

NETNOD

NEWS

NETNOD NEWS — ISSUE 2 — 2014

Netnod launches COMIX — the distributed IXP, connecting Copenhagen and Malmö!

PAGE 5–8

The IETF and pervasive monitoring in a post-Snowden Internet

— an interview with IETF chair Jari Arkko

PAGE 10–11



NO FREAKING PAPER,
I WANT IT ON MY SMARTPHONE.

Work meets pleasure
— your travel guide to the
upcoming industry events

PAGE 16–18

What is at stake at Busan?
— Perspective on the future
challenges in Internet governance

PAGE 13–15



Word from the CEO

happens, one of the first points of presence we established outside Stockholm was actually in Copenhagen. This made sense with the closely linked business environments in Sweden and Denmark, and it was reflected in customer demand. Now, 16 years later, these ties remain as close as ever, and it's apposite that Netnod has taken the step to acquire the COPENIX sites in Copenhagen and fully integrated them with our expanded Netnod Malmö sites to create Netnod COMIX.

Netnod has always believed that creating local Internet Exchange Points adds value for the local community, builds capacity and knowledge locally, and creates a more resilient and robust infrastructure. When Netnod was first established, it

active in the Euro-IX twinning programme. Through that program, larger and more mature IXPs help smaller and developing IXPs to become members of Euro-IX and thereby gain access to the vast amount of experience and best practice knowledge of the collective Euro-IX members.

Netnod has, for a few years, been approached by several Danish ISPs, requesting our help in getting easy access to Netnod Malmö. Netnod, believing that there is a great value in local traffic staying local, saw potential value in this. At the same time, the IXP market in Copenhagen and Malmö had become very fragmented, with five IXPs operating in the region, and Netnod's long-held position was that we did not want to fragment the market further. But when

COPENIX approached us with an offer to take over their existing IXP, things changed.

It was by no means an easy decision, and Netnod and our board spent a lot of time evaluating what we could do. But in the end, we believe that contributing to consoli-

dation of IXPs in the region will add value to the local ISPs and to the end-users.

So in our long tradition of supporting the exchange of local traffic locally, we are pleased this spring to bring Netnod COMIX live. It's a milestone for us, and I'd like to thank the Netnod team for the hard work they put into this, especially getting it live in such a short time. We are making sure we continue to add value for operators of all sizes in the Nordics, and we are excited to extend our footprint in data centres in Stockholm, at the same time as we continue to offer 100Mbps connections for free.

CEO, Kurt Erik Lindqvist, Netnod

“Netnod has always believed that creating local Internet Exchange Points adds value for the local community ...”

was decided to expand from just the IXP in Stockholm, to local IXPs in Gothenburg, Malmö, and Sundsvall, and later also Luleå. By doing this, Netnod provides for the exchange of local traffic in all population-dense areas of Sweden and builds greater geographical coverage.

Our belief in local IXPs has also been a driving force in Netnod's partnering with other organisations and our involvement in establishing and building IXPs around the world. For many years, we have sent trainers to the workshops of APRICOT and MENOG. And Netnod is partner with ISOC in the African Union's AXIS program for bringing more IXPs to Africa. Netnod is also a strong believer in the unique capacity sharing that exists among the IXPs, and is therefore very

In my distant past, I worked for a large European ISP and was responsible for building up the network in Sweden. In doing so, I became part of the Swedish Operator Forum, SOF, and came to witness the time in 1997 when “D-GIX” – the predecessor to Netnod – was moved both legally and physically from KTHNOC to the newly established company Netnod.

I remember thinking these were exciting times and the beginning of something new. In my position at the time, as it

New IXP networks

OCTOBER 2013 – MARCH 2014

Stockholm Internet eXchange (STHIX), (AS33886)

Stockholm Internet eXchange (STHIX) is a neutral and independent exchange in Stockholm.

Contact: peering@sthix.net

Teknikbyrån (AS51815)

Teknikbyrån builds and operates open fibre-based networks in the Stockholm area.

Contact: peering@teknikbyran.com

One.com (AS51468)

One.com provides diverse web hosting packages and cloud services for individuals and businesses.

Contact: peering@one.com

MrFriday (AS197617)

MrFriday provides Linux managed services solutions for clients in need of 24/7/365 coverage.

Contact: peering@mrfriday.com

Excellent Hosting Sweden AB (AS50986)

Excellent Hosting provides IT solutions and services to businesses, associations and individuals. Their services consist of dedicated servers, colocation, VPS, web hosting and game servers.

Contact: peering@excellent-hosting.se

LinkedIn (AS14413)

LinkedIn operates the world's largest professional network on the Internet with more than 238 million members in over 200 countries and territories.

Contact: peering@linkedin.com

SpaceDump IT (AS30880)

SpaceDump IT AB is a small ISP in Sweden providing colocation, dedicated servers, web hosting and more. They also have an irc server for the IRCNet Network that announces to everybody who peers with them.

Contact: peering@spacedump.net

Etisalat (AS8966)

Etisalat is the Middle East's leading telecommunications operator and one of the largest corporations in the six Arab countries of the Gulf Cooperation Council. Etisalat has operations in 15 countries in the Middle East, Africa and Asia.

Contact: noc@emix.net.ae

SG.GS (AS49342)

SG.GS is a Singapore/Asia based network provider with its own hosting arm, HostSG, that has been operating since 2000.

Contact: peering@sg.gs

Valve Corporation (AS32590)

Valve is an entertainment software and technology company and the creator of several of the world's most award-winning games. Valve is a developer of leading-edge technologies including the Source® game engine and Steam®, the premier online gaming platform.

Contact: peering@valvesoftware.com

NTT Communications (AS2914)

NTT Communications (AS2914) own and operate one of the world's largest Tier-1 global IP backbones, spanning Europe, North and South America, Asia and Australia on a single ASN. NTT have a worldwide infrastructure, reaching over 150 countries, and over 120 secure data centres.

Contact: peering@ntt.net

Zen Systems (AS28717)

Zen Systems provides stable, secure Internet solutions to over 1000 corporate customers in Denmark using a combination of secure technology and customised solutions.

Contact: peering@zensystems.net

Telavox (AS44123)

Telavox helps companies get the most out of their communication through a simple, broad experience achieved through the development of service and support system platforms.

Contact: peering@telavox.se

WestCall (AS8595)

ZAO WestCall Ltd is an upwardly mobile leader in the Russian telecom market.

Contact: sasha@westcall.ru

Speedy Networks (AS49342)

Speedy Networks provides high speed Internet in the Moscow region. They have a wide coverage area, providing Internet access in the Leninsky district and other cities in the Moscow region.

Contact: admin@speedyline.ru

Spritelink (AS2863)

SpriteLink is involved in educational and research operations.

