

## NEWS

NETNOD NEWS – ISSUE 4 – 2015



NO FREAKING PAPER,  
I WANT IT ON MY SMARTPHONE.

## Netnod and NIX sign mutually beneficial MoU

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## The Internet Protocol Journal rises again

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# Word from the CEO

so that we continue to understand and meet the needs of our customers.

Emerging and increasing competition will drive us to evaluate everything from operations and cost structure to partnerships and branding. To do this, we are launching qualitative customer surveys, performed by an external party, to make sure we know what you, our customers, need and that we understand how you view us as a provider and market actor. We will follow these up with regular quantitative surveys to make sure we track emerging trends.

Netnod has always believed strongly in working together to create added value for partners, customers, and the Internet in general. We were proud and excited at the Netnod meeting when we announced the Memorandum of Understanding (MoU) with NIX, the Norwegian Internet Exchange. This MoU will see us working

“It’s an interesting challenge to see markets shift from services more or less provided on good reputation and geographic location – to a market where product portfolio, price, and brand recognition become deciding factors.”

on technical and commercial cooperation, and we have a lot to learn from each other. It also highlights how the Nordics are a tightly integrated market, where we need to provide uniform peering alternatives. With NIX and COMIX together, Netnod offers a great peering service portfolio.

Furthermore, we are working on a new IX network architecture and evaluating the model for Stockholm and COMIX. Those of you who attended the Netnod meeting in March saw a presentation on some of our thinking. The current models have served us well so far, but we need to

evaluate the most effective way to deliver IXP services for the future.

The rapid change to 100GE ports, and the scaling for this growth, will pose challenges, but we believe we need to continue to support the fast growth we have seen so far. I have been mocked in the office for my gross underestimate of 100GE takeoff, but to be honest I’m happy to have been wrong and to see Netnod at the forefront of 100GE customer port uptake. For the DNS services, we are also working on some new services and have launched our largest ever development project. I will get back to this project in future newsletters.

Finally, besides all the work on market analysis, strategic development, and partnerships, we have also been busy developing our organization. The past year saw a record seven new staff join us. And we have just hired one extra.

These hires reflect our commitment to continuous service development and high customer service standards. With these hires, we are better positioned to handle future growth and a much larger customer base.

I feel privileged to work in such dynamic times in such a dynamic industry. I am quite excited to see what the future will hold in store for us!

  
CEO, Kurt Erik Lindqvist, Netnod

# New IXP networks

SEPTEMBER 2014 – APRIL 2015

**Softlayer Dutch Holdings (AS36351)**  
SoftLayer provides cloud infrastructure services from datacentres and PoPs around the world, including bare metal and virtual servers, networking, turnkey big data solutions and private cloud solutions. <http://www.softlayer.com>  
**Contact:** [peering@softlayer.com](mailto:peering@softlayer.com)

**Excedo Networks (AS199150)**  
Excedo provides data communication security and domain related services to the corporate market, including data communications, security, infrastructure, DNS and domain names. <http://www.excedo.se>  
**Contact:** [peering@excedo.se](mailto:peering@excedo.se)

**Mainloop (AS43893)**  
<http://www.mainloop.se>  
**Contact:** [peering@mainloop.net](mailto:peering@mainloop.net)

**Highwinds (AS12989)**  
**Contact:** [peering@hwng.net](mailto:peering@hwng.net)

**CloudFlare (AS13335)**  
CloudFlare provides services to protect and enhance websites online. <https://www.cloudflare.com>  
**Contact:** [peering@cloudflare.com](mailto:peering@cloudflare.com)

**Core-Backbone (AS33891)**  
Core-Backbone is a hosting company and international network, which guarantees secure, high-availability and high-performance connection to the Internet. Core-Backbone also provides services like IP-transit, remote-peering, Layer2-connections, DDoS protection, and CDN. <http://www.core-backbone.com>  
**Contact:** [peering@core-backbone.com](mailto:peering@core-backbone.com)

**DGC Access AB (AS21195)**  
<https://www.dgc.se>  
**Contact:** [peering@dgc.se](mailto:peering@dgc.se)

**InternetOne (AS44160)**  
InternetOne implements ICT services with high added value. <http://www.internetone.it>  
**Contact:** [marco@internetone.it](mailto:marco@internetone.it)

**ViaEuropa (AS47155)**  
<http://viaeuropa.net>  
**Contact:** [peering@viaeuropa.net](mailto:peering@viaeuropa.net)

**Metroset (AS50923)**  
<http://metro-set.ru>  
**Contact:** [peering@metro-set.ru](mailto:peering@metro-set.ru)

**Tyfon Svenska AB (AS21250)**  
Tyfon has provided high-speed Internet access and VOIP services to business and consumers since 1999. <http://www.tyfon.net>  
**Contact:** [peering@tyfon.net](mailto:peering@tyfon.net)

**Nexellent ag (AS31424)**  
Nexellent is a Swiss ICT service provider with future-oriented infrastructure services. Nexellent can meet the highest demands security, availability, and quality of service thanks to multiple datacentres and an innovative, modular range of colocation, hosting, and housing services; servers; private clouds; and networks services. <https://www.nexellent.ch>  
**Contact:** [peering@nexellent.net](mailto:peering@nexellent.net)

**Keycom PLC (AS25178)**  
Keycom PLC designs, develops, installs, maintains, monitors, and supports best-in-class high-speed broadband, IT, and telecommunication solutions across diverse sectors. <http://www.keycom.co.uk>  
**Contact:** [peering@as25178.net](mailto:peering@as25178.net)

**NetIX Communications Ltd (AS57463)**  
NetIX Communications is a global platform for sharing ethernet traffic and services exchange. It connects all members without intermediaries across Layer 2 access technology around the world. <http://netix.net>  
**Contact:** [peering@netix.net](mailto:peering@netix.net)

**Completel (AS44020)**  
<http://www.cln.net>  
**Contact:** [noc@cln.net](mailto:noc@cln.net)

**Ziron (AS202112)**  
Ziron provides API- driven wholesale voice and messaging services. <https://www.ziron.com>  
**Contact:** [peering@ziron.com](mailto:peering@ziron.com)

**IDNet (AS12496)**  
IDNet is a leading technology-driven Internet services & communications provider (ISP/CP), delivering high performance data and telecoms solutions for businesses, blue-chip corporations, and government agencies in the UK. <http://www.idnet.net/>  
**Contact:** [peering@idnet.net](mailto:peering@idnet.net)

**Canadian Internet Registration Authority (AS55195)**  
CIRA manages the .CA domain. <http://www.cira.ca/>  
**Contact:** [peering@cira.ca](mailto:peering@cira.ca)

**Twitter (AS13414)**  
Twitter provides social networking and microblogging services. <https://about.twitter.com>.  
**Contact:** [peering@twitter.com](mailto:peering@twitter.com)

