ΠΕΤΠΟD

NEWS

1 / 2013

Netnod proud host of the European Peering Forum in Iceland

Network redundancy
– the advantages of the Netnod model

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

You are cordially invited to ...
– the Netnod autumn meeting

Word from the CEO

Netnod was founded at the end of 1996 with the mission to run critical Internet infrastructure for "the good of the Internet". The Internet Exchange Point D-GIX, operated at KTH (The Royal Institute of Technology), needed a new home, and thus Netnod was created!

Hans Wallberg from SUNET (the Swedish University Network), who was a key figure in Internet development, played a crucial role in this process. Sadly, Hans passed away much too early, this year in June, after a period of illness. Hans will be much missed by all of us here at Netnod, in the Internet community in Sweden and abroad. He remained chair of the board until the end, and stayed actively involved with Netnod and the IX world.

Since I joined in July 2002, Netnod has grown significantly, but we have always stayed true to our original vision of acting for "the good of the Internet".

Our aim in meeting that vision has been to operate our two core businesses, the Internet Exchange Points in Sweden and the DNS infrastructure, as world-class services. The dedicated and hardworking team at Netnod has worked on evolving these services over the years and we will continue to do so.

"... Netnod has grown significantly, but we have always stayed true to our original vision ..."

For our DNSNODE platform, which provides anycast services to TLDs around the world, we have long operated the most comprehensive statistical analysis tools in the market, and we are working on new feature sets which will allow DNSNODE users even more advanced analysis of DNS queries and traffic patterns. As with our previous tools, this will be available via APIs which our users can build their own tools around. For the IX services, we are continuing our work with providing more cost-effective connectivity options for smaller ISPs. We are well aware of the price pressure in the market, mostly from very low transit costs. Netnod will, therefore, use old and fully depreciated equipment to offer low bandwidth and low cost entry points into peering for smaller providers. Netnod sees this as part of our commitment to work for the good of the Internet in Sweden. By also bringing the smallest ISPs into Netnod's peering fabric, they can enjoy the benefit of access to content, as well as the potential to peer with the largest eyeball networks in the region. This complements the Netnod Reach reseller product that we launched last year and provides yet another stepping-stone for peering in northern Europe.

There's work underway at Netnod to replace the existing IX switches. Early this summer, we completed the change of switch platform in Stockholm, allowing us to provide more cost-effective 100GE ports in Stockholm, at a higher port density. We will be replacing the switches at the IXs outside of Stockholm, providing us with higher port density, but allowing us to expand the Netnod Reach services to other parts of Sweden.

It has been a busy year so far at Netnod, and something tells me, this autumn will be even busier!

CEO, Kurt Erik Lindqvist
Netnod

Welcome to Netnod, Sarah!

Netnod is happy to have Sarah Pratt onboard as an Administrator, let's get to know her a bit better.

Tell us about your background. Where have you worked and lived before?
I've now lived in four countries: I was born and raised in Zimbabwe, lived in South Africa during my university years, moved to the UK in my early twenties to start my working life, and then moved to Stockholm to live with my partner. In London I worked mostly for financial firms providing M&A research support, so Netnod is a refreshing change for me.

What was your first impression of Netnod?
Very positive. I quickly got the impression that Netnod takes care of its staff.

Netnod also seems very dedicated to the Internet community and includes all its staff in feeling part of the company's mission, which I appreciate. I must also add that I am comforted by a notice in the kitchen that includes an anti-dinosaur emblem, and announces that Netnod has been a "velociraptor-free" workplace for 237407034889 number of days (someone diligently updates this figure on a regular basis. Thank you).

What are your main objectives and challenges at Netnod at the moment?
Mastering my new role and developing a fuller understanding of the company's operations.

What is your favourite drink and why?
Water. I need it to be able to fully enjoy other drinks … and food!

How do you like to spend your free time?
I draw, paint, read, and dream up various creative projects for myself.

IXP member upgrades

- **TDC**, AS3292
  peering@tdc.dk
- **ComHem**, AS39651
  anders.bloom@comhem.com
- **Elisa**, AS3336
  peering@elisaip.net
- **Rostelecom**, AS12389
  peering@rt.ru
- **Netflix**, AS2906
  peering@netflix.com
- **Amazon**, AS16509
  peering@amazon.com
- **Akamai**, AS20940
  peering@akamai.com
- **Hi3G**, AS44034
  daniel.wiberg@tre.se
- **COMCOR**, AS8732
  peering@akado-telecom.ru
- **MegaFon**, AS31133
  peering@megafon.ru

New IXP members

TransTeleCom, AS20485
TransTeleCom operates the largest fibreoptic communications network in Russia: it's over 75,000 km long and has a capacity over 1 600 Gbps. The network goes along the railway and has more than 1000 access nodes in all regions of Russia and connects Europe and Asia.
Contact: *peering@ttk.ru*

UAB Bitė Lietuva, AS13194
UAB Bitė Lietuva is a telecommunications operator in Lithuania, which ensures modern, high-quality and customer friendly services.
Contact: *peering@bi.lt*

Golden Telecom, AS3216
Golden Telecom is the leading telecom-munication company on the Ukrainian market. They offer integrated services to corporate clients and communication operators.
Contact: *peering@gldn.net*

Justin.tv, AS46489
Justin.tv provides a platform where anyone can share live video. As one of the original and largest live streaming platforms, Justin.tv lets viewers watch more than 300 million live streams in over 250 countries each month.
Contact: *peering@twitch.tv*

Nurani Nimpuno
Head of Outreach and Communications

Join us in Stockholm for the Netnod autumn meeting

The Netnod autumn meeting will take place in Stockholm 3-4 October. To spice up the agenda this time we have invited a few well-known names from the industry: Jason Kleeh from Brocade will present "Orchestrating the Cloud with SDN", Martin Levy from Hurricane Electric will take to the stage with his "Geo analysis of ASNs and peering data", and Andreas Sjöman from Voddler will share the latest from the streaming side of the industry.

