



ANNUAL REPORT 2003

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Preface of the Chair

The year 2003 was again one of continuous growth for the Amsterdam Internet Exchange. Contrary to market tenor we have seen the volume of Internet traffic and number of ports increasing steadily and

the neutrality and independence of the exchange (i.e. no competition with members) and sound management. The careful choices that have been made in this process so far give great confidence for the future.

The new Executive Board inaugurated in the September 2003 General Meeting feels that it takes control over a sound and stable AMS-IX from the leaving board members. The Amsterdam Internet Exchange is no longer a pioneering and organically growing community; it is becoming a mature and professional organisation with a clear goal and well defined responsibilities. The new board defined its first target to support this process and will submit proposals to the members to that effect in 2004.



many new members joined the AMS-IX Association. The member count as of 31st of December 2003 was 178 representing 245 ports.

The AMS-IX company delivered outstanding quality of service to the Associations' members. The increasingly competitive market in which the exchange operates requires careful positioning with respect to

With its management and staff, the exchange is in good hands and will continue to develop and expand its position as highly credited Internet Exchange in the coming years, while increasing the value for our members.

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

A handwritten signature in blue ink, appearing to read 'Boudewijn Nederkoorn'.

Boudewijn Nederkoorn
Chairman

Organisation

The Amsterdam Internet Exchange Association

In 1997, about twenty Internet Service Providers and Telecommunication Carriers formed the AMS-IX Association. Since 1994 the exchange had been run on shared infrastructure in the Amsterdam Science Park.

In 2003 the AMS-IX Association counted 39 new members, likewise the company counted as many new customers, see their names in the list. Since 6 members “left” the exchange due to a variety of reasons such as mergers and acquisitions or new network insights this makes a total of 178 members at the end of 2003. This is about the same absolute member growth as in 2002, representing a growth percentage of 23%.

The member profile becomes increasingly international. During 2003 the balance shifted from a majority of national to a majority of international members, out

of the 178 members (31/12/'03) we ‘tag’ almost 100 being international. Of those international parties most have a European background. The Amsterdam Internet Exchange is now truly an international network hub. Moreover, AMS-IX is now the mutual Internet Exchange with the largest number of members worldwide.

Executive Board

The Executive Board of the Association forms the linking pin within the organisation. They are responsible for managing the activities of the Association and have a supervisory role over the management of the BV which was formed in 2000. Every two years new boardmembers are elected, members can serve a maximum of two terms. The Executive Board calls for General Meetings twice yearly, as well as regular Technical Meetings.

The composition of the board changed during the General Meeting of September 24th 2003. Board members in 2003 were: *See Table 1*

The new board represents a good mixture of the type of members with a target ISP, business ISP, a content provider, a mobile operator and an international carrier.

Board members in 2003

1st January 2003

Marc Gauw – *Priority Telecom (chair)*
 Ad Bresser – *Planet Technologies*
 Sjoerd van der Maaden – *Active ISP*
 Vincent Rais – *Versatel*
 Maurice Dean – *Global Crossing*

31st December 2003

Boudewijn Nederkoorn – *Surfnet (chair)*
 Michel van Osenbruggen – *BIT*
 Jan Paul Dekker – *RTL iMedia*
 Mark van der Laan – *Vodafone*
 Maurice Dean – *Global Crossing*

Euro-IX

Euro-IX (European Internet Exchange Association) was formed in May 2001 with the intention to further develop, strengthen and improve the Internet Exchange Point (IXP) community throughout Europe.

A number of Europe's Internet Exchange Points, amongst which AMS-IX, recognised a need to combine their resources so as to co-ordinate technical standards across the continent, develop common procedures, and share and publish statistics and other information. This publishing of information in turn gives all interested parties a better insight into the world of IXPs across Europe.

Since the formation of Euro-IX, AMS-IX has played a major role in the Association, CEO Job Witteman has been on the executive committee since the first elections. Furthermore the Euro-IX office is run by AMS-IX, providing the secretariat service which will continue until the end 2007.

Serge Radovic

Secretariat General



Board meetings were held seven times during 2003. Discussion topics mainly focused on the development, growth and continuity of AMS-IX, the financial situation and the legal structure.

General Meeting

Two general assembly meetings (GAM) were held in 2003. Especially the 15th general meeting on 24th of September where the new board was elected was very well attended, supposedly due to the high number of board member candidates.

The results of 2002 and the annual figures were presented by the board and approved by the assembly at the 14th GAM on May 28th 2003. It was agreed that profit made will remain within the BV to allow for investments necessary to be made in upgrading the platform to sustain the continuing exponential growth of the traffic.

The election of the new board at the 15th GAM was a lengthy process but resulted in a well balanced board. In the same meeting the price structure for 2004 was approved, resulting in a reduction of the price for the 10BaseT port from 500 to 200 Euro per month.

Additionally a proposal was made to initiate a partner program for reselling AMS-IX services by third parties, all within the mutual benefit, which was well received.

Technical Meeting

The Technical Meeting gathered three times during 2003 at January 31st, May 28th and September 24th. To continue improving the stability of the platform increasing port hygiene & security measures and the use of quarantine VLANs were introduced in January. Link aggregation as potential service was proposed in the meeting of May 2003. Link aggregation (a.k.a.

trunking, etherchannel etc.) allows members to grow their bandwidth at AMS-IX beyond 1Gbps, and bridge the gap between 1G and 10G.

A renewed proposal for a new architecture was introduced at the 18th TM in May. The main goals of this new architecture were:

- Make the inter-switch capacity more manageable
- Offer more access bandwidth to members (introducing 10 Gbps ports)

Of all the options presented, the AMS-IX NOC believes that the “double-star” topology would be the best alternative which was supported by the TM. At the 19th TM the details of the topology were discussed further. More details on all technical topics can be found in chapter 2.

The Amsterdam Internet Exchange BV

Amsterdam Internet Exchange BV is a company with



Above (left to right): Marcel van der Bilt, Geert Nijpels, Henk Steenman, Rafael Kooij, Driek van Dijk, Arien Vijn, Romeo Zwart. Below (ltr): Steven Bakker, Cara Mascini, Job Witterman, Anneloes Boshoven, Chantal Sporkslede. Absent: Serge Radovic, Niels Bakker

limited liability. The sole shareholder of the company is the Amsterdam Internet Exchange Association. The company was established in 2000 with the purpose to take over all contractual relations previously engaged by the Association, as well as taking over all administrative tasks previously executed by the Facility Management Partner, and develop AMS-IX into a professional company. All assets generated by the Association have then been transferred to the BV. Later also the operation and support of the platform is transferred from the Facility Management Partner to the company.

The Board of the Association has a supervisory role on the management of the BV. Members of the Association are customers of the BV and pay their fees directly to the BV. The BV acts in the interest of, and is controlled by the Association.