**Serverel (AS50245)**  
Serverel is a hosting company that offers everything from storage to managed clusters to databases, as well as providing applications and programming. Serverel also offers VPS and server co-location. <http://www.serverel.com>  
**Contact:** [peering@serverel.com](mailto:peering@serverel.com)

**Göteborgsnätet (Gotanet) (AS12597)**  
Gotanet is a national ISP whose services are primarily targeted to customers in the west of Sweden. <http://www.gotanet.se/about/>  
**Contact:** [peering@gotanet.se](mailto:peering@gotanet.se)

**Host Virtual (AS36236)**  
Host Virtual is a cloud hosting provider operating dual-stack IPv4 and IPv6 clouds worldwide, built around scalability, self-service, and ease of use. <http://www.hostvirtual.com>  
**Contact:** [peering@vr.orgVR.ORG](mailto:peering@vr.orgVR.ORG)

**OnLive EMEA Sàrl (AS46391)**  
OnLive provides cloud computing services to millions of users across the US and Europe, including OnLive Game and OnLive Desktop. <http://www.onlive.com>  
**Contact:** [peering@onlive.com](mailto:peering@onlive.com)

**Telekom Srbija (AS8400)**  
Telekom Srbija is a modern, locally-owned, telecommunications company with international PoPs in Frankfurt, Vienna, Budapest, Ljubljana, Timisora, and Sofia. <http://www.telekom.rs>  
**Contact:** [peering@telekom.rs](mailto:peering@telekom.rs)

**SEACOM (AS37100)**  
SEACOM is a global communications service provider, with emphasis on connectivity solutions between Africa and the rest of the world. SEACOM operates a global IP/MPLS backbone as well as submarine cable systems between Africa, Europe, and the Asia Pacific. <http://seacom.mu>  
**Contact:** [peering@seacom.mu](mailto:peering@seacom.mu)

**Nordiska Servercentralen (AS49515)**  
<http://www.servercentralen.se/>  
**Contact:** [mikael@servercentralen.se](mailto:mikael@servercentralen.se)

**Inter Connects (AS57858)**  
Inter Connects provides IP transit, colocation, and servers. <http://interconnects.us>  
**Contact:** [noc@interconnects.us](mailto:noc@interconnects.us)

**Swedish Armed Forces (AS9201)**  
Försvarsmakten (Swedish Armed Forces) is the Swedish authority responsible for Sweden’s military defence. <http://www.forsvarsmakten.se>  
**Contact:** [fmtm-peering@mil.se](mailto:fmtm-peering@mil.se)

## IXP member upgrades SEPTEMBER 2014 – APRIL 2015

**Telavox (AS44123)\***  
[peering@telavox.se](mailto:peering@telavox.se)

**TransTelecom (AS20485)**  
[peering@ttk.ru](mailto:peering@ttk.ru)

**Microsoft (AS8075)**  
[peering@microsoft.com](mailto:peering@microsoft.com)

**Tyfon Svenska AB (AS21250)**  
[peering@tyfon.net](mailto:peering@tyfon.net)

**Golden Telecom (AS3216)\***  
[noc@gldn.net](mailto:noc@gldn.net)

**AllTele (AS44581)**  
[peering@alltele.se](mailto:peering@alltele.se)

**HizG Access AB (AS44034)**  
[daniel.wiberg@tre.se](mailto:daniel.wiberg@tre.se)

**Limelight Networks (AS22822)**  
[peering-team@llnw.com](mailto:peering-team@llnw.com)

**Mobile TeleSystems (AS8359)**  
[peering@mtu.ru](mailto:peering@mtu.ru)

**Com Hem (AS39651)**  
[peering@comhem.com](mailto:peering@comhem.com)

**EasySpeedy Danmark ApS (AS30736)**  
[peering@easyspeedy.com](mailto:peering@easyspeedy.com)

**Linkedin (AS14413)**  
[peering@linkedin.com](mailto:peering@linkedin.com)

**Valve (AS32590)**  
[peering@valvesoftware.com](mailto:peering@valvesoftware.com)

**British Telecom (AS5400)**  
[peering@bt.com](mailto:peering@bt.com)

**EdgeCast Networks Inc. (AS15133)**  
[peering@edgecast.com](mailto:peering@edgecast.com)

**31173 Services AB (AS39351)**  
[peering@31173.se](mailto:peering@31173.se)

**Hurricane Electric (AS6939)**  
[peering@he.net](mailto:peering@he.net)

**Amazon, AS16509**  
[peering@amazon.com](mailto:peering@amazon.com)

\* multiple upgrades

NETNOD NEWS:

We are growing – and we make sure services keep up with the demand



**New traffic record**  
Netnod has seen a tremendous increase in traffic volume as well as many new members signing up to us. 16 October 2014 marked an important day at Netnod as we reached 1 TB in traffic volume across our IXPs.

**New staff members**  
To continue to meet the increased needs of our customers, in the last 12 months Netnod has added seven new staff members.

**The Communications and Outreach** team added three new team members: Martin Eriksson as Strategic Account Manager, Alexander Borodin, as Communications Officer and just recently, Siri Brenden, as Events and Marketing Officer.

Our Communications and Outreach team is our window to the world – staying in touch with our customers and partners, at conferences, at our own Netnod events, and through our external communication channels. Our aim is to provide the Netnod customer base with great services, and to give you updated and accurate information.

**Serving our expanded board** and executive team: To meet the increased need for support in the expanded board and in the executive team, we recently welcomed Nathalie Alberti Fidani as our Executive Assistant.

**The Operations team adds more support staff:** More customers, increased traffic and the development



of new services, puts greater demands on our Operations team of course. The latest additions are JörgenThun, Data Centre Engineer, and Love Dufva and Kim Dahlgren, Junior Systems and Network Engineers. With these great additions, we strive to provide better and quicker first line support to our customers.

**Additions in the RnD team to improve automation:** In order to continue to improve our tool sets, and to automate external and internal processes, the RnD team is adding a programmer to continue that important work.



**Interested to join?**  
There is actually room for even more people at Netnod. This year, we will see further growth in the organisation. We know where we are going, but we are looking for the right people to join us for that journey. And we know that it's the individuals in an organisation that makes it succeed, rather than what title each role is given on paper.

**Sounds interesting? Have a look at:**  
<https://www.netnod.se/about/organisation/employment/netnod-growing>



COMIX one year on

It has already been a year since Netnod launched COMIX. By merging CPHIX and the Netnod Malmö IXP into COMIX, we created an optimum solution for content providers and network operators to interconnect. COMIX services a very large and dynamic region in Sweden and Denmark. Currently there are over 30 members connected to COMIX, and growing.

**Netnod deployed our first "Nano site" at COMIX**  
Netnod has deployed our first small DNS anycast "nano site" at COMIX, which is a 1U server with a virtualisation environment. The new server system is used for distributing the Netnod anycast DNS services, such as i.root-servers.net (I-root) and the DNSNODE TLD anycast service. The new server only requires 1U compared to the

old nodes that consisted of several servers and took up around 8 rack units of space.