Thanks to our social sponsor Brocade we have the pleasure to bring you to one of our favourite restaurants in Stockholm. "Orangeriet". We hope to see you all in Stockholm!

Are you joining us? Contact Emelie Carlsson at meeting@netnod.se

New switches at Netnod

Netnod has upgraded its layer 2 IXP platforms in Stockholm to MLXe-32 machines, which have been in operation since the beginning of June.

"With the new equipment, Netnod gains higher port density and is able to grow with the needs of the industry," says Netnod CEO Kurt Erik Lindqvist. Netnod's IXP platforms in Stockholm have recently seen an increase in content providers using them to reach the northern European markets, and the older machines where becoming short of slots. Netnod also expects to have higher demands on interconnect bandwidth from its members in the future, due to the increasing availability of streaming content, online video services, and gaming. With the new equipment, Netnod's IXP in Stockholm is well positioned to keep its leading position as one of the largest IXPs in Europe.

The recent upgrade went smoothly and took place without any problems.

Håkan Hellström
Head of Operations

We had some problems getting the equipment through the door.

Don't worry! This is easily solved by Pierre, Kurtis and ... a crowbar!

All good and safe. Time to open the boxes and get the switches down to the bunkers.

Redundancy & the Netnod advantage

Operators typically commit to their users that they will maintain high levels of reliability and packet delivery with low latency. Achieving network redundancy is one of the most important strategies for meeting those commitments, and Netnod services are specifically designed with redundancy in mind. The design of Netnod's connection model in Stockholm, in particular, is a leading example offering many advantages for operators who require highly redundant interconnection services.

What is network redundancy?

Redundancy is the ability of a network to withstand a failure without significantly affecting users, usually achieved by deploying secondary resources. Failures may span a spectrum of outcomes from degraded service – such as packet loss – to a full outage, affecting a subset of users or the entire user base. However, redundancy as a network design principle can significantly mitigate the impact of failures.

When failures strike, services will suffer long before an engineer even receives an alarm, so true redundancy must be automatic and not reliant on manual intervention from network staff. Furthermore, network operators need to consider both single failures and combinations of failures, which may be physical, electrical, environmental, or logical in nature. Multiple routers and links, backup power supplies and cooling systems, and careful configuration practices can all provide degrees of redundancy.

When failures occur, routing protocols can detect changes in network topology and help networks route packets around link and router failures. However, routing around problems is only possible if an alternative path exists. This is why the design of Netnod's Internet Exchange Point (IXP) services is so important.

Redundancy at the Netnod IXPs

Netnod operates a Layer 2 IXP service in Stockholm, Göteborg, Malmö, Sundsvall, and Luleå. Networks that connect to a Netnod IXP gain a common "meet-me" point to exchange Internet traffic by mutual arrangement with other connected networks. By keeping local traffic local, Netnod customers enjoy lower latency for content access and savings on transit costs.

In Stockholm, customers connect by either dark fibre, which Netnod orders from Stokab, or Dense Wave Division Multiplexing (DWDM), via a cross connect to Netnod's presence in the two Telecity data centres, InterXion's data centre, or in the Portlane Nacka Station data center. Connections to Netnod's IXPs in other cities are all by dark fibre, arranged with one of the local access providers listed on the Netnod web site.

From a logical perspective, the customer routers function as though they are connected on a shared Ethernet segment (configured with both IPv4 and IPv6 prefixes). The technical configuration of the Netnod IXPs is very simple, varying little from the setup of a Gigabit Ethernet LAN. Netnod's IXPs comprise Ethernet switches in secure bunkers, and connectivity to the switches is by virtual LANs (VLANs) as specified in the IEEE 802.1q standard.

VLANs in an enterprise or service provider environment are often used for traffic separation. But, in this case, their use is slightly different. Each Netnod switch uses two common VLANs to accommodate two different maximum transmission unit (MTU) sizes: one for the commonly used 1500 byte MTU and one for 4470 byte "jumbo frames". The two VLANs are not connected at the IXP.

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However, simply using multiple VLANs alone does not constitute a redundant set-up. If customers were to configure both VLAN tags on a single connection to a Netnod switch, their connection would remain inherently vulnerable to a single fibre cut or element failure. A fully redundant set up requires a physically separate connection to each VLAN.

Netnod's infrastructure in Stockholm features two switches, located at separate facilities and not connected to each other. This adds resiliency to IXP connectivity for customers that are connected to both switches. Also, as noted above, all Netnod customers receive two VLANs for each switch.

So, a customer could connect to one Stockholm switch in a basic, non-redundant set-up, as depicted in Figure 1.

However, for fully redundant access to Netnod in Stockholm, customers can connect to both switches – preferably using different routers at the customer premises – as depicted in Figure 2.

Netnod's IXP model in Stockholm – comprising multiple VLANs, on multiple links, to multiple unconnected switches – offers huge advantages to customers. Furthermore, Netnod's infrastructure – such as the switches and DWDM systems – is supported by dual power feeds, backed up by an uninterrupted power supply (UPS). The total package adds up to a highly available service.