The company has a straightforward structure. Job Witterman as Chief Executive Officer is responsible for the company as a whole. Two main departments exist, Office and Technical. Henk Steenman is as Chief Technical Officer responsible for all technical issues, research & development and the Network Operating Centre team. At Westeinde 12, Amsterdam, the AMS-IX offices house all the companies' employees. The total team grew from 9 to 12 FTE during the year. (See organogram on page 10)

AMS-IX Network Operating Centre

The NOC team delivered outstanding service during 2003. Even though no service level agreements are in place many of the members have found their service extremely stable as a result of all measures put in place in 2002. More details on the technical issues can be found in chapter 2.

Word of the CEO

The year 2003 was one of internationalisation for AMS-IX, now the majority of the members have an international profile. Additionally we see more competition coming from abroad that is interested in our home market. The AMS-IX company has therefore focused on professionalisation on an international level in 2003.

The measured service levels of AMS-IX can easily compete with any commercial service level agreement of international standard. The NOC team has implemented several tools and procedures to keep track of incidents and statistics to increase awareness of quality issues.

Moreover a lot of work has been done by the technical team this year regarding a timely upgrade as well as the new architecture and topology of the AMS-IX platform. Careful planning and consultation with members was done in preparation for the migration of members to the latest version of current switches. In the September General Meeting the actual design of the next generation platform and topology was approved, involving the use of innovative photonic switches.

Business processes such as membership applications and connection changes have been streamlined in 2003 and as a result are increasingly efficient and mainly through digital channels. The administrative team has been expanded to keep the lead times to a minimum.



AMS-IX has taken some steps toward business development and expansion of reach amongst others by drafting the principles of a partner program, to be initiated beginning of 2004. Besides that marketing was added as a new discipline to the AMS-IX office.

Financially AMS-IX is a sound business. The business ratio's and growth figures show increasing turnover and profit on the one hand and increasing investments and depreciation on the other. Cash flow management is always a balance with the timing of investments, building up of endurance capital by keeping reserves within the company for future events is important for the steady operation of the exchange. Continuation of the exchange, preserving the renowned market position and bringing increased value to the members is our main goal for the years to come.

Job Witteman
Chief Executive Officer

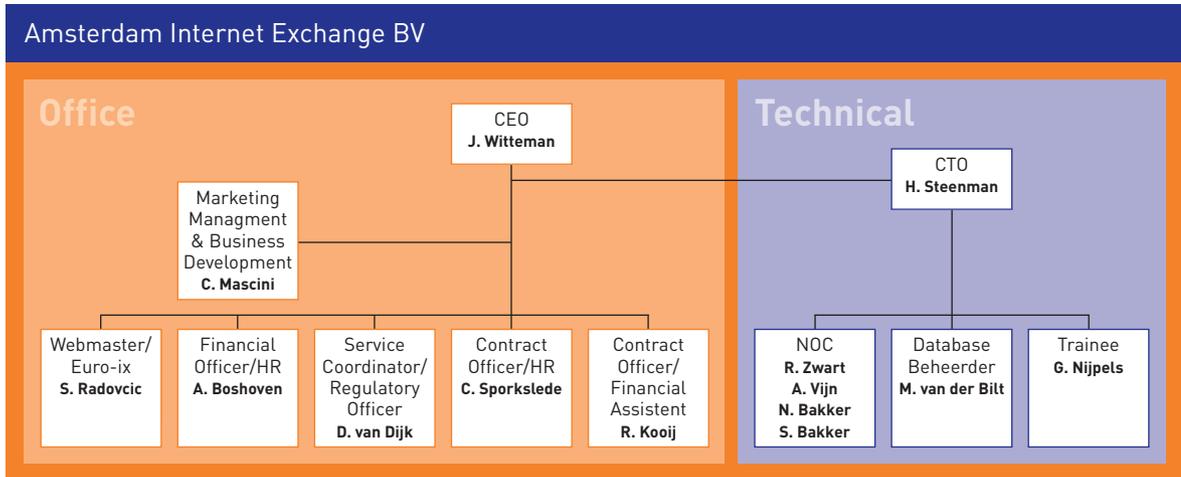


Figure 1: Organigram

AMS-IX Office

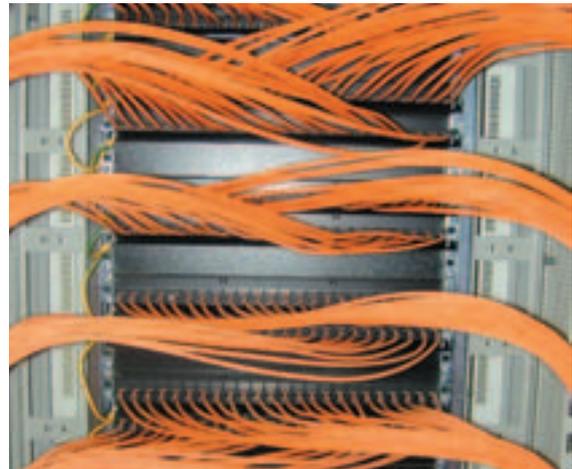
The office team and disciplines continued to professionalise in 2003. Administration, financial and contractual processes were efficient, professional and speedy, many compliments to that effect were received in 2003. End of 2003 marketing was introduced as a new discipline to the AMS-IX Office assignments amongst others to develop the AMS-IX partner program.

Value of the exchange

It is always said: the value of the exchange is defined by its members, without the ability to really quantify. Knowing that factors like the number of members (peering opportunities), traffic load and type of traffic (local/regional/national) they have individually and together as well as the relation between prices of the IXP ports versus the commercial IP-transit market are important factors in the area of value.

At the Euro-IX forum in November 2003 experts in the field¹ presented a way to rationalise the value of an

IXP and the value to its members. Although it does not take into account all factors it seems a clear measurable unit and therefore useful in comparing (some form of) value. The formula quantifying the value of the exchange to its members is as follows:



$\text{Value}_{IX} = (\text{Avg Traffic Maximum} * \text{Avg Cost of IP-transit}) / (\text{Avg Number of members})$

The theory is that as long as the value of the IX based on the peering opportunities at the IX exceeds the cost to connect, new members will continue to apply.

For 2003 it would bring AMS-IX at an average monthly value per member of:

$\text{Value}_{IX} = (16 \text{ Gbps} * 75 \text{ E/Mb}) / (160) = \text{Euro } 7680 \text{ per month}$

Average cost to connect (V_c) including port fees, colocation fees amount to roughly Euro 2000 per month, therefore the value of AMS-IX is proven in its value to members by the reduction of operational costs.

Other important elements defining the value but not quantified lie in for instance: the autonomy membership stands for, the liberal attitude, the professionalism, service levels, responsiveness and accessibility, as well as the neutrality and independence of the exchange

Strategic charter

There are several strategic factors to keep in mind to be able to continue the success of AMS-IX in a more competitive and potentially more strictly regulated environment for the future. The following strategic charter we developed in November 2003 gives AMS-IX the ability to manage the exchange towards an even more mutually benefited future.