Contact: <http://www.sritelink.net/>

IXP member upgrades

OCTOBER 2013 – MARCH 2014

- **Global Network Management (AS31500)**
peering@gblnet.ru
- **Rostelecom (AS12389)**
peering@rt.ru
- **Netflix (AS2906)**
peering@netflix.com
- **RETN (AS9002)**
peering@retn.net
- **Com Hem (AS39651)**
peering@comhem.com
- **IP-Only (AS12552)**
peering@ip-only.net
- **Elisa Oyj (AS6667)**
peering@eunet.fi
- **Justin.tv (AS46489)**
peering@twitch.tv
- **IP-Only (AS12552)**
peering@ip-only.net
- **Justin.tv (AS46489)**
peering@twitch.tv (2nd upgrade)
- **Bredband 2 (AS29518)**
noc@bredband2.se
- **EdgeCast (AS15133)**
peering@edgecast.com
- **Highwinds (AS12989)**
peering@hwng.net
- **Hi3G (AS44034)**
daniel.wiberg@tre.se
- **Com Hem (AS39651)**
peering@comhem.com (2nd upgrade)
- **Golden Telecom (AS3216)**
peering@gldn.net
- **Portlane Networks (AS42708)**
peering@portlane.com
- **Excellent Hosting (AS50986)**
peering@excellent-hosting.se

Welcome to Netnod, Martin!



Netnod is happy to welcome Martin onboard, our newest addition to the communications team. Martin is taking on the challenging role as Strategic Account Manager – a new position within Netnod!

Tell us a little bit about yourself!

I come from a little town in Norra Västmanland, but I now live with my wife and three kids in Västerås, a beautiful city 100 kilometers from Stockholm. I'm an outdoors guy, and I like sports and nature. In summer, I love taking a boat on Mälaren. I'm turning 40 in September, which I am looking forward to celebrating! I have worked in sales for the past 20 years and within the Telecom industry since 2002, where I have worked for a variety of Internet companies, such as Song Networks, TDC, and most recently IP-Only.

What is your impression of Netnod?

A welcoming and collegial atmosphere, a professional attitude, and of course a great knowledge about the Internet industry.

So this is a new role at Netnod. What do you think you can bring to it?

I think my solid experience in sales and account management will bring value to Netnod. My priority is to take care of existing customers and, of course, to help new customers find a solution that best suits their needs. Netnod has a great reputation, and I'm looking forward to helping spread Netnod's name further, especially to those who are not so familiar with us today.

This role involves a bit of travel.

What's your best travel tip?

Always bring a pair of running shoes! It's definitely the best way to explore and get a feeling for a new place. Personally, I always try to skip coffee during long-haul flights, but I know there are some people who simply cannot live without it.

What do you find so interesting about the Internet industry?

The Internet is constantly growing and evolving. It gets more and more important for everyone. With more services being offered through and on the Internet every day, it constantly presents new challenges and opportunities.

What's your favourite drink and why?

Nothing compares to an ice cold beer in the sun after a good day on the mountain skiing. Why not?!

... and favourite gadget?

Maybe this is a little bit boring ... but my Leatherman multi-tool has followed me ever since I was an UN peacekeeping soldier in Bosnia back in the '90s. The Leatherman can cut a rope, strip a wire, tighten a rack in a datacenter, and then after all that hard work, it can open a beer. So it has definitely saved me in many sticky situations. I wouldn't leave home without it!

So we hear that you're a decent skier. Tell us all about it!

I really love skiing and have a bit of history as a ski instructor. I am also a co-founder of a web-based ski school

“My best travel tip?

Always bring a pair of running shoes! It's definitely the best way to explore and get a feeling for a new place.”

www.slopepro.com (That's my contribution to Internet content :-).

I used to spend every opportunity I had, skiing. Nowadays I ski about 20 days a year, and if I'm lucky some of those days are in deep powder together with my best friends. I understand that a few of my new colleagues at Netnod share that passion for skiing. Maybe we'll get the opportunity to hit the slopes together some time.

What do you like to do outside work?

I like spending time with family and friends. I also try to keep fit with different activities such as crossfit and running. A couple of years ago I sold my enduro motorcycle, which was by far one of my most fun “outside work” activities (unfortunately, with kids and work, I just didn't have the time for it). But one day there will be a new bike in my garage, that's for sure.

If you were a character in Lord of the Rings, who would you be?

I should say Legolas, a brave character with a big heart!

Martin will start his employment at Netnod on 1 May 2014 and will be part of the Communications team, led by Nurani Nimpuno.



Nurani Nimpuno

Head of Outreach and Communications

COMIX extends Netnod IX footprint, bridges the gap between Danish and Swedish operators

Once again, the World Happiness Report (yes, there is such a thing, and no, it's not a comedy revue but in fact an ironically serious United Nations project), has named Denmark the happiest country in the world. It's great news for our Nordic neighbours, whose health outcomes, education, life expectancy, distribution of wealth, and freedom of life choices all add up to enviable levels of objective and subjective happiness.

But, you may wonder, these fleshy measures are all about people, so what about the connectivity?

Good question. Because, while it was decent before – how could the local humans have been happy without it? – it just got a whole lot better.

On 13 March 2014, Netnod flicked the switch to officially extend its footprint across the Öresund Strait from Sweden to Denmark.

Until now, Denmark had been served by the local Internet exchange point (IXP), Copenhix, with three locations in Copenhagen, at Telia Telehouse, InterXion Copenhagen, and Global Connect. But there have been long-standing concerns expressed within the local operator community, and by Copenhix itself, that the existing arrangements were not able to scale to the growing demand for capacity and service levels.

Netnod maintains close ties with the community and, as the largest IX in northern Europe, was ideally placed to address those concerns and provide more stability to a fragmented local market. So, following a long series of talks, and by mutual consent, Netnod

has assumed responsibility of the Copenhix locations and interconnected them with Netnod's existing exchange point in Malmö, which itself has also been expanded to include a new site, VG4 (Västergatan 4). Together, these developments add up to the new distributed IXP, COMIX.

"We have for a long time had discussions with Internet operators in Denmark, who have been wanting a better interconnection solution in Copenhagen," explained Netnod CEO Kurt Erik Lindqvist.

about the new possibilities that the COMIX solution offers to networks in both countries," Lindqvist said.

Netnod COMIX is a logical, elegant solution to a growing bottleneck. The newly distributed IX infrastructure across Copenhagen and Malmö is a boon for network operators, increasing the value of peering in both cities. Likewise, operators in Denmark and southern Sweden now benefit from new options for tapping directly into Netnod's expanding contact network.

“By merging Copenhix with the expanded Netnod Malmö IXP, we are creating the optimum solution for content providers and network operators to interconnect and service a very large and dynamic region.”

