Mongolia's Internet Journey: from bits to Gigabits

Philip Smith

mnNOG 3

29th October 2021

In the beginning

- mnNOG 1: Dr Enkhbat Dangaasuren presented his fascinating keynote covering the founding of the Internet in Mongolia
- Some statistics, shared with the Network Startup Resource Center
    - UUCP connection started by Datacom in December 1994
        - Daily dial-up to IGC
        - 16-line BBS running on a 90MHz Pentium PC with a 4Gbyte hard drive
    - In January 1996, the first 64kbps link via PanAMSAT went live
        - Connecting to Sprint International in the US
    - December 1997 saw this capacity go up to 512kbps
        - About 1500 users using the service
    - And by March 1999 there were three ISPs:
        - Datacom, MTC, and Bodi Computer (MTC customer)
        - Total capacity passing 1Mbps

Workshops!

- ## November 1998:
  - ### Cisco ISP/IXP Workshop hosted by the United Nations Development Programme's APDIP activity in Kuala Lumpur

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*Internet Routing Technology Workshop*
NOVEMBER 23-27, 1998

APDIP in co-operation with CISCO Systems, leading supplier of
networking equipment, will host the Internet Routing Technology
Workshop in Kuala Lumpur from November 23rd to the 27th. The
workshop will cover topics on Networking, Internet Protocol
 (IP) routing, Top Level Domains (TLDs) and procedures for
domain registration. Essentially, it will include hands-on
tutorials on routing configurations alongside technical
explanations. The workshop is targeted to a technical audience,
preferably engineers, from government Telecom and ISPs in our
member countries. For more information and availability of seats
please contact Ms. Ramita Sharma at ramita@apdip.net
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Workshops!

- Topic: Internet Service Provider Design and Operations <u>Best Practices</u>

- 32 participants from all over Asia Pacific region:
  - Kiribati, Nauru, Vanuatu, Tuvalu, Solomon Islands, Fiji, Bhutan, Samoa, Laos, Nepal, **Mongolia**, Thailand, Vietnam, Cambodia, Malaysia, Myanmar, and Afghanistan

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14.
Name: Mr. D. Altansukh
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Specific Requests: Public Internet services and Internet access
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Networking…

- In the following decade, many participants of this pioneering workshop stayed in touch
  - Including good friends in Mongolia

- Advice or assistance requests for many of the start up Internet infrastructure operators
  - Mongolia's first network operators and IP network providers
  - Including: Mobicom/Mobinet, Railcom, MICOM, Newcom, Magicnet, ICN, Datacom, Digicom, Erdemnet, Gemnet,…

2005 ISP Workshop

- First ISP Workshop in Mongolia
  - Initiated and hosted by Mobicom
  - Taught with Gaurab Raj Upadhaya
  - For the 9 ISPs at the time (5 came)

Other 2005 observations

- ## MISPA
  - Mongolia ISP Association – an NGO mainly to determine policy on foreign connections and interconnection between ISPs

- ## There was an IXP, called OpenMIX
  - Static routing! But wanting to introduce BGP

- ## IT Park had just started up
  - To support new IT, Systems Integration, and Software Development companies in Mongolia

- ## No NOG
  - But considered a good idea – OpenMIX mailing list existed, hosted by MICOM, but unused