Of course, the experience of each customer is dependent on their own network design decisions. But customers are not on their own, and Netnod can recommend configurations based on industry

FIGURE 1   NON-REDUNDANT CONNECTION TO ONE STOCKHOLM SWITCH
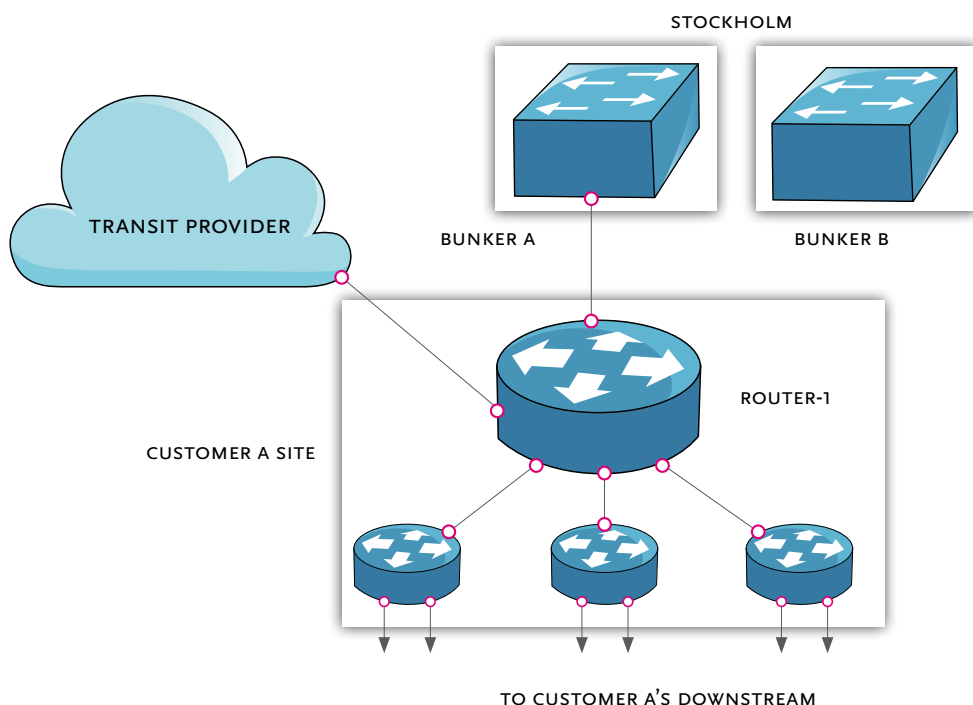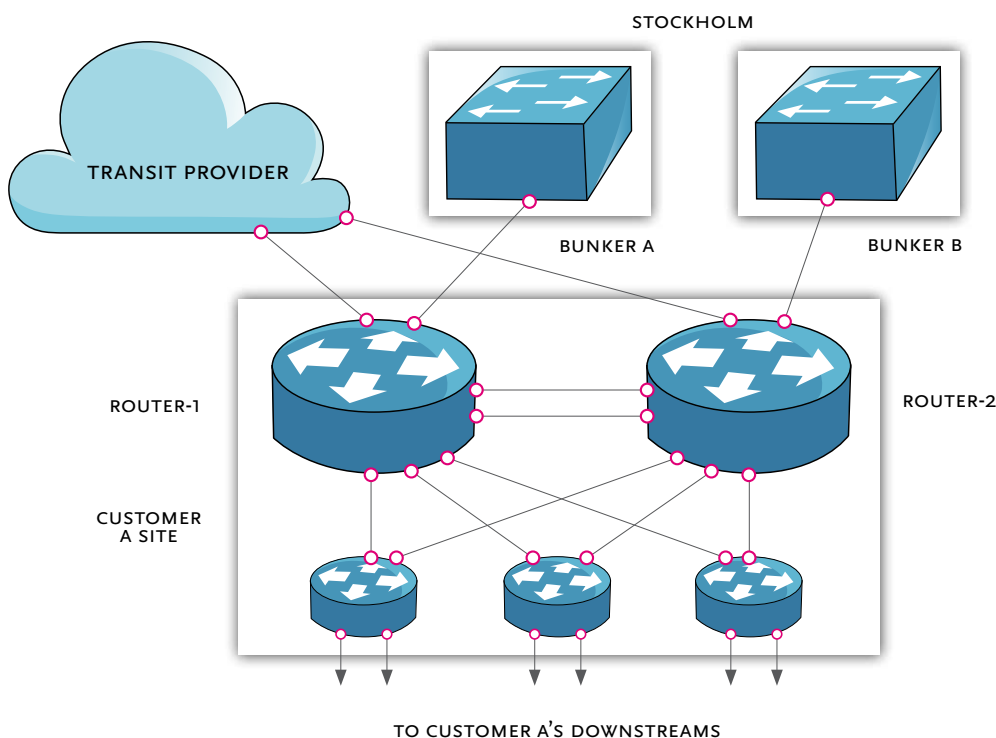

FIGURE 2   REDUNDANT ACCESS TO BOTH STOCKHOLM NETNOD SWITCHES

best practices and years of working with customers to minimize downtime.

Netnod encourages operators to document all their potential failure events and outcomes for planning purposes. Because redundancy often involves back-up components or circuits, adding redundancy does involve costs, and operators will need to make business decisions on whether or not to invest in redundancy for a given failure event, by prioritizing

a failure event list by severity of the outcome. Customers also need to be aware that redundancy in IXP connectivity design is not a "configure and forget" operation. Network environments are very dynamic: configurations change, hardware is augmented, hardware is removed, and engineers may change positions. For these reasons, verifying redundancy is crucial. Indeed, many operators have scheduled times during maintenance windows to manually force failure

events. If redundancy exists, no outage should result.

It all comes down to planning and design. But Netnod's architecture, experience, and services can help all customers maximize the resilience and availability of their networks.