With the connection of Netnod's DNS services to COMIX, we are making use of the distributed benefits of COMIX. While the server is physically installed at our site in Malmö, network operators at all the COMIX locations in Copenhagen (InterXion, Global Connect and Telia Telehouse), can directly access the services through the COMIX IXP.

These value-adding services, as well as the increased network base at COMIX, benefits all connected operators and CDNs at COMIX IXP.



Håkan Hellström  
Head of Operations

EXPANDING NETNOD'S OUTREACH & COMMUNICATIONS:

We welcome two new team members

MEET ALEXANDER:

Alexander Borodin started at Netnod last year as a Communications Officer, working with marketing activities such as customer events, business development, and press related tasks.

**You have worked here now for some months – what's your impression of Netnod?**  
I'm so impressed by the technological know-how at Netnod and its commitment to the Internet. We are really so closely tied to the community, wherever we attend events, it feels like everyone knows us personally. I also like that Netnod really cares about its staff. It's a great company and I'm proud to work here.

“Netnod works at the heart of the Internet, so it's exciting to be part of it!”

**Tell us a little bit of yourself!**  
I was born in Stockholm to a Ukrainian mother and a Swedish father, who raised me with a mix of cultures. I studied in Stockholm and Amsterdam and have a master's degree in Media and Communications. Before Netnod I held various communications and marketing roles in different industries. But my focus has mostly been on online and digital marketing, so now it feels exciting to be a part of the Internet's infrastructure.

**What do you like to do?**  
I like to travel, experience things, and meet new people. I'm quite adventurous and never afraid to test new things (although I also like quiet and cosy nights at home). I'm a cineast and into all sorts of movies – from Bergman to the latest Hollywood action adventures. I like art and my home is full of paintings (mostly Swedish contemporary art). I love running – I compete regularly and do 10 km just under 40 minutes. And I love music of all sorts.

**Yes, we heard some rumours about your involvement in the music industry, tell us!**  
Eurovision is really big in Sweden, and I am one of the founders (and a former editor-in-chief) of a big website about Eurovision and Swedish music in general. I still blog sometimes, and I'm a board member for the official Swedish Eurovision fan club.

**What's so interesting about the Internet?**  
What's not interesting you mean? Almost everything happens online now. For a guy that was interested in media, it was only natural to focus my interest where the whole media industry is heading. Even early on, I was into programming, web design, and usability. Netnod works at the heart of the Internet, so it's exciting to be part of it!



**What's your favourite drink?**  
Easy – that's coffee. I need coffee to wake up in the morning, to keep going during the day. Maybe that's not healthy, but it's my only real vice.

**What's your favourite gadget?**  
That's for sure my new iPhone 6. I use it whenever I'm not working on my Mac Book Pro or iPad. A boring answer, maybe, but this is how it is. I cannot say it's a Swiss Army knife or anything like that! Internet is such a part of my life now, I need access to it always. Plus, I can control my TV and many other things with it. In the worst case, you could even use your iPhone as a bottle opener!



**Say Hello to Siri!**  
Siri Brenden has just started at Netnod as our Events and Marketing Officer and will be focusing on developing our Netnod meetings and our events in the future. She has a background in event organisation from the hospitality industry and a great knack for adding just “that little bit extra” to an event. You can meet Siri, as well as rest of the Netnod team at our summer drinks social. Interested in discussing Netnod meeting ideas or sponsoring our next meeting? Make sure to grab Siri!



# Towards the IANA functions transition

Early last year, the US government's National Telecommunications and Information Administration (NTIA) made an historic announcement: it intends to cease its role as the oversight body for the Internet naming and numbering functions managed by IANA. But making history can take a lot of time and effort, and the task of replacing NTIA's role is complex and politically sensitive.

So what has happened so far and what remains to be done to ensure a smooth, orderly transition?

As we reported in an earlier article, the issue at stake is that of the NTIA's stewardship role over the IANA functions, not the IANA functions themselves. Affirming the value and legitimacy of the Internet's multistakeholder development model, the NTIA specifically tasked ICANN to coordinate a process in which interested stakeholders develop a transition proposal.

In response, ICANN formed the IANA Stewardship Transition Coordination Group (ICG) to coordinate proposals from the three stakeholder groupings responsible for the three main IANA functions, numbering, protocol parameters, and domain names.

The ICG held its first meeting during the London ICANN meeting in July 2014.

With the current IANA contract set to expire in September this year, the ICG was set an aggressive timeline (see sidebar), including community development of proposals by 15 January 2015. So the various communities quickly got to work.

### Protocol parameters

The IETF took on this task, forming the IANAPLAN Working Group (IANAPLAN WG), which followed normal IETF processes and produced a proposal ahead of the deadline.

**IANAPLAN website:** <http://www.ietf.org/iana-transition.html>

**Proposal:** <http://tools.ietf.org/html/draft-ietf-ianaplan-icg-response-09>

### Numbering

The Consolidated RIR IANA Stewardship Proposal (CRISP) Team was formed to develop a proposal for the numbering

function. The process started with discussions in each of the five RIR communities, which informed the regular CRISP Team meetings, culminating in a proposal delivered on time.

**CRISP Team website:** <https://www.nro.net/crisp-team>

**Proposal:** <https://www.nro.net/wp-content/uploads/ICG-RFP-Number-Resource-Proposal.pdf>

### Names

The names community, coordinated by the GNSO and ccNSO, formed the expansively titled Cross Community Working Group to Develop an IANA Stewardship Transition Proposal on Naming Related Functions (CWG). The work on the naming proposal has, unsurprisingly, proved more complicated than that for the other functions. Within the CWG multiple subgroups (called Design Teams) have formed and, late in 2014, the names community spawned a new group, the Cross Community Working Group on Enhancing ICANN Accountability (CCWG-Accountability), chartered to "deliver proposals that would enhance ICANN's accountability towards all stakeholders" in the absence of an NTIA-ICANN contract. By the time of writing, the names community had not yet submitted a proposal. It has, however, set itself a revised timeline aiming for a 2<sup>nd</sup> draft proposal on 22 April and a final proposal by June.

**CWG website:** <https://community.icann.org/x/37fhAg>

**Public consultation document:** <https://www.icann.org/en/system/files/files/cwg-naming-transition-01dec14-en.pdf>

## What has been proposed so far?

### Protocol parameters

Under the IETF's rather minimal protocol parameters proposal, relatively little would change. This reflects the uncontroversial – indeed uneventful – history of protocol parameter registration functions. The proposal does seek assurances about preserving the integrity and public domain nature of the registry in the event of any future transition away from ICANN.

But otherwise, it states that "no new organizations or structures are required" and reaffirms the existing framework of protocol parameter functions and the oversight role of the IAB.