Vision

“Develop and expand the high credited value as renowned IXP”

Mission

“Continuously increase the value of the IXP while pre-

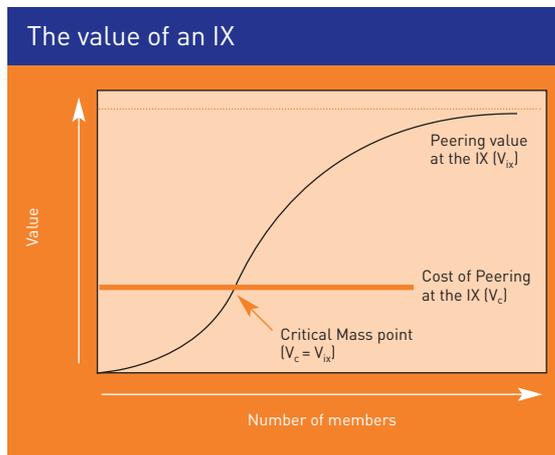


Figure 2: Graph William B. Norton

“serving our members’ interests and ensuring continuity by providing professional services, increasing the number of qualifying participants and facilitate traffic growth using technological innovation”

Values

- We are a neutral and independent facilitator;
- We are reliable and capable;
- We are proactive and responsive;
- We have an accessible and open IXP attitude;
- We inspire trust;

And always and above all:

- We serve our members

1 The art of peering: The IX playbook by William B. Norton – Presentation at the Euro-IX forum in Lisbon November 3rd 2003

Housing Locations value AMS-IX ...

Nikhef

“In the last years NIKHEF has invested substantially to upgrade its facilities to the current professional level. On 31 January 2003, following the AMS-IX tech meeting, NIKHEF together with SARA celebrated the deliverance of our no-break installations. In April a new NIKHEF entrance protocol came into force and a website was launched with all relevant information about our facilities (<http://www.nikhef.nl/ams-ix/>). Further in 2003 NIKHEF installed an overhead fiber cabling system and streamlined its cable management. The number of customers and racks in use continued to grow.”

“NIKHEF welcomed the first steps in the upgrade of the AMS-IX backbone infrastructure. NIKHEF values the innovative approach taken by AMS-IX. In preparation SARA and NIKHEF have installed additional fiber infrastructure between both our facilities.”



National Supercomputer (SARA)

Sara

“SARA experienced in 2003 a considerable increase in the number of AMS-IX members. This has had a positive effect on SARA’s co-location facilities and resulted in a growth of the AMS-IX connections at SARA. In December 2003, approximately 80 AMS-IX members used SARA’s datacenter for their business activities. Compared with 2002, this is an impressive increase.”

“SARA, based at Sciencepark Amsterdam, is the Dutch National Supercomputing center and offers a range of services related to high performance computing and networking. Since the foundation in 1997 of the Amsterdam Internet Exchange (AMS-IX), SARA Computing & Networking Services is one of the first and the largest locations of this Internet exchange. At Sciencepark Amsterdam, SARA and NIKHEF provide in close cooperation co-location services to AMS-IX members. Besides SARA offers fiber connectivity to other AMS-IX sites, remote hands and helpdesk support, hosting, large-scale storage, backup and archiving.”

“Further initiatives to strengthen the Sciencepark Amsterdam as the main Internet port of the Netherlands are still ongoing. SARA considers the implementation of the new state-of-the-art infrastructure by AMS-IX a guarantee for AMS-IX’s major position as one of world’s largest Internet exchanges for years to come.”

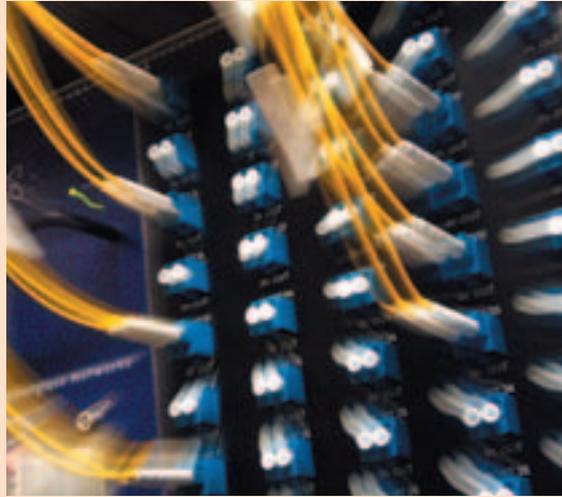
Telecity

“TeleCity as leading provider of Data Center services highly appreciates its longlasting relationship with AMS-IX. The presence of AMS-IX in our data center in Amsterdam is an important element of our total service portfolio. By offering direct connections to AMS-IX, our customers can realize the most efficient connections to the Internet,” says Alexandra Schless, Country Manager TeleCity.

“Our cooperation with the professional AMS-IX organization guarantees our customers a competitive environment for doing world-wide business over the Internet now and in the future.”



Diesel generator (Telecity)



Photonic Switch

Global Switch Amsterdam

“An important factor for Global Switch’ continued success in signing up new colocation customers in our Amsterdam data centre is fast and reliable access to internet peering points. AMS-IX is supplying just that.

The presence of AMS-IX in our centre provides customers with a comprehensive portfolio of services and connection with all major Dutch ISPs and a growing number of international ISPs.

We believe that the unique profile of AMS-IX combined with Global Switch Amsterdam’s state-of-the-art, purpose designed data centre presents a valuable colocation proposition to businesses in the Netherlands.”

Technical & Services

Technical

NOC

Since their first year of operations in 2002, after having taken over from Facility management partner SURFnet, the AMS-IX Network Operating Centre team further expanded the set of tools, methods and processes of the NOC in 2003. Moreover the team was expanded with one fulltime employee resulting in a team of 5 engineers. The NOC is servicing 24x7x365, outside of extended office hours on a 'on call' duty basis.

