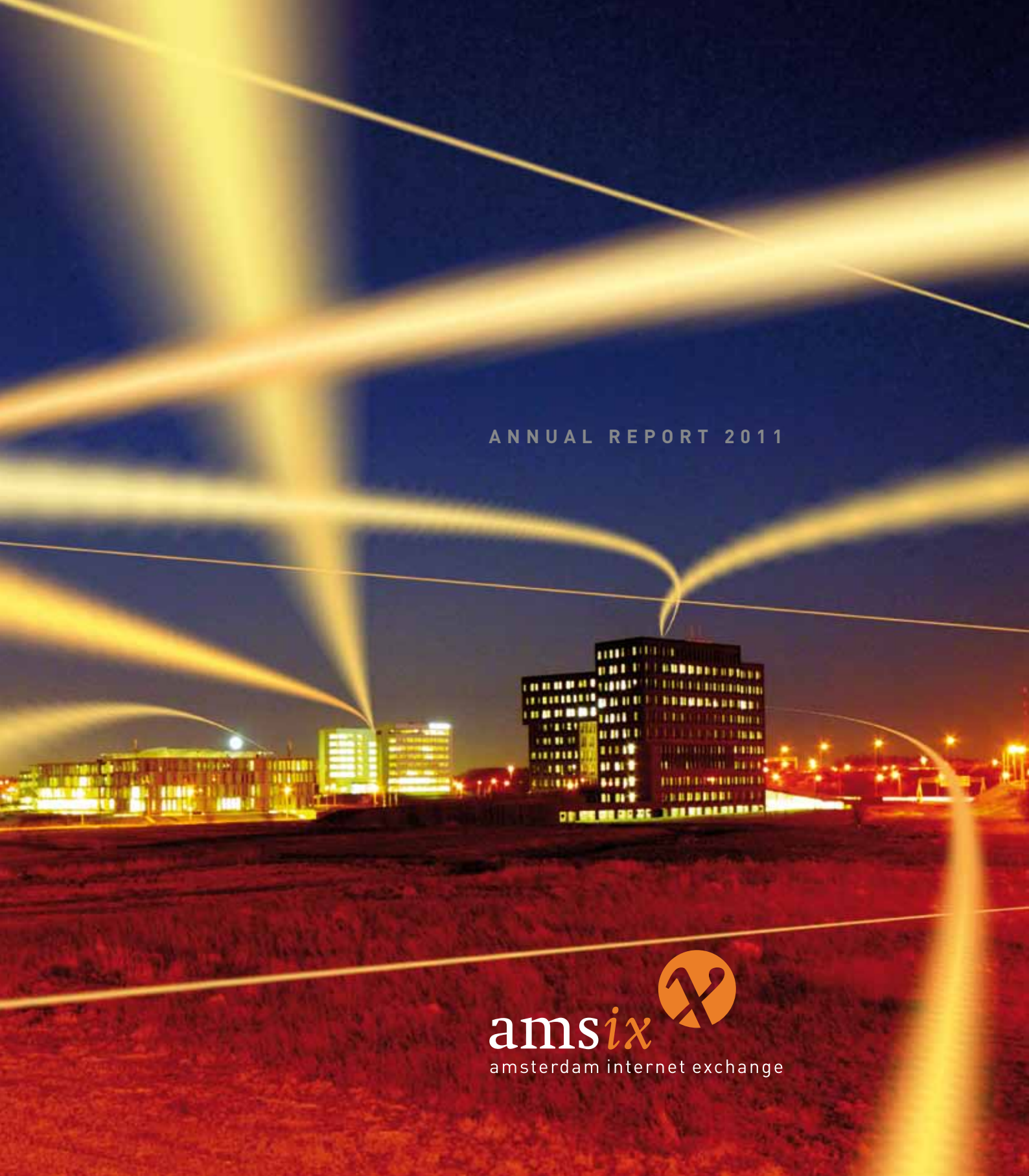
ANNUAL REPORT 2011
amsix
amsterdam internet exchange

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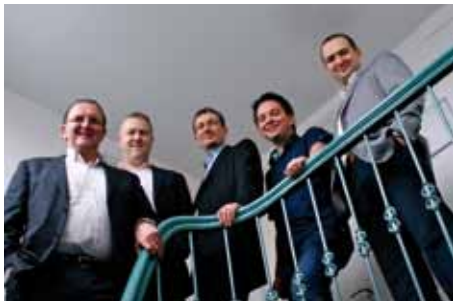
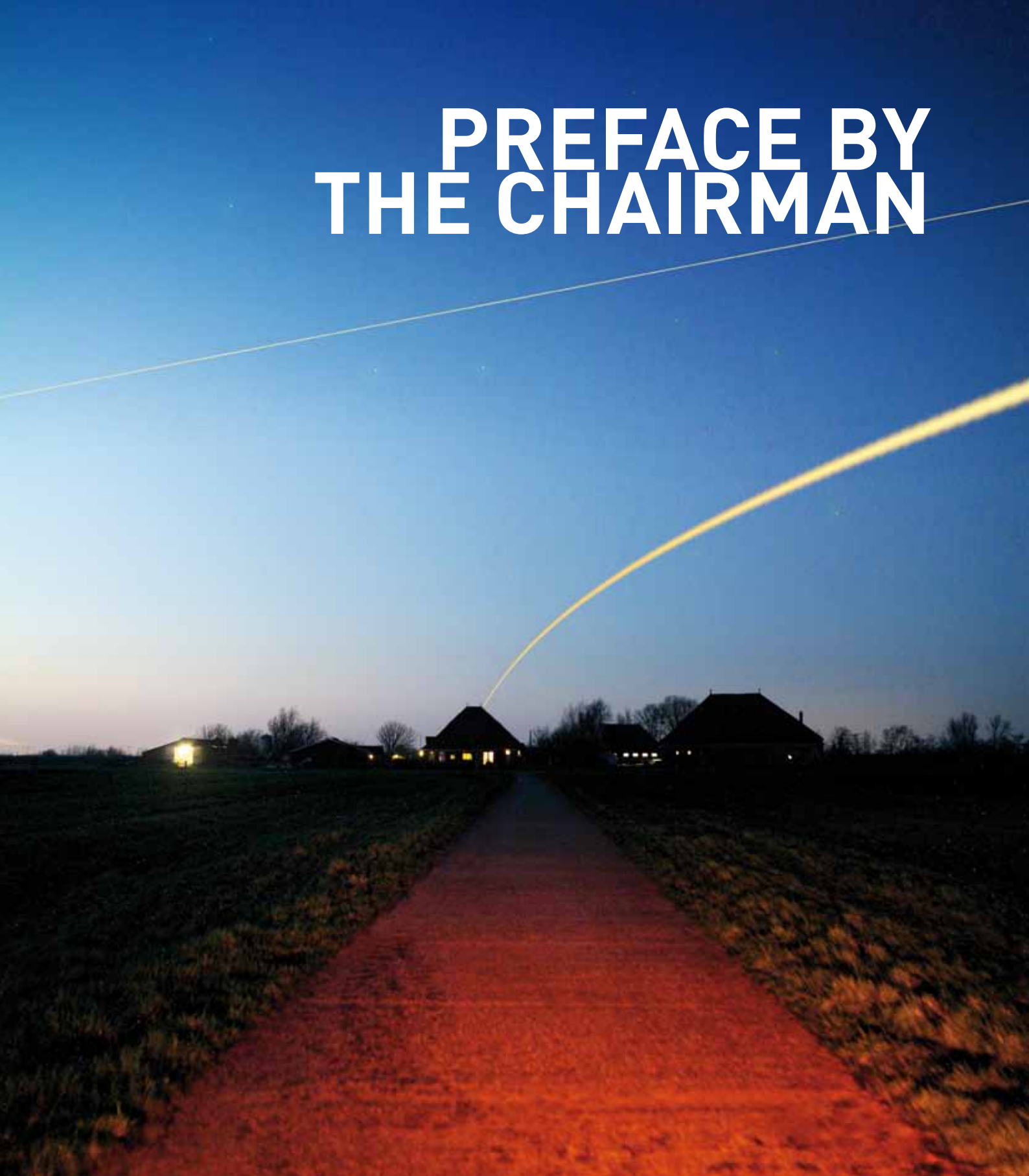


PREFACE BY THE CHAIRMAN



OWNED BY THE ASSOCIATION AMS-IX IS STEERED AND GUIDED BY ITS MEMBERS. IN NO OTHER YEAR IN THE HISTORY OF AMS-IX THE INTERNET EXCHANGE WAS THIS PRODUCTIVE AND VISIBLE AS IN 2011.

In 2011 AMS-IX launched the first industry standard SLA on a peering platform, a logical succeeding of two member surveys in which up to 60% of the participating members expressed their interest. Also members voted for the SLA in the General Meeting.

Another milestone was the members' decision to support extension of the existing reseller model with Reseller Plus. Reseller Plus means building a local IX in a regional hub location where the reseller is situated. So it keeps local traffic local and does not backhaul traffic via the resellers network to Amsterdam that should be kept in the region. Furthermore it not just creates value for the AMS-IX members by adding new networks but also strengthens the Internet in the region. The first example of such a partnership was with Hutchinson Global Communications (HGC) in Hong Kong, planned for 2012.

An additional productive example is the result of the member decision to allow customers and not just members to connect to the platform. This enabled an unprecedented growth of 98 new networks in 2011, where roughly 30% of them were customers. Also more evolutionary than revolutionary innovations happened in 2011. The 100GE interface finally reached production stage for some of the router vendors and was immediately ordered by one of the resellers. Plus the Inter-IPX platform - the GPRS roaming successor - is now live, and the first mobile carrier providers are already connected.

Looking in retrospective to 2011, it is clear that AMS-IX management fulfilled their promise of "MORE-IP" not just by adding new products, new technologies and an even higher member growth than ever, but also made the General Meeting, a better attended and more significant event for the peering community. The Board wants to thank the whole AMS-IX team for their dedication and hard work.

Looking into the future, we will follow the current successful course by continuously listening to the feedback of the members as to how AMS-IX can add value for them. With the expansion to four new sites in 2012, there will be even more choices to connect to the AMS-IX platform. And we will see how AMS-IX Hong Kong will evolve in the regional eco-system. Also member requested technical features like for example Jumbo Frames and others are under discussion for the roadmap.

On behalf of the Executive Board of the AMS-IX Association,

Christian Kaufmann
Chairman

Background: What is an Internet Exchange?

AS A NETWORK OF NETWORKS THE INTERNET BUILDS ONTO THE RELIABILITY OF THESE NETWORKS INTERCONNECTION. THIS IS WHERE INTERNET EXCHANGES COME INTO THE PICTURE.

At an Internet Exchange, the networks of Internet Service Providers, telecommunications carriers, content providers, webhosters and the like, meet to exchange IP traffic with one another.

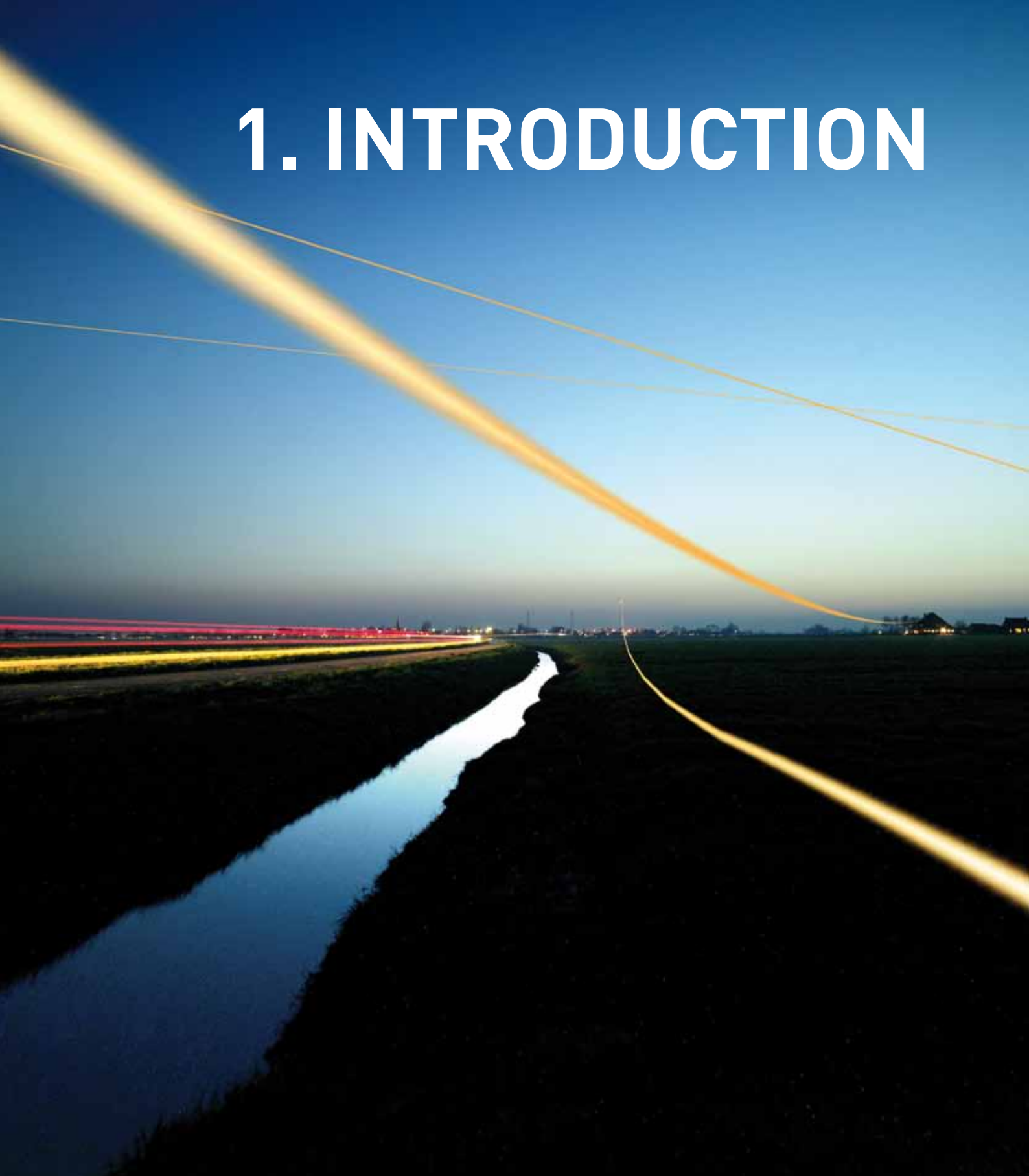
Exchange points offer a shared infrastructure for these networks to interconnect on an individual basis with all the other networks. This exchanging of national and/or international IP traffic is generally known as ´peering´. AMS-IX is one of the world's largest Internet exchange points in number of connected parties.

Peering is mostly done without an exchange of money and based on a balanced situation where parties see a mutual benefit.

Every member at AMS-IX is in the position to peer with any of the other connected parties although they are not obliged to: each member might have a different peering policy, and this policy may differ depending on the party that is negotiating with them. Peering is mostly done without an exchange of money and based on a balanced situation where parties see a mutual benefit.

This mutual benefit is generally established by the traffic and routes sent and received, so unless parties have an open peering policy, they will peer with parties of about the same size.