### Numbering

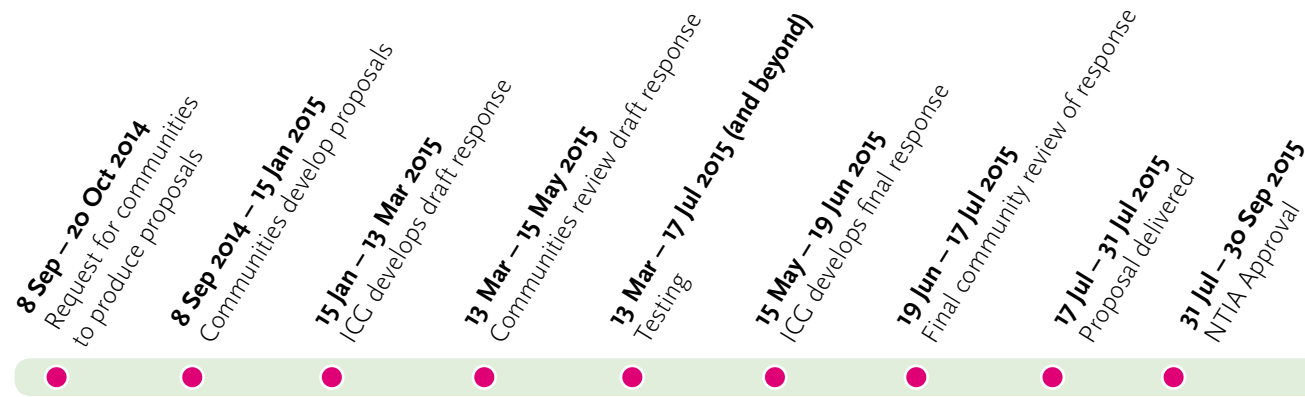
At the core of the CRISP Team proposal, the NTIA's contractual accountability role would be taken over by the RIRs, who would be informed by community advice from a review committee. The main components of the proposal are:



- IANA function stability and reliability – ICANN to continue as the IANA Numbering Services Operator; orderly transition to another operator if need arises.
- RIRs (as representatives of RIR communities) to replace NTIA's role – RIRs to establish a service level agreement with the IANA Numbering Services Operator.
- Review Committee – Reviews performance of IANA Numbering Services and advises the RIRs; provides community perspective; representative of each RIR, members selected by RIRs' bottom-up processes.
- Clarify IPR-related issues – Intellectual property rights related to IANA services stay with the community.



### ICG TIMELINE





The 52<sup>nd</sup> ICANN meeting, held in Singapore in February, heard reports from all communities on their progress. Assistant Secretary for Communications and Information and NTIA Administrator Lawrence E. Strickling has since published an article praising the efforts so far, but reminding stakeholders of the need to keep their efforts synchronised. In this process, once all of the separate proposals are complete, the ICG will still have the task of coordinating broad community support for a single, consolidated proposal to be submitted to the NTIA.

“We will only consider a coordinated and complete transition plan,” writes Strickling.

Apart from achieving a consolidated proposal, it will also be necessary to stress test the proposal to demonstrate that it can work. If all of this raises doubt that the NTIA will have anything to review before the IANA functions contract expires, then Strickling does give some hope, noting that quality will be more important than timeliness.

“While September 2015 has been a target date ... we have the flexibility to extend the contract if the community needs more time to develop the best plan possible,” he writes.

However, the further this process stretches into the next US election cycle (which has already begun), the greater the risk of this essentially administrative



“Netnod has assured the Internet community that our commitment to providing the i.root-servers.net service in a stable manner remains, independent of any future changes to the IANA stewardship.”

issue being politicised and brandished as a vital issue of national sovereignty.

On 25 February, Strickling testified before the Senate Committee on Commerce, Science, and Transportation, explaining in very careful language the background to and status of the transition process. The activities of this committee could be well worth observing in coming months.

On 17 April, Netnod publicly re-affirmed its commitment to operate DNS root name server I-root in a stable manner, independent of any future changes to the IANA stewardship. Netnod assured the Internet community that our commitment to providing this service and to coordinating appropriately with ICANN and the other root server operators, remains and will not be affected by the outcome of these discussions.

<https://www.netnod.se/netnod-re-affirms-commitment-operate-i-root>

## What is left to do?

As noted above, we must now wait for the CWG and the CCWG-Accountability to complete their tasks before work can begin to consolidate the proposals and achieve broad community support.


In the meantime, other work is ongoing to communicate details of the proposals and process to the various stakeholder communities. The ICG has worked with the IETF and the numbers communities to clarify some aspects of their proposals and ensure there were no conflicts between the two on the subject of intellectual property rights. And to ensure timely coordination of upcoming issues, the CRISP Team recently wrote to the CWG asking that group to “communicate directly to the Chair and Vice-Chair of the CRISP team, regarding any proposals or developments that might affect the numbers community in advance, and not wait for the final submission to the ICG”.

The next ICANN meeting will be held in June in Buenos Aires, where the transition process will be one of the major issues.

**Read more**  
IANA Stewardship Transition Coordination Group (ICG) website:  
<http://www.ianacg.org>

Larry Strickling, “Stakeholders Continue Historic Work on Internet DNS Transition at ICANN Singapore Meeting”:  
<http://www.ntia.doc.gov/blog/2015/stakeholders-continue-historic-work-internet-dns-transition-icann-singapore-meeting>

Testimony of Assistant Secretary Strickling before the Senate Committee on Commerce, Science, and Transportation on “Preserving the Multistakeholder Model of Internet Governance”:  
<http://www.ntia.doc.gov/speechtestimony/2015/testimony-assistant-secretary-strickling-senate-committee-commerce-science-and->

 **Nurani Nimpuno**  
Head of Outreach and Communications

# Netnod’s contribution to African peering community recognised

The African Internet is on the move. Internet penetration across most of the continent, which has long lagged the rest of the world, is now growing rapidly. However, while several major cable landings in recent years have greatly improved international connections, there’s still a lot to be done to improve (or create) local infrastructure, interconnection, and regulatory policy.

In this context, the African Peering and Interconnection Forum (AfPIF) plays an increasingly important role.

**AfPIF**  
AfPIF was launched in 2010 by the Internet Society’s Michuki Mwangi and Karen Rose (now also a Netnod board member) to develop a more cohesive African IX community and promote the establishment of an IX association.

At that time, many of the IXes in Africa were the failed attempts of development agencies which had put too much focus on deploying hardware and technical solutions and not enough on the human factor. Without sufficient social engineering, technical deployments typically struggle to reach a critical mass of members or gain regulatory support.

AfPIF’s presence is a significant improvement, both helping with basic capacity building and stimulating the vital

discussions and peer interactions needed to seed IX development.

**Netnod supports AfPIF**  
Netnod is committed to promoting interconnection for the good of the Internet, and in many ways, sees AfPIF’s role as similar to the European Peering Forum, which Netnod hosts with Ams-IX, DE-CIX, and LINX. In particular, the face-to-face interaction and relationship building that these meetings offer is an invaluable part of building a healthy, functional IX community.