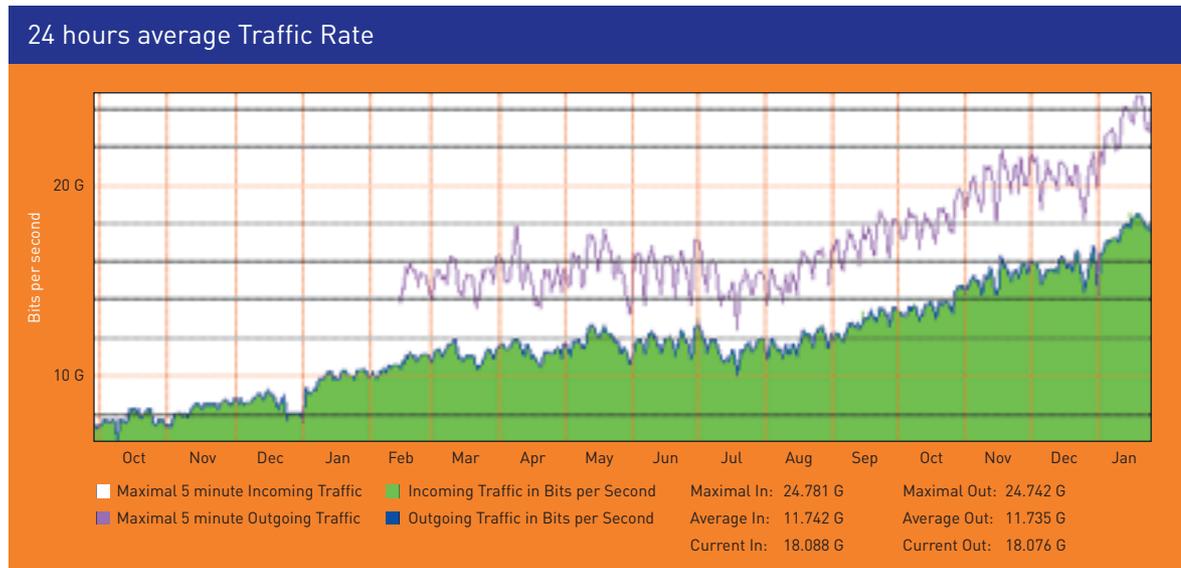
The network was kept very stable with high availability rates of the switches (> 99.9%) and platform connections. No major incidents occurred in 2003.

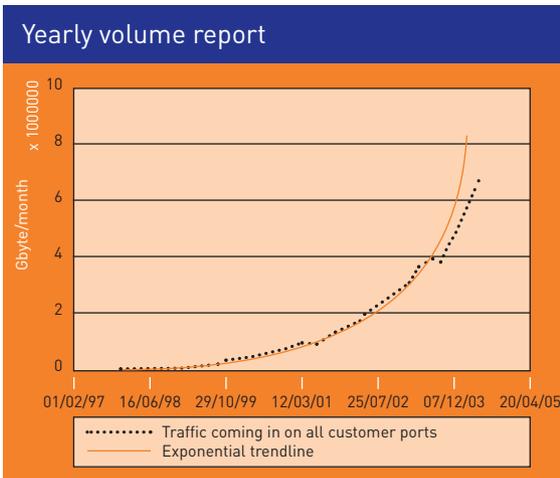
Port hygiene measures in combination with an automatic port shutdown procedure and placing in the use of a quarantine VLAN in the connection procedure for new ports have resulted in less pollution of the production platform.

Volume & Traffic Rate

The total monthly ISP traffic volume of the member connections increased from 3.0 Petabyte in December 2002 to 5.1 Petabyte in December 2003.

The 24 hours average traffic rate overall increased from an average 9 Gbps in December 2002 to just under 17 Gbps in December 2003. In February we started showing the maximum 5 minute traffic rate which was





then 12 Gbps and grew to 21 Gbps in December 2003, a growth rate of 75%!

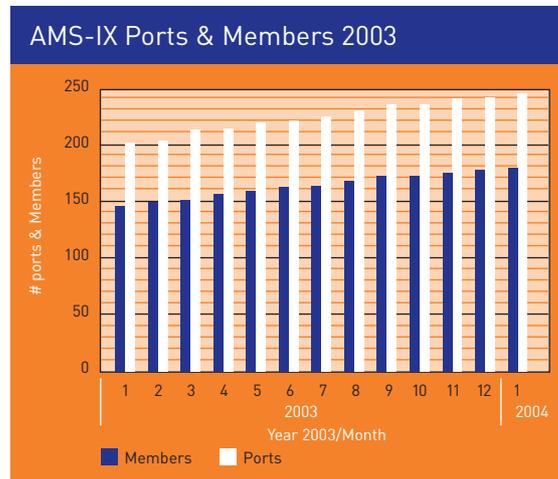
Even at night the exchange carries over 10 Gbps of traffic at the end of 2003. Although the traffic profile still reflects the Dutch/European daytime distribution, it is getting more and more international.

Traffic growth during 2003 was somewhat atypical compared to previous years. We saw exponential growth during the first and fourth quarter but something between no growth and a small linear growth between march and august. Although the explanation for this is not entirely clear it is believed that a number of members outgrew their GE connection capacity and shifted a lot of traffic from the exchange to private interconnects.

Connections

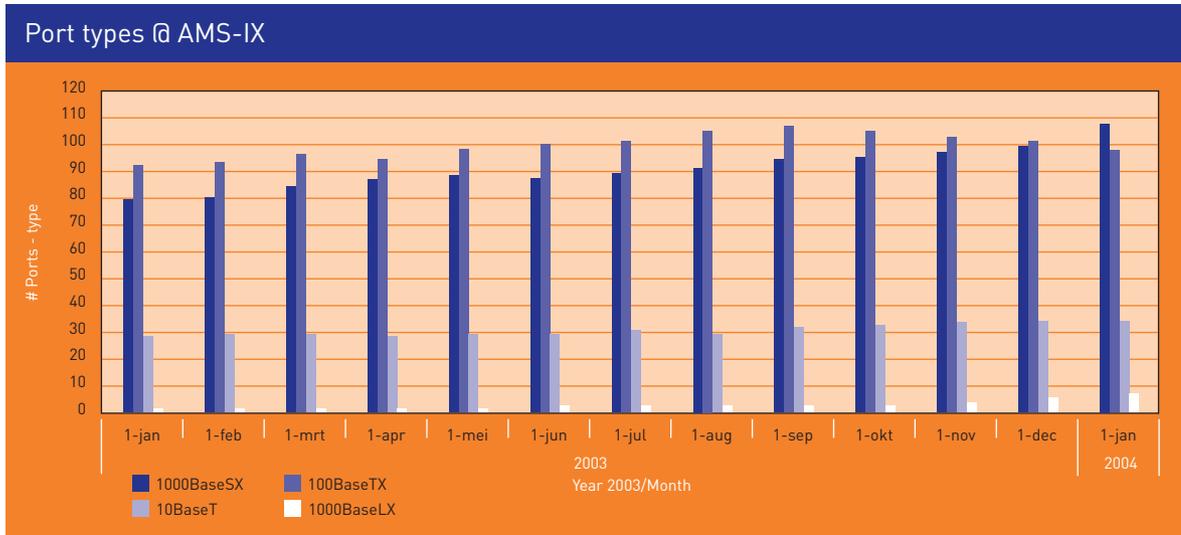
During 2003 the port versus member ratio remained more or less stable at 1,37 connections per member. The total number of connections grew from 201 to 245. At the last quarter a clear trend is set in port upgrades

from 100BaseT to 1000 Base both SX and LX and occasionally also from 10 to 100 base T. Mid November 2003 the Gigabit ports surpass the 100 Megabit ports in number. The distribution 10/100/1000 Mb ports changed from 14/46/40 percent to 13/40/47 percent. Although the 10 and 100 Megabit ports knew quite some growth in 2003 compared to 2002, due to the GRX and MDX connections, the absolute growth was low because of many upgrades.