1. INTRODUCTION



MORE IP IS THE THEME OF THE 2011 ANNUAL REPORT. JUST LIKE IT WAS AN IMPORTANT THEME THROUGHOUT THE WHOLE YEAR. THIS WAS NOT WITHOUT REASON.

More IP is also the name of the new event AMS-IX organized in June around its general meeting of members. A well-received industry event with a broad perspective on all relevant developments in Internet infrastructure. The theme arose from the many new developments that took place at AMS-IX in 2011. Several new services were launched. Despite their different perspectives all aiming towards 'more IP': 100GE - more IP traffic, Inter-IPX - more mobile IP, SLA - higher value IP.

AMS-IX is known in the industry as an innovator. With the new services AMS-IX confirmed this image again, and thus bringing new innovations and driving market developments. Another good example is the Reseller program that we introduced in 2010 and is now being copied throughout the exchange community. The program drives connected network growth to new heights. Almost 100 new parties joined in 2011, many through the program.

More IP is also driven by port and capacity growth: 200 new dedicated ports and virtual links were implemented over 2011 with a total additional capacity of 1.4 Terabits per second (Tbps), bringing the overall connected capacity to 5.6 Tbps on December 31st.

The connected parties and associated port growth naturally drives revenue growth for AMS-IX. Because of AMS-IXs governance structure these increased economies of scale allow us to decrease our 'cost per bit', and therefore decrease fees while offering a higher value, so More IP against lower costs.

In short we can say that More IP was a successful theme and we will therefore continue to organize the event for many more years to come. AMS-IX whishes all its members and customers and the industry at large More IP!

Cara Mascini
Chief Marketing Officer

AMS-IX IN THE NEWS

THE WAY THE OUTSIDE WORLD LOOKS AT AMS-IX IS MOSTLY INFLUENCED BY INFORMATION FROM THE MEDIA.

Therefore we find it valuable to focus on how we appeared in here. So when looking at the 2011 news items about AMS-IX two themes stand out: innovation and an increasing growth compared to 2010. Four stories can be distinguished within the first theme:

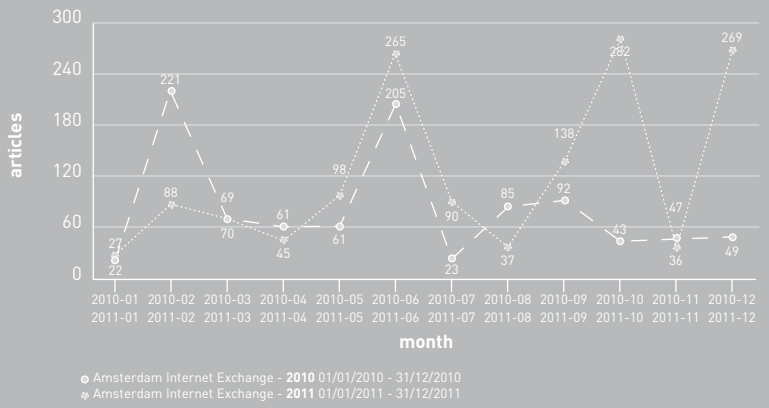
- AMS-IX being the first Internet exchange to offer an optional Service Level Agreement (SLA)
- AMS-IX becoming the first neutral organization to introduce the new generation of mobile connection services with Inter IPX to IPX providers who make use of a SLA
- The introduction of 100GE ports
- The deployment of the largest 100Gbps Ethernet connection together with CERN and SURFnet

In particular the last two items got a lot of attention in the media. IT- and telecom magazines around the world as well as national newspapers in the Netherlands informed their public about these new developments. The highlights around AMS-IX' growth in 2011 are:

- The 400th connection with AMS-IX
- The 100th new connection within one year
- The new partnership between the Internet exchange, partner IX Reach and UK Grid

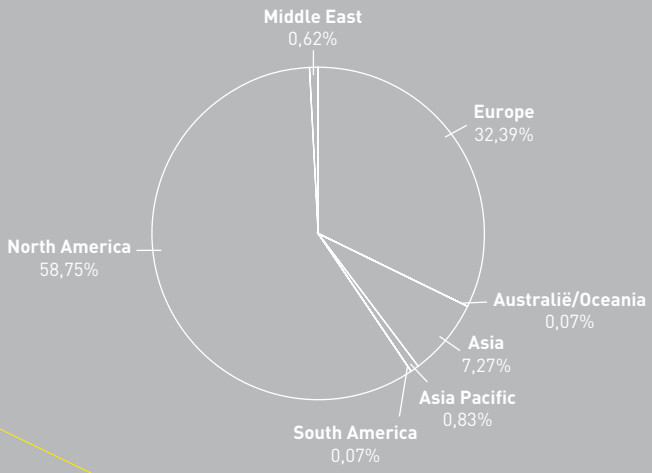
Growth not only was to be seen in the number of connections and members. The same goes for the number of news articles about AMS-IX. Compared to 2010 the number increased from 979 articles to 1445 articles in 2011, which is an increase of almost 50 percent.

COMPARISON AMS-IX NEWS 2010-2011



Finally most articles were published in North America. An explanation may be found in the presence of a large part of our technical suppliers in the United States. Therefore, media in that country may be more willing to (re)publish news about AMS-IX. In Europe also a large amount of articles appeared in the media. Because of AMS-IX' location in Amsterdam this is not surprising.

NEWS HITS PER CONTINENT IN 2011



Pauline Hartsuiker
PR and Communications

2. GENERAL

IN THE COURSE OF THE AMS-IX HISTORY, NOW ALMOST TWO DECADES LONG, WE HAVE BECOME MORE AND MORE CONVINCED THAT A LARGE PART OF THE SUCCESS OF THE EXCHANGE IS DUE TO ITS NEUTRALITY STRUCTURE.

The built-in neutrality and independence are important building blocks for the trust we receive from our customers, which at the same time is very important for the collaborative environment that we are in.

Our technical reputation for high quality of service and innovative platform development is another pillar supporting our leading market position. Other factors such as the open attitude, pragmatism and Dutch sense of trade as well as the dense infrastructure and liberal regulatory situation in the country also add to our success.

To decide which of these adds most value is not easy. Each of the points adds to the total picture.

ORGANIZATION

AMS-IX' core-business is the unlimited exchange of Internet traffic. This comes down to continuous innovation, scaling for growth and sustained increase in value for all stakeholders. To be able to do so long term continuity has to be built into the organization.

Continuity is part of all of AMS-IX' organizational elements. It's chosen structure provides flexibility and autonomy of operation for the company as well, It also includes enough influence for the AMS-IX members. It is an organizational model that is being copied throughout the world by new and existing Internet exchanges, and even by similar not-for-profit organizations in other industries. AMS-IX is happy to share its experiences in this regard and has done so on a regular basis.

Governance Structure

The current official legal entities of AMS-IX are the Amsterdam Internet Exchange Association and the limited corporation Amsterdam Internet Exchange B.V. Both are commonly referred to by the acronym AMS-IX.

Both legal entities are obliged to have two formal meetings per year for their stakeholders, namely the General Assembly Meeting of the Association and the Shareholders Meeting of the Corporation. To keep things straightforward AMS-IX combines those meetings into one. The same principle applies to the Executive Board of the Association and the Supervisory Board of the Corporation. They consist of the same elected people and are simply called the Board. The management of the Corporation reports to the Board on a quarterly basis. The board reports to the assembly/shareholders twice a year in the General Meeting, also called GM for short.

MORE BANDWIDTH

INTRODUCTION OF 100GE AT AMS-IX

AMS-IX ALWAYS CRAVES FOR MORE BANDWIDTH. IN THE BEGINNING OF 2011 THE LARGEST BACKBONE LINK IN THE PLATFORM CONSISTED OF TWELVE 10GE PORTS.

On the customer side demand for higher capacity connections also existed, with several customers using eight times 10GE in an aggregated link. Realizing the need for more capacity would continue to grow, AMS-IX amongst others, has been actively pushing the development of standards and products for speeds above 10GE. Within the IEEE standards body this has lead to the development of the 802.1ba standard for 40 and 100 Gigabit Ethernet. In addition, AMS-IX took part in the 10x10 MSA initiative for development of low-cost 100GE solutions.

In 2011 vendors started releasing products based on two 100GE standards. As these products started to appear on the market we began to conduct extensive field trials. We conducted these trials with two different types of solutions. The first type is 100GE-LR4, which is an interface based on the 802.1ba standard. It divides the 100GE stream into four 25Gbit signals, which are sent through a single fiber over a maximum distance of 10 kilometers. The second interface type we used is 100GE 10x10-2km, which uses ten 10Gbit signals per fiber over a maximum of 2 kilometers.

Together we created a 1650km 100GE link between Amsterdam and Geneva; the longest 100GE circuit in the world at that time.

The first test we performed was a customer trial together with Limelight Networks. It started in April, and lasted several months. During this trial we went through several hardware and software revisions, helping our vendor to fine-tune its implementation for production use. In

addition we did a large scale deployment test at Brocade's lab in San Jose, where we ran tests with bundles of up to ten 100GE connections, and installations with up to 126 10GE ports and 16 100GE ports in a single chassis. Also worthwhile mentioning was a proof of concept that we set up in August together with SURFnet, CERN, Ciena and Brocade. Together we created a 1650km 100GE link between Amsterdam and Geneva; the longest 100GE circuit in the world at that time.

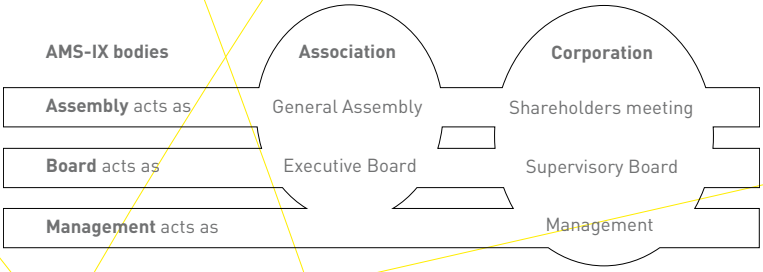
After the successful completion of all the tests we were ready to offer the new Ethernet speed as a production service to our members in the last quarter of 2011, making us the first Internet Exchange in the world to do so. We offer ports with 100GE-LR4 interfaces as well as with 100GE 10x10-2km interfaces.

In the third quarter of 2011 we started to work on an affordable solution for 100GE metro area connections. Standards-based products for running 100GE on distances between 10km and 40km are not expected to become available until late 2012. Still, in order to be able to deploy 100GE in our backbone before that time, we are researching techniques to amplify existing products to cover these distances. By the end of 2011 we identified several potential solutions for this.

For 2012 we expect to connect several 100GE customers, and use the technology to connect new AMS-IX locations to the core of the platform.

Martin Pels
Senior NOC Engineer

AMS-IX ORGANISATION STRUCTURE

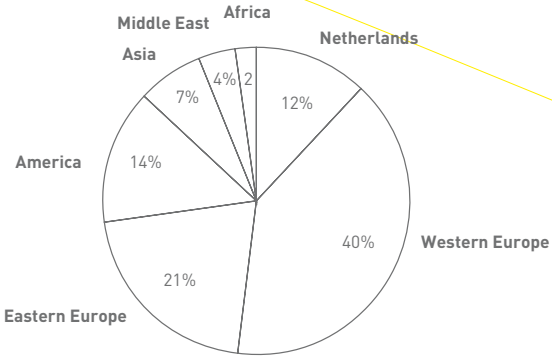


AMS-IX ASSOCIATION

In 2011 49 new members joined the Association. For the first year in the history of AMS-IX also non-member customers were allowed to connect to the exchange and 32 new customers were added. The combined number of newly connected networks is much higher than in previous years, a 44% gross annual growth. A sizable increase compared to the previous linear growth line that we have seen since the start of the exchange. The total number of connected parties (AS count) at the end of the year was 473.

Equal to previous years the majority of new parties for 2011 originate from Europe: 72%. The new additions from our home-country are decreasing, only 12 % of the newly connected parties is from the Netherlands. In contrast to the last 2 years the percentage of new parties from Western Europe has increased over Eastern Europe. The latter is a result of the Reseller program that brought mainly Western European parties.

NEW MEMBER ORIGIN



On a country basis most members came from Germany, Italy, the US and Russia. The highest growth region was Asia where the numbers doubled compared to the years before.

The Board

Because members have the possibility to influence the direction of the organization and the decision making process with regards to the companies' strategy and operations it is important that the Board is a well-balanced representation of the membership. The Board holds 5 seats and the officials are elected from representatives from the member organizations. There is a rolling election scheme. The terms in seat are 3 years with one option for re-election.

In 2011 there were no changes to the board.

BOARD IN 2011

Board Member	Organization	Exec member since
Christian Kaufmann	Akamai	21 Nov 2007 (Chairman)
Reinart Wellinkvoorde	Vodafone	26 Nov 2008 (Vice chair/Secretary)
Remco Frijling	Level3 communications	24 Nov 2010 (Treasurer)
Arif Polat	Turk Telekom	24 Nov 2010
Alex Bik	BIT	24 Nov 2010

The composition of the current Board reflects a mix of a large content distribution network, an international carrier, a regional telecoms company, a mobile operator and a Dutch business ISP.

General Meeting

The General Meetings (GM) are the official General Assembly Meetings of the Association as well as Shareholder Meetings of the Limited Corporation. There are a number of compulsory topics for every meeting, however the meetings also provide a platform for the visiting members to meet one another and socialize.

It is not mandatory for members to physically attend the meeting in order to follow the presentations and discussions to vote. The meetings are broadcasted over the Internet by video (webcast) and

ATRATO SUCCESS FACTOR FOR AMS-IX

THE LARGE GROWTH IN NEW PARTIES CONNECTED TO AMS-IX IN 2011 IS PARTLY DUE TO THE EFFORTS OF OUR RESELLERS.

One particular reseller stands out: Atrato IP Networks. This AMS-IX' member managed to bring in 20 new connected parties, which makes it the top scoring reseller of 2011. Among the connections are Internet service providers (ISPs) and hosting companies. Founded in 2005, Atrato can still be seen as a young company. It is a leading provider of high quality IP transit, carrier services, remote peering and managed services in both Europe and the United States. By the end of 2008 Atrato found its way to AMS-IX and became a member of the Exchange. Within less than two years it joined the AMS-IX Reseller program, which has given Atrato the possibility to sell AMS-IX' ports to third parties.

Connecting new parties is not the only activity of Atrato in relation to AMS-IX during 2011. Together with TelecityGroup, provider of carrier-neutral data centres, the parties tested extensively 100GE port connections with their customers. By working on this innovation the three parties have been preparing for future traffic growth as well as a higher demand for capacity. By the release of this annual report we can say the testing of the 100GE port connections was a big success. Besides AMS-IX being the first Internet Exchange worldwide to introduce 100GE ports, Atrato became the first AMS-IX member, in January 2012, to use this port.

For the rest of 2012 we expect a continuation of our successful cooperation with Atrato, because judging by the typical Dutch saying 'A good beginning is half the job' we can expect no less.

Atrato ip Networks

we offer an online voting facility as well. On top of the webcast and voting functionality there is a chat channel open during the meeting to answer questions in real-time from remote attendees. All in all, international members can choose to follow most meetings remotely and still have a satisfactory meeting experience.