Kurt Erik Lindqvist
Chief Executive Officer

DNSSEC pioneer inducted into the Internet Hall of Fame

Netnod would like to congratulate .SE's Head of Security Anne-Marie Eklund Löwinder for being the first Swede to become inducted to Internet Hall of Fame.

She joins famous Internet names such as Vint Cerf and Jon Postel in the Internet Hall of Fame, receiving recognition for their important work on the Internet.

Anne-Marie has been inducted in recognition of her longstanding work to implement and spread DNSSEC. Her achievements recognised by the Internet Hall of Fame includes the following:

"Anne-Marie Eklund Löwinder has been an innovator in the implementation of the Domain Name System Security Extensions (DNSSEC),

which enables users to be sure they are visiting a legitimate website. Since 1999, when the protocol was introduced, she has spurred the development of both its technology and its usage procedures. Mrs. Eklund Löwinder made sure that .SE became the world's first top-level domain to be signed with DNSSEC, in 2005."

At Netnod we are proud of working together with Anne-Marie and .SE!

Iceland – Land of Unpronounceable Beauty

It was a Sunday morning in 2009 and we were sitting at the breakfast table reading the morning paper. There was article about the financial crash in Iceland, a country I'd always wanted to visit. But even though it's just a few hours away from Europe, I had never been. Well it was very expensive for one, and I guess it just wasn't "on the way" to a lot of other countries. And when I moved to the other side of the world a few years later, Iceland didn't exactly come any closer.

Anyway, there I was, in Sweden, in 2009, reading in the paper about how cheap Iceland was. I thought for a second, looked up at my husband and said: "let's go to Iceland!" A few weeks later we were on the plane to the Land of Ice.

I have travelled to a few countries. Not as many as some but perhaps more than most. But I can honestly say that Iceland is one of the most exotic places I've been to. The culture, the landscape, the atmosphere. It's absolutely amazing. So if you haven't yet been, just go! Now.

We went in May and were incredibly lucky with the weather. You never know in Iceland and if the weather is bad, some of the roads might not even be open. But we managed to go all the way up to Húsavik, down to Mývatn, out to western Iceland and all the way down to Vastmannaejar in the South.

So, first things first. Well, you can't go to Iceland without doing some horseback riding now, can you? I've done some riding as a kid, but I can't say I'm terribly experienced. But our visit to Eldhestar, just outside of Reykjavik was fantastic. Stunning landscape, lovely people and beautiful horses. Icelandic horses are known for their ambling gait, called a "tölt". It's sort of a lull, where you're supposed to sit quite loosely in the saddle and just lull along with the horse. Sounds relaxing? Well, it was really more like cycling on rough gravel. I felt shaken, not stirred and it was not very relaxing at all. But hey, still quite a fun experience!

We drove up along the west of Iceland and stopped at Skagafjördur. The beautiful Skagafjördur fjord hosts the picturesque little town of Saudárkrókur tucked in between the mountains (apparently Marlene Dietrich stayed in Hotel Tindastóll in Saudárkrókur during the Second World War, when she was over to entertain the British troops). It's great place for keen photographers (but then again, so is all of Iceland), and it's a great place for salmon fishing. But stay out of the water – it is amongst the coldest in Iceland!

From Skagafjördur it's a few hours' drive east to Húsavik, one of the absolute highlights of our trip. It's a small simple fishing village, which is not too exciting in itself, but the reason you go there is not for the fish, but for the whale watching!

Calm waters, spectacular mountains, and... all of a sudden, a great humpback whale that jumps up in the air and splashes down in the water with full force. Unforgettable.

The Mývatn region is located just south of Húsavik, where you will find Goðafoss, one of the most spectacular waterfalls in Iceland. (Did I mention not to forget to bring your camera?) Apparently, in the year 1000, the lawspeaker "Þorgeir Ljósvetningagoði" made Christianity the official religion of Iceland by throwing his statues of the Norse gods into the waterfall. (Archeologists have confirmed that this was one of the earliest examples of downsizing.)

The Mývatn region is also known for its spectacular hot springs which you can take a dip in, the volcanic area around Mývatn with huge pseudo craters, and of course, Krafla – one of Iceland's most active volcanoes. Visiting Krafla was like nothing we'd ever see before (or after for that matter). With its craters, its boiling pools and smoke, and its mysterious landscape, we felt like Neil Armstrong taking our first steps on the moon (if the moon was about to explode at any moment).

We went out to see the beautiful western Iceland too and then down back towards Reykjavik. We had to check out the Strokkur Geysir of course, which goes off every few minutes (very cool), and Gullfoss, another spectacular waterfall.

We finished off our road trip by heading down to Vastmannaejar to check out the famous puffin colonies. And yes, we saw plenty of them. And yes, they are cute and very funny looking birds. But no, despite puffin being on literally every restaurant menu there, we didn't eat any of them - how could anyone eat such adorable creatures (especially since they are supposed to taste like liver)? We spent the last few days back in Reykjavik, checking out the vibrant bar and café scene, before heading back home again. Reykjavik definitely has its own special atmosphere. It is small, cool and funky. The Icelandics are proud but laid back, and you really get the sense that their culture has evolved quite isolated from the rest of Europe, with its own, unique identity. Our trip to Iceland is still one of the best trips I've ever made.