So the decision for Netnod to get behind AfPIF was clear. Right from the start, Netnod has provided support and expertise, including sponsorship of all five AfPIF meetings held so far.

At the most recent AfPIF – held in Dakar, Senegal in August 2014 – Netnod’s support was recognised with a special award of thanks.

“I know it can be hard to gauge the value of participating in such efforts,” says Rose. “But I can tell you from experience that Netnod’s involvement truly helped catalyse the amazing change that is happening across Africa.”

From the five years since AfPIF’s launch, several positive developments are worth highlighting. For one thing, the number of IXes in Africa has grown and, importantly, a new African IX association,

Af-IX, has been established. Rates of traffic exchange have also grown, and providers are more aware of the benefits of exchanging traffic locally, to the extent that AfPIF participants have requested dedicated bilateral peering sessions, which Mwangi interprets as indicating faster than anticipated community growth.

“Netnod’s involvement truly helped catalyse the amazing change that is happening across Africa”

With Internet penetration now passing 15 percent, and growing faster than in other regions, the business case is strengthening for domestic and global content providers and networks to turn to Africa. This, in turn, could stimulate more in-region peering and drive the demand for geographically wider investment in broadband access.

The most recent AfPIF attracted almost 200 participants – despite the concerns of the Ebola outbreak in West Africa – and many regional and international sponsors.

The next meeting will be held in Maputo, Mozambique from 25-27 August, 2015, and registration is already open.

Once again, Netnod will sponsor the event and is looking forward to enjoying a dynamic agenda of stimulating discussions, learning, and sharing.

**More information is available here:**  
<https://www.internetsociety.org/afpif-2015>

 **Kurt Erik Lindqvist**  
Chief Executive Officer



# SPRING IS IN THE AIR... THE NETNOD SPRING MEETING 2015



The Netnod Spring Meeting 2015 attracted more than 130 participants – our biggest meeting so far – and featured several keynote speakers from the international community.

Emlie Aben from RIPE NCC gave a great presentation on IXP measurements and peering in different countries, using RIPE Atlas. His conclusion was perhaps not surprising, but no less important: IXPs help keep local traffic local!

There were quite a few DNS presentations this year. Jim Reid used 100 Billion DNS Queries to Analyse the Name Collision Problem. Mikael Kullberg told us about the latest Internet plague: Random Subdomain Attacks, and Cathy Almond gave a great presentation about how to handle unusual DNS client behaviour, which sparked some spirited discussion.

Ondrej Filip, CZ.NIC talked about Knot DNS – the authoritative and recursive DNS servers developed by CZ.NIC, and he also demonstrated the Turris project.

On the more operational side, Pablo Barrera from Spotify gave a very interesting talk about network usage in a distributed Kafka setup, and Anders Berggren from Halon talked about Trusted email with DKIM/DMARC.

Jan Zorz from ISOC organised a panel discussion on how to get more operators involved in the work of the IETF (Internet Engineering Task Force), and you can read more about ISOC’s work on this at: <http://www.internet-society.org/deploy360/blog/2015/03/operators-and-the-ietf-update-from-ietf-92/>

Anne-Marie Eklund Löwinder, from .SE presented about monitoring the Swedish ccTLD to get rid of malicious code. Robert Malmgren talked about attacks against critical infrastructure. Susmita Adhikari, from HUBER+SUHNER Cube Optics AG dealt with Real-time monitoring and fault localization. Olle E. Johansson discussed

“Staying Happy with SIP”. And we ended with Måns Nilsson from SR giving us a practical example of service convergence in telecoms from a customer perspective.

IPv6 is always a hot topic, and in Sweden the Internet geeks are complaining that the rollout is too slow – especially as many operators still can’t deliver IPv6 to end customers. Thomas Nilsson from Certezza carried out an IPv6 survey in Sweden in 2011, which he presented at the Netnod meeting back then. He came back to conduct a new survey this year, and while there have been some improvements, he still found that only 12 of 19 of the major Swedish ISPs could deliver IPv6 to end customers. A frank panel discussion followed, exploring the challenges of finding a business case in IPv6 to present to the management layer in the organisation. There is no clear customer demand seen yet, so the message to everyone in the room, was to start demanding IPv6 as a customer, from your ISP.

Our social at the fabulous Trattorian restaurant offered drinks, classic rustic Italian dining, and beautiful views of the water – all on a gorgeous Stockholm spring evening. The bar was full right up until closing time! Many thanks to the TeleCity Group for sponsoring this fantastic evening.

Check out the meeting photos at: [https://www.facebook.com/netnodix/photos\\_stream](https://www.facebook.com/netnodix/photos_stream)

All meeting presentations and video streaming at: <https://www.netnod.se/netnod-spring-meeting-2015>

**Save the date** for the Autumn Meeting on 14-15 October!  
<https://www.netnod.se/netnod-autumn-meeting-2015>

 **Alexander Borodin**  
Communications Officer





THE LATEST BUZZ IN THE INDUSTRY (SEPTEMBER 2014 – APRIL 2015)

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

**EPF9**  
The ninth European Peering Forum (EPF) took place in beautiful Split, Croatia. It had over 240 attendees, making it the most well attended EPF to date. Mario Klobučar from CIX presented an interesting overview of the Internet landscape in Croatia, and Grzegorz Janoszka from Booking.com made a strong case for peering by showing hard data on how peering improves speed for his company. Apart from the great content in the agenda (and some lovely socials of course) the meeting was packed with bilateral peering meetings.



**ICANN 51**  
The ICANN 51 meeting was, like many other meetings in this period, focused mainly on the IANA stewardship transition discussions and the key expectations of the names community, namely security, stability, predictability, redress mechanisms, and separation of functions. Discussions on ICANN accountability intensified, as ICANN had published a new accountability proposal just before the meeting.

**ITU Plenipotentiary Conference (PP-14)**  
The much-anticipated ITU Plenipotentiary conference (Plenipot) in Busan was an intense three-week intergovernmental conference. Netnod’s Nurani Nimpuno participated as part of the Swedish delegation. There were many concerns before the conference about the potential risks of the meeting ending with relations between nations broken, and significant da-

mage to the Internet. There were several proposed ITU resolution texts covering aspects such as IP addressing, routing and Internet exchange points which raised concerns about the ITU attempting to expand its mandate. But despite the many fears beforehand, the outcome was overwhelmingly positive, resulting in the event being labelled “The Busan consensus” by the U.S. Government and others.



**RIPE 69**  
Talks at the RIPE 69 meeting were unsurprisingly dominated by the IANA stewardship transition. The enthusiastic discussions in the RIPE community materialised into a set of guiding principles for the numbers community proposal group, called CRISP (Consolidated RIR IANA Stewardship Proposal Team). The RIPE community chose Andrei Robachevsky and Nurani as RIPE community representatives on the CRISP team. There were also good reports on the positive outcomes of Plenipot, with the message “engagement works”. In other news, Bind provider ISC announced that it will take over distribution and secretariat functions for NLnet Labs, to help its Dutch competitor in the DNS server software market manage the transition from foundation funded to self funded.