On the 9th of June 2011 the 32nd General Meeting was held during the More IP event in De Rode Hoed along the Keizersgracht in Amsterdam. Just like former spring meetings, the Annual Accounts of the Association for the previous year were presented, and approved. The company Annual Accounts are always presented for information as they hold all assets, income, depreciations and costs.

Separately the Long Term Commercial Strategy 2011-2014, a four year outlook plan, was approved by the GM. The LTCS document describes in detail the plans for the direction of the company, especially in the commercial sense, as this needs approval by direction of the articles of association. By discussing, giving feedback and ultimately agreeing upon to this document the members exercise control over the course of AMS-IX. The main business strategy set out in the plan is aimed at continuing the leadership position and increasing the value of the exchange for its members by among others attracting new quality peers to the exchange.

A special topic on the agenda was the proposal for an extension of the Reseller program called Reseller Plus. More on this is to be found in the commercial chapter.

The second General Meeting of 2011 (GM33) was held on November 16th at the NH Barbizon Palace in Amsterdam. On the agenda were the Annual Operating Plan and Budget for 2012 (AOPB2012) and the first Reseller Plus implementation. Normally there are also Board elections in November, however no seats were up this time.

The AOPB is a tactical one-year plan approved beforehand by the Board and presented to the members in the General Meeting for information. The plan sets out in detail what the expected developments are for 2012 concerning the platform with regards to new equipment, sites, etcetera as well as commercial activities such as forecasts, what events will be organized and attended. In the chapter Outlook 2012 and Beyond some of these details can be found.

AMS-IX CORPORATION

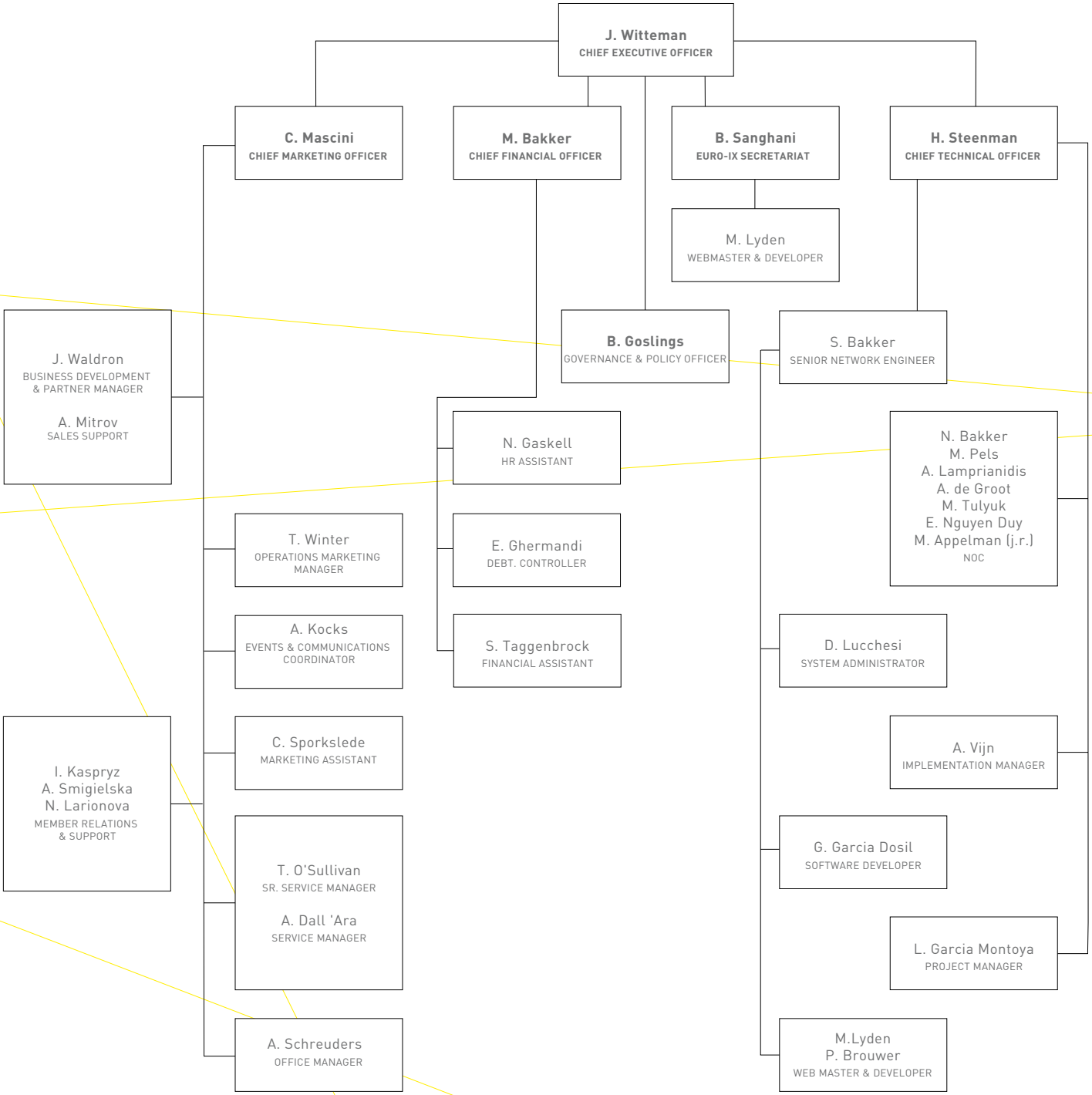
The AMS-IX Company has grown with a percentage of 30% in new employees during 2011. This is quite a growth, but in line with the growth in business. The company, a limited corporation or in Dutch a Besloten Vennootschap (BV), is headed by CEO Job Witteman. Mr. Witteman has been CEO of the company since its start in 2001. The company by now has three main operating divisions, Technology, Commercial and Financial as well as general staff regarding Quality Assurance, Regulatory, Office support and the facilitation of Euro-IX.

CTO Henk Steenman is head of the technology team. He celebrated his 10 years anniversary at the company in 2011 and has gathered a team of highly skilled professionals around him. The team is split in two main departments, the network engineering and the system teams. The Network Operations Center, part of network engineering, operates the exchange platform around the clock. Traffic patterns and growth are analyzed continuously and new developments regarding layer 2 and 3 and optical networking are researched. The team is well known for its engineering competence throughout the community and cooperates and shares their knowledge willingly at the several network operators group meetings around the world. Web- and system development is headed by Steven Bakker, who with a team of both developers and soft- and hardware engineers delivers a state of the art support environment.

Additionally to engineering are the project management and platform implementation professionals.

Cara Mascini is the Chief Marketing Officer and runs all commercial disciplines including Sales & Business Development, PR & Communications, Product Development & Marketing, Customer Service/Member Relations and Service Management. All commercial teams were extended over the course of 2011 to reflect the growing customer base. The emphasis that is put on customer service and service management, the success of the reseller program and new business objectives.

AMS-IX' Chief Financial Officer is Marco Bakker, who manages the Finance and HR departments. A new HR officer was hired, Nicolette Gaskell, to manage the increased load of human resource management tasks. The team further consists of financial assistants handling debit control, invoicing and accounts receivables.


J. Witteman
CHIEF EXECUTIVE OFFICER
C. Mascini
CHIEF MARKETING OFFICER
M. Bakker
CHIEF FINANCIAL OFFICER
B. Sanghani
EURO-IX SECRETARIAT
H. Steenman
CHIEF TECHNICAL OFFICER
M. Lyden
WEBMASTER & DEVELOPER
J. Waldron
BUSINESS DEVELOPMENT & PARTNER MANAGER
A. Mitrov
SALES SUPPORT
B. Goslings
GOVERNANCE & POLICY OFFICER
S. Bakker
SENIOR NETWORK ENGINEER
N. Gaskell
HR ASSISTANT
N. Bakker
M. Pels
A. Lamprianidis
A. de Groot
M. Tulyuk
E. Nguyen Duy
M. Appelman (j.r.)
NOC
T. Winter
OPERATIONS MARKETING MANAGER
E. Ghermandi
DEBT. CONTROLLER
A. Kocks
EVENTS & COMMUNICATIONS COORDINATOR
S. Taggenbrock
FINANCIAL ASSISTANT
D. Lucchesi
SYSTEM ADMINISTRATOR
I. Kaspryz
A. Smigielska
N. Larionova
MEMBER RELATIONS & SUPPORT
C. Sporkslede
MARKETING ASSISTANT
A. Vijn
IMPLEMENTATION MANAGER
T. O'Sullivan
SR. SERVICE MANAGER
A. Dall 'Ara
SERVICE MANAGER
G. Garcia Dosil
SOFTWARE DEVELOPER
L. Garcia Montoya
PROJECT MANAGER
A. Schreuders
OFFICE MANAGER
M.Lyden
P. Brouwer
WEB MASTER & DEVELOPER

EURO-IX: THE STORY CONTINUES

AS EURO-IX MOVES INTO ITS 11TH YEAR OF OPERATION WE SEE THAT THE EURO-IX AFFILIATION HAS GROWN FROM JUST A FEW EUROPEAN IXPs IN 2001 TO OVER 60 AFFILIATED IXPs FROM ALL OVER THE WORLD TODAY.

Since its start Euro-IX has been collecting data not only from its members but also from other non-affiliated IXPs around the world. Not without reason, because with this data we have been able to get a better view of what the future might hold for the IXP community globally.

During 2011 Euro-IX added more functionalities to its website, which are now beneficial not only to the IXP community but also to ISPs. The tools include an ASN Filter, which allows you to see which ASNs are present at which Internet Exchanges, and an Euro-IX ASN Database. With this tool you can see the number of ASNs present in different parts of the world and even search an ASN so you can see in which IXPs it is present. If you on the other hand want to see which are the newest ASNs added to the Euro-IX database check out the 'ASN newest' tool. Finally the IPX Matrix allows you to see what the EURO-IX IPX members offer at the Internet Exchange points, whether this is IPv6 peering or Jumbo Frames Support.

Not only the EURO-IX website has undergone a transformation in 2011, the year also brought a change to the organization itself. After being with the association right from its very start and building it into the organization it is today, Serge Radovcic accepted a new challenge at RIPE NCC. Therefore we would like to thank Serge for his time, energy and good work over the previous years. As his successor I am looking forward to continue the Euro-IX story.

Bijal Sanghani
Euro-IX Secretary

CONTRIBUTION TO SOCIETY

AMS-IX performs a significant role in society by keeping an important part of the internetworking aspect of the Internet in first class condition at all times. The Internet performs an indispensable role in global information gathering and exchange, software, and service development in daily business and social life. The AMS-IX Association, the company, and its representatives and employees, are well aware of the importance of this responsibility. We feel this is our contribution to society and we will fulfill this even beyond the boundaries of roles and job descriptions or normal working hours.

AMS-IX performs a significant role in society by keeping the inter-networking aspect of the Internet in first class conditions at all times.

3. TECHNICAL DEVELOPMENTS

AS AN ENGINEERING BASED COMPANY THE TECHNOLOGY DEVELOPMENTS IN THE INDUSTRY ARE OF UTMOST IMPORTANCE.

Due to its density and sheer size as an exchange and interconnection point AMS-IX always is and has to be a frontrunner. Over 2011 three new services were rolled out by AMS-IX as first in the market: 100GE ports, carrier grade SLA and Inter-IPX.

All teams but especially the network engineers made sure that the new services were up and running for the joint launches during the More IP event. This is another new development you can read about in the commercial section of this report.

Network Engineering and Network Operations Center (NOC)

The NOC-team is based at the AMS-IX offices in the center of Amsterdam. From here we operate the platform on a 24x365 basis by means of a redundant and separate (from the production network) management network and a multitude of ingenious monitoring tools. Though most of the management tasks on the AMS-IX platform are done remotely, engineers frequently need to go "on site" in one of the datacenters where the production switches are located.

Besides day-to-day management of the platform and interaction with the connected members, the engineering team defines solutions for new services, necessary platform extensions, upgrades and migration plans. Due to the scale of the platform and the huge amounts of traffic AMS-IX works with the latest developments in switch hardware. This is also why we are often asked for input by leading switch manufacturers for the development of their next generation equipment.

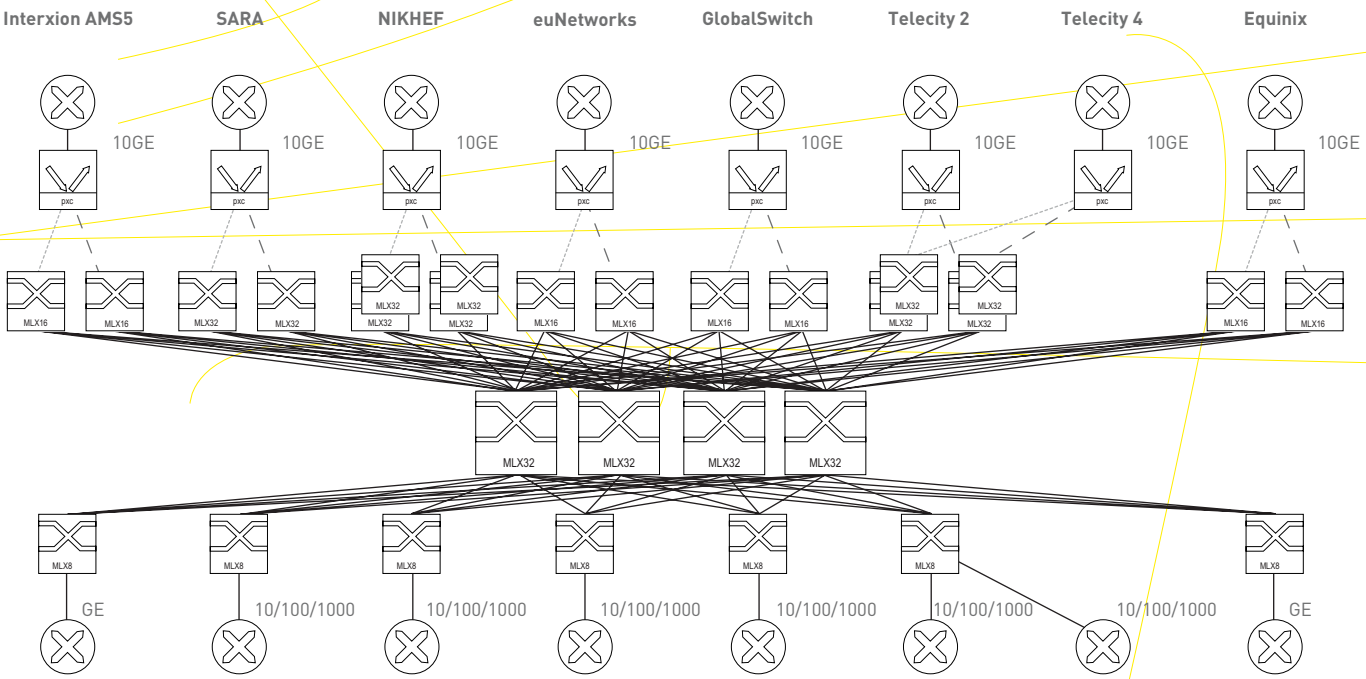
High customer satisfaction is part of the pride of the engineers and they have shown to be among the best in the industry. The engineering competence of the team for example scores a 9 out of 10. All other quality of service aspects of the team, such as trouble ticket support or flexibility to requests, score between 8.5 and 8.8.