"Takk fyri" Iceland, I had a fab time. It's great to see you again!
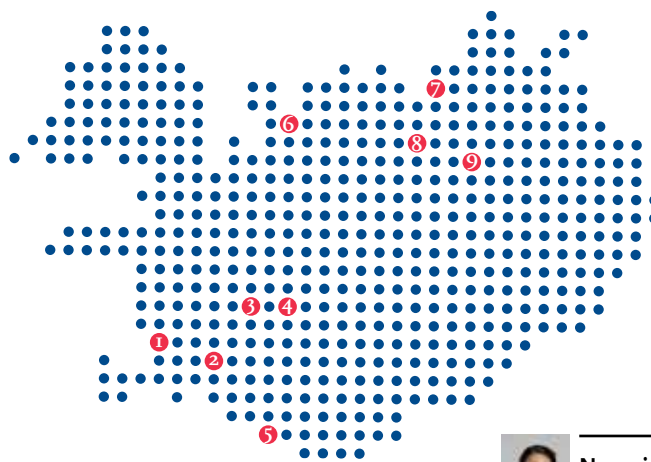
1	Reykjavik
2	Hotel Eldhestar
3	Strokkur
4	Gullfoss
5	Vestmannaeyjar
6	Skagafjörður
7	Húsavík
8	Godafoss Waterfall
9	Mývatn

Nurani Nimpuno
Head of Outreach and Communications

Under the skin of …?

Favourite destination (why?)
San Francisco is one of my favourite places in the world. I usually go there once or twice a year. It's a nice, compact city with a great atmosphere and it's only a short drive to Napa valley.

Favourite drink?
My favourite drink is a gin & tonic, as you can find that in pretty much every single airport lounge and hotel bar in the world. When you're on the road as often as I am, it's good to have a few familiar things around you.

Why I work in networking...
Networking for me is one of the best mixes of hardcore technology and 'soft' skills out there. It's probably also the only industry in the world where you find such a collaborative environment between companies of such wildly diverging sizes and backgrounds. The bigger question to me is why the rest of IT isn't more like networking.

I am an excellent …
Optimising-the-content-of-my-backpack artist. My backpack goes everywhere I go and has pretty much everything I could conceivably need on a trip. There's a collection of converter plugs, cables, gadgets and enough horse tranquillisers to last me long enough to fly me back from the other side of the world. It's a mobile office, IT depart-ment, pharmacy, and wardrobe rolled into one. I have dreams of a backpack I can plug into a wall socket and that will automatically recharge, refill, and update all the pieces of kit inside it.

Can't guess who I am? Scan the QR code or see page 19.

Iceland for the brave

Want to be a real Viking? Well, then there's no avoiding venturing into the Icelandic traditional food "Þorramatur". This is the food that has turned children into Vikings for centuries in Iceland. It consists of a selection of cured meat and fish served on dark rye bread, butter, and brennivín (Icelandic akvavit). Þorramatur is consumed during the Nordic month of Þorri (January and February), particularly at the mid-winter feast of Þorrablót. But really, there's no reason you can't eat it anytime of the year!

Þorramatur consists of many different foods, including:

– **Kæstur hákarl**, fermented Greenland shark

– **Súrsaðir hrútspungar**, the testicles of rams pressed in blocks, boiled and cured in lactic acid

– **Svið**, singed and boiled sheep heads, sometimes cured in lactic acid

– **Sviðasulta**, head cheese or brawn made from svið, sometimes cured in lactic acid

– **Lifrarpylsa** (liver sausage), a pudding made from liver and suet of sheep kneaded with rye flour and oats

– **Blóðmör** (blood-suet; also known as slátur, meaning slaughter), a type of blood pudding, which is made from lamb's blood and suet, kneaded with rye flour and oats

– **Harðfiskur**, wind-dried fish (often cod, haddock or seawolf), served with butter

– **Rúgbrauð** (rye bread), traditional Icelandic rye bread

– **Hangikjöt,** (hung meat), smoked and boiled lamb or mutton, sometimes also eaten raw

– **Lundabaggi**, sheep's loins wrapped in the meat from the sides, pressed and cured in lactic acid

– **Selshreifar**, seal's flippers cured in lactic acid

Does it sound tempting? Well if you want to experience the authentic Viking Iceland, you know what's next on your list!

Islandic phrases!

Góða nótt – Good night
Bless – Goodbye
Sjáumst – See you later
Takk – Thanks
Já – Yes
Nei – No
Kannski – Maybe
Allt í lagi – Okay
Halló – Hello
Komið þið sæl og blessuð
– Hello (to a group of people)

Góðan daginn – Good day
Gott kvöld – Good evening
Og – And
Er það? – Really?
"Nei takk, ég vill ekki borða hrútspungar. Enn ég tek gjærna glas af kampavín!"
– No thanks, I don't want pickled sheep's testicles. But I would love a glass of champagne!

When in Reykjavik:

Emelie's insider tips

Eating Out

Við Tjörnina
A celebrated seafood establishment serving Icelandic dishes including the house specialty of marinated cod cheek, which is worth a try. The restaurant has the classy ambiance of a 1950's drawing room.
Address: Templarasundi 3

Bæjarins Beztu
Icelanders love their hot dogs, and Bæjarins Beztu, a van located near the harbour, serves the ultimate hot dog! Use the magic words "Eina með öllu" ('One with everything') to get the full deal with mustard, tomato sauce, rémolouda, and crunchy onions.
Address: One block away from the harbour of Reykjavik lies this little stand in a modest parking area, next to a taxi stand.