More 2005 observations

- Railcom is fibre infrastructure provider
  - Only selling E1s (nothing bigger)
  - E1 (2Mbps) transit cost about US$2000 a month
- TransTel (Russian company) selling E1s at US$1000 per month
  - But only at the Russian border 😖
- Mobicom and Micom both have:
  - Fibre around Ulaanbaatar
  - Fibre to China Unicom
    - (Unreliable, poor quality)
  - Satellite links to Hong Kong
- Other providers use satellite to various parts of the world
- 2.4GHz wireless too congested to be usable
- Total traffic for Mongolia around 20Mbps in, 10Mbps out
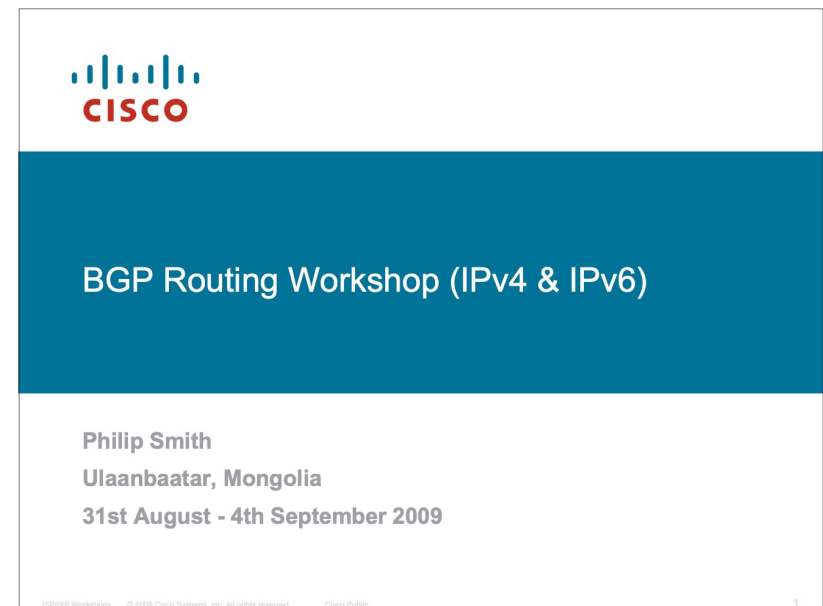
My view from the Bayangol Hotel ↕
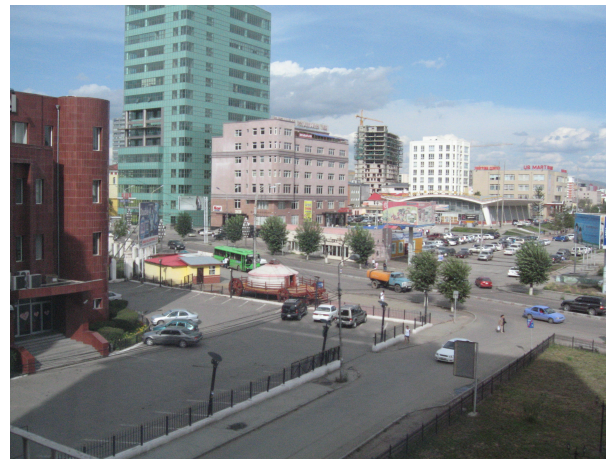
Ulaanbaatar in 2005

2009 ISP Workshop

- ☐ **Workshop hosted by ICTPA**
  - ◼ Venue: Computer Science Management School in the "Cisco Networking Academy Lab"
  - ◼ My introduction to Erdemnet!

- ☐ **BGP Routing Workshop**
  - ◼ Taught IS-IS and BGP
  - ◼ And: IPv6 for the first time in Mongolia!

- ☐ **Took place after APNIC 28 conference in Beijing**
  - ◼ H1N1 (Swine Flu) struck me on day 4 of the workshop 😬
  - ◼ Last day had to be cancelled 😭

CISCO

BGP Routing Workshop (IPv4 & IPv6)

Philip Smith
Ulaanbaatar, Mongolia
31st August - 4th September 2009

ISP/IXP Workshops   © 2009 Cisco Systems, Inc. All rights reserved.   Cisco Public   1

Ulaanbaatar in 2009

My view from the Bayangol Hotel

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Accelerating Internet

- 2009 onwards saw big changes
  - In 2005, industry opinion was that 9 ISPs was too much for Mongolia
  - And indeed, between 2005 and 2009, there was consolidation too

- Gemnet had arrived on the scene in late 2009
  - New transit carrier & competition for Mobicom
  - And another relationship & friendship was formed
  - Gemnet started big!
    - Cisco GSRs and a 10Gbps link to Los Angeles
    - The ISP Workshop teaching could be put into practice!
  - October 2010 saw:
    - Core network dual stack (IPv4/6)
    - 2nd international link, to Germany via Russia (InterRoute)

Rapid Growth Continues

- By 2011:
  - Google Cache recommended (by Google) to be installed in Ulaanbaatar due to traffic volumes
    - Operational by 2013
  - Infrastructure upgrades by Gemnet:
    - Replacing InterRoute with GLBX (via NewTelco)
    - Turning up at DE-CIX and transit via Cogent Europe
    - Direct link to Hong Kong (working by 2013)

Scaling the infrastructure

- 2012 saw the next workshop
  - BGP IPv4/IPv6 Workshop again
  - Hosted by Gemnet, held at Ramada Hotel