Topology & Architecture

AMS-IX is a distributed exchange, in 2011 present at 8 datacenters in Amsterdam. Each site is equipped with one or more access devices to enable connections to the AMS-IX infrastructure. AMS-IX has an MPLS/VPLS network allowing us to scale well beyond the traditional Layer2 exchange network. The setup makes a resilient and highly scalable infrastructure possible, which is inherent to MPLS, while at the same time the interface towards the connected networks is Ethernet.

Networks connect with Gigabit Ethernet (GE), 10 Gigabit Ethernet (10GE) or 100 Gigabit Ethernet (100GE). They connect to the access devices (PE routers), these are Brocade MLX-8 PE routers for GE connections or Brocade MLX-16-e or MLX-32-e PE routers for 10GE or 100GE connections. The 10/100GE access connections are terminated on a glimmerglass photonic cross-connect (PXC) to provide more resilience in their connections. The PXC connects the member router (at Layer 1) to one of the local PE routers and in case of issues or maintenance moves this connection to a backup router.

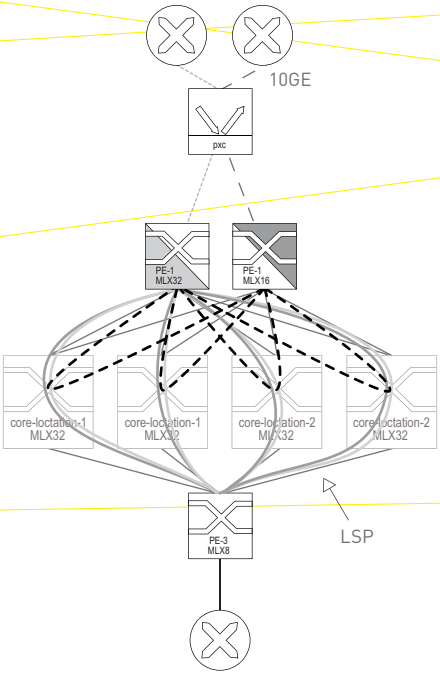
The core of the network is build around 4 Brocade Networks MLX-32-e systems of which 2 are based at Global Switch and 2 at the euNetworks location in a fully redundant set-up. The geographically dispersed locations are even at different power-grids. A schematic setup of AMS-IX at layer 1 is visualized below.



At the MPLS/VPLS level the 4 core switches are used in parallel. Load sharing of the VPLS traffic is done over logical connections in parallel, called LSPs (Logical Switch Paths) defined over these core switches. Between each pair of access devices in the network 4 LSPs

are defined, one over each core switch. The LSPs are configured over pre-defined paths and backup paths (not dynamic paths like in many carrier networks). VPLS traffic is load balanced over these 4 LSPs. In case of path failure an LSP will fall back on its backup path, which is defined over another core switch in the other core site. In this way we allow for full core site redundancy. In picture 'the MPLS platform in detail' this process is shown.

THE MPLS PLATFORM IN DETAIL



Redundancy

As noted before, 10/100GE connections are not terminated directly on an access device, a PE router, but on a photonic cross connect (PXC). This PXC connects the customer router at the physical level (L1) to one of a pair of PE routers. We use this setup because the reliability of a PXC is orders of magnitude higher than that of a PE router. In case of problems on a PE router this setup allows us to quickly (typically 50 to 100ms) fail over 10/100GE customer connections from one PE router to another. Also, when maintenance on a PE router is necessary, customer connections on the affected PE router can be moved to the other PE router, and thus minimizing service interruptions and maximizing flexibility for the AMS-IX staff.

During “normal” operations 10/100GE customer connections at a co-location are distributed over the two 10/100GE PE routers. In the picture ‘the MPLS platform in detail’ this is indicated by a half dark PE router and light grey connections going to the customer routers. This setup further reduces the impact in case of an issue or during maintenance, since only half of the customer connections on a site will need to be moved from one PE router to the other.

In an extreme situation when a complete core site is down and both core-routers in that site become unusable, the LSP between a pair of PE routers have a pre-defined backup path over one of the other PE routes in the other co-location. Failover from an LSP to its backup path typically takes less than 50ms and has no impact for the customer connections.

Contrary to 2010 no new access locations at datacenters were added this year.

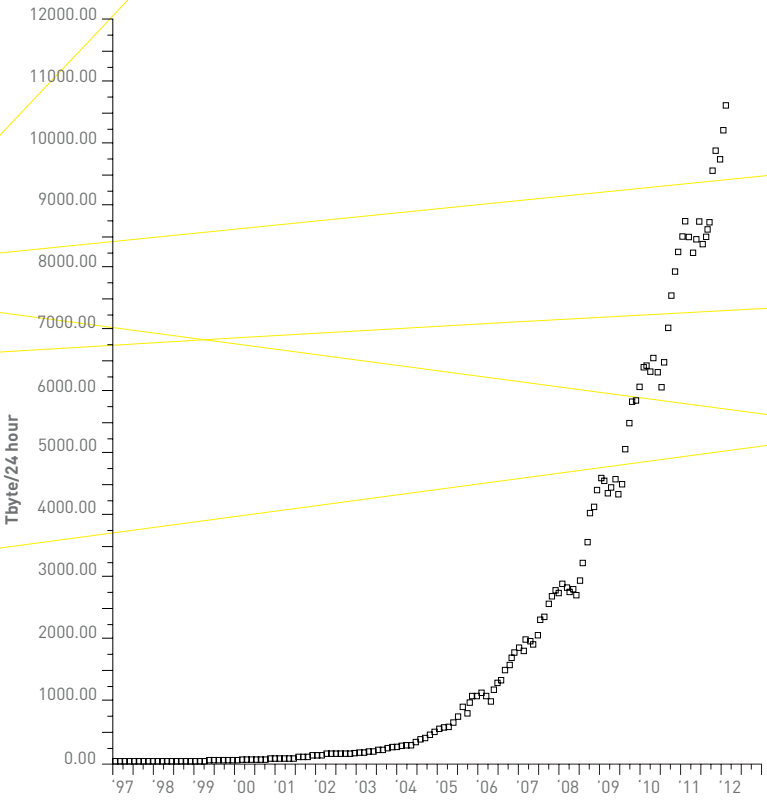
Volume and Traffic Rate

The volume of IP data that is exchanged between the connected networks each day was around 10 PetaByte at the end of the year. For your reference this equals the daily exchange of around 22 Million full DVDs or 18 Billion average text e-mails. The annual volume shipped between the connected networks was almost 3.2 ExaByte.

On a monthly basis the volume grew from 254 PB to 301 PB. Just as concluded in previous years, the growth-rate in traffic volume is slowing down (2005 138%, 2006 79%, 2007 68%, 2008 54%, 2009 50%, 2010 45%, 2011 32%) with the Internet becoming more and more mainstream. Seen from a global perspective AMS-IX volume grows at a similar rate as the Internet in general.

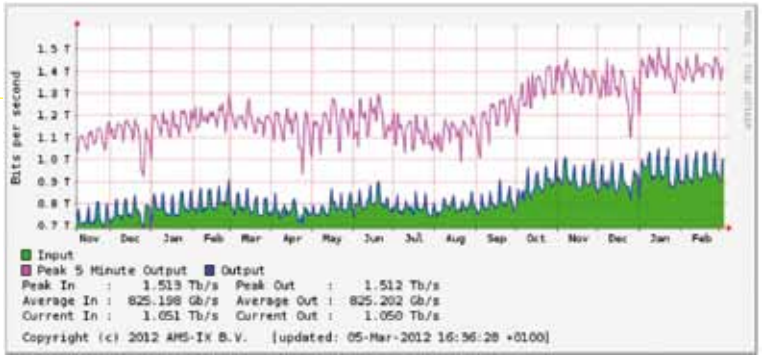
Seen from a global perspective AMS-IX volume grows at a similar rate as the Internet in general.

GRAPH HISTORICAL TRAFFIC VOLUME IN TBYTE PER 24 HOURS



DOWNLOAD GRAPHIC

MRTG TRAFFIC GRAPH PEERING VLAN -ANNUAL



Clearly visible in the MRTG Traffic graph is the low traffic rate in the spring, summer and during Christmas holidays. Traffic rate growth starts again after summer. Monthly growth rates in these periods are sometimes over 15% and jumps in sustained traffic growth of over 100Gbps.

WORD FROM THE CTO

WITHOUT THE CONTINUOUS COMMITMENT, DRIVE, ABILITY TO INNOVATE AND OPEN-MINDEDNESS OF THE AMS-IX ENGINEERS THE AMS-IX PLATFORM COULD NOT HAVE EVOLVED TO ITS CURRENT CUTTING EDGE STATE. IT HAS THEREFORE BEEN AN EXAMPLE FOR MANY OTHER IXPs.

Three major technological developments characterized 2011 and set the stage for the coming years.

Large uptake of virtual connections

The MPLS/VPLS platform using the Brocade MLX hardware still provides us with the stability and scalability that allows us to offer services that were hard to implement before. The reseller ports introduced in 2010 are a good example of this. The strong uptake of this type of connection in 2011 has made it possible to continue the growth of connected parties to the Exchange with a number of 81. Also the virtual connections on the reseller ports now make up around 10% of the total number of connections.

Managing remote exchange platforms

An extension to the Reseller program is the Reseller+ in which the Reseller port on the AMS-IX platform is combined with an Exchange point in the resellers' region of operation. The first implementation of this model involves the development, installation and management of AMS-IX Hong Kong. This new Internet exchange is imposing new challenges on the AMS-IX technical team, both technical and organisational. Although we already have experience in managing a remote exchange platform (the CAR-IX) the AMS-IX Hong Kong operation on the other hand, as being part of the reseller program, will be completely integrated in the management environment at AMS-IX Amsterdam. Also, to support AMS-IX HK customers during local office hours, service hours from the AMS-IX NOC will be extended to cover 24 hours, benefitting also from the service at AMS-IX in Amsterdam.

Introduction 100GE

The long anticipated 100GE hardware became available in the summer of 2011 and we were the first IXP to put it to the test. Typical customer connections using very early 100GE blades and optics were tested with Limelight, while a special connection over a distance of 1650 km was tested in cooperation with SURFnet and CERN. Together with the internal testing at the Brocade labs we concluded at the end of 2011 that 100GE was ready for production. Since then we offer 100GE as a connection type for both customer and reseller connections. The latter being of upmost interest as it allows virtual connections of 10Gbps and larger. The first production of a 100GE connection was brought live in January 2012.

The technological challenges we are facing are mainly twofold:

- With further implementations of the Reseller+ program we expect to manage more remote exchange platforms, which at the same time will have more impact on the technical and organizational capacity of the AMS-IX NOC.
- The introduction of 100GE customer ports will necessitate the use of 100GE on the AMS-IX Amsterdam metro area connections; i.e. use 100G technologies beyond the currently available reach of 10km. Together with expansion to new datacenters this will induce a lot of adjustments on the design and implementation of the platform.

Henk Steenman
CTO

The peak traffic rate on the ISP VLAN, measured as per industry standard 5-minute average, over the year grew from 1185 Gbps to 1485 Gbps, a growth of 32%.

According to Cisco's VNI Forecast (Cisco Visual Networking Index) this is above average for Europe.

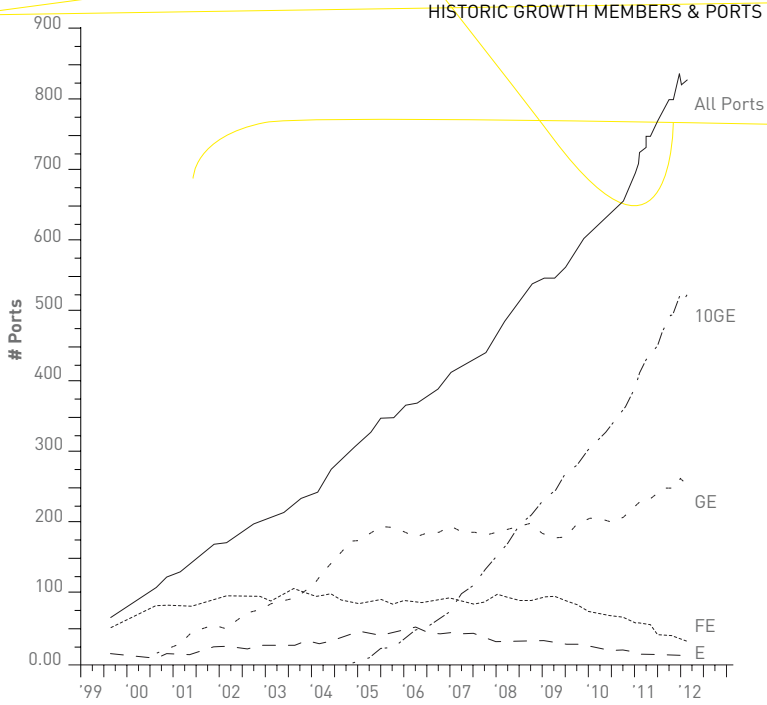
IPv6 traffic grew marginally with a peak at 3 Gbps in 2011. More growth was seen in mobile roaming and interconnection with volumes doubling from 119 to 241 Terabyte per month. Traffic rates increased with 100% up to 1.2 Gbps and peak at the exact same times as the dips in the above peering VLAN traffic.

Ports & Connections

Over half of the customer ports on the exchange platform at the end of 2011 are 10GE's with 525 ports out of 835 in total. Most of the 10GE ports are part of a so-called link aggregation, which is a combination of several ports on one link, also called a LAG (see also the high speed physical customer connections graph).

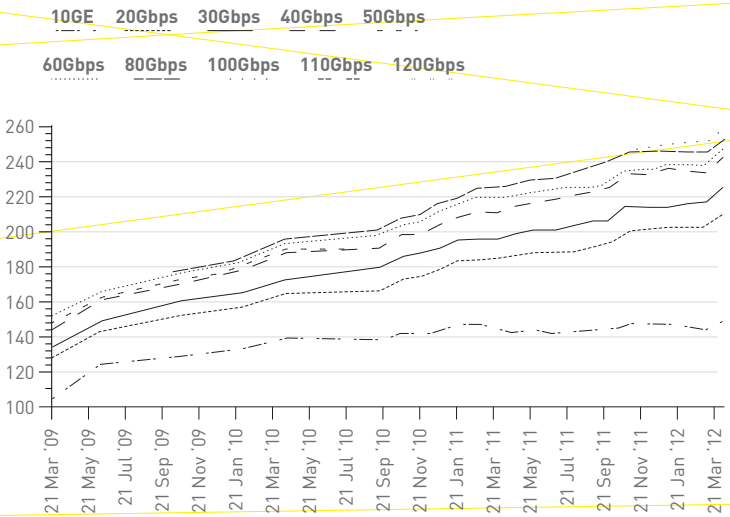
At yearend there were 261 ports at Gigabit Ethernet (GE) capacity and still some 40 Fast and regular Ethernet ports. Since 2006 the latter are no longer sold directly to connecting customers, but the speeds

HISTORIC GROWTH MEMBERS & PORTS

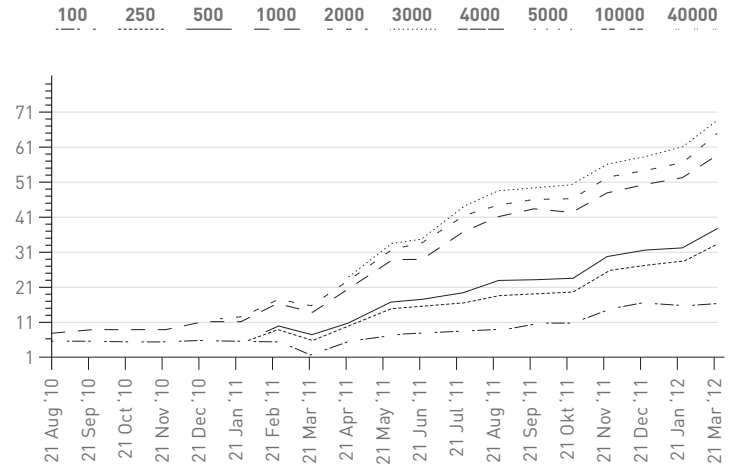


now returned as virtual link offers under the Reseller Port service. All together 200 new ports and virtual links were added in 2011, which is a historic record. See the graphs on distribution of port speeds and virtual links for more details.