Icelandic Fish & Chips
The owners have put a unique touch to this simple offering with their own range of skyr-based sauces (skyr is a thick cultured milk product special to Iceland) as an alternative to mayonnaise.
Address: Tryggvagötu 8

Þrír Frakkar
The owner and chef, Úlfar Eysteinsson, serves Icelandic specialties including salt cod, and fish-stew "plokkfiskur" with black bread, as well as seal, puffin, reindeer, and whale steaks.
Address: Baldursgata 14

Fiskfélagið
Located in the old harbour, this restaurant offers a gastronomical tour in either Icelandic or world-cuisine, and despite the name ("Fish company"), they serve a variety of different foods. The interior is a fusion of rustic warmth and trendy elegance.
Address: Vesturgata 2a, Grófartorg

Café Loki
Recommended if you are interested in very traditional dishes, ranging from egg & herring on toast to sheep's head jelly or shark meat.
Address: Lokastigur 28

Indian Mango
Indian Mango offers a unique hybrid of Icelandic-Indian cuisine created by their chef. The dishes are light and spicy and include beef, duck, fish, and some vegetarian dishes.
Address: Frakkastígur 12

Babalú
Sells tea, coffee, chocolate drinks, and crêpes in a charming lounge setting. Also offers a good view over Skólavörðustígur from its mini balcony.
Address: Skolavoroustigur 22a

Tíu Dropar
Good Icelandic food offerings, and a typically Icelandic rustic ambiance.
Address: Laugavegi 27

Best museums in Reykjavik

The Settlement Exhibition – Landnámssýningin

Based on an excavation that reveals the oldest settlement in Iceland, the archaeological exhibits of a house and artefacts give you insight into the Viking lifestyle. There are also interactive multimedia displays that make the visit both entertaining and fun. The museum is located in downtown Reykjavik (beside Hotel Reykjavik Centrum). Open daily 10:00 – 17:00.

Víkin Maritime Museum

The best place to explore a vital aspect of Icelandic history and survival: seafaring! The Maritime Museum´s exhibition tells the story of Icelandic maritime history and the development of the seafaring throughout the ages, from rowing boats to modern trawlers. Located in Reykjavik harbour, you can also learn more about the harbour's history while visiting the museum, and visit the veteran Coast Guard vessel Oðinn, which has survived three Cod wars against Britain.
Open daily 10:00 – 17:00.

Árbær Open Air Museum – Árbæjarsafn

This open-air museum consists of a recreated typical Icelandic village that gives you a sense of how Icelanders used to live before and after industrialisation came to the country. Árbær can be reached by bus. Guided tours are offered at 13:00 in the winter season.

The National Museum of Iceland – Þjóðminjasafn Íslands

Iceland´s national museum houses a vast collection of art, craft, tools and furniture, religious artefacts, and archaeological remains. It is organized chronologically, and includes displays from as late as the mid 20th century. It is also displays a valuable ancient Viking statuette that is believed to represent either Christ or the Viking god Thor (no one is certain which).
The museum has a cosy café with a rotating exhibition on the first floor. Open Tuesday – Sunday 10:00-17:00. Closed Monday.

Reykjavik Art Museum

Founded in 1973, the Reykjavík Art Museum is the largest visual art institution in Iceland. It comprises three different venues and locations, each with a different focus: Kjarvalsstadir features painting and sculpture by established artists, Hafnarhus features contemporary art, and Asmundarsafn is a sculpture museum and garden dedicated to the sculptor Ásmundur Sveinsson.
Open daily 10:00 – 17:00.

Best Coffee in Reykjavik

Icelanders depend on a that little extra energy-kick that comes with a good cup of coffee, and there is a variety of options open – here a few suggestions for you!

Kaffiar: in multiple locations.
A widespread national coffee chain that offers unlimited filter-coffee refills … and free WiFi!

Te & Kaffi: in multiple locations.
The second largest coffee chain, often located within bookstores.

Mokka: Skolavoraustig 3A
One of the oldest cafés in Reykjavik, with a retro-style interior. Good for spotting Icelandic celebrities, with a history of Icelandic intellectual patrons!

Kaffismiðja Íslands: Kárastígur 1
For a charming, unique coffee shop experience, complete with coffee-roasting machines.

Kaffibarinn: Bergstadastraeti 1
This is an avant-garde bar and café, popular both by day and by night.

The Nightlife in Reykjavik

The Icelanders know how to party and Friday and Saturday in town are really good nights out. The city centre of Reykjavik is small and easy to get around by foot. It's never far to a good watering hole so there is no need for a list over the best bars. They're all good and they're everywhere!

Emelie Carlsson
Communications Officer

The latest buzz in the industry
– What's been going on at the meetings you've missed?

Star-struck at ITW

Nurani Nimpuno and Emelie Carlsson went to Chicago for the International Telecoms Week (ITW) in May, where Netnod had an exhibition booth.

They had an exhausting but productive week full of meetings, social events, and spontaneous discussions at the booth. Star keynote speaker Al Gore spoke about the close-knit structure of the telecom industry. Nurani and Emelie were naturally star-struck, but had to admit disappointment that the former VP's speech rode mostly on buzz words.

Keep calm and peer on – RIPE 66

CEO Kurt Erik Lindqvist (Kurtis) and the R&D team, Patrik Fältström (Paf) and Lars-Johan Liman (Liman), all attended RIPE 66 in Dublin in May. Netnod sponsored a coffee bar, which was greatly appreciated by many! The Netnod team was kept busy meeting peers, attending and giving presentations, and of course, making sure people got "real barista-made coffee" and Netnod "KEEP CALM AND PEER ON" t-shirts! Kurtis shared the latest Netnod news, and Paf gave a presentation on "Article 5", providing insight into the legal context of electronic signatures.

Shared on Facebook:

"Netnod makes you smile in the morning with the best coffee ever ever ever!"