Regarding the housing locations of AMS-IX, the Amsterdam Science Park with NIKHEF and SARA, still forms the major segment. Comparing the four individual sites NIKHEF is still the largest followed closely by SARA both over 80 ports at 31st December, but Telecity is catching up fast with 63 ports. So the relative importance of the two Science Park locations is declining. Port growth at Global Switch is still small with 12 ports at the end of the year.

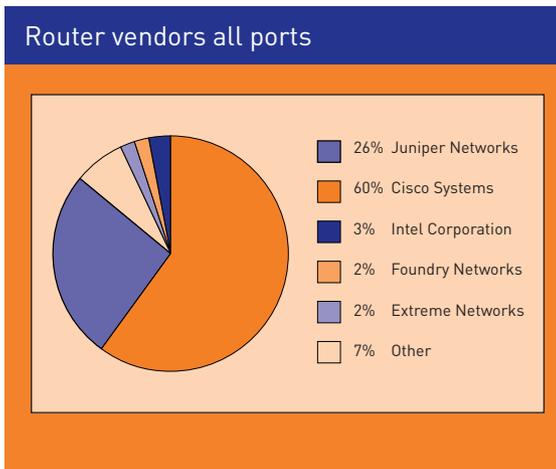
The customer connected equipment reflects market findings with the majority using Cisco and



Juniper. Amongst the members with Gigabit connections the Cisco power is less strong than overall and the number of Juniper routers almost equals that of Cisco.

Topology & architecture

The topology of the platform was discussed intensively during 2003. End of 2003 beginning 2004 the architecture of the platform will be upgraded and changed to a new topology. There are a number of reasons for this change and upgrade, mainly lifting capacity constrains, scalability constrains, interdependent performance issues and to enable new service development. Basically these changes are necessary for continuity reasons.



Double star with photonic switching

The new topology will be a double star with next generation switches, Foundry Mucho Grandes 8, in the middle and the existing switches connected as spokes to both these central switches. Existing customers (up to 1Gb ports) will remain connected to the existing switches. The edge switches will be also be upgraded to JetCore ASIC based Foundry Network Big Iron 15000 switches. To gain back the resilience of the former ring topology AMS-IX will use photonic switching. The main pur-

Word of the CTO

On the technical level the year 2003 was an important milestone for the Amsterdam Internet Exchange.

It was the second year of operation of the AMS-IX NOC and it has become clear that the NOC has evolved in a very dedicated team of professionals who keep the Exchange operational at a very satisfying level for the AMS-IX members. To be able to cope with the growing work load we hired an extra engineer, with whom we now total 5 NOC engineers.

Though we saw a slow down in traffic growth during the second and third quarter of the year, the growth in the other quarters was still exponential and amongst others made it necessary to investigate an upgrade of the AMS-IX platform.

During the year we spent considerable time in choosing new equipment to be able to cope with the growing traffic for the next coming years. From the limited choice available we have again chosen for Foundry Networks as the vendor for the core Ethernet switches. Next to these we have chosen for Glimmerglass Network photonic switches to help us build a network topology that resembles a double star/hub. The photonic switches introduce a new concept



in the AMS-IX infrastructure which might start of new directions for interconnectivity.

With the equipment chosen and the introduced topology change during the year 2003 the foundation has been laid for the next step in AMS-IX services where upscaling of member connectivity from a maximum of 1 GE to 10 GE (or more) is realistic.

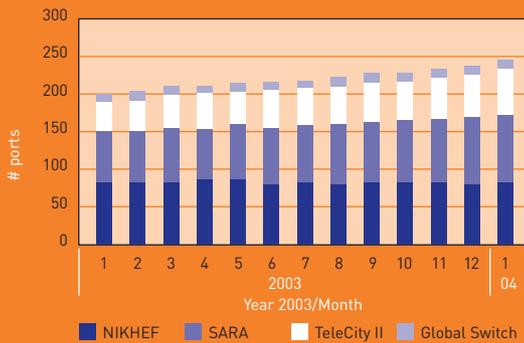
Henk Steenman
Chief Technical Officer

pose of the photonic switches is to resiliently connect 10GE customers to both core switches. Resilience in the edge/core infrastructure will be implemented by using VSRP (virtual switch redundancy protocol) between the two core switches, essentially building two star topologies, one as a backup for the other.

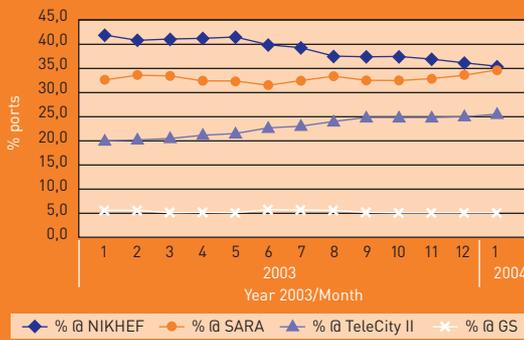
Research & development

In 2003 the technical team installed a laboratory in which the production platform is mirrored in a test

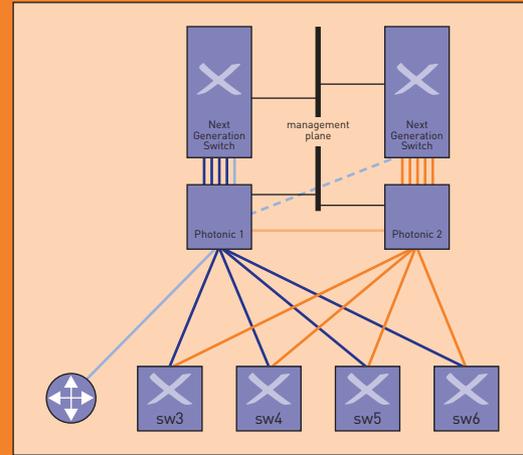
AMS-IX # Ports per location stacked



AMS-IX # Ports per location % total



New topology



environment. Here we can test software upgrades, patches, protocols, configuration changes, new versions of platform equipment, new customer equipment etcetera. Moreover we test and in some cases even co-develop new innovative technologies.

During 2003 the focus of the lab was on the upgrade, migration and new architecture of the platform. The Foundry BigIron 15000 JetCores and Mucho Grandes 8 Ethernet switches were tested extensively before being implemented in the production platform. Besides the Ethernet switches the laboratory was instrumental in defining the exact configuration and workings of the Glimmerglass photonic switches.

Services

Few new services were added to the portfolio in 2003, although in the lab we did quite some testing, amongst others the 10 Gigabit Ethernet connection service.