HIGH SPEED PHYSICAL CUSTOMER CONNECTIONS



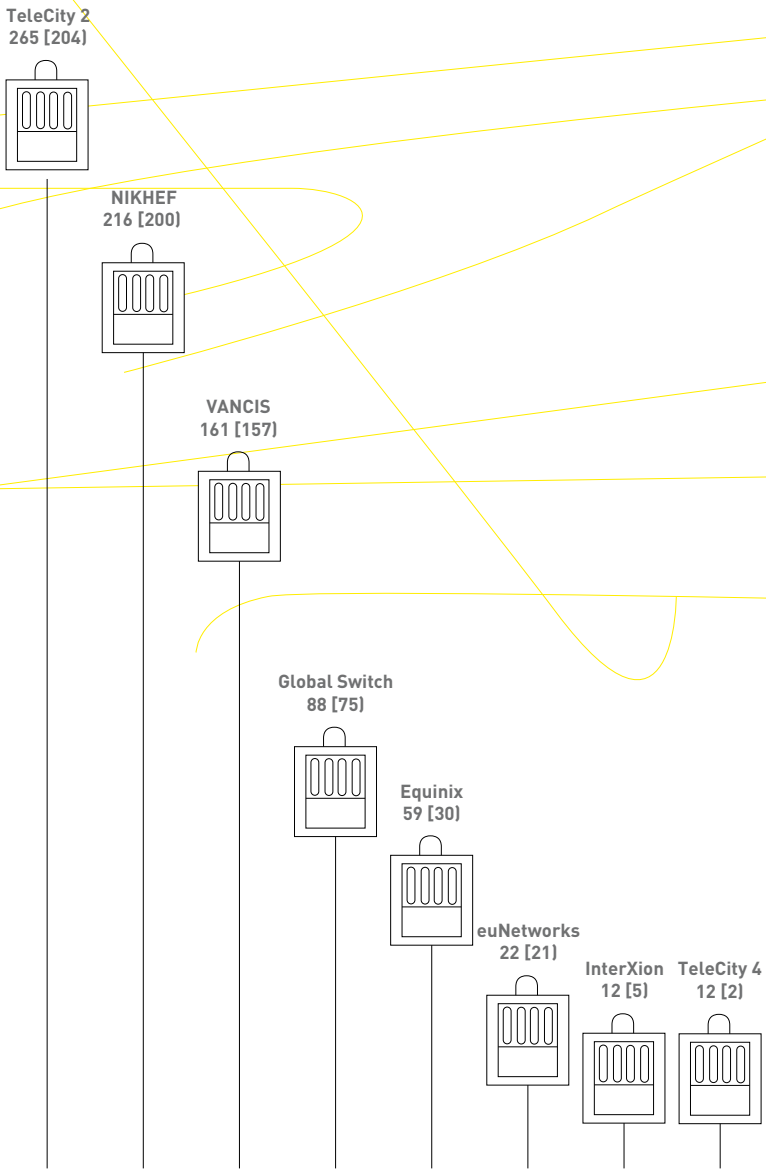
VIRTUAL CONNECTIONS MBIT/S



Access Locations

With 265 connections and around 500 Gbps average traffic rate Telecity-2 clearly is the densest access location for customers to connect to AMS-IX. Of the more recent sites Equinix doubled its number of connections and is the second largest growth site and the fourth site in traffic. The two oldest locations NIKHEF and SARA, now Vancis, have shown little growth in the last year.

PORTS PER LOCATION 2011



All AMS-IX datacenter locations except euNetworks comply with the AMS-IX datacenter standard. An independent auditor, Capitoline, defined the objective standard based on industry norms and performed an audit of compliance on all datacenters used by AMS-IX. The euNetworks datacenter was audited, but was found unable to comply and corrective action is under discussion.

Similarly any new datacenter to be added in the future, becoming an AMS-IX location, will have to be audited against the standard.

Research & Development

Any change, software or hardware upgrade, or new service is extensively tested in our own lab in the basement of our office building in Amsterdam before being placed into production. In addition to testing, reproduction and analysis of bugs, customer requests and incidents, service features and monitoring tools are also done here on a daily basis.

The collaborative research relationship that AMS-IX has with its vendors has often been instrumental in coming up with new innovative solutions and breakthrough developments. We are a tough customer to please. We are always at the bleeding edge of technology, but still willing to put a lot of effort and brainpower into the equation, which inevitably pays off. We value these reciprocal relationships highly.

SERVICES

General

As mentioned earlier, 2011 was the year AMS-IX introduced three major new services:

- 100GE ports on the peering VLAN
- Service Level Agreements on ports in the Peering VLAN
- Inter-IPX service VLAN for mobile interconnection

Internet Peering VLAN – IPv4 & IPv6

The Internet Peering VLAN is the most widely used exchange service. During 2011 more than 100 new unique networks, or unique AS-numbers were added to this VLAN. It is the common service on which the Internet Exchange is based and where public peering is done. The Internet Peering VLAN is an Ethernet based non-blocking Unicast service, supporting both IPv4 and IPv6 natively.

The service offers interface speeds of 1 Gigabit Ethernet (GE), 10 and 100GE and multitudes of these (LAGs). All members can have a look at their overall live traffic (MRTG) and specific AS to AS or IP to IP traffic (sFlow) on their dedicated my.ams-ix portal.

In 2011, after a long industry development period and as soon as it was operationally available and stable, AMS-IX launched a 100GE port service for peers. With quite a few peers that have capacities over 40 to 50 Gbps with LAG ports, we expect the take-up of 100GE over the first few years to be considerable. For 2011 the router interface and optics costs were still too high though for an active take up. Only test connections with 3 different parties were made for the time being.

Routeservers

An additional service on the Internet Peering VLAN is a redundant set of routeservers. The purpose of route servers is to facilitate the implementation of peering arrangements, and to lower the barrier of entry for new participants on the peering platform. A connected member normally needs to maintain separate BGP sessions to each of their peers' routers. With a route server this can be replaced for all or a subset of these sessions with one session towards each route server. Filtering can be maintained through IRRdb filters using the RIPE or other registries databases.

In 2011 the two OpenBGPd route-servers were very stable. Over the year the pair of servers together had a 100% uptime. Peers on the

route-servers grew to 342, most of which are with both routeservers and both IPv4 and IPv6.

Mobile Peering – GRX and IPX peering

AMS-IX hosts the main mobile peering point worldwide. Providing a full-service, scalable GRX Peering Exchange for the interconnection of GPRS/UMTS roaming networks and the new Inter-IPX service for next generation mobile interconnection such as LTE. GRX Peering Amsterdam (GP-A) was the first global multi-party peering point for the mobile Internet. There are 2 others since then (Ashburn, USA and Singapore, hosted by Equinix) but Amsterdam remains the largest. Currently almost 30 GRX operators exchange GPRS roaming traffic with each other in Amsterdam. The GRX exchange facilitates global data roaming for mobile end user customers and is a core component in enabling a truly global mobile Internet.

The Inter-IPX service was launched in 2011 and is the first peering point for IPX providers worldwide. Parties enabling LTE, interconnected through IPX providers, are developing their services and the take-up is starting to become more than just test-traffic.

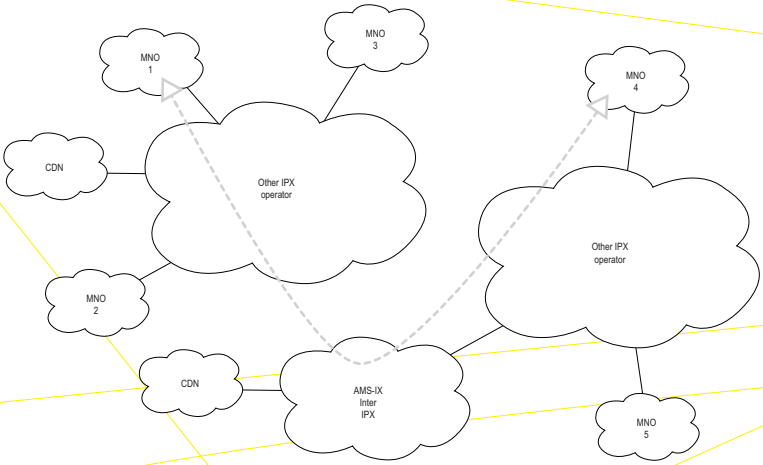
IPX is defined by the GSMA to solve a number of limitations of GRX and to prepare the industry for a future in which the distinction between mobile and fixed networking will gradually disappear, and where consumers will expect the same continuous quality of experience no matter how and where they connect.

The mobile world requires a guaranteed consistent quality of services offered ('QoS'). Therefore the main focus points of IPX are the guaranteed end-to-end QoS as supported by SLA's and the involvement of other parties besides MNO's, such as content providers and content delivery networks (CDN's), application service providers, ISP's and Fixed Network Operators (FNO's), and the support of cascading billing throughout the whole supply chain.

The Inter-IPX service by AMS-IX is a combination of the standard IX services with added redundancy through distributed ports and an increased SLA attached. It has specific reporting services on relevant KPI's for the IPX providers as well.

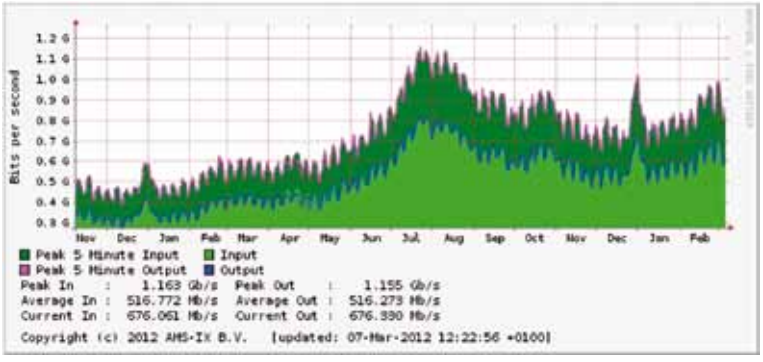
The Inter-IPX service by AMS-IX is a combination of the standard IX services with added redundancy through distributed ports and an increased SLA attached.

INTERCONNECTING IPX OPERATORS



Mobile peering traffic doubled over 2011 to reach 1.2 Gbps. Also quite notable and contrary to the dip in Internet traffic on the peering VLAN are the peaks during summer, at Christmas day and New-years eve.

GRX TRAFFIC STATISTICS ANNUAL



Service Level Agreement (SLA)

As the first exchange in the industry AMS-IX also launched a carrier grade SLA on the peering VLAN ports service including provisioning, availability and Key Performance Indicators (KPIs). With the SLA we responded to the wish of the industry for more than a best-effort service and offer an optional service to any network that would like to have more certainty and warranty with regards to the level of service on their peering set-up.

The SLA service includes service credits for non-delivery, unavailability or under-performance up to 100% of the monthly fees that are calculated for the connection.

The KPIs are continuously monitored and measured by probes in the monitoring platform. AMS-IX further provides real time statistics to SLA customers and reports monthly on a number of key performance indicators (KPIs) of the network:

- Availability
- Packet loss
- One-way and two way delay
- Delay variation or jitter

KEY PERFORMANCE INDICATORS

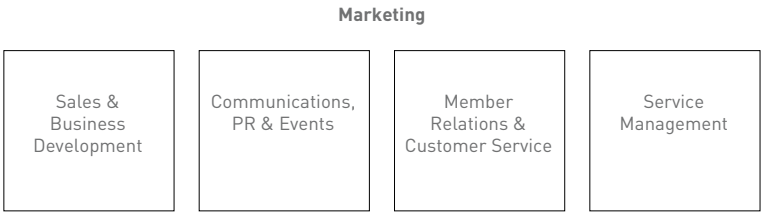
KPI	Target value	Description
Availability	≥99,99%	Per month
Packet Loss	≤ 0.05%	Average per hour in 24 hour period
One Way Delay	≤ 500 micro-seconds	Average per hour in 24 hour period
One Way Delay variation	≤ 100 micro-seconds	Average per hour in 24 hour period

Apart from the SLA we also measure customer satisfaction with our service and platform parameters - platform stability & availability, frame loss, delay and jitter - all of which scored between 4.2 to 4.4 out of 5 during our annual member survey in October 2011.

4. COMMERCIAL DEVELOPMENTS

We also saw developments in the marketing team; we now have four distinct disciplines with clearly defined roles and responsibilities. The team grew in 2011 from 6.8 to 10.8 full time equivalents.

2011 WAS A YEAR OF BREAKING RECORDS FOR THE COMMERCIAL TEAM. NEVER BEFORE SO MANY NEW NETWORKS WERE ASSIGNED. MORE THAN 100 NEW PORTS AND EXACTLY 200 VIRTUAL LINKS.



The aims and objectives of AMS-IX Marketing are:

- Increasing the attractiveness of the exchange by stimulating traffic exchange and adding new interesting peers and routes
- Increase the awareness of the value and benefits that AMS-IX offers
- Communicate the distinctions between AMS-IX and other Internet Exchanges
- Support reselling partners with brand recognition and sales support
- Generate interest and curiosity regarding AMS-IX current and new services
- Keep existing customers satisfied and facilitate peering relationships
- Build a closer bond to our connected parties and continue to build a loyal community
- Develop new services and broaden the diversity of the service portfolio reflecting future customer needs
- Stimulate the development of the IP Interconnection eco-system with external value added services through collaboration
- Continue to position AMS-IX as a solid, dependable and recognized pillar within the Internet industry and do so in an AMS-IX appropriate manner (neutral & independent, open, trusted, pragmatic and innovative)
- Sharing and spreading our knowledge and supporting "the good of the Internet" in general

Sales and business development

Both the direct and indirect sales channels are managed by our sales team. With 100 new applications the team did a tremendous job as up to now the high score had been 59 new applications within one year (2010). The success of the Reseller program is the driving factor behind this growth. More and more time of the team goes into the support of the

indirect channel and the challenge was to balance out the direct and indirect sales efforts.

Several new resellers joined the program over 2011, amongst others: Hutchison Global Communications, Expereo, Technicolor, VirtuaOperator, Sofia Connect, InterFiber and KPN. Other active Resellers from 2010, the year the program was launched, are: NL-IX, Atrato IP, IX Reach, NAMEX and VTL Wavenet. The Resellers are parties with Reseller ports that bring us mainly parties that connect remotely using virtual links on their Reseller ports. The top scoring Reseller over 2011 was Atrato IP with 20 new connected parties. One particular Reseller to name is NaMeX, the Internet Exchange in Rome, they joined the program late 2010 and brought us 9 new parties from Italy in 2011. The collective of members from Italy decided to purchase connectivity to Amsterdam together bundled by NaMeX and the IX used their infrastructure to offer this additional service to their members as a value add. It turned out to be a very synergetic relationship that increased the value of both exchanges.