Christian Kaufmann, Akamai Technologies

Gold sponsor at ENOG 5

Netnod sponsored the ENOG event in St. Petersburg in May. Kaj Kjellgren from Operations and Emelie were there to meet Russian IXP members and to make new contacts within the Russian Internet community. There were lots of great discussions at ENOG! The session on blocking and blacklisting was particularly interesting: the controversial topic of "Law 149" (an attempt by the Russian authorities to block IP addresses for child pornography content, information facilitating drug-abuse or suicide, and sites criticising the government) generated a very heated debate.

NANOG 59

Mathias Wolkert from the Operations team travelled to New Orleans (or "Nawlins", as the locals say) for NANOG 59. Despite the 90% humidity, Mathias managed to have a productive and useful trip, meeting with vendors and peers in the operators' community!

ICANN 47

Patrik (SSAC chair), and Liman (RSSAC chair) spent a busy week in Durban in July at ICANN 47, meeting with Netnod DNS customers, partners and the community at-large. As the newly elected chair of RSSAC (DNS Root Server System Advisory Committee), Liman's mission is to reinvigorate the dialogue between the root server operators and the ICANN community, and to increase the transparency and accessibility of RSSAC.

Looking back at the WTPF

By Martin Boyle (Nominet)

This article has also been published in the CENTR Monthly Roundup, May 2013

Nothing fails to make the headlines like a good-news story. After the publicity from WCIT in December, hardly anyone wrote about the outcome of the World Telecommunications Policy Forum.

As ITU Secretary General Touré said in his final remarks:
"I can feel very proud that we are able to engage here in a very constructive dialogue... This was the most productive World Policy Forum I have ever seen and, of course, it was the most inclusive ever. Indeed, in building bridges and achieving consensus we have triumphed. The world was listening. The world was watching and the world was participating... We showed the world that we can discuss difficult issues with all stakeholders involved and emerge united. And we will continue to engage with all stakeholders, with ICANN, ISOC, IETF and all other stakeholders in a positive spirit of collaboration."

Constructive dialogue? Productive? Inclusive? Positive spirit of collaboration? These are not words usually associated with international discussions on Internet governance.

The WTPF agreed six opinions by consensus. The cooperative approach led to agreement on the difficult issues of IPv4, IPv6, multi-stakeholder engagement, and enhanced cooperation: a significant achievement. Perhaps more important was a draft

seventh opinion, on the role of government in the multi-stakeholder framework for Internet governance. This is an important issue for many governments and the proposal addressed it by supporting engagement and capacity building. This debate now moves into the ITU Council, but discussion is encouraged in the IGF and elsewhere.

What next? The preparation for the World Telecommunications Development Forum in 2014 has started in parallel with the 10 year review of the World Summit on the Information Society. Preparations for the ITU's four yearly Plenipotentiary Conference in 2014 are also underway.

The WTPF opinions will be used in these discussions. More importantly, will the "WTPF approach", where ISOC sits next to Iran and speaks as an equal, be the model for future Internet governance discussions? And if so, are we ready to engage constructively, productively, and with a positive spirit of collaboration in the ensuing dialogue?

Draft Opinions discussed at WTPF 2013

Draft Opinion 1: Promoting Internet Exchange Points (IXPs) as a long term solution to advance connectivity.

Draft Opinion 2: Fostering an enabling environment for the greater growth and development of broadband connectivity.

Draft Opinion 3: Supporting capacity building for the deployment of IPv6.

Draft Opinion 4: In support of IPv6 adoption and transition from IPv4.

Draft Opinion 5: Supporting Multi-stakeholderism in Internet governance.

Draft Opinion 6: Supporting operationalizing the enhanced cooperation process.

Netnod spring meeting 2013

Netnod Spring meeting day 1. The guests mingle after registrations.

The Netnod spring meeting in Stockholm brought over 60 international members and friends of Netnod together for the two-day long meeting. One of the popular agenda items was a panel discussion on the challenges posed by the increasing availability of streaming content, online video services, and gaming. The Swedish public service SVT, the streaming company Bambuser and TDC, all took part in the discussion.

"It is the most well rounded IXP meeting I have attended in a long time." Michuki Mwangi, Internet Society, Africa.

Nina Hjorth Bargisen, TDC, Joakim Fors, Bambuser, and Johan Wahlberg, SVT all have different perspectives of the challenges with the increasing traffic volumes in the future.

Thomas Weible, flexOptics is talking about finding the Technology x.

Netnod summer drinks

The summer social was a short and sweet get-together before the summer holidays. Over 50 of our friends made it and we had an enjoyable evening with drinks and snacks at one of our favourite venues in Stockholm: Och Himlen Därtill.

Emelie Carlsson
Communications Officer

Work meets pleasure:

Your travel guide to the upcoming industry events

Athens – RIPE 67

We have a few must-sees if you travel to Athens.

Syntagma Square

Syntagma (Constitution) Square is home to the Greek Parliament building, and also home to the traditionally dressed, pom-pom toed guards, known as "Evzoni". Worth the wait is witnessing the changing of the guards, a ten-minute ceremonial procedure that takes place every hour, on the hour. The foustanela, or skirt, that is part of their uniform is made up of 400 pleats, each one symbolizing a year that Greece was under Turkish rule. Don't miss this!

Plaka

There are some wonderful views and sights if you make your way to the old town and the "Plaka" area. With its indisputable charm, this area is one of the most frequented by visitors and natives alike. Plaka's winding pathways carry thousands of years of history. Walk amongst the buildings whose facades are dressed in 19th century neoclassical design and architecture. Explore the ancient monuments, contemporary museums and traditional souvenir shops throughout.

The morning run

Are you one of those sporty, healthy people who start the day with a run? We recommend a morning jog along the pedestrian street around the Acropolis.