"By taking over the responsibility of Copenhix, and merging it with the existing expanded Netnod Malmö IXP, we are creating the optimum solution for content providers and network operators to interconnect and service a very large and dynamic region. We are very excited

Netnod COMIX spans the waters that once moderated Denmark and Sweden's less neighbourly instincts via the iconic Öresund Bridge. The bridge (known to crime TV viewers the world over as *The Bridge*) is a remarkable piece of engineering itself, a physical connector





of modern Scandinavia, and an apt medium of this seamlessly integrated Scandinavian exchange point.

Boney Walia, Manager of CPHIX, has welcomed the development, which will give CPHIX's existing customers full access to Netnod's international contact network.

"It is clear that the new IXP, Netnod COMIX, will attract new networks to the region, which will benefit the Internet ecosystem as a whole, including the end users in the Öresund region," said Walia. "As a neutral, non-profit IXP, with a longstanding history of running robust infrastructure and with an excellent reputation, Netnod was the natural partner for us to work with. We believe that the Netnod COMIX exchange point will put the Öresund region on the map, as the natural location to establish your network presence."

"The sum of this architecture and engineering is that peers connecting to either the Swedish or Danish side will experience COMIX in the same way, with reduced latency and no backhaul for local traffic."

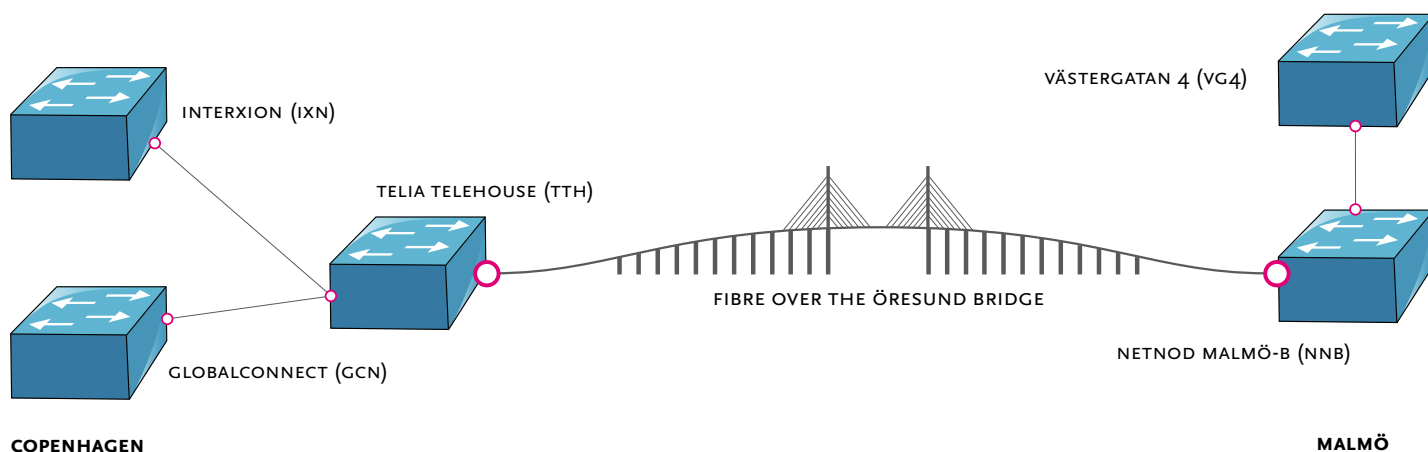
Operators at Netnod's established IXPs enjoy some of the world's highest traffic rates per peer, and it is hoped that those connecting at COMIX will build to similar rates. To support that ambition, Netnod has created a highly efficient, multi-chassis architecture for COMIX, installing new switches in the interconnected Danish data centres. At the same time, the Malmö infrastructure – which was already handling peak loads of 20-30Gbps – has also been extended.

COMIX is built for business and able to support high growth levels in the coming years. While it is currently equipped for more than 900 Gbps edge capacity, the

platform can scale to more than 5Tbps. Likewise, the main uplinks are now 100Gbps, scalable to 400Gbps.

All new equipment – largely supplied by Brocade – is in place and the sites are joined by fibre running across the Öresund bridge. That link is no mean feat in itself. The bridge alone is almost 8km across and the total fibre between the sites is approximately 50km long and prone to -20dB attenuation. To make this work, Netnod used optics rated for 10km, boosted at multiple points in line. CubeOptics, who supplied the optical amplifiers, have noted that this link is the longest stretch so far completed with their equipment.

NETNOD COMIX – A DISTRIBUTED EXCHANGE POINT, BRIDGING TWO CITIES



Peers in Sweden and Denmark see COMIX as a single IXP. An efficient architecture, high-capacity equipment, and fibre connections extend the benefits of local peering to a broader community: lower latency and costs, higher performance, resilience, and control.



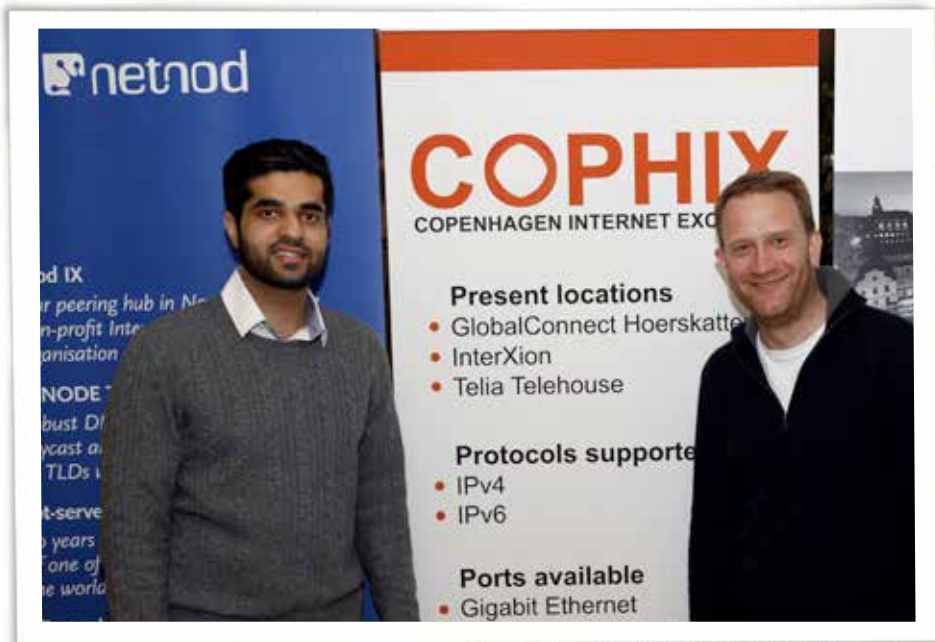
The sum of this architecture and engineering is that peers connecting to either the Swedish or Danish side will experience COMIX in the same way, with reduced latency and no backhaul for local traffic.