**IETF 91**  
The IETF 91 meeting marked a return to Honolulu, Hawaii, fifteen years after IETF-15, which had the tagline “Nerds in Paradise”. This “Nerds in Paradise 2.0” had 1100 participants from 50 countries,

and seven remote hubs throughout Latin America Privacy, encryption, open source, and data models were high on the agenda, and so was the IANA stewardship transition. The IANAPLAN working group had a lively discussion about the IETF transition plan for the IANA services. And there was a surge of YANG data models submitted to the IETF. YANG is a data modelling language for the NETCONF network configuration protocol, and these models are needed to manage network nodes in operator networks in centralised fashion. A great report from the IETF91 meeting is available on the IETF chair’s blog: <http://www.ietf.org/blog/2014/11/ietf-91-summary>



**Internetdagarna 2014**  
Kurtis Lindqvist, Patrik Fältström, and Nurani all presented at the yearly Swedish Internet conference. Kurtis gave a technical perspective on Net neutrality in the session “Should Net neutrality be legislated?”. Nurani moderated the session “Internet governance – who will shape the future of the Internet?” with a great line-up of speakers from NTIA, ICANN, ISOC and the IETF. Patrik gave an update in the “The latest and greatest from SSAC” session.

**ICANN52**  
The ICANN 52 meeting in Singapore was a big and busy one as usual. Unsurprisingly, discussions on the IANA stewardship transition dominated the meeting, as well as broader discussions about ICANN accountability. For Lars-Johan Liman, Patrik, and Nurani it meant a hectic, but productive week!

**NANOG 63**  
NANOG 63 took place in San Antonio, Texas, with 622 attendees from 19 countries. Netnod was represented by Mathias Wolkert and Kurtis, who each had a full three-day agenda of presentations and meetings. The topics of DevOps and real life network automation got a lot of attention during the conference. These days everyone is talking about automation and autoconf, so it’s becoming a hot topic to follow. On other topics, a DWDM-panel session featured discussions about the fact that fibre prices are going down so fast now that some business cases do not hold anymore. One potential scenario is the raise of co-operative fibres, with operators splitting channels.

**APRICOT 2015**  
APRICOT is the largest operators’ forum in Asia Pacific, and this year’s event attracted 835 participants. The Peering Forum had lots of interesting interconnection presentations and the security track included great discussions on national and regional security challenges. Discussions on security, threat mitigation, and incident handling all showed how cooperation is the key to reducing security threats. APRICOT 2015 also saw the launch of the Cooperation SIG, a forum for broader Internet policy and Internet governance issues. This meeting was the first RIR meeting since the number community submitted its IANA Stewardship transition proposal, which meant intense discussions with a focus on the next steps in the process. Elise Gerich




from IANA, gave a great comprehensive report of the history of IANA and the Internet numbering system. Check out APNIC’s blog post and video at: <http://wp.me/p4XXJg-Od>

**DKNOG 5**  
Netnod has been a proud supporter of the Danish Network Operator Group DKNOG since its inception, so we were happy to see another successful event. DKNOG is a tight-knit community of operators in a small, but still very vital and changing scene. This year saw 100 participants at DKNOG. Netnod also celebrated COMIX’s first anniversary with a special giveaway: a special edition of our “Peer to the future” t-shirt, in the Danish colours red and white, with the COMIX logo on the back – a future collector’s item indeed! The main social, presented by Netnod, turned out to be a highly appreciated event.

**CEE Peering day 2015**  
The third edition of CEE Peering Day took place at the Sheraton Hotel in Bratislava, Slovakia. The event has expanded to a two-day meeting and now gathers 250 attendees, mostly from within the region. Netnod was a Gold partner this year, and we gave out a rainbow collection of our ever-so-popular “Peer into the future” t-shirts, which all disappeared in no time. We also very much appreciated the social evening that took place in the old town of Bratislava, where we got a lesson on how to make yourself a real vodka ice cream.

We are already looking forward to next edition.

 **Nurani Nimpuno**  
Head of Outreach and Communications





# Netnod and NIX sign MoU for ongoing cooperation

Netnod and the Norwegian Internet Exchange Point, NIX, have signed a mutually beneficial memorandum of understanding (MoU), setting a framework for ongoing cooperation.



Netnod CEO Kurtis Lindqvist and NIX CEO Kjetil Olsen, announced the arrangement on 11 March 2015, during the Netnod spring meeting. The MoU is a non-binding statement of the parties' shared understanding about how they can work together for the good of both organisations and The Nordic Internet community. It covers four broad areas of cooperation, namely:

- Technical development
- Other technical cooperation

- Community building
- Commercial development

The full extent of the cooperation in those areas will emerge over time.

"We look forward to closer cooperation with Netnod," says Olsen. "While we at this point don't know exactly where this cooperation will take us, a good start is information sharing and knowledge transfer. Netnod is a mature IXP in the region, whose experience we really

believe we can benefit from at NIX." For Netnod, which last year solidified its presence in Denmark by establishing COMIX, cooperating with NIX is an opportunity to now make a greater contribution to networking and interconnection in Norway.

"We have always had very good relations with NIX," says Lindqvist. "We see that taking this step to somewhat formalise our cooperation as a very positive signal to the region. We hope we can help further boost the interconnection market in Norway, and we want to explore how we can work together for the Internet in the whole Nordic region."

NIX is operated by the Centre for Information Technology Services (USIT) of the University of Oslo.



**Kurt Erik Lindqvist**  
Chief Executive Officer

## YOU ARE CORDIALLY INVITED TO THE NETNOD SUMMER DRINKS 2015



The Netnod team invites all our friends, partners and customers to the Netnod summer drink – an opportunity to catch up before the summer with bubbly, drinks and some nice food.

This time we are going to Josefina, behind the Nordic Museum. A summer oasis at Djurgården, that offers superb views over Nybroviken and Djurgården Canal. A perfect place for an exciting party!

Are you joining us?  
Mail us at: [meeting@netnod.se](mailto:meeting@netnod.se) with your:

- Full name, Email & Organisation
- AS number (if available)

# The Internet Protocol Journal rises again

Since June 1998, the quarterly publication *The Internet Protocol Journal (IPJ)* has been exploring and documenting Internet protocol development. Although published by Cisco Systems, IPJ remained a vendor-agnostic journal, intended as an informational and educational resource, and it soon became one of the most important and respected publications for "...engineering professionals involved in the design, development, and operation of public and private internets and intranets."