- Notable events in Mongolia's timeline:
  - Extensive discussion with Mobicom about IPv6 deployment
  - Discussion about NDC-MIX
    - OpenMIX "gone", now an "IX" hosted at NDC
  - Installation of I-root in Gemnet's datacentre
    - Done by Kurtis Lindqvist (then CEO of Netnod, and Chair of Euro-IX)
    - Not ideal, but there is now no IX following international best practices in Mongolia
  - Peering between Gemnet and Mobicom:
    - Kurtis and I met with both transit operators to discuss the importance of peering
    - Customers of one provider go via US to get to customers of other provider (sigh)
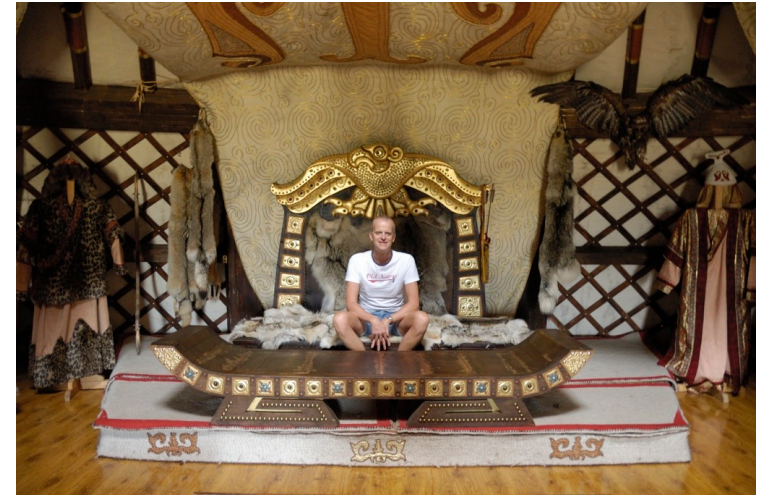
Ulaanbaatar in 2012

Travels with Kurtis

The training continues…

- CRC invitation in 2014 to teach a BGP/IXP Workshop
  - Joint effort by CRC, NSRC, and Netnod
  - Advanced BGP and dual stack network
  - Emphasis on Peering and IXP
  - Taught with Kurtis Lindqvist

- Part of a CRC effort to promote peering and re-establish an IXP in Ulaanbaatar
  - Several meetings held to again explore how to create an IXP
  - Including round table hosted by CRC

CRC's BGP/IXP Workshop
July 2014 @ IT Park

A rapidly changing
Mongolia

IPv6

- ❑ Despite all the efforts to help with IPv6 deployment
  - ■ Still nothing outside the core networks of Mobicom and Gemnet

- ❑ Next effort a collaboration between CRC, ITU, and APNIC
  - ■ 2015: a three-day IPv6 Workshop, hosted by CRC
    - ❑ Held again at IT Park
    - ❑ For business decision makers and technical staff
    - ❑ Around 40 participants from across the Internet industry
  - ■ Meetings hosted by CRC inviting industry leaders to discuss a roadmap to deploy IPv6

July 2015

And the most recent chapter…

- The formation of mnNOG!
  - After the first discussion about it in 2005
  - …and for years after that
  - Just like IXP discussions, IPv6 discussions,… 😀

- Speaking of IPv6:
  - In 2018, ITU & APNIC requested by CRC to run another IPv6 Workshop
    - Follow up to the 2015 effort – another push needed!
  - Similar format to the 2015 workshop:
    - https://bgp4all.com/pfs/training/itu-ipv6-mn/start

- mnNOG formation was a side activity
  - And a lot of social engineering 😀

How are NOGs created?

- ☐ In mnNOG's case:
  - ■ New friends get together for an enjoyable evening of food and drinks
  - ■ The venue: Grand Khaan Irish Pub
  - ■ (This is very traditional Internet "getting things done")

Ulaanbaatar
October 2018

NB: end of month, coming
direct from Fiji! 🥶❄️

Mongolia's story is ongoing…

- What next?
  - mnNOG 3 conference today
  - IPv6 deployment (maybe?)
  - More local content and new types of content delivery?
  - Ongoing training: best practices as well as new technologies
  - New transit carriers?
    - But still have to live with physical connectivity through Russia or China
- The story is really:
  - More / Bigger / Faster… That's technology side though…
  - Collaboration at personal and business level is vital to make the story a success
  - mnNOG is a testament to the collaboration I now see in the Mongolian industry!

- Congratulations mnNOG!