Other than the resellers we also have 'Classic Partners' who bring us new connected parties on dedicated ports. This program was initially launched in 2004. The most active party under this predecessor of the new reseller program is Equinix who over time has brought us 20 new parties.

Member Relations & Customer Service

The Member Relations and Customer Service teams main tasks are to support existing non-technical requests from members, customers and partners, contract administation and order processing. The team operates under service level aiming to answer 95% of the requests (by mail) within 1 working day. The number of transactions under the service level increased with 29% over 2011 after an increase of 35% in 2010. With this fast growing number of requests each year, the team was extended with another representative.

Even if the number of requests to the MR & CS team grew significantly the average and median delivery time for new applications went down considerably with 28%.

Apart from the measured statistics we evaluate the satisfaction of the members and customers with the support services offered, which is rated 4.25 out of 5, a very satisfactory score.

Communication, PR and Events

When we first noticed the rise of social media like Twitter, Facebook and LinkedIn it did not take us long to create AMS-IX accounts on the most widely used social media platforms. Although back then we were not very active on these platforms, but were present, we dramatically changed our course over 2010 realizing that quickly and surely new and social media were gaining steady ground in the overall media landscape and were here to stay. As a result social and new media were, and still are, becoming more and more important tools for AMS-IX in sharing updates and interacting with our members, potential members, customers and other communications target groups.

The lead time to deliver a new connection from request to assignment went down to 2 days.

The results of our increased focus on pr, traditional media and social media in particular during 2011 were absolutely pleasing. By the end of 2011 almost 800 people had subscribed to the newsletter we had launched by the end of 2010. The number of members in the AMS-IX LinkedIn group grew with an astonishing 190% from 100 members to 290 in December. AMS-IX now has more than 1450 followers on Twitter and we have seen a 48% increase in news articles and press releases. As the AMS-IX technical platform performed outstanding during the whole year we did not receive any negative publicity.

In the Annual Operating Plan and Budget for 2011 we had set out a number of goals for the year concerning PR and Communications like: focus on reputation management, increasing international pr, joint partner communication, increasing online awareness and the use of social media. Next to this: measuring activity on social media and measuring PR and free publicity.

Looking back we can now say that we have lived up to the goals we had set out for the year 2011 and are looking forward to setting an even higher standard for the year to come.

Events

In a business-to-business environment one on one contact is regarded as the most effective mean for selling products or services. Events are a great support in getting into contact with the right people, to start up a discussion, a conversation or a collaboration. Events are therefore an essential support in sales and business development.

As in previous years the 2011 events calendar was action packed with events to organize, attend and sponsor. First event of the year to organize was the traditional AMS-IX party during RIPE62. Like in 2010 held at Club Home in the center of Amsterdam. A novelty during 2011

was the first time organization of the two-day AMS-IX MORE IP event during which three new services were launched in a festive manner. Read more about the MORE-IP event in the MORE-IP frame in this Annual Report. Next to the second Community Meeting of the year, in November in the St. Olofskapel at the Barbizon Palace Hotel in Amsterdam, there was the Global Peering Forum in Santa Monica, the European Peering Forum in Budapest and the AMS-IX Capacity dinner during the Capacity Europe Meeting at the Okura Hotel in Amsterdam.

Conferences

AMS-IX staff on a yearly basis attends a selection of important industry events and influential operator conferences. Leading the list are RIPE, NANOG and APRICOT. Besides attending these conferences we actively contribute to events by sponsoring or preferably by speaking on topical subjects related to peering or Exchanges. Other events that were attended by AMS-IX staff over the year were the two EURO-IX meetings, a diversity of capacity meetings, the Next Web, ITW, MENOG, IBC, PICNIC and CNX5.

Sponsoring

Most of the sponsoring by AMS-IX is done in line with the AMS-IX 'for the good of the Internet' program. Like in other years we continued the sponsorship of the ISP kartcompetition, the biggest Dutch ISP industry event, and the ISOC new years drink. A modest philanthropic budget is kept by AMS-IX next to its regular sponsor budget. This philanthropic budget is split into smaller sums and enables AMS-IX staff to spend it on a good cause of their own choice. Causes that were supported during 2011 were amongst others: 'de rode neuzen race' of the cliniclowns, the Archie foundation, NZ Earthquake relieve and Jabulani kids in Zimbabwe. The money we would normally spend on sending out Christmas cards was, in 2011, donated to Sunrise kids Nepal.

Pricing and Promotion

In line with our cost and continuity based price strategy prices were decreased considerably in 2011. The price strategy is based on the AMS-IX B.V. being owned by the Association. For AMS-IX this strategy focuses on decreasing prices gradually while maintaining a sound net result ensuring continuity and a positive cash flow situation. The main point regarding continuity is to keep a sufficient Capital & Reserves

level to be able to keep investing in the platform and perform operations according to the expected AMS-IX service level. The company may deviate from this after consultation with the members. Still there are other reasons to decrease (or increase) prices such as member expectations or market developments.

The strategy for the price structure is to keep it simple and straightforward with monthly port-fees only. No other costs to be charged such as membership, joining, initial set-up or variable charges.

AMS-IX price positioning therefore reflects the high quality and service level choices made, even though AMS-IX is one of the least expensive exchanges due to economies of scale.

The strategy for the price structure is to keep it simple and straightforward with monthly port-fees only.

AMS-IX MORE-IP EVENT

WHILE WORKING ON THE NEW 100GE, SLA AND INTER-IPX SERVICES THE PLAN EVOLVED TO LAUNCH THESE SERVICES DURING A WELL-ORGANIZED TWO-DAY SPECIAL EVENT AIMED AT DISCUSSING FUTURE DEVELOPMENTS AND DEMANDS WITHIN THE INTERNET INDUSTRY AND IP INTERCONNECTION MARKET IN PARTICULAR.

Internet growth simply means More IP and because our new services are all in preparation and support of the expected future internet growth and developments we named the event appropriately: MORE IP.

The first AMS-IX MORE-IP event took place on June 8th and 9th of 2011 in the historic setting of de Rode Hoed in Amsterdam. The event was a combination of the traditional AMS-IX community spring meeting, the festive launch of the three new services, a press event, partner workshops and an interesting topical agenda. It was aimed at peering, wholesale business and Internet peering professionals interested in forecasting and managing regional, national and global Internet infrastructure demand.

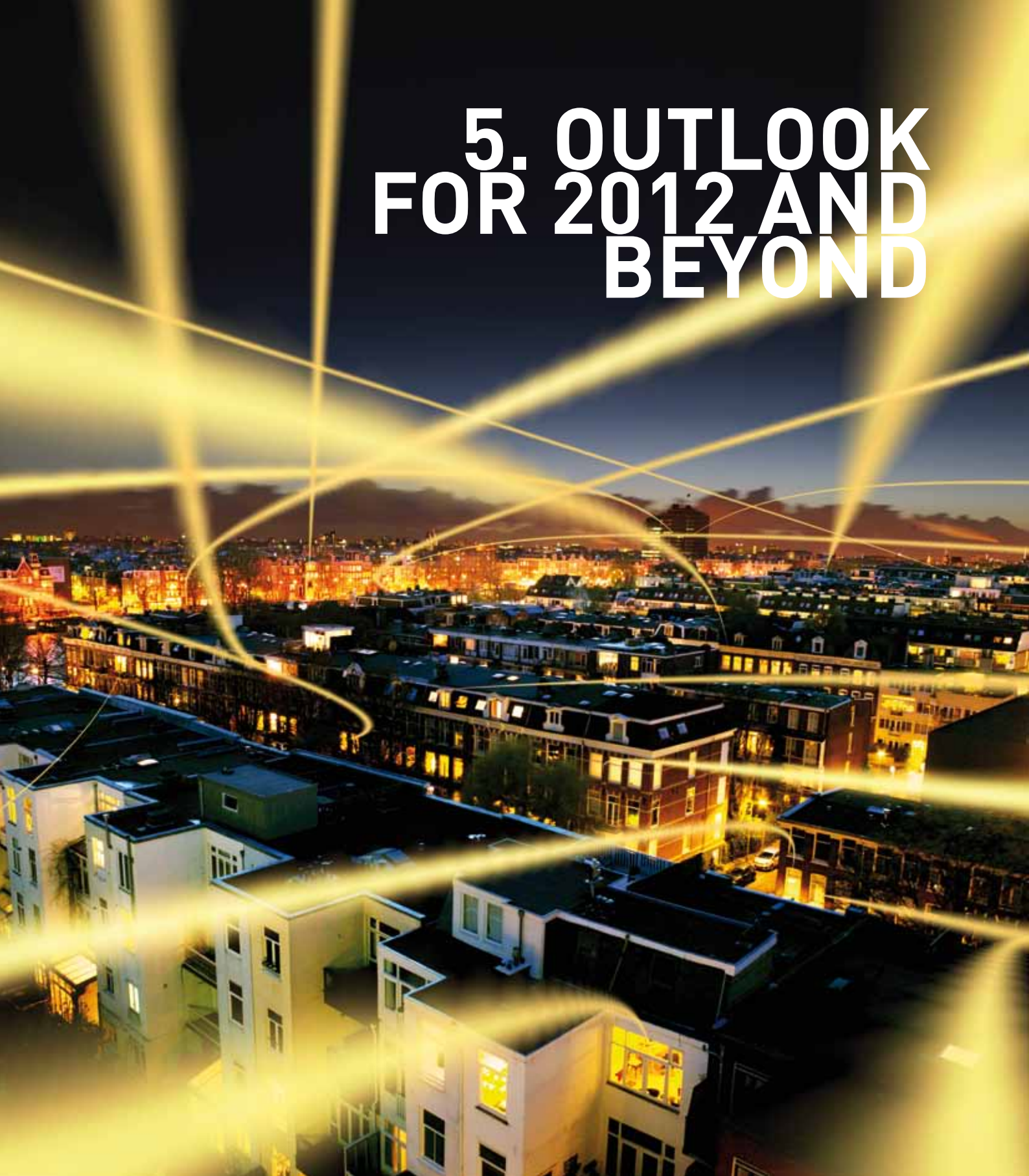
The AMS-IX MORE-IP event was attended by a diverse group of networks varying from the hosting industry to Internet service providers and included representatives from all over Europe, Asia, the Middle East and North America. Among the presenters was a representative from Softbank who gave a presentation on the state and repair of Japanese networks after a devastating Tsunami. Other presentations came from: Brocade, Level3, Capitoline, EvoSwitch and Interxion.

The highlight of the MORE IP event could have been the winning of a prize hidden in one of the 100 balloons that dropped from the ceiling during the launch. It also could have been the buzz at the networking social or even the exited Japanese winner of the IPv6 contest, but the highlight that will continue to resonate from this event is that everyone is aware the Internet is growing. Everyone is aware of their part in that growth and although not one person, network or IX can predict the future still everyone at the event believed the future will include more and MORE IP.

After the successful and much appreciated first MORE-IP event we decided to continue to organize this two-day springtime conference. So in 2012 MORE-IP will return with a new theme, a new and exiting agenda and definitely MORE-IP.

Anna Kocks
Events and Communications Coordinator

5. OUTLOOK FOR 2012 AND BEYOND



THE COMPOSITION OF THE AMS-IX BOARD IS EXPECTED TO BE SLIGHTLY DIFFERENT IN 2013 AS ELECTIONS WIL TAKE PLACE IN NOVEMBER 2012

GENERAL

Association

With the possibility of parties to connect to the exchange without becoming members of the Association we expect to see less new members in the coming years than we have seen before. Even if the number of new customers of the AMS-IX company is increasing.

Company

Keeping the personnel costs as a percentage of the overall costs, at is around 20%, is the aim of the management team. With a growing customer base and increasing related costs this means growth of the organization. In all teams we have scheduled increases but the main growth will be in the NOC team in 2012 as they will extend their full service opening hours to 24 hours a day. Up until 2011 the team covered 24 hours support to customers, but not for all services such as testing and new implementations. During the course of 2012 this will change and customers may expect all technical support at all hours.

TECHNOLOGY & SERVICES

The platform

Four new access sites will be added to the platform in 2012: Terremark NAP of Amsterdam, EvoSwitch, Telecity AMS5 and Equinix AMS3. The datacenter sites are distributed over a larger area of Amsterdam: two in the West (Schiphol and Haarlem) and two in the East (South-East and Science Park). At each location a standard edge deployment will be set-up. This is a set of redundant PE routers, Brocade MLX16/32-e, to which the customers connect to their 10GE or 100GE ports resiliently by use of photonic cross connects. Moreover Brocade MLX8's are used to connect GE based customers. The new exchange PoP's will be deployed using 100GE backbone links to the core switch sites where applicable.

Volume & connections

The growth in traffic rate is expected to be around 30 to 35% each year nowadays which means AMS-IX could reach levels up to 2.1 Terabit per second in 2012. Volume-wise the traffic exchanged between the connected networks can be extrapolated to 4.3 ExaByte of data over the year.

AND THE BEAT GOES ON...

AS ANNOUNCED IN THE 2010 ANNUAL REPORT WE MANAGED TO OFFER 100GE PORTS BEFORE THE END OF 2011. WHICH MAKES US THE FIRST IX GLOBALLY TO OFFER 100GE PORTS AS A STANDARD SERVICE TO OUR GROWING MEMBERSHIP, WHICH IS A TRUE MILESTONE.

2011 can be recognized as the year that we decided to take our reseller program to the next level. A good combination of the reseller's desire to increase value for their network and our ambition to export our business model, which resulted in a program that we call reseller+, for lack of a better word. The way we are implementing this idea results in AMS-IX branded Internet Exchanges outside the Netherlands. All technically created, managed and monitored by the AMS-IX NOC, but marketed by our reselling partners. Getting there was a delicate process because we needed our members to recognize the value of such international ventures while still staying close to our charter and core values. I am extremely proud with the outcome of this process, and by the release of this annual report we have launched AMS-IX Hong Kong together with Hutchison Global Communications.

Of course the company grows in line with these high ambitions: continued growth both in traffic and number of connected parties on our platform, as well adding more sites in the greater Amsterdam area serving demanding customers with Service Level Agreements (quite a novelty in a traditional best-effort environment).

Trying to summarize all our activities in a single sound bite: More IP.

Job Witteman
CEO

In terms of ports it is more difficult to make a prediction as each new 100GE port that is introduced potentially means a decrease in several 10GE ports, so we may see a 'cannibalization' there. For 2012 2700 Gbps of new connected capacity is expected to be mainly distributed over 10 and 100GE ports. There will be enough upwards migrations from GE to keep the level stable.

We expect quite a few more virtual links through the reseller program, which is capacity wise not necessarily large in numbers yet but therefore interesting in new routes.

New Services - AMS-IX Hong Kong

With three major new services launched it is difficult to top 2011 but by now the news has reached the community and public that AMS-IX has launched AMS-IX Hong Kong.

AMS-IX Hong Kong is a full fledge Internet exchange that was founded under the Reseller Plus program.

