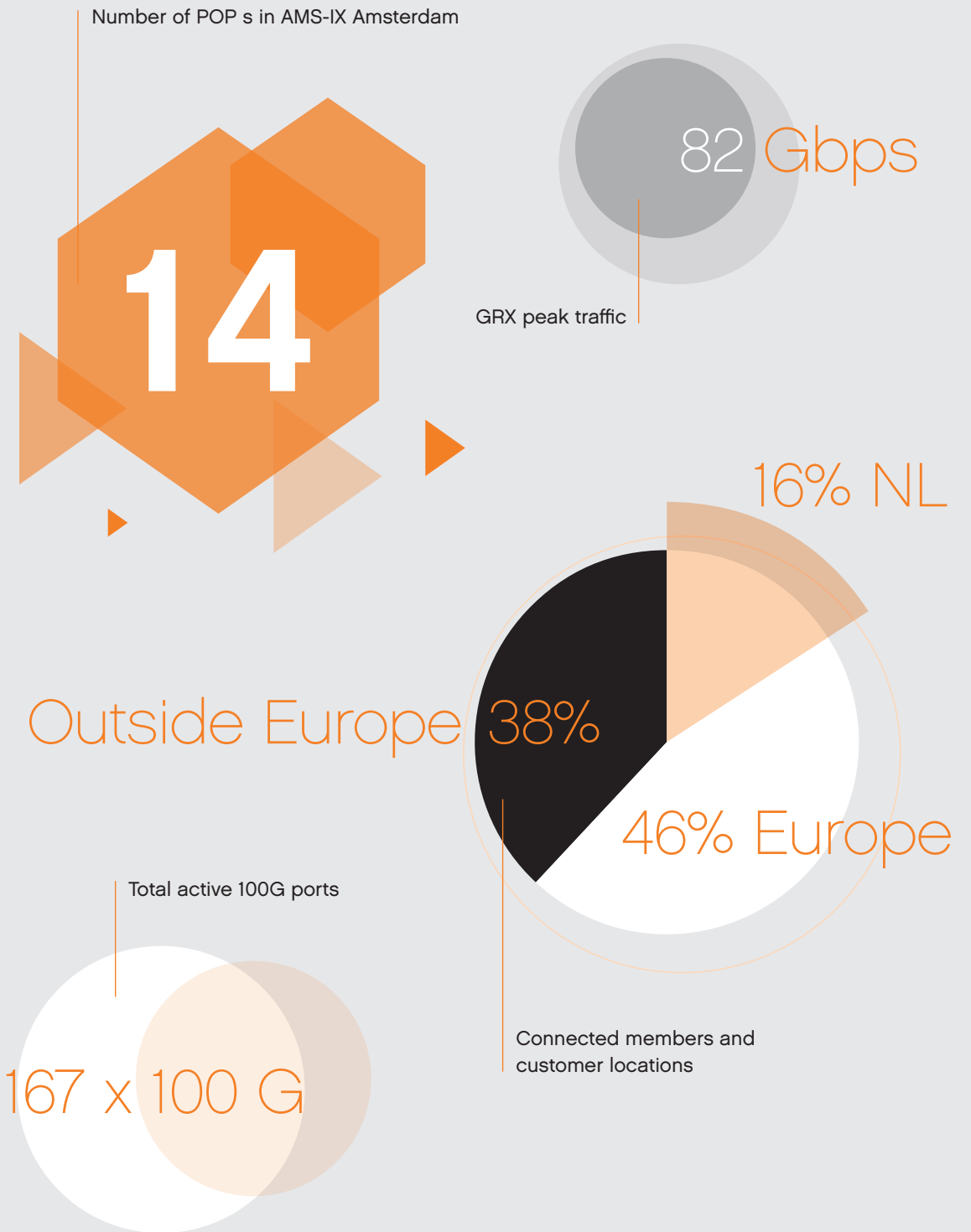
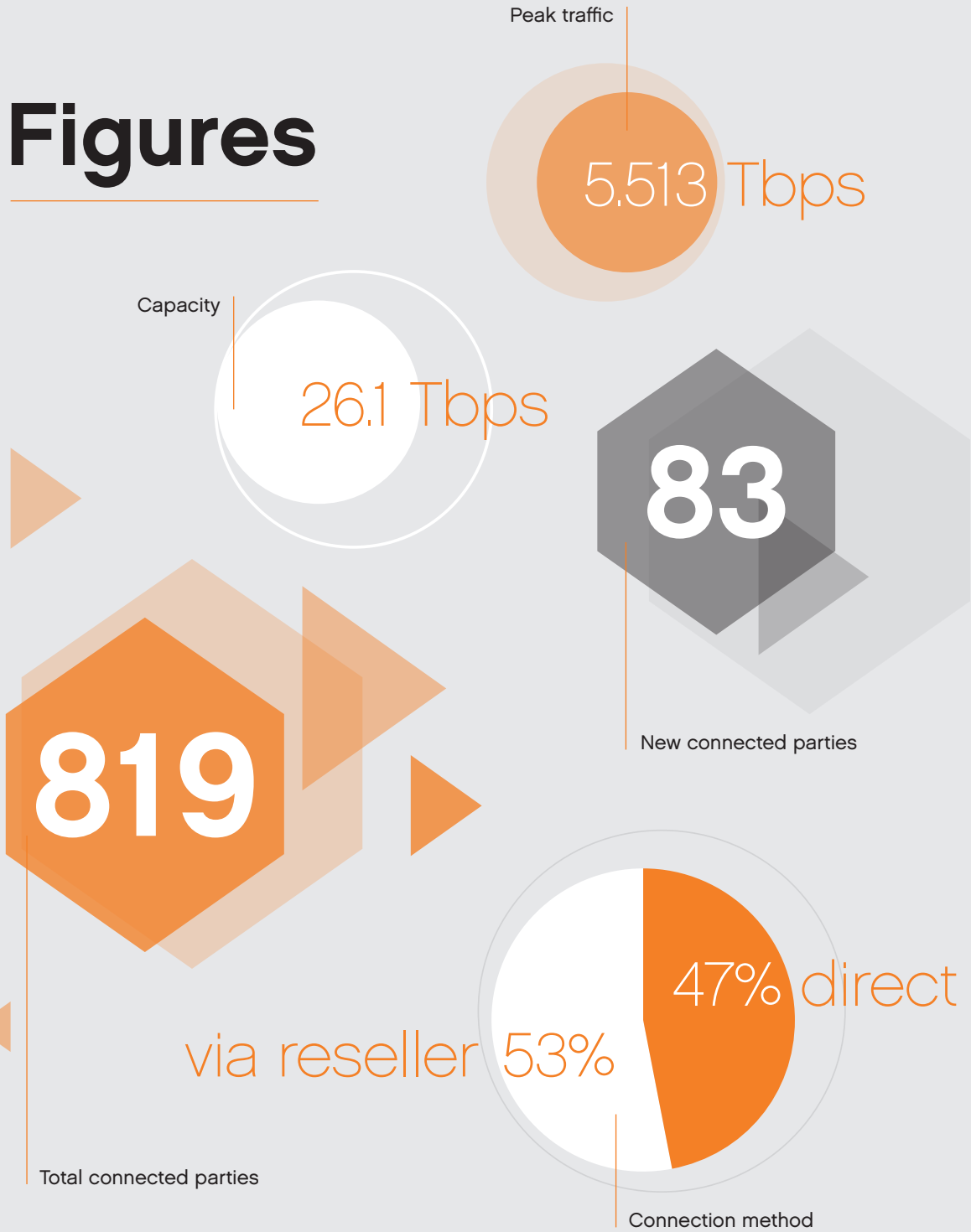
This is helping us develop a marketplace where we can bring connected parties together.