Zonar's Café

If you like your coffee, visit the historical Zonar's Café down town. It's pricy, but the quality of the cakes and the coffee is great.

Address: At the corner of Voukourestiou and Panepistimiou streets Stoa Spyromiliou

Work meets pleasure: Your travel guide to the upcoming industry events

Bali – IGF

Bali is a breathtakingly beautiful place with a fascinating, rich culture and excellent food. It is definitely worth spending a few extra days (weeks… months…) in Bali if you happen to be travelling there for work. Here are a few things not to miss when you're there.

Enjoy the Balinese art

Bali is known for its rich culture and creative art. Make sure to get some beautiful handicrafts, statues, and paintings while you're there!

Escape to Ubud

Situated in the beautiful mountains, the artistic heart of Bali has streets lined with excellent art galleries. Escape the beach, catch some fresh mountain air, visit the monkey forest, and get your hands on some great art.

Balinese dance

Balinese dance is renowned worldwide for its colour, dynamism, and beauty. If you get the chance, try to catch a dance performance at the foot of Ulu Watu as the sun is slowly setting. You won't regret it!

Go surfing!

If you don't know how to, get a few lessons! *http://www.prosurfschool.com/*

Become a master chef

Discover the secrets of Balinese food through a cooking class. Casa Luna Bali with the excellent chef Janet De Neefe provides great hands-on classes! *http://www.casalunabali.com*

Treat yourself to a Balinese massage

Enter tired and over worked. Re-emerge relaxed, rejuvenated, and full of energy!

Where to meet up with Netnod 2013

- **AfPIF**, Casablanca, Morocco 3-5 September
- **EPF8**, Reykjavik, Iceland 9-11 September
- **CENTR GA**, Brussels, Belgium 2-3 October
- **Netnod autumn meeting**, Stockholm Sweden 2-4 October
- **RIPE 67**, Athens, Greece 14-18 October
- **IGF 2013**, Bali, Indonesia 21-28 October
- **LACNIC**, Willemstad, Curaçao 28 October - 1 November
- **Euro-IX 23**, Helsinki, Finland 27-29 October
- **IETF 88**, Vancouver, Canada 3-8 November
- **Capacity Europe**, Amsterdam, Netherlands 18-20 November
- **ICANN 48**, Buenos Aires, Argentina 17-22 November
- **Internetdagarna**, Stockholm, Sweden 25-26 November
- **Netnod Christmas drinks**, Stockholm, Sweden 5 December

Nurani Nimpuno
Head of Outreach and Communications

Helsinki – Euro-IX 23

If you only visit one bar in Helsinki, make sure it's the A21 Cocktail Lounge! A21 is one of Helsinki's best cocktail spots! Furnished in cream and chocolate hues, with booth seating strewn with cushions, this is a classy little place. We suggest that you try the local spirits such as Koskenkorva or "Kossu" (a clear spirit distilled from barley, similar to vodka) or Jaloviina (cognac with a splash of water). This bar also offers a special dining experience – each dish is inspired by a scene from Finnish culture, with the perfect cocktail to match.

Address: Annankatu 21

Vancouver – IETF 88

Don't miss the following:

Stanley Park

Explore the 400-hectare natural West Coast rainforest and enjoy scenic views of water, mountains, sky, and majestic trees along Stanley Park's famous Seawall. It's amazing!

Le Gavroche

Visit this small, rather high-end, modern French restaurant in the City centre of Vancouver. They offer à la carte or a 7-course tasting menu which are both meant to be ridiculously tasty. Make sure to book in advance!
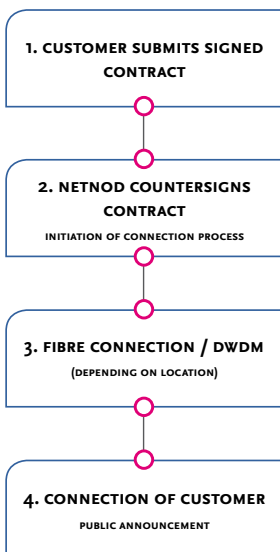
Address: 1616 Alberni Street
Phone: 604.685-3924

Buenos Aires – ICANN 48

Let's Tango! If there's one thing to learn or experience in Argentina, it's of course, the Tango. Tango classes are available almost everywhere, many taught in English. Don't miss the outdoor "milonga" experience 'La Glorieta' at the bandstand at the Barrancas de Belgrano on Sunday evenings!

Join Netnod IX

Want to connect to Netnod? Go through these simple steps, or get in contact with one of our trusted Netnod Reach partners.

1. CUSTOMER SUBMITS SIGNED CONTRACT

2. NETNOD COUNTERSIGNS CONTRACT
INITIATION OF CONNECTION PROCESS

3. FIBRE CONNECTION / DWDM
(DEPENDING ON LOCATION)

4. CONNECTION OF CUSTOMER
PUBLIC ANNOUNCEMENT

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REACH

An easy, fast, and cost-effective way to peer at Netnod!

Connect with our trusted Netnod Reach partners:

Atrato ip Networks

Atrato IP Networks
sales@atrato.com

iXREACH
ONE · SIMPLE · SOLUTION

IX Reach
alan.ward@ixreach.com

netnod

"Netnod manages Internet exchange points (IXPs) in Sweden, 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."

"Under the skin of ...?" Answer: Remco van Mook

Who we are

Pierre	**Emelie**	**Håkan**	**Henrik**	**Johan**
Kaj	**Kurtis**	**Liman**	**Magnus**	**Mem**
Mathias	**Nico**	**Nurani**	**Patrik**	**Sarah**

"The global Netnod DNS anycast infrastructure handles 80 000 DNS queries per second"