Link aggregation of 1GigE

The aggregation of multiple Gigabit Ethernet interfaces, also called “trunked ports”, was tested extensively in 2003 and in the last quarter of 2003 released for beta-testing on the production platform. Up to 4 connections can be linked creating a virtual 4 Gigabit connection. XS4ALL was the first member to use

link aggregation in Betatest. Link aggregation will be offered as a standard service in 2004.

1GigE LHA interface

Another service addition was the Long Haul Interface for the Gigabit Ethernet connections, enabling fiber connections up to 80 km of the exchange. The ability

Long time member BIT says ...

One of the increasingly fewer privately owned and successful Dutch ISP's BIT has been AMS-IX member for more than 6 years. “BIT aims to be independent and as entrepreneurs we have always valued the autonomy and business benefits that the AMS-IX membership brought us, right from the start” says Michel van Osenbruggen, CEO and co-owner of BIT.

This attitude reflects the peering policy* they advocate on their AMS-IX connections. Their policy is open, meaning they will peer with anybody. Due to their professional reputation and independence BIT is able to offload almost 80 % of their traffic on the Amsterdam Internet Exchange. They peer with 130 of the current 178 members of the AMS-IX Association.

The neutrality and independence of AMS-IX is very important to BIT. Michel: “I very much doubt we would have connected to an exchange owned by a carrier or other commercial party. The mutuality of AMS-IX is insurance of the continuation of the platform and thus our peerings, while the Association as a whole directs the AMS-IX company. All members are equal, whether small national ISP or large international carrier.”

About the price/service quality ratio Michel says: “If anything AMS-IX is too cheap, AMS-IX offers tremendously good service for a very fair price. I know AMS-IX is a non-profit environment based on the Association but given the state-of the art platform and pro-active service prices could increase as far as I am concerned.”

* NB: AMS-IX is not involved in any of the peering negotiations or settlements between its members. AMS-IX's objective is to facilitate connections and maintain the infrastructure.



Member

Michel van
Osenbruggen

CEO and co-owner
of BIT.



to house customer equipment on a remote location offers the members even more flexibility in network design and choice of suppliers. The LHA interface (single mode, 1550 nm) will be offered as a standard service in 2004.

Closed User Group IP on Demand

Member Telefonica formed a new Closed User Group to offer a service IP on Demand to the other members. Their offering enables the members of the CUG the ability to scale their IP bandwidth within a matter of minutes. Bandwidth purchased through IP On Demand is priced dynamically through an auction process and

provisioned automatically in real-time, converting the fixed costs into variable and thus, creating significant advantages for users.

Designing a Platform for Growth

When AMS-IX was looking to re-engineer its network topology to create a more resilient core structure and to scale up service provisioning to offer 10GbE connections, it contacted Foundry Networks. Foundry is a long time provider of high-performance network infrastructure to AMS-IX.

AMS-IX chose Foundry's award-winning, Terabit-capacity BigIron MG8 switch for deployment in its network to keep pace with explosive growth in network traffic among its 178 customers and to provide additional capacity for continued growth in years ahead.

For instance, large volume users, particularly ISPs, have a great need for scalable expansion and will benefit from the increasing densities of 10GbE ports that AMS-IX can offer using the BigIron MG8.

AMS-IX chose Foundry's solution for this important milestone in its history because of the excellent working relationship and the high-quality technological innovation offered by Foundry. Another decisive factor was the superior support and cooperative testing Foundry offered in helping AMS-IX carry out these far-reaching changes to its network architecture.

With its 40-Gigabit-capable architecture, the BigIron MG8 switch will allow AMS-IX to easily upgrade to even higher Ethernet speeds in years ahead using its existing switches.

Suppliers

Bob Schiff

Director of Marketing,
Enterprise Business
Unit



Outlook 2004 and beyond

Although this is basically the annual report for 2003 we want to offer some insights in the expected activities planned for 2004 and other future developments.

Organization

Office

The office team is expected to be quite stable for 2004 with the additions to the team in 2003. In due course the office unit will grow with the expected increasing workload due to the growth of members and connections.

Apart from the regular activities in finance and administration AMS-IX BV will be initiating some marketing and communication activities. One of the first visible results of the marketing activities was the choice for a new house style in December 2003 to be implemented in the first quarter 2004, resulting also the style of this report.

Public Relations will result in some more press attention, both online and in print. Main focus of the marketing and business development manager will be to develop and initiate a Partner Program.

AMS-IX Partner Program (APP)

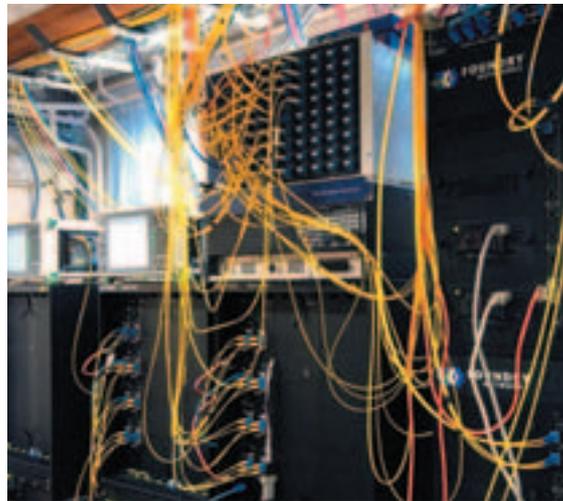
The APP will allow AMS-IX relations to re-sell AMS-IX ports as part of their own service portfolio. The model is aimed to provide easier (remote) access to AMS-IX without jeopardizing the mutual benefit. The partner will take care of customer relation including billing and first line support.

A substantial number of current members and relations have already expressed interest.

Partners will cover the complete IX service portfolio and are expected to offer additional services to customers such as co-location or transit. Customers of partners will become a member of the Association and sign a connection agreement with the BV.

NOC

The technical/NOC team is planned to grow prior to forecasted growth in connections and traffic to keep up the regular quality of service. For 2004 this means potential expansion of the team with one employee.



AMS-IX laboratory in fully operational configuration

Technical

The focus of the technical activities in the first half of 2004 will be on the upgrade of the systems and migration of the platform to the new topology. More detailed and neutral measurement of quality of service is planned for implementation in 2004. Realization of the infrastructure to support many aggregated GE connections throughout the platform and customer 10 GE connections on the core switches will be realized during the first half of 2004.

The photonic switches introduced at the end of 2003 in the AMS-IX infrastructure may be key to future developments in the area of fiber or lambda switching. Application of these technologies will be extensively researched in the AMS-IX lab environment to see whether this is applicable to an Internet Exchange model. Potentially this technology allows for a connection oriented exchange where BGP sessions can be mapped to a lambda or fiber connection. In this model, each connection (and thus BGP session) could scale to very high bandwidth capacity (> 40 Gbit/s)

Services

For the first time AMS-IX decreases a price, the price of the 10BaseT connection drops from € 500 to € 200 per month per January 2004.