COMIX also features a newly-installed route server to simplify administration of peering arrangements for networks connected to the exchange. By connecting to the route server, operators can replace multiple, separate BGP sessions to peers with one single session to the route server. Not only does a route server make it easier for networks to manage their peering arrangements, but it also makes it easier for new peers to start exchanging traffic at the exchange point from day one.

Operators can peer at COMIX via 1GE, 10GE, or 100GE paying accounts. For smaller networks, 100Mbps connections are available without charge. Previous customers of CopenhIX can now become Netnod peers, enjoying the benefits of being part of one of the highest traffic exchange points in Europe and eligible for the full range of Netnod services.

Netnod announced COMIX on 14 February 2014, with official launch events held at the Netnod-sponsored DKNOC meeting on 13 March and at the Netnod meeting on 11-12 March. CopenhIX will formally close soon after the transition is complete.

“Operators can peer at COMIX from Copenhagen or Malmö, via 100 Mbps, 1GE, 10GE, or 100GE.”



Kurtis Lindqvist (Netnod) and Boney Walia (CopenhIX) jointly announce the launch of the new COMIX IXP.

The signs are good for COMIX's success. Within its first weeks of operation, Hurricane Electric, Portlane, a number of large content providers and several Swedish and Danish operators had already expressed interest in connecting to the COMIX exchange.



Kurt Erik Lindqvist
Chief Executive Officer

Öresund Bridge facts

At a length of 8 kilometres, the Öresund Bridge (Öresundsbron) rises up to 57 metres above the Baltic waters, before performing the somewhat terrifying illusion of plunging cars and trains straight into the sea, when in fact it's actually entering Copenhagen via an offshore tunnel entrance. Carrying road and rail traffic, it's the longest bridge of its type in Europe. It took five years to build, opening in July 2000. At Netnod, we think it may be one of the coolest pieces of IXP infrastructure in the world.



SPRING MEETING 2014

Netnod's biggest and best meeting to date

It was mid-March, spring was in the air, and Netnod was in the house. On 11 and 12 March, we welcomed the Netnod members and friends to happily sunny Stockholm for our biggest meeting ever. Almost 120 people registered: customers, partners, and friends of Netnod to network, share experience, and exchange knowledge in a relaxed community of peers.

Sweden's views in Internet governance, human rights and freedom on the net, and how today's Internet governance challenges could affect the future of the Internet. In a talk that was short and sweet – but much appreciated – Linda Sandberg and Anders Sundman introduced CryptoParty Stockholm – which teaches people from all walks of life encryption – and “The Day We Fight Back” event against mass surveillance.

at: <http://bambuser.com/channel/netnod>
Putting down the microphone and presentation clickers at the end of day one, we moved on to the Netnod social function at Lux Dag För Dag (Day By Day) restaurant, where bubbly, fantastic food, and a stunning view across the water capped a great day of discussion. Many thanks to the TelecityGroup for supporting a memorable and relaxing night out.



Netnod CEO Kurtis Lindqvist opened proceedings with some great news about Netnod's expansion with the launch of the new distributed exchange point, COMIX, bridging Denmark and southern Sweden (you can read more about it on page 5-8.)

As usual, the two-day meeting agenda included a good mix of technical information, industry updates, and Internet governance news. For example, Michele Neylon (Blacknight) entertained and informed us on the topic of new gTLDs. Carl Fredrik Wettermark from the Swedish ministry for foreign affairs presented

The lightning talk session also generated a lot of interest and questions from the audience. We heard talks on the SSAC, the RSSAC, covering the Olympics, “Gaming in a connected world”, and “Internet and the Swedes 2013” (in which Pamela Davidsson revealed, among other things, that 61% of Swedes who are over 76 don't use the Internet at all, whereas 65% of 3-5 year olds in Sweden use the Internet occasionally, including 25% who use it daily!).

We don't have the space here to recount all the great presentations, but you can watch videos of all the meeting sessions

Check out our meeting photo gallery on our Facebook page at: https://www.facebook.com/netnodix/photos_stream

We really hope to see even more of you at the next meeting, from 1-2 October – write that in your calendars today!
<https://www.netnod.se/netnod-autumn-meeting-2014>



Nurani Nimpuno
Head of Outreach and Communications

The IETF and pervasive monitoring in a post-Snowden Internet

Internet security is a perennial issue, and one that the Internet Engineering Task Force (IETF) has always pursued as a major concern. But the revelations from Edward Snowden about pervasive monitoring by the NSA and other agencies have rocked the Internet community and thrown a sharper focus on the IETF's security work. Jari Arkko, chair of the IETF, spoke to Netnod recently about the IETF's response to pervasive monitoring and how that response fits within the broader context of the IETF's history and current work. As disturbing as these revelations have been, do they change in any fundamental way the mission of the IETF? And can we even see this current turmoil as an opportunity for progress?

You have said "My vision of the end goal is that we try to build a more secure Internet based on the assumption that there are all these threats around us". How do we get there from here?

The first step in getting somewhere is to realise that you have a problem and, of course, I want to emphasise here that there are many threats to the Internet and this is one of them. We at the IETF have been for years trying to improve the security of the Internet in various ways. But last year's revelations point to a changed model of how we view what kinds of vulnerabilities there are and what kinds of attacks are possible. A while ago, I said that in some sense the surveillance revelations were a wake up call. Now, we've been working on security for a long time, but the wake up call is more about how broad the kinds of dangers really are.

You wrote on your blog in November that the current IETF audit of all applications for vulnerability to pervasive monitoring is "not a reaction to specific revelations, but a wholesale upgrade to our view what the threats in the Internet are and how they need to be addressed." How long will that application-by-application process of "strengthening the Internet" take?

It will take forever, because we will be doing it continuously. At the IETF, we created this new working group looking at how to apply TLS for various applications – the UTA, or Using TLS for Applications Working Group – that's going to address things like using TLS for email, and what can we do with TLS and instant messaging, at web traffic, at improvement in DNS – how we can make that confidentiality friendly – and how can we improve some of the basic protocols like TCP.

How far will TLS and HTTP updates go towards improving the situation, and what issues will these not fix?

The HTTP work, which is nearing completion, and the TLS work, which I hope will complete this year, are steps along the path. They are important, but they are not the only thing needed. The technology development is one thing, but even more important is what's happening out there in the real world. There is a trend – and it started even before the Snowden revelations – of turning on more security for web traffic, and that seems to be continuing and now many service providers are doing that and that's a key result. We can do certain things with email security like, from my client to the server, but

end-to-end security for email, for instance, is a difficult thing and it would not be helped by TLS.

Bruce Schneier has argued for approaches that make widespread surveillance administratively and economically unattractive. Does that strategy fit with the current IETF priorities?