The AMS-IX Reseller Program specifically generates new connections to AMS-IX in Amsterdam. However when there are many parties from a particular region the 'unwritten' rules of the Internet dictate that local traffic better stays local and a regional hub makes sense. Hence the Reseller Plus development where AMS-IX deploys an exchange, mirroring the set-up in Amsterdam, it's a professional high quality and neutral exchange in a place where a regional hub has potential.

Of course for the AMS-IX Association's members, the shareholder of AMS-IX, and the other Amsterdam based customers the main benefit of the AMS-IX HK exchange establishment is providing easy access for Asian peers to come to Amsterdam using Reseller HGC. Thus potentially increasing the number of peers from the Asia-pacific region in Amsterdam. Also it becomes easier and more economically feasible to peer in Asia.

For Asian networks a new neutral professional regional exchange in their territory, according to the AMS-IX model with high quality services, opens up new possibilities and enables them to decrease connectivity costs and optimize their network as well as having a easy and economic access to Amsterdam through Reseller HGC.

Under the AMS-IX Reseller Plus program it is AMS-IX who designs, builds and operates the exchange and HGC who handles sales and first line customer service. Also connectivity to the exchanges and between Amsterdam and Hong Kong is offered by HGC. Marketing is done by HGC with support from AMS-IX.

COMMERCIAL

Each year the members of the AMS-IX Association vote for the Long Term Commercial Strategy plan that needs to be approved in the AMS-IX General Meeting. The plan is updated and sets out the strategy for the years to come.

Member Relations & Customer Service

Customer Relationship Management is literally what this team is all about. Constant development in the my.ams-ix.net environment takes place to give our customers better management control and maintain customer data to offer a world-class service. With the volume of transactions expected to increase again, with a similar percentage as in 2011, an increase of the efficiency capabilities is the challenge.

Sales & Business Development

The increased efforts in partner relationship management in 2011 will be continued. However the direct sales will also get more emphasis in 2012 as direct relationships with new prospects need their time investments as well to thrive. The reseller channel developments are aimed at ensuring interested parties to benefit from the additional connectivity services resellers offer. With AMS-IX partners having an array of different profiles, including Carriers, Layer 2 and fellow Internet Exchanges, a fair share of market is covered and more effort will be placed in managing both the sales activities as well as marketing support to the partners.

At AMS-IX events and conferences more energy will be put into ignite business networking by members, potential customers and partners. Case studies are being developed and made available to support sales presentations, partner's representations and to offer members testimony of the benefits of connecting to AMS-IX.

Communication, PR and Events

A new member was added to the marketing team in the first quarter of 2012, someone with a background in, and experience with pr, journalism and new media. Main focus point of this new addition to the team will be communicating with the AMS-IX target groups by all communication tools and media applicable and not in the least by social media. Where in the past the pr tasks were divided among all team members we expect a lot of good to come from this new and highly focused set up.

As in 2010 and 2011 we will continue to place great effort in social media and managing press contacts during 2012. Joint partner communication will also play a big role in communications during this year. Writing co-joint press releases, creating partner marketing collateral and supporting our partners with branded materials and customer cases. New this year will be the active media campaigns before and during events organized or co-hosted by AMS-IX.

As in previous years the AMS-IX events calendar will be action packed. Apart from our regular events like the European and Global peering forums we will continue with visiting more commercial events as they have proven to be quite successful for AMS-IX staff to attend and bring us great new opportunities.

Like other years the technical conferences such as RIPE and NANOG will also not be forgotten. The first MORE-IP event in June 2011 was a great success and AMS-IX has therefore decided to continue to organize this two-day event. MORE-IP 2012 will be held in an historical building in the center of Amsterdam during the last week of May. Another special AMS-IX (by invitation only) customer event was also a success over the last two years. The AMS-IX Capacity dinner will again take place on the Sunday before the Capacity Europe meeting in Amsterdam.

Sponsoring

The AMS-IX sponsoring is aimed at a very specific audience. As only a handful of events fit with the criteria and the AMS-IX sponsor budget is higher but limited, AMS-IX will continue to support local, international, peering and industry events that have brought results in branding and commercial access. In addition, and in the continued support to AMS-IX partner, AMS-IX will also have a greater role in sponsoring or jointly sponsoring events, conferences and activity far reaching the globe, with partner access in mind or to continue our strive for the good of the Internet.

For the Good of the Internet Projects

One of the things that is embedded in AMS-IX' culture is the sharing and spreading of our knowledge and experience for the Good of the Internet. The introduction of the program 'IX in a box' for example is a result of that part of our culture. The program is about helping or supporting (emerging) exchanges according to our model and values in other locations around the world. In 2011 our aim to support other exchanges was put into motion again.

SLA

ANOTHER STEP IN THE EVOLUTION OF THE AMS-IX PORTFOLIO IN 2011 WAS THE INTRODUCTION OF THE SERVICE LEVEL AGREEMENT (SLA) OPTION. AS THE FIRST EXCHANGE IN EUROPE TO OFFER THIS SERVICE, AMS-IX HAS AGAIN RAISED THE QUALITY BAR BY COMBINING HIGH-END KPI'S WITH HIGH-END SERVICE CREDITS.

The high KPI's have their roots in GSMA IR34, which forms the basis for the Inter-IPX SLA service provided by AMS-IX. Subsequent surveys carried out by AMS-IX showed a wish by members/customers to extend a qualified SLA service to cover Standard 1GE and 10GE ports as well.The SLA is applicable to the delivery and the operation of the customers network connection to AMS-IX. It defines the service levels, quality of the services and the applicable service credits for non-delivery, unavailability or under-performance. Service credits up to 100% of the monthly fees due for a connection can be obtained depending on the case severity. Here is a quick glance at the Standard KPI's and Service credits available:

Monthly Calculated Availability (P)	Approximate Monthly Minutes downtime*	Monthly Service Credit
P ≥ 99.99%	0-4	0%
99.99% > P ≥ 99.95%	4-22	50%
P < 99.95%	> 22	100%

KPI	Measured value	Monthly Service Credit
Packet Loss	0.05% ≤ % value ≤ 0.1%	25%
	% value > 0.1%	50%
One Way Delay	500 µs ≤ delay value ≤ 1000 µs	25%
	delay value > 1000 µs	50%
One Way Delay variation	100 µs ≤ jitter value ≤ 200 µs	25%
	Jitter value > 200 µs	50%

To aid with the implementation of this service two Service Managers were added to the AMS-IX team. The role out of the service started in November with a free trial period offered to existing members/customers. Ironically one of the main challenges faced by the SLA in the role out is the robustness and resilience of the AMS-IX platform itself!

The SLA is still in a development phase and as we move into 2012 and beyond we will continue to define and refine this service with such offerings like the introduction of the SLA on 100GE ports. In the eco-system of IP Interconnection where best effort has been the norm, the introduction of the SLA offers a differentiating factor to peering parties where higher reliability and availability are now demanded.

First of all thanks to the Caribbean Internet Exchange (CAR-IX), of which we are responsible for the design of the technical platform and where our technical team manages the Internet exchange in cooperation with local technicians, the performance of the Internet in that part of the world improved as well as the number of connected networks increased.

Furthermore, AMS-IX and Kenya Internet Exchange Point (KIXP) started collaborating in the second half of 2011. The collaboration, which includes the sharing of our knowledge and the donation of AMS-IX Gigabit Ethernet equipment to Kenya, focuses on strengthening the capacity, resilience and stability in the African region and helping the growth of the Internet ecosystem as a whole.

Kenya is not the only country in 2011 to which we gave technical equipment and shared our knowledge with. The same applies to Armenia. In the first quarter of that year the country suffered an outage of all three wholesale network providers due to a search for copper by a 75-year-old woman in the neighboring state Georgia. Although all services were restored in just a few hours the incident highlighted the need and importance for improvements of the Internet in that area.

The European Internet Exchange Association (Euro-IX) reacted and asked AMS-IX to help, leading to the donation of a Foundry Biglron 15000 switch by AMS-IX to support a scalable number of ports and better redundancy. One of the things that is embedded in AMS-IX' culture is the sharing and spreading of our knowledge and experience for the Good of the Internet. That other exchanges ask AMS-IX to be their advisor and give our input. Naturally we are pleased to do so again in 2012.

One of the things that is embedded in AMS-IX' culture is the sharing and spreading of our knowledge and experience for the Good of the Internet.

6. SUMMARY OF ACCOUNTS

DUE TO THE CONSIDERABLE NUMBER OF NEW CONNECTIONS THE 2011 REVENUES INCREASED WITH ALMOST 2 MILLION EURO (+19.6%) TO 12.0 MILLION EURO.

We managed to keep the level of external operating costs the same as last year. Therefore also the net revenue, compared to last year, increased with 2 million euro (+22.8%) to 10.5 million euro.

In 2011 AMS-IX developed the reseller+ program and the possibility to add service level agreements to connected ports. To be able to support this, we hired two service managers. Besides the service managers we hired additional staff in other departments too. By the end of 2011 we had 5.4 FTE more than at the beginning of the year. This all was budgeted for, and results in an increase of personnel costs of 221 thousand euro (+9.2%) compared to last year. Although the investments in the switch park were less compared to 2010 and 2009, the amount of depreciation of tangible fixed assets increased by 23.6%, from 3.3 million euro in 2010 to 4.1 million euro in 2011.

Other operational cost increased with 17.1% compared with 2010, from 1.1 million euro to 1.3 million euro. The financial result is 131 thousand negative, mainly caused by exchange rate differences on the US dollar. The result of income before taxation increased with 684 thousand euro (+41.5%), from 1.6 million to 2.3 million euro.

The investments in the switch park amounted 4.8 million euro, which is considerably less than the original 2011 budget but also less than spent in the years 2009 and 2010.

As a result of the lower investments and the large number of new connections the cash generated by operating activities, 6.1 million euro, was well sufficient to cover for these investments.

AMS-IX made use of a temporary fiscal facility applicable in the Netherlands, offering companies the opportunity to shorten the term of depreciation of fixed assets acquired during the years 2009, 2010 and 2011 from five to two years. This facility was intended to support companies against the global financial crisis. It decreases corporate income tax payments on a short-term basis and offered companies more liquidity. The differences are of a temporary nature (time difference) and not permanent, the cash flow will be equal over a five years' period. The result of this facility is that this year an amount of 609 thousand of corporate income tax payment is postponed (2010: 993 thousand). As the annual accounts in this report are based on the economical depreciation, the difference between economical and tax reporting is shown in the balance sheet as a provision for deferred taxes and not as part of the net result.

Capital and reserves policy

The building up of capital & reserves (C&R), as to safeguard the continuity of the business, confirms the need to add the entire net profit of the year 2011 to the reserves.

In the 17th GM the agreed policy determining the C&R target consists of three parts that together determine the desired level:

1. Investment needs totaling to 50% of the replacement-value of the switch park;
2. Working capital equaling to one quarter of revenues;
3. Reserves for unforeseen costs of 1 million euro.

The desired level of C&R for 2011 amounts to 16.5 million euro (2010: 13.6 million euro), the actual level according to the balance sheet is 12.9 million euro, which is 77.7% of the desired level (2010: 11.1 million euro and 81.3%). The C&R has not reached the necessary level in 2011. For this reason it is proposed to add the result of 2011 entirely to the general reserve, which is included in the financial statements.

100% C&R coverage means that we reach our upper limit for building the reserve. Thus before we reach that limit, we should decrease pricing. The bottom C&R percentage is defined by what the cash flow allows us to do. Therefore a price decrease will only take place when after a price decrease the calculated future cash & cash equivalents balance in the cash flow statement remains positive.

KEY-FIGURES AMS-IX					(x EURO)
	2011	**2010**	**2009**	**2008**	**2007**
Net revenues	10.497.298	8.545.670	8.842.102	7.202.937	5.545.045
Income before depreciation and taxes	6.431.365	4.964.798	5.932.072	4.633.065	2.918.609
Depreciation of fixed assets	4.100.478	3.317.504	2.379.812	1.696.221	977.170
Income before taxes*	2.330.887	1.647.294	3.552.260	2.936.844	1.941.439
Net result	1.756.219	1.236.473	2.655.837	2.201.827	1.447.107
Cash generated by operating activities	6.097.134	5.440.844	5.475.442	3.354.267	3.191.980
Investments in tangible fixed assets	4.980.161	5.736.431	5.807.069	2.591.589	3.841.129
Capital and reserves	12.862.430	11.106.211	9.869.739	7.213.902	5.012.076
Cash and cash equivalents (31/12)	2.116.590	990.986	1.282.372	990.604	224.253
Full time equivalents (average)	29	24	22	21	21
Members (31/12)	437	388	349	317	290
Customers (31/12)	32	-	-	-	-
Connections (31/12)	835	694	609	547	469

BALANCE SHEET AS OF DECEMBER 31, 2011

(x EURO)

		2011		2010
ASSETS				
Fixed assets				
Switch park	12.130.948		11.381.283	
Computer equipment	64.345		66.464	
Furniture	159.501		35.995	
Subtotal		**12.354.794**		**11.483.742**
Current assets				
Debtors	82.657		81.115	
Taxes	668.328		610.954	
Other receivables and prepaid expenses	720.808		572.539	
Cash	2.116.590		990.986	
Subtotal		**3.588.383**		**2.255.594**
TOTAL ASSETS		**15.943.177**		**13.739.336**
LIABILITIES				
Capital and reserves				
Issued share capital	41.500		41,500	
Share premium reserve	385.779		385,779	
Other reserves	12.435.151		10.678.932	
Subtotal		**12.862.430**		**11.106.211**
Provisions				
Deferred tax liabilities	2.155.700		1.546.902	
Subtotal		**2.155.700**		**1.546.902**
Current liabilities				
Creditors	102.765		366.352	
Taxes and social security premiums	75.034		70.165	
Other payables	747.248		649.706	
Subtotal		**925.047**		**1.086.223**
TOTAL LIABILITIES		**15.943.177**		**13.739.336**

PROFIT AND LOSS ACCOUNT FOR 2011		(x EURO)
	2011	**2010**
Revenues	11.962.177	9.998.211
External operating costs	1.464.879	1.452.541
NET REVENUES	**10.497.298**	**8.545.670**
Other operating costs		
Personnel costs	2.617.822	2.396.899
Depreciation fixed assets	4.100.478	3.317.504
Other operational costs*	1.317.093	1.125.235
Loss on disposal of fixed assets	0	0
Total operating costs	**8.035.393**	**6.839.638**
NET OPERATING INCOME	**2.461.905**	**1.706.032**
Financial results	-131.018	-58.738
Result before taxes	2.330.887	1.647.294
Taxes	574.668	410.821
NET RESULT	**1.756.219**	**1.236.473**

CASH FLOW SUMMARY

(x EURO)

	2011	2010
CASH FLOW OPERATING ACTIVITIES		
Net profit	1.756.219	1.236.473
Deprecation of fixed assets	4.100.478	3.317.504
Cashflow	5.856.697	4.553.977
Changes in working capital:		
Provisions	608.798	993.324
Short term receivables	-207.184	-343.845
Short term liabilities	-161.177	237.388
Total	**240.437**	**886.867**
Cash generated by operating activities	6.097.134	5.440.844
Purchase of tangible fixed assets	4.980.161	5.736.431
Disposals (book value)	-8.631	-4.201
(net cash used in investing activities)		
Increase in cash and cash equivalents	1.125.604	-291.386
Cash and cash equivalents at Jan 1	990.986	1.282.372
Cash and cash equivalents at Dec 31	**2.116.590**	**990.986**

Auditor's report on the summary of accounts

The accompanying summary of accounts (financial highlights 2011, key-figures, balance sheet as of December 31, 2011, profit and loss account for 2011, and cash flow summary), as presented on page 59 to page 62 of this report is taken from the financial statements for the year ending 31st of December 2011 of Amsterdam Internet Exchange B.V. in Amsterdam. We have issued an unqualified independent auditor's report dated April 12, 2012 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 the 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 31st of December 2011 of Amsterdam Internet Exchange B.V. in Amsterdam, on which we have issued an unqualified independent auditor's report dated April 12, 2012.