Trunked Gigabit connections will be offered standard in the first quarter of 2004.

10 Gigabit Ethernet connections will be offered standard in 2004, probably from the second or third quarter onwards.

We will welcome members to use our Closed User Group service for setting up separate dedicated VLANs for the purpose of offering each other value added services such as Telefonica's IP on demand.

Members

Due to the possibility to officially connect by pseudo-wire (long haul layer 2 connection) and medium range fiber we expect that remote parties will find fewer thresholds to connect. Especially since the partner program will offer them a one-stop-shop solution.

Potential members will no longer have to deal with 3 parties for connectivity, housing and connection but with just one, the partner.

This will probably result in more national connections of smaller parties wanting 10 and 100 Mb connections, especially since the price of the 10 Mb port has gone down to € 200. But equally important it will allow for easier connection of internationally remote parties to AMS-IX such as from Asia or the US.

AMS-IX will initiate a survey in 2004 amongst members to get their opinion on amongst others market developments, traffic forecasts and use of the exchange to increase the forecasting accuracy.

New kind of member RTL iMedia about AMS-IX ...

RTL iMedia represents a new type of member company for AMS-IX. As a major content provider with a focus on audio and video streaming they are defining the new media business model as we speak. AMS-IX plays an important facilitating role in this model. Jan Paul Dekker, manager of RTL iMedia explains.

Jan Paul Dekker: "Just last week a delegation of Bertelsmann Corporation a media conglomerate and our shareholder visited RTL iMedia and were very impressed with our business model. They are thinking of extending the concept throughout their international subsidiaries."

Content providers are not yet familiar with the use of Internet Exchanges as a means of routing their IP traffic. Jan Paul: "With a limited investment in autonomy of infrastructure we were ready to connect to AMS-IX. What it brought us was a means to off-load a minimum of 93% of our traffic through peerings and a very low stable cost base. Our fixed cost per Mb is now 9 Eurocents and we know that most of our colleagues in the market pay at least 10-fold per Mb and sometimes even a lot more."

"We could not do high quality online/live broadcasts were it not for our AMS-IX connection. It would just be much too expensive in terms of bandwidth purchase and probably too slow for the user due to too many network hops between user and content." says Jan Paul "Even with over 50 % of our viewers having broadband connections, which is a much higher broadband % than the average site has."

The peering policy* of RTL iMedia is open. Since they want their content to be available to as many users at the best possible quality they pursue as many peers as possible. RTL splits peering traffic from transit traffic to other servers to offer their peers even better quality.

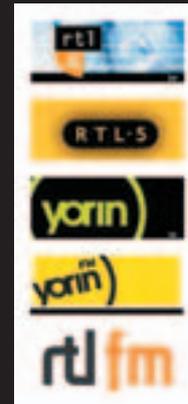
The neutrality & independence of AMS-IX is important because it brings many different types of peers for RTL iMedia, from all local ISPs, small and large, to international carriers bringing their content worldwide.

* NB: AMS-IX is not involved in any of the peering negotiations or settlements between its members. AMS-IX's objective is to facilitate connections and maintain the infrastructure.

Member

Jan Paul Dekker

Manager RTL iMedia



Summary of Accounts

Financial

The Amsterdam Internet Exchange is in sound financial condition. The turnover of AMS-IX BV for 2003 amounts to 2,6 Million Euro with a net result percentage of 21% (562 K Euro). The turnover represents an increase of 24% from the 2002 figure of 2,1 Million Euro. The main source of income comes from the port fees of the members. The earnings before tax, interest and depreciation are almost 1,3 Million Euro, representing 47% of the turnover, showing an increase of 8% compared to the year 2002. Net profit increased from 363 K Euro for 2002 to 562 K Euro, being 21% of the turnover (17% for the year 2002).

Countering the increase in results are the increased investments. As a consequence depreciation has grown with 35% in 2003 compared to the previous year main-

ly due to the switchpark upgrades. Cash flow management is always a balance with the timing of investments, therefore building up of endurance capital by keeping reserves within the company for future events is important for the steady operation of the exchange.

The cash flow from operating activities increased significantly from Euro 373 K for the year 2002 to Euro 1.130 K for the year 2003. These amounts were entirely used for investments in switches and technical equipment.

Endurance capital build up is amongst others based on cash flow coverage and potential business risks. The maximum endurance capital for AMS-IX would preferably equal at least the immediate replacement value of the platform. Currently this value is estimated to be around 2,5 million Euro and subsequently grows with new investments. Capital build up has not reached the necessary level in 2003 (capital as per 31/12/2003 amounts to Euro 1.640 K). For this reason

Key figures AMS-IX (in €)

	2003	2002	2001	2000
Turnover	2.605.275	1.959.298	1.614.020	1.023.512
Operating result	848.337	551.135	372.199	175.421
Net result	561.970	363.616	247.523	39.757
Investments in tangible fixed assets	1.121.795	482.186	156.728	467.704
Capital and reserves	1.640.085	1.078.115	714.559	467.036
Cash and cash equivalents (31/12)	358.069	349.343	457.747	313.705
Full time equivalents (31/12)	12	9	7	4
Members (31/12)	178	145	119	105
Connections (31/12)	245	201	172	120



it is proposed to add the result of 2003 to the general reserve.

Especially because AMS-IX does not want to rely on banks or other external financing solutions, our relations, government and business partners demand sound business ratios for continuity reasons, which is another reason for capital build up. Otherwise AMS-IX would not be able to continue as a serious business partner and negotiate favorable contract conditions.

Principles of valuation and determination of result

The accounts have been prepared in accordance with general accepted accounting principles in The Netherlands on the basis of historic costs. Tangible fixed assets have been valued at purchase price less accumulated depreciation calculated on a straight-line basis over the estimated useful life (3 years in general). Other

assets and liabilities have been valued at face value, with deduction of a provision for bad debts.

Income and expenses are accounted for in the year to which they relate (accrual basis). The turnover consists of invoiced amounts, excluding turnover tax, for the connections provided. The turnover on these connections is attributed to the period in which the connection was used. The costs incurred are based on historic prices and charged to the relevant period. Corporation tax payable is provided on taxable results at the current rate.

Result appropriation for the financial year 2003

As in previous years the result for the year 2003 of Euro 562 K is proposed to be added to the general reserve. This has been included in the financial statements.