I think it does. One of the things that we are doing is turning security on more – encryption for instance, is turned on more widely. And we're trying to, obviously, encourage that, but also build tools that make it possible more easily. A small example of that is that maybe TLS1.3 will have a slightly quicker set-up time because of less round trips and this will lead to a situation where it's perhaps more acceptable to a wider range of operators. So I think it does fit Bruce's overall strategies quite well.

SSL on websites asks basically nothing of the end user. But today encrypted email remains complex and messy, even for relatively advanced users. Is there any need in the IETF for a cultural shift that better recognises the realities of the non-technical community?



Absolutely it's required. We recognise the situation, for instance, with regards to end-to-end email protection. It works quite well with current systems in enterprise environments, as an example, but it works much less well in the global Internet. I don't think that the recognition itself is a problem, but it's a question of developing the technical means that could overcome these challenges.

You have said previously that the surprise in the Snowden revelations was not the existence of governmental surveillance, but rather the "scale and some of the tactics". In your view, what are the most troubling tactics revealed so far?

Since we work at the standardisation forums, one critical thing for us, of course, has been whether there has been – as claimed – some influence by the intelligence organisations on standards. We obviously take that very seriously and while we've heard of complaints in some other standards organisations, I don't at the moment believe that we have cases like that in the IETF standards.

On that topic, there has been a controversy around an NSA employee co-chairing the Crypto Forum Research Group (CFRG). Without going into that specific case, in an open, trust-based organisation like the IETF, how do you deal with people who don't come to the party in good faith?

We have to understand that it's a more general concern. It's not just about the surveillance incident...

Yes, and I'm asking in the general sense as well, from a corporate interest position as well as a government one.

Right, and people are different, even in different organisations. Some of them might have commercial interests; some of them might have other interests, like this case shows. But the way that we deal with that, is that in all of the situations that we have open participation and broad input on any topic. So when we have broad review of cryptographic standards, for instance, or selection of some security technology then that's our best chance of combatting any undue influence, whether it's commercial or personal or governmental. And that's the way: rather than trying to block particular persons of particular organisations from

the work, make sure that we get enough broad participation, with many people commenting on the topic. Then we can be more certain that the results are good.

Finally, Edward Snowden's leaks have unleashed a metaphorical avalanche on your workload, but I believe you recently found yourself in a literal avalanche. What's worse?

Obviously the actual avalanche was a great danger...

I guess that's over quickly though.

It is over quickly. But from the perspective of Internet work, the Snowden revelations and everything else that's going on, I don't take it negatively. I think these are opportunities for us to do better for the Internet. That's a very good thing. I see a lot of very constructive, good work in the IETF and elsewhere. I think it's a happy thing, improving the security of the Internet, even if you learn of some new issues.

This is a condensed version of an interview held on 17 March 2014. A fuller version of the transcript is available on the Netnod website. <https://www.netnod.se/jari-arkko-ietf-and-pervasive-monitoring-full-transcript>

THE LATEST BUZZ IN THE INDUSTRY

– What’s been going on at the meetings you’ve missed?

LACNIC XX

LACNIC XX took place in lovely Curaçao. Patrik Fältström attended to meet with the LACNIC community there to discuss I-root deployment and participate in LAC-IX, the IXP association in the Latin American region.

Internetdagarna 2014



Nurani Nimpuno and Patrik were both at Internetdagarna (the Internet days), the largest Internet conference in Sweden, where Jimmy Wales from Wikipedia, and game designer and researcher Jane McGonigal opened the conference. There were lots of good discussions in 15 different tracks during two intense days. Patrik spoke about broadband development in Sweden and Nurani discussed *The End of the Beginning of Internet governance*.

APRICOT 2014

The APRICOT 2014 meeting took place in Petaling Jaya in Malaysia. Despite the fact the meeting was forced to relocate from Bangkok only four weeks before, it still drew a great crowd. From Netnod, Kurtis Lindqvist, Pierre Baume, and Nurani participated, with Kurtis and Pierre flying in a week before to give a hands-on routing workshop. The conference week was packed with policy and Internet governance discussions and many excellent operational talks. It was great to see board of IX-F – the federation of all

regional IXP associations (including Euro-IX, LAC-IX, and APIX) – coming together. IX-F will act as a platform for all the affiliated IXP associations to share information and experience between themselves – all for a better, more interconnected Internet.

IETF89

Johan Ihrén and Henrik Levkowitz attended the IETF meeting in London. As expected, the IETF's work to strengthen the security and privacy of the Internet was a major area of interest this time. In particular, the workshop on “Strengthening the Internet Against Pervasive Monitoring” (STRINT), attracted more than 100 experts. Internet governance is another topic that continues to increase in importance, and the topic was well-covered in a presentation by Olaf Kolkman. In this ever-more-complex environment, it's great to see that the IETF is working on ways to address problematic or unacceptable behaviours while preserving its fundamental principles of openness and inclusiveness.

DKNOG4



Netnod has been a supporter of the Danish Network Operators Group since its very first meeting. Once again, we sponsored their social, and Mathias Wolkert, Kurtis, and Patrik also took the opportunity to talk to operators in

Denmark about the COMIX launch (see pages 5-8 for more details).

Euro-IX 24

The highlight of the recent Euro-IX meeting was definitely the peering rendition of “Imagine” performed at the social with the lyrics “Imagine there's no transit, it's easy if you try. No price decay below us...” You should definitely check it out at: <https://vimeo.com/89387000>

ICANN 49



The focus of many discussions at ICANN 49 was the US government's announcement to transition the IANA functions to a global multistakeholder arrangement. There were many good discussions about the way forward with this and how to design a process that is inclusive, multistakeholder, secure, stable, and resilient. Lars-Johan Liman (RSSAC chair), and Patrik (SSAC chair) had a busy week meeting up, and digging deep into the issues, with new and old friends and colleagues in the industry.



Nurani Nimpuno

Head of Outreach and Communications

What is at stake at Busan?

By Les Bloom*

With vital questions of Internet governance on the table for the ITU Plenipotentiary later this year, there has never been a greater need for spirited, open airing of the core issues and challenges that will affect future Internet development. It's time for all voices to be heard, and Netnod is pleased to provide a catalyst and platform for discussion. Here, cyber security expert Les Bloom calls for urgent engagement of more diverse participants to defend the Internet's multistakeholder processes. The United States Department of Defense has cleared this article for public release as written.

The multi-stakeholder model has kept international telecommunication infrastructure and international telecommunication services, including the Internet, functioning in a stable and reliable manner for decades. But this model is under an on-going existential assault by a group of nation states, led by the Russian Federation. If this fight is lost, it will lead to nation state control of the Internet's capabilities and the absorption into the International Telecommunications Union (ITU) of the functions of the Internet's principal multi-stakeholder organizations. Over time, these actions, will introduce uncertainty into every aspect of the Internet.