We aim to further improve automation of service provisioning, making it easier to order and use any combination of our services. For example, a company might want Cloud interconnectivity or a closed group without peering services and we're striving to cater to these requirements in a fast, flexible, and dynamic way.

Steven Bakker
PLATFORM & SOLUTIONS ARCHITECT



Figures



Looking ahead: a new strategy for 2018-2022

50+ interviews

We have conducted more than 50+ interviews to investigate how we can best leverage new developments.

We are seeing marked changes in the industry, so we are increasingly engaging in dialogues with clients and markets. Requirements and customers are changing. Entire industries are migrating online. Companies developing specific services, such as video-conferencing, are seeking to work directly with us, our partners and our customers, as peering becomes more interwoven with business. This brings new opportunities.

Companies are also moving through the value chain. Partners and Data Centres are changing service portfolios horizontally and vertically as content and access companies expand through mergers and acquisitions.

Our infrastructure streams vast amounts of content between these parties. We have to determine how to best accommodate, add value for existing and future internet ecosystems and make most of these developments.

With this in mind, we have examined market developments and conducted 50+ interviews with clients, partners, industry leaders and other stakeholders, including people involved in blockchain, energy grids, fintech... We've studied these areas, as well as technical developments and long-term innovation such as quantum computing.



Which developments can we expect and what will they mean for us?

AMS-IX, one of the founders of global interconnectivity for peering, continues to be successful. We want to remain at the heart of the internet and remain one of the largest, independent players at its core, providing the most valued interconnection ecosystem. We will achieve this by offering a unique combination of players to interconnect with, as well as the

option to connect with Value Add Services (VAS) such as Cloud and Security Services. Partnerships will remain high on the agenda.

Bigger clients connected with multiple large ports are primarily interested in efficiency. Small to mid-sized enterprises (SMEs) and firms with small internet departments, however, have a 'long tail'.

Their aim is to provide more services over the AMS-IX connection they have invested in. Our goal is to enhance efficiency for all customers, providing excellent connectivity with the latest technologies and value-adding partners (including AMS-IX customers) that offer unique services, whilst staying true to our core values. Our rich ecosystem plays an essential part in this, offering access to a wide variety of connected customers and members, bringing a large number of networks and Value Added Services (VAS).

Colofon

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2017

annual report

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