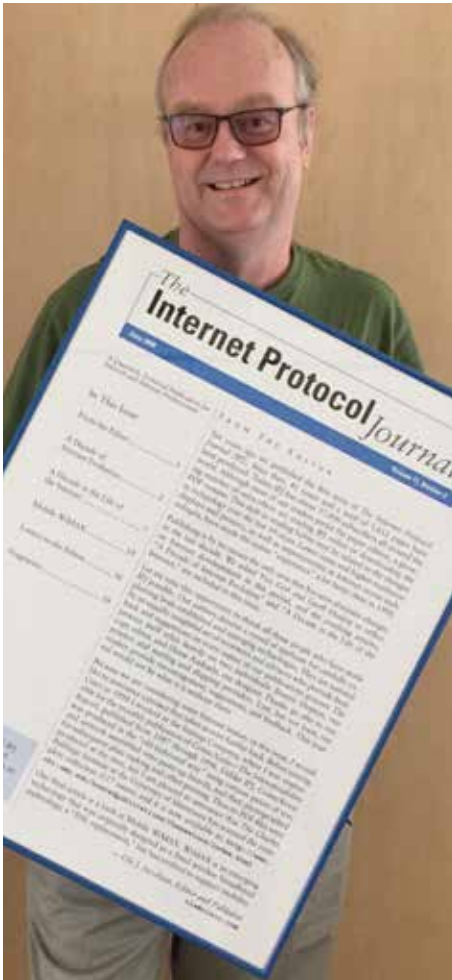
But then, in October 2013, the IPJ fell victim to new business realities, with Cisco Systems announcing it would no longer be published.

Ole Jacobsen, IPJ editor from issue 1, reached out to the Internet community, and in the true spirit of Internet development, the community responded. So, after a hiatus of one year, IPJ rose again, with Volume 17 Number 1 published in September 2014.

The relaunch of the journal is thanks to the dedication of Jacobsen and the generous support of many organisations and individuals within the Internet community. Despite no longer publishing IPJ, Cisco Systems is one of the journal's sponsors, maintains the archive of back issues, and allows the IPJ name and subscriber list to be used under licence.

"Netnod, is proud to be a supporter of IPJ as a corporate subscriber," says Nurani Nimpuno. "It's great news that such an important and useful publication will continue, and we congratulate Ole Jacobsen for securing such a diverse group of supporters."

The IPJ archive is a rich history of nearly two decades of Internet technical development. The first issue explored various efforts to retrofit security measures onto protocols first developed in an era of assumed trust, including a primer on the emerging technology of Secure Sockets Layer (SSL). The current issue looks at how the DNS root, which has scaled to accommodate not just



prominent names in the technical community, including several from Internet co-creator Vint Cerf, who remains a member of IPJ's Editorial Advisory Board.

**"Netnod, is proud to be a supporter of IPJ. It's great news that such an important and useful publication will continue"**

network growth but also IPv6 and DNSSEC deployment, will continue to scale for future developments, and it examines the status of standardisation efforts in Gigabit Ethernet.

Over the years, the IPJ has published articles from some of the most

Anyone coming to the next Netnod meeting will be able to get a free printed copy of the latest issue (Volume 18, Number 1, March 2015). In the meantime, everyone is welcome to download the IPJ in PDF format at: <http://protocoljournal.org>



Work meets pleasure:

# Your travel guide to the upcoming industry events

## Chicago – International Telecoms week (ITW)

**10-14 May**  
Chicago, the third biggest city in the USA, is heaven for **skyscraper** lovers or, if you prefer a beach, try the ten kilometre stretch along **Lake Michigan**. Downtown, around **The Loop**, **River North** and **Streeterville**, you'll find restaurants, stores and bars. Check out **Millennium Park** and the **Cloud Gate** (a giant silver bean!). For architecture lovers, a **boat trip** on the river gives a great view of the city. Downtown, we recommend **Frontera Grill** for great Mexican food. If it's full, try their sister restaurant around the corner, **XOCO**. **Gilt Bar** is a trendy restaurant with a fantastic bar. Or escape downtown for **Wicker Park**, **Bucktown**, or **Logan Square** for good restaurants and cool, stylish stores.

## Amsterdam – RIPE70

**11-15 May**  
May in Amsterdam means **tulips**. Everywhere. Bring your camera because the city will be bursting with colour. Get mobile like a local – grab some wheels from one of the **bike rental** places you'll find all over town. It's the best way to explore and there are plenty of chances to stop for a coffee or a beer. Or stop at some of the many **markets** for flowers, antiques, art, fruit, and anything else you can imagine. For the unimaginable, try eating at **Febo** – or don't. For something different, catch a cult movie and a meal at **The Movies**.

## San Francisco – NANOG 64

**1-3 June**  
In San Francisco, you can say what you like, act like a freak, or wear what you



want without anyone caring. Sounds perfect for the technical community! The most authentic way to go is by **cable car** and stand on the side. Don't miss spectacularly steep and colourful **Lombard Street**. To enjoy the skyline, the best way is to take a **bay cruise** away from the city,



taking in the **Golden Gate Bridge** and **Alcatraz**. SF is one of the best American cities for fine dining. One of its Michelin-starred restaurants is Coi, in the North Beach district. The local coffee culture is also legendary. Try the oldest cafe on the west coast, **Cafe Trieste**.

## Sofia – EuroDIG

**4-5 June**  
**Sofia, Bulgaria**

Like other great cities cursed to be built on a strategic location, Sofia has a long history of "visitors" leaving their mark on culture, food, architecture, and art. The UNESCO-listed **Rotunda of St George** is the oldest building in town and **Alexander Nevsky Cathedral** is the most popular, but for a more playful alternative, try the **Snail House**. Come dinner time, try **shopska salad**, **kebapche**, **kyufteta**, and **kavarma**. And don't miss **Bulgarian yoghurt**. For traditional food, there's **Resaturant Petleto**, or to sample the work of a famous TV chef, try **Hristo Belchev**. For a coffee fix, give **Sparrows Kafe** a try, or for an evening tippie, try the cocktail bar **Kolibri**. Browse books in the book market at Slaveykov Square or get fruit, vegetables, and cheese at **Zhenski Pazar** (the Women's Market).

## Kazan – ENOG 9/RIPE NCC

**9-10 June**  
Kazan is the capital and largest city of the Republic of Tatarstan and the "Sports capital of Russia". It's also home to international **opera**, **ballet**, and **music festivals**. In June, the locals celebrate Sabantuy, the **Tatar summer festival**. The easiest way to discover the city is to jump on a **tourist bus**. English is not widely



spoken, so one useful word you should learn is "**ресторан**", meaning restaurant, café, or pizzeria. To catch some summer sun, head for the **artificial beach** on the north shore of the Kazanka River. The main tourist attraction is the majestic local **kremlin**, parts of which date back to the 1200s. Hungry? Try **Pashmir** restaurant, for good Uzbek and Tartar cuisine.