With a catastrophic 89-7 victory at the World Conference on International Telecommunications (WCIT) in Dubai under their belts – and an untold number of nations waiting in the wings ready to accede to the International Telecommunication Regulations (ITRs) – the final act of this drama will take place at the ITU Plenipotentiary at Busan, Korea in October and November 2014. Despite the worldwide outreach that has taken place in Buenos Aires, Montevideo, London, and Davos (and will soon happen in São Paulo) – all of which will result in non-binding recommendations and studies – I am convinced that the proponents of nation state Internet

dominance are focused on just one thing: having enough votes at Busan to institutionalize their radical agendas in the ITU Constitution and Convention. So, while the multi-stakeholder organizational leadership continues to waste precious time and resources on pseudo collaborations, I believe that the rest of us, the Internet users who will be most affected, must quickly demand a completely different approach to fight this impending evil: we need to get the major worldwide multi-national corporations that are not presently cognizant of what is at stake to become engaged with the full force of their national influence and economic power.

That the multi-stakeholder Internet governance model should consist of broad categories of participants – international organizations, governments, civil society, academics, and the private sector – is a given. In reality, proposals and decisions regarding international telecommunication infrastructure and services, including the Internet, are overwhelmingly made and influenced by participants associated with just two critical infrastructure sectors: communications and information technology. The net effect is that these two sectors are making recommendations that affect the business models of all of the other sectors. And, if you look over the attendee lists at the significant

meetings that set much of the agenda for Internet governance, you will find that this problem is not just endemic to the US, but is replicated in all 193 ITU Member States. To me it is dangerous when only these two sectors enable the business models of all of the others.

My experience with the other sectors is that they are totally oblivious to the implications for their business models of what happened at Dubai and what may occur at Busan. While Internet governance is an extremely esoteric area, if these sectors continue to allow – unwittingly to be sure – the IT and communications sectors plus a smattering of others to protect their interests, they will wake up one morning to find that their business models have been severely impacted. So, the question is what can be done to bring, as a minimum, other critical sectors to this fight.

As we all now know, the efforts by Mr. McDonough (the former President and CEO of the Federal Reserve Bank of New York) and countless others to raise the Y2K issue at the right levels led to world-wide awareness and eventually the cooperation, coordination, information sharing, assessment, contingency planning, remediation, and testing that averted this potential disaster.





ITU World Conference on International Telecommunications (WCIT) in Dubai, United Arab Emirates, December 2012.

The Y2K model, which consisted of educating the leadership of each nation's private sector core infrastructure about its dangers and then having them determine the consequences to each of their business models, is precisely what is needed to ensure that the ITU Constitution and Convention plus the Dubai ITRs do not become the Y2K problem 14 years later: a potential disruption of international data flows, a destabilizing of the international infrastructure, and ominous effects upon the world's governmental and commercial business models.

Expecting a different outcome at Busan from Member State delegations, composed almost entirely of core infrastructure sectors of communications and information technology, is unrealistic. The human factor in this is frightening. My take is that this group of elitists, who have much to gain, is impossible to budge by the methods that failed at Dubai and are still contemplated today. They have their own personal agendas that are not aligned to ours. Many have personal loyalties that logic and reason will not sway. Gift baskets will not move them and if you looked into the baskets you would LOL. Calls for more inclusive

participation in multi-stakeholder organizations and processes are laughable: why would the Russian Federation and its allies accept a sop when they have the votes to take over the processes, change management for the core Internet standards and organizational functions, and reinstitutionalize them in an organization (the ITU) that they have already captured?

“Major non-traditional critical infrastructure protection sectors in all countries need to be engaged in protecting the multi-stakeholder Internet governance model, and they need to be engaged now.”

But they have made mistakes. Just like the elite IT and communications delegates in the US they too have kept their other critical infrastructure sectors out of the know. Because they have operated in an insular fashion within their own nation, their nations as a whole, like us, have not done their homework on the effects to their economies if the Dubai Treaty and additional extreme Internet agendas are allowed to progress. Their non-traditional sectors are, as are our own, oblivious to these extreme agendas.

Is there a solution to turn this around? Yes. Major non-traditional critical infrastructure protection sectors in all countries need to be engaged in protecting the multi-stakeholder Internet governance model, and they need to be engaged now.¹

Here in the US, we need to immediately form a Committee for the Protection of the Internet (CPI) to perform outreach to a small group of leading non-traditional sectors. Based on the Y2K model, I would go after the big three first: banking and finance, transportation systems, and energy. The CPI would engage sector leadership – heads of their associations and the CEOs of the three largest companies in each. These leaders need to be educated as to what happened in Dubai, and given a first cut at economic implications and what may be institutionalized in Busan, they need to be convinced to provide their experts to determine and validate impacts against their business models. Then, based on their own analyses, we need their experts to bring the rest of the sector up to speed.

Once these sectors are on board, they should use their international influence through personal relationships, government contacts, direct investment leverage, trading partners, G30, G20, and coordinated media campaigns to convince their partners in the other 192 ITU Member States to do the same impact analysis on their business models; to form their own national CPI; and,

if their analysis shows severe impacts on their aggregate business models, to make their governments aware of the national economic consequences of contributions to the ITU their representatives have been promoting and reverse them at Busan.

Beyond Busan, these non-traditional sectors need to participate in multi-stakeholder Internet governance, international telecommunications infrastructure, and international telecommunications services bodies to protect their equities and business models and to address legitimate issues within these areas. It is in their existential interest to do so.

What would be the desired outcomes of such an approach as outlined above? Win sufficient votes to: keep unwanted ITR 2012 changes out of the 2014 Constitution and Convention, prevent other extreme agendas from being progressed, and elect a fair and moderate Secretary General and Deputy Secretary General.

Further, if the world's nations recognize how their economies were put at risk by the unsupervised actions of a few, it might be an opportune time to begin to take some cyber risk off the table.



Les Bloom

Dubai and Busan may be just the wakeup call needed for recognition by the main protagonists in the escalating cyber security and surveillance drama – the Russian Federation, the United States, the most important allies of both, and especially the People's Republic of China – that the Internet and international telecommunications infrastructure and services must remain

operational in times of peace and times of war. These international capabilities are just too important to the world's economies and its social relations to be put at risk by any nation or coalition of nations or by anyone else. The multi-stakeholder approach to Internet governance, where nations play a role but not the dominant role, has served the world well for the past decades. It needs to be institutionalized in a bi-lateral by these nations and enforced through joint risk reduction centres, staffed around the clock.

“The Internet and international telecommunications infrastructure and services must remain operational in times of peace and times of war. These international capabilities are just too important to the world’s economies and its social relations to be put at risk by any nation or coalition of nations or by anyone else.”

1 Major non-traditional sectors: banking and finance, transportation systems, critical manufacturing, energy, food and agriculture, chemical, materials and waste, commercial facilities, water, healthcare, and public health.