Balance sheet as of December 31, 2003

in €	2003	2002
Fixed assets		
<i>Material fixed assets</i>		
Switch park	1.186.485	485.770
Fittings, computer hard- and software, furniture	<u>106.236</u>	<u>83.739</u>
	1.292.721	569.509
Current assets		
<i>Receivables</i>		
Accounts receivable	59.542	95.709
Taxes and social premiums	10.770	17.340
Other receivables	<u>248.284</u>	<u>155.995</u>
	318.596	269.044
Cash at bank and in hand	<u>358.069</u>	<u>349.343</u>
	<u>1.969.386</u>	<u>1.187.896</u>
Capital and reserves		
	1.640.421	1.078.115
Current liabilities		
Accounts payable	115.353	2.716
Taxation and social premiums	162.497	60.649
Other liabilities	<u>51.115</u>	<u>46.416</u>
	328.965	109.781
	<u>1.969.386</u>	<u>1.187.896</u>

Profit and loss account for 2003

in €	2003	2002
Net turnover	2.605.275	1.959.298
<i>Expenditure</i>		
Personnel costs	918.800	815.890
Depreciation material fixed assets	398.582	294.782
Other operating expenditure	<u>439.555</u>	<u>297.581</u>
	<u>1.756.937</u>	<u>1.408.253</u>
Operating result	848.338	551.045
Interest received	<u>8.633</u>	<u>91</u>
Result from ordinary operating activities before taxation	856.971	551.136
Taxation	<u>294.665</u>	<u>187.580</u>
Net result	<u>562.306</u>	<u>363.556</u>

Cash flow summary

in €	2003	2002
Cash flow from operating activities		
Net profit	562.306	363.556
Depreciation of fixed assets	<u>398.582</u>	<u>294.782</u>
<i>Cashflow</i>	960.888	658.338
Changes in working capital:		
Short term receivables	-49.551	-75.100
Other short term liabilities	<u>219.184</u>	<u>-209.456</u>
Total	169.633	-284.556
<i>Cash generated by operating activities</i>	1.130.521	373.782
Cash flow from investment activities (Investment in tangible fixed assets)	<u>-1.121.795</u>	<u>-482.186</u>
<i>Increase in cash and cash equivalents</i>	8.726	-108.404
Cash and cash equivalents at January 1	<u>349.343</u>	<u>457.747</u>
<i>Cash and cash equivalents at December 31</i>	358.069	349.343

Auditor's statement

The accompanying financial information as presented on page 26 through page 28 is taken from the financial statements for the year ended 31 December 2003 of Amsterdam Internet Exchange BV, Amsterdam. We have issued an unqualified auditor's opinion on these financial statements.

Oostzaan, May 2004,
CPAccountants BV

New Members List 2003

Teleglobe Netherlands B.V.
T-Mobile Netherlands B.V.
Internet Pipeline AG
Cyberlink Internet Services AG
Init Seven
LAN Services AG

EWE TEL GmbH
Nxs Internet B.V.
Next Element Services & Facilities
Unilogic Networks B.V.
IC&S RoutIT B.V.
KPN Mobile The Netherlands B.V.
B2 Bredband AB
UTA Telekom AG
Plusline AG
We Dare B.V.
Cogent Communications
City of Amsterdam
MJ Internet B.V.
Signet Internet
Song Networks Oy
Eweka Internet Services
Orange Nederland N.V.
Viatel Global Communications B.V.

IP Exchange GmbH
Big Pipe U.S./ Shaw
Telecomplete Limited
GrafIX Internet B.V.
Magnet.ch AG
Gemeente Den Haag
OTE International Solutions S.A.
NFSi - Soluções Internet, Lda
UNET B.V.
Rokskom Internet B.V.
Cambrium Internet B.V.
Transip B.V.
Cablecom GmbH
Virtu Secure Webservices B.V.
Casema
RealROOT

City of Amsterdam

“International accessibility is a key factor in the attractiveness of a business location. Today, that means both physical and virtual accessibility. Amsterdam holds trump cards in both respects. Physically, the city has Schiphol Airport, plus excellent road and water links to main European markets. Virtual connectivity is just as strong, with AMS-IX forming one of Europe’s largest Internet exchanges. The city really leads the pack when it comes to fast, easy access to the Internet. Through AMS-IX, Amsterdam is ideally placed to meet the increasing demand for bandwidth as the integration of voice, data and video continues. AMS-IX is proof of Amsterdam’s innovative strength, and a great source of pride to us. We know that the presence of AMS-IX can be a decisive factor for companies when they are deciding where to conduct their business.”

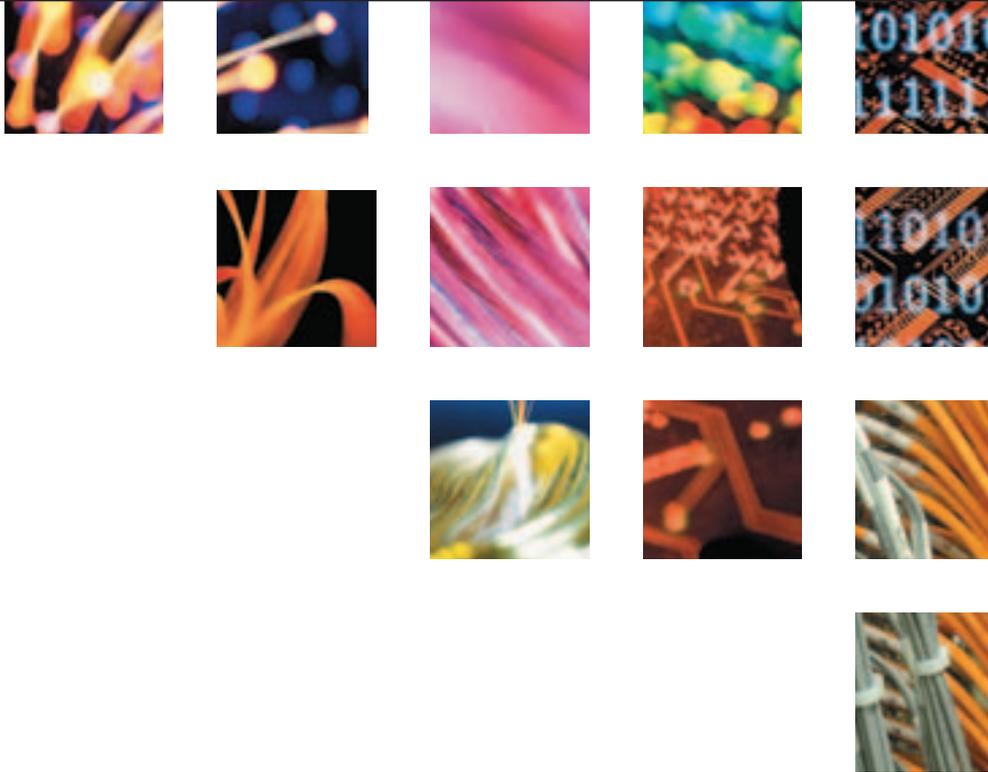
G. Ph. Huffnagel

Deputy Mayor and
Alderman for
Economic Affairs,
Finance, ICT and
Airport Affairs.



Colofon

Tekst: AMS-IX
Ontwerp: BBK informatie-overdracht
Druk:
Oplage: 250 stuks



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