## Buenos Aires - ICANN53

**21-26 June**  
In Buenos Aires, it's enough to spend time drinking good coffee, eating in restaurants, and admiring the view. But to learn more about Argentina, a visit to the **national historical museum** is a great start. To eat and drink, try **Chan Chan**, home to some of the best ceviche in the city. Try their **pisco sour**, a South American classic. **Don Julio** offers an affordable introduction to Argentina's famous beef, grilled to perfection. For coffee with

atmosphere, **Libros del pasaje** combines a café and bookstore in a classic Palermo house. **B-Blue** serves refreshing juices, coffee, and pastries.

## Prague - IETF 93rd

**19-24 July**  
Prague has one of the most beautiful old towns in Europe. Unfortunately, that means swarming tourists. But battle the crowds to **Charles Bridge**, going strong since 1357 (is your engineering that good?). All the regular tourist things are here, portrait painters, street performers, and pickpockets. In **Wenceslas Square**, soak up the atmosphere of some of the biggest moments on the 20th century, explore the **National Museum**, or simply enjoy its restaurants, pubs and many stores. Choose a **river cruise** for great city views. And when the **Astronomical Clock** rings beer o'clock, head for one of Prague's many specialty beer bars. Try **U Medvídků**, **U Černého vola**, **U Houdků**, **U Provaznice**, or **U Vejvodů**. You don't have to pronounce them to enjoy them.

## Maputo – AfPIF 2015

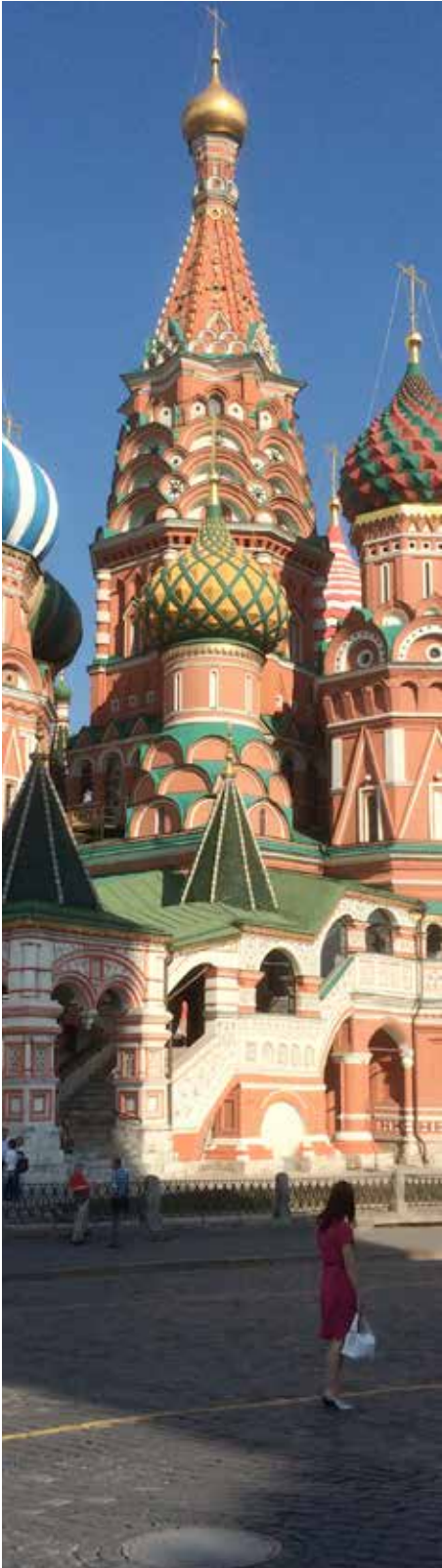
**25-27 August**  
Mozambique's capital is a vibrant port town, famous for colourful markets and thriving nightlife. Surprisingly, Maputo's most popular attraction is its century-old **train station**, once named by Newsweek as the world's seventh most beautiful. Mozambique is famous for its food, and you should try some sizzling **peri-peri prawns**. To get around, look for the **green-yellow taxis**. These are the most reliable, but agree on the rate before you start. And remember that taking photos of official buildings, airports and police stations is forbidden.




**Jakarta – APNIC 40**  
**3-10 September**  
Jakarta has as many people as the whole of Sweden, more than 9 million, but to escape the crowds, try **Lembang Park** or **Suropati Park**, great for a morning run or an evening stroll. The Old Town, **Kota Tua**, is north of the **National Monument** and is full of heritage buildings from the Dutch colonial years. Check out **Barack Obama's** elementary school, **SDN Menteng 01**. Or haggle in the **antiques markets** along Jalan Surabaya. Look for delicately-cut shadow puppets, carved wooden masks, chandeliers, silks and metalwork.



**Moscow – Capacity Russia**  
**14-15 September**  
We wrote about Moscow in our last issue (2014 # 3) so this time, let's try something different. From near the main **Moscow State University** building there's a great view over the city. Check out **Victory Park**, the major WWII monument. The **Silver Forest** is so scenic and tranquil you'll forget you're so close to the city. Finally, the **Novodevichy Cemetery** cemetery is the resting place of many famous Russians and home to some spectacular, artistic graves.



 **Alexander Borodin**  
Communications Officer

Where to meet up with Netnod

APRIL 2015 – SEPTEMBER 2015

**GPF**  
27 - 29 April 2015  
Freeport, Bahamas  
<http://www.peeringforum.com>

**ITW – International Telecoms week**  
10 - 14 May 2015  
Chicago, IL, USA  
<http://www.internationaltelecomsweek.com>

**RIPE70**  
11 - 15 May 2015  
Amsterdam, Netherlands  
<https://ripe70.ripe.net>

**NANOG 64**  
1 - 3 June 2015  
San Francisco, CA, USA  
<https://www.nanog.org/meetings/nanog64/>

**EuroDIG**  
4 – 5 June 2015  
Sofia, Bulgaria  
<http://www.eurodig.org>

**ENOG 9**  
9 - 10 June 2015  
Kazan, Tatarstan  
<http://www.enog.org/meetings/enog-9/>

**ICANN53**  
21 - 26 June 2015  
Buenos Aires, Argentina  
<http://buenosaires53.icann.org>

**IETF 93**  
19 - 24 July 2015  
Prague, Czech Republic  
<http://www.ietf.org/meeting/93/>

**AfPIF 2015**  
25 - 27 August 2015  
Maputo, Mozambique  
<http://www.afpif.org>

**APNIC 40**  
3 - 10 September 2015  
Jakarta, Indonesia  
<https://conference.apnic.net/40>

**Capacity Russia**  
14 - 15 September 2015  
Moscow, Russia  
<http://www.capacityconferences.com/Capacity-Russia-CIS.html>

**EPF10**  
21-23 September 2015  
Madrid, Spain  
<https://www.peering-forum.eu>



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Jörgen



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Kim



Kurtis



Liman



Love



Martin



Mathias



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Nico



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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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“I feel privileged to work in such dynamic times in such a dynamic industry. I am excited to see what the future will hold in store for us!”

CEO KURT-ERIK LINDQVIST



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.