**On 1 December 2012, after forty-five years as a Department of Defense (DoD) civilian, I retired as a GS-15 from the Office of the Deputy DoD Chief Information Officer for Cyber Security. My job from 2008 to 2012 was to do everything I could to keep the Internet open, stable and secure. This article is based on a document that I used as the basis for a lecture I gave at Georgetown University, Washington, DC on 4 December 2013.*

Work meets pleasure:

Your travel guide to the upcoming industry events

Stockholm – Forum on Internet Freedom and Global Development 27-28 May 2014

Stockholm, the beautiful capital of Sweden, is a city of islands, lakes, and sea. In Netnod's hometown, we recommend (of course) a visit to the Netnod office, one of the coolest and most glamorous places in the city,-). Take a tour of *The Old Town (Gamla Stan)*, including *The Royal Palace*. Even better, stroll through the galleries, boutiques, bars, and colourful housing of Södermalm. In particular, the cliff walk around the meeting venue has some of the best views in town. In May, the weather should be quite nice (oh please gods, let it shine!), so jump on a boat to see the beautiful archipelago. You can dance, you can jive, having the time of your life, especially if you visit *ABBA The Museum*. But if you don't look good in white flares, maybe you'd prefer the drop-dead cool of *Fotografiska*, featuring exhibitions from the world's greatest photographers



Explore the galleries, boutiques, bars, and colourful housing of Stockholm's Södermalm.

(also serving good food and a great water view). And of course, the *Vasa Museum* is an extraordinary monument to building, sinking, and restoring wooden warships.

Bellevue (Washington, USA) – NANOG61

2-4 June 2014

Bellevue nestles the shores of Lake Washington between Seattle and Microsoft's hometown of Redmond. Head for one of the many parks and reserves in the area

and try *Analog Coffee* on Seattle's Capitol Hill. Take to the skies at the *Museum of Flight*, or dock at the *Microsoft Visitor Center* (you might even meet Clippy, if it looks like that's what you're trying to do).

Berlin – EuroDIG

12-13 June 2014

Berlin, brimming with cultural and historical heritage, is one of the most visited metropolises in Europe. It is full of institutions like universities, research



to take in the famous natural beauty of Washington State. Nevermind the reputation for grungy weather, Seattle offers many vantage points over the gorgeous waters of the Puget Sound, none higher than the *Space Needle*. You're in coffee country here, and you might even find some that isn't Starbucks. So drop your digital ways

Berlin - a city of contrasts

centers, theatres, and museums, but is also rich with festivals, nightclubs, cafés, and outstanding architecture. *The Jewish Monument*, is a stark memorial to the 6 million people who suffered and died during the Second World War, is close

to **Brandenburg Gate**. A somewhat different tourist attraction is the **Berliner Unterwelten** tour, taking you under the streets of Berlin. Many Berliners swear the best coffee is found at **The Barn**, in the Mitte area, where coffee is seen as a religion. In summer, the outdoor scene is vibrant. You'll need to eat currywurst on the street, and wash it down in one of the city's many beer gardens (try **Cafe am Neuen See** in the **Tiergarten**).

London – ICANN 50

22-26 June 2014

London is London and has always a lot to offer. This time we recommend **The Beatles museum**, **Portobello Road**, and the **Sticky Fingers restaurant** owned by The Rolling Stones. To try a different pub experience, check out the small theatres above pubs like the **King's Head** and **The Hen and Chickens** in Islington, which offer a special theatre menu in the pub and maybe a night of comedy. For the wine lover, we recommend **Gordon's Winebar**, between Charing Cross and Embankment Underground stations. **Borough Market**, is a nice market with fresh fruit, meat, fish, wine, beer, and delicacies.

Toronto – IETF goth

20-25 July 2014

Niagara falls is something you must see when you are in Toronto, though we recommend not doing so from inside a barrel. Downtown, **The CN Tower** is the classic way to scale the heights. For a stunning view from a less lofty perch, but with drinks and atmosphere worth savouring, try the **Roof Lounge** at the Park Hyatt or the **Panorama Restaurant and Lounge**. The **Toronto Islands** are also fantastic walking and cycling territory. The driving range at the **Polson Pier** entertainment complex offers golf by day, but tees off in another direction after dark, lighting up North America's largest drive-in movie screen. For the thirsty, microbreweries are going strong in Toronto, and one of the best is **Granite Brewery**, whose bitters, ales, and stouts are available only on the premises.

The flower markets of Delhi in a land of colour.



New Delhi, India* – SANOG 24 & APriGF

1-9 August 2014

New Delhi – built by the British Raj within one of the most historical, sprawling, chaotic, and fascinating cities in the world – is the seat of political power in India. There are a million things to do, and the **HoHo** bus ride can make it a little easier to start. Join emperors, armies, and colonists of days past at the massive sandstone **Red Fort**. Explore ancient tombs and monuments in relative peace at the **Mehrauli Archaeological Park**. See through the

London, one of the world's great cities, has it all.

eyes of India's best artists at the **National Gallery of Modern Art**, or learn about the great movers of Indian modernization at the **National Rail Museum**. For an insider's guide to street food, try the **Eat and Dust blog**. Or for fine North-West Frontier cuisine, **Bukhara** has a reputation for excellence. And in India, **cricket** is everywhere; it really is time you learned.

(*Note: SANOG 24 was originally scheduled for Hyderabad but has now been shifted to co-locate with APriGF.)





Taiwan's food is some of the best in the world.

Nantou, Taiwan – 38th APAN Meeting 11-15 August 2014

Bring your camera to capture the beautiful natural surroundings of Nantou, including the scenic tranquility of *Sun Moon Lake*. Bring your bathing suit to relax in the *Dongpu Hot Springs*. But most of all, this is Taiwan, so bring your stomach for some of the best regional food on offer. Chicken's feet may be an acquired taste, but the many delicacies we'd recommended include pan fried pork buns, beef noodle soup, Taiwanese sausage, stinky tofu, and pearl milk tea.

Istanbul – Internet Governance Forum 2-5 September 2014

Make what you will of Istanbul – a cool, modern metropolis; a bustling, exotic escape; a culinary delight; or a spectacle for jaded eyes – it's got it all. If this is your first time, you must visit the *Aya Sofya*; it may have changed hands a few times, but it can still teach the cathedrals

of Europe a thing or two about elegance, as can the neighbouring *Blue Mosque*. There's no better way to appreciate the Istanbul skyline than from the water, so grab an intercontinental *ferry* ride across the Bosphorus. Get hip in the urban galleries, restaurants, and boutiques of the *Karaköy* district, or get lost and confused in the labyrinthine, pan-sensual cacophony of the *Grand Bazaar*. For honest, high-quality local cuisine *Çiya Sofrası* has built a reputation as one of the best kitchens in Istanbul. Then end the day in style with a classy cocktail and water view on the terrace at the *Vogue Restaurant and Bar*.