Oostzaan, May 2012
CPAccountants B.V.
C. van Prooijen RA

HISTORY OF AMS-IX

1994 In the Science Park in Amsterdam a layer-2 shared infrastructure had been formed between (academic) organizations to exchange traffic. In February 1994 it was internationalized to exchange traffic with CERN in Switzerland and other ISP's were allowed to connect. The name AMS-IX was first used.

1997 The twenty connected Internet Service Providers and Carriers found the AMS-IX Association. Founding members are: Surfnet, NLnet, AT&T EMEA, Unisource, BT, KPNQwest, XS4All, Global One, Euronet, EUnet, Wirehub, Belnet, RIPE NCC, Demon, IXE/PSI, Telecom Finland, IBM GN, A2000, UUnet/MCI, GTS Europe (Ebone)

1998 The Multicast VLAN is implemented for test-purposes and the first IPv6 tests are done. The volume of all connections increased from 4.5 Tbyte in September 1997 to 26.3 Tbyte in September 1998, or some 81 Mbit/s on average over the month.

The MPLS/VPLS platform, implemented during 2009, has allowed AMS-IX to develop new value adding services for their members and customers.

2000 The Association forms the AMS-IX limited company, AMS-IX B.V., and holds all its shares. All assets are transferred to the company. SURFnet continues to manage the overall operations of the exchange, technical management is subcontracted to SARA. The Gigabit Ethernet service is launched. The 100th member is connected.

2002 The operations management of the exchange is in-sourced to the AMS-IX company. A professional NOC is formed. AMS-IX extends the platform to two other sites in Amsterdam, Telecity-II and Global Switch. The total aggregate traffic on December 31st is 22 Gbps.

2003 AMS-IX becomes the IX with the largest number of connected networks worldwide with 178 members at the end of the year.

2004 The platform is migrated from a ring to a double star topology,

AMS-IX becomes the first IX in the world to deploy photonic switches. The trunked Gigabit and 10 Gigabit Ethernet services are launched.

2005 AMS-IX becomes the IX with the highest level of public exchange traffic worldwide, the 5 minute average high of the aggregate traffic now reaches 120 Gbps for a total of 234 members.

2006 The GRX peering traffic between the mobile parties is now at the level of the ISP peering traffic in 1997 with a 80 Gbps peak. The ISP peering exchange switches over 1.5 Petabyte a day.

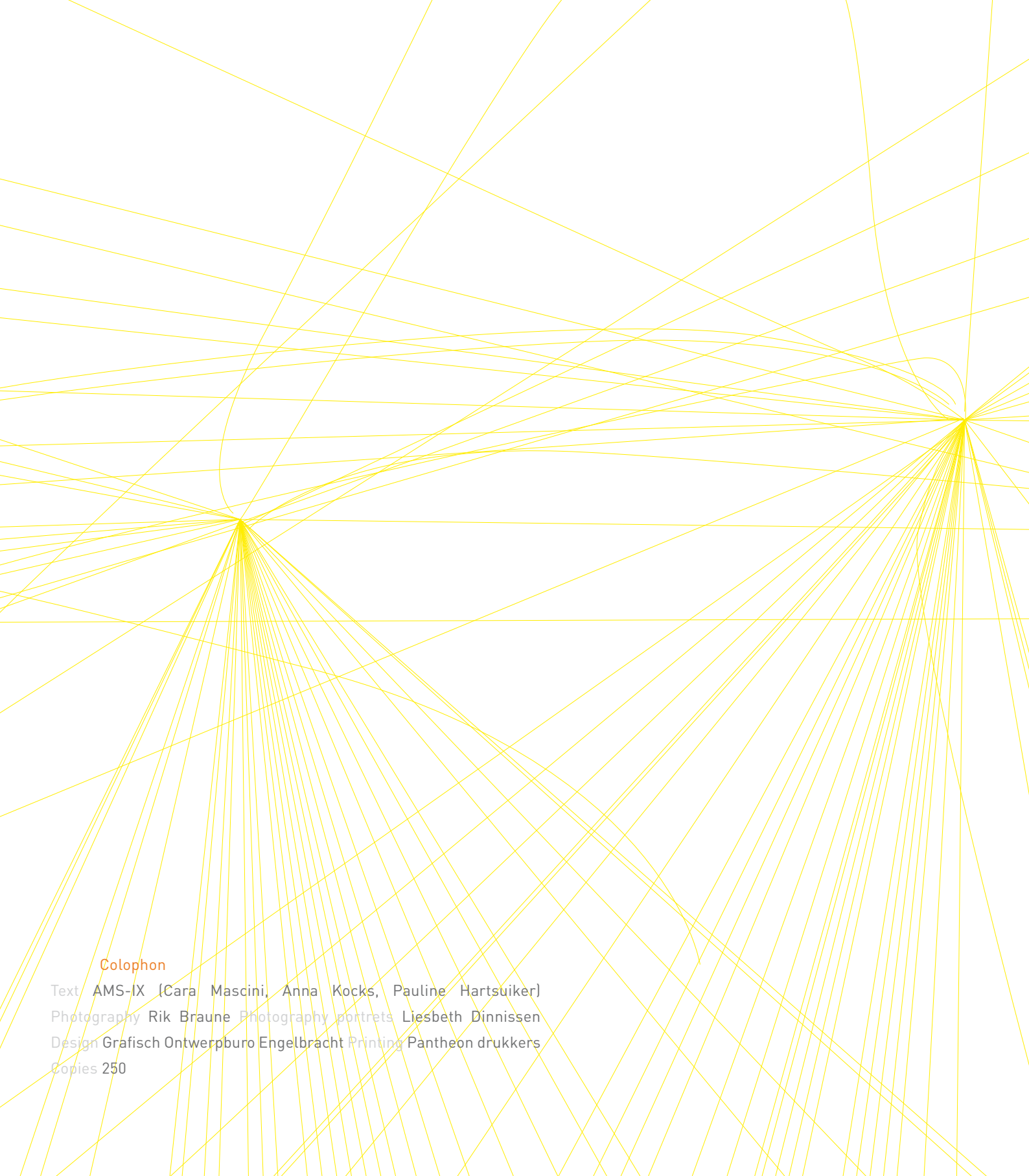
2007 AMS-IX expands to a fifth location at euNetworks and relocates its core switches to the new location euNetworks and existing location Global Switch. Both core switches are upgraded to the MLX32. The total AMS-IX capacity is over 1 Terrabit per second.

2008 300, 400, 500! During 2008 AMS-IX reached the point where we had over 300 connected parties using over 400 ports and exchanging well over 500 Gbps of traffic during peak moments (based on industry standard 5-minute average). Additionally AMS-IX expanded to its sixth core-location at the first Equinix datacenter in Amsterdam.

2009 The platform is migrated from a double star into a MPLS/VPLS topology. The new platform has increased stability and scalability and will be able to support the traffic growth over the coming period. Additionally AMS-IX expanded into its seventh co-location at Interxion.

2010 As a result of growing interest from ISP's from countries in Europe, North America, the Middle East and Asia to connect locally to the Amsterdam Internet Exchange, combined with the heavily increased adoption of smart phones and PDA's with Internet connection. In September 2010 the AMS-IX traffic broke the barrier of 1 terabit of traffic per second and with that marking a new milestone in the history of the Exchange.

2011 The MPLS/VPLS platform, implemented during 2009, has allowed AMS-IX to develop new value adding services for their members and customers. At the start of June, during the first MORE-IP event, AMS-IX launched three new services: Inter-IPX, 100GE ports and a carrier grade SLA.

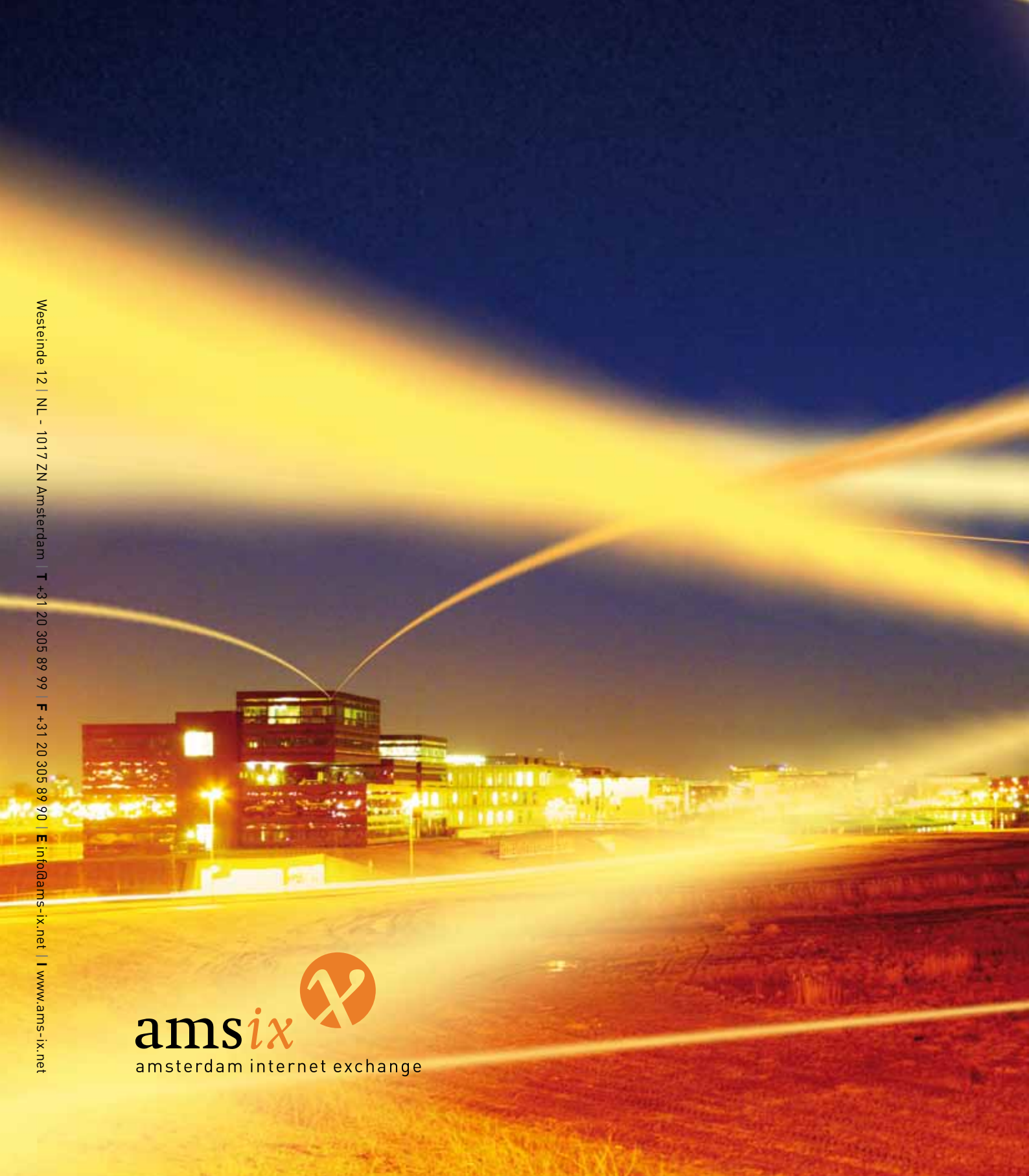


Colophon

Text AMS-IX (Cara Mascini, Anna Kocks, Pauline Hartsuiker)
Photography Rik Braune Photography portrets Liesbeth Dinnissen
Design Grafisch Ontwerpburo Engelbracht Printing Pantheon drukkers
Copies 250

List with new members

The unbelievable Machine Company DE Netriplex LLC US GoDaddy.com, Inc. US IELO FR Keenondots NL Teqnobase NL Ecritel FR Convergenze s.p.a. IT Unidata s.p.a. IT Oman Telecommunications Company S.A.O.G. OM SED Multitel s.r.l. IT Infracom Italia SpA IT Clio Srl IT A100 ROW, Inc UK TV1 GmbH DE Joint Stock Telecommunications Company Telekom Srbija a.d. RS Seeweb s.r.l. IT IT.Gate S.p.A. IT CASPUR IT Redbee NL 012 Smile Telecom IL OJSC "North-West Telecom" RU iNES GROUP RO AppNexus Inc. US Hutchison Global Communications (UK) Limited HK KMD A/S DK Balkan IX BG Voxility RO Quantcast US Prefix Servers NL Bigwells Technology LLC US KAMP Netzwerkdienste GmbH DE Yandex Europe B.V. NL Internet Port Hamburg GmbH DE Blue Jeans Network Inc. US PIN RU Rascom CJSC RU Rentabiliweb Telecom FR Sri Lanka Telecom Plc LK Computerline CH OpenX US Netsign GmbH DE Websense Deutschland GmbH DE Softbank Telecom Corp. JP Oxalide FR Closed Joint Stock Company TransTeleCom RU Conet Services AG DE AireNetworks ES Associated Networks (UK) Ltd UK Nederlandse Gasunie NL Hong Kong Broadband Network Limited HK Advanced TV Net AB SE BT Italia S.p.A. IT Eutelia S.p.A. IT Virtuaoperator Sp. z o.o. PL Equant RU Service Industriels de Lausanne CH Bell Aliant CA Etop Sp. z o.o. PL Softlayer US ICT Facilities E.U. B.V. NL CloudFlare, Inc US Uniserver Internet B.V. NL Bolignet-Aarhus F.M.B.A DK Gamania Digital Entertainment Co. TW SPEEDY NETWORKS LLC RU Alamid CY Fastly US Blackboard US Jazz Telecom Sau ES Swiftway PL Comvive ES AC Webconnecting BV NL BCC GmbH DE Global Communication Net Plc BG Glasvezelring Hilversum NL Host Europe GmbH DE Intercity Zakelijk NL FusionStorm International LLC US TENET ZA GleSYS Internet Services AB SE bn:t Blatzheim Networks Telecom GmbH DE STRATO AG DE Bradler & Krantz GmbH & Co. KG DE TMR - Telekommunikation Mittleres Ruhrgebiet GmbH DE SUPERONLINE ILETISIM HIZMETLERI A.S TR INOTEL S.A. PL MCKAYCOM LTD UK Websense US Global Layer NL GOPAS Solutions GmbH DE Justin.tv, Inc. US V Kontakte Ltd. RU Redstation Limited UK Isocel Telecom BJ OAO "Rostelecom" RU Academia Sinica Grid Computing Centre TW Custodian LTD UK MNI Telecom S.A. PL Wifiweb srl IT Ntrnet srl IT RRbone DE Magyar Telekom plc. HU Hawe Telekom PL Its Hosted NL TRENTINO NETWORK S.R.L. IT SeFlow s.n.c. di Marco Brame & C IT



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