Nurani Nimpuno
Head of Outreach and Communications

Where to meet up with Netnod

APRIL – SEPTEMBER 2014

ITW

11 – 14 May 2014
Chicago, IL, USA
<http://www.internationaltelecomsweek.com>

RIPE 68

12 – 16 May 2014
Warsaw, Poland
<https://ripe68.ripe.net>

ENOG 7

26 – 27 May 2014
Moscow, Russia
<http://www.enog.org>

Stockholm Forum on Internet Freedom and Global Development

27 – 28 May 2014
Stockholm, Sweden
<http://www.stockholminternetforum.se>

NANOG61

2 – 4 June 2014
Bellevue, WA, USA
<https://www.nanog.org/meetings/nanog61/home>

EuroDIG

12 – 13 June 2014
Berlin, Germany
<http://www.eurodig.org>

ICANN 50

22 – 26 June 2014
London, UK
<http://meetings.icann.org/icann50>

IETF 90

20 – 25 July 2014
Toronto, Canada
<http://www.ietf.org/meeting/>

APrIGF

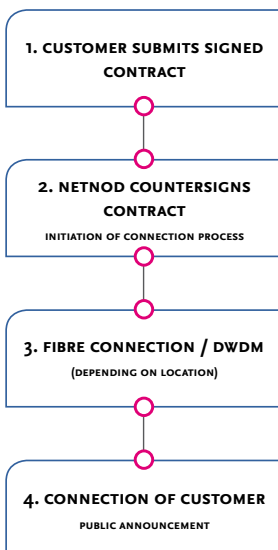
3 – 6 August 2014
New Delhi, India
<http://www.aprigf.asia>

AfPIF (African Peering and Interconnection Forum) 2014

26 – 28 August 2014
Dakar, Senegal
<http://internetcommunity.org/events/afpif/>

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Have an article or some great
photos you want published in the
next Netnod newsletter?

Get in touch!

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**“Netnod manages Internet
exchange points (IXPs) in
Sweden and Denmark, offers
DNS anycast & unicast slave
services to TLDs, and is the
operator of i.root-servers.net,
one of 13 logical DNS root
name servers.”**

Who we are



Pierre



Emelie



Håkan



Henrik



Johan



Kaj



Kurtis



Liman



Martin



Mem



Mathias



Nico



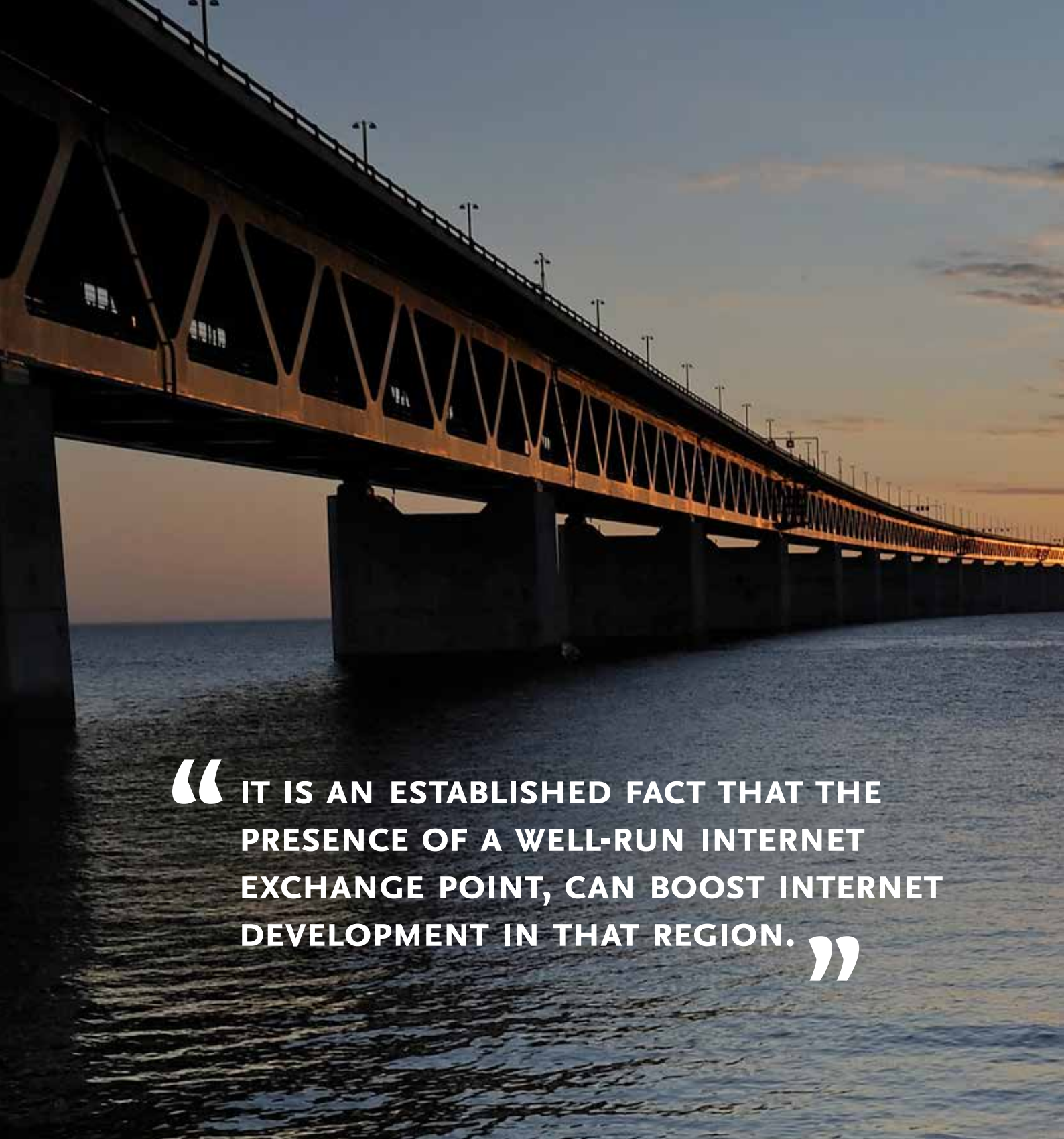
Nurani



Patrik



Sarah

A long, multi-span bridge with a steel truss structure extends across a body of water. The bridge is illuminated by warm, golden light from the setting or rising sun, which is visible on the horizon. The water reflects the light, and the sky is a mix of blue and orange. The bridge has multiple support pillars and a series of lights along its length.

**“ IT IS AN ESTABLISHED FACT THAT THE
PRESENCE OF A WELL-RUN INTERNET
EXCHANGE POINT, CAN BOOST INTERNET
DEVELOPMENT IN THAT REGION. ”**