



APNIC

Afghanistan, American Samoa, Australia, Bangladesh, Bhutan, British Indian Ocean Territory, Brunei Darussalam, Cambodia, China, Christmas Island, Cocos Keeling Islands, Cook Islands, East Timor, Fiji, French Polynesia, French Southern Territories, Guam, Hong Kong, India, Indonesia, Japan, Kiribati, North Korea, South Korea, Laos, Macau, Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, New Caledonia, New Zealand, Niue, Norfolk Island, Northern Mariana Islands, Pakistan, Palau, Papua New Guinea, Philippines, Pitcairn, Samoa, Singapore, Solomon Islands, Sri Lanka, Taiwan, Thailand, Tokelau, Tonga, Tuvalu, Vanuatu, Vietnam, Wallis and Futuna Islands.

Effective Internet Governance in the Asia Pacific

Internet number resource distribution
as a model of enhanced cooperation

Asia Pacific Network Information Centre

APNIC services

APNIC provides key services to all stakeholders in the Asia Pacific region, such as:

- **Distributing IP addresses and Autonomous System (AS) numbers** to any network or organization that demonstrates a need
- **Developing policies** that meet the changing needs of the Asia Pacific Internet industry
- Delivering skill development and **capacity building** programs through APNIC **training**
- Improving Internet scalability in the Asia Pacific by supporting the **deployment of root DNS servers** – from 1 in 2002 to 35 in 2008
- Maintaining the IP **whois database** and providing a public access service
- Presenting **statistics** and technical developments through APNIC **research and liaison** programs
- Administering **fellowship and development grants** to support local emerging economies
- **Representing the interests of the Asia Pacific** Internet community on the global stage
- Providing **consultation on Internet development** by key APNIC staff

APNIC supports the IGF

Since its creation in 1992, APNIC has been **actively involved** in Internet governance related activities.

APNIC **supports** the Internet Governance Forum's (IGF's) work to facilitate discussions on matters affecting multiple stakeholder groups and to provide an open forum that addresses emerging issues.

APNIC **encourages** all stakeholders to work together during IGF 2008 and in the future to support the continued growth, security, and stability of the Internet.

About APNIC



APNIC is one of five Regional Internet Registries managing global Internet number distribution. APNIC represents the Asia Pacific region, comprising 56 economies, including China and India.

APNIC ensures the fair distribution and responsible management of the Internet Protocol (IP) addresses and related numeric resources that are required for the stable and secure operation of the Internet.

If you are interested in the development of the Internet in the Asia Pacific, APNIC encourages you to join the APNIC community and participate in the development of Internet number resource management policies in the Asia Pacific region.



APNIC's commitment to the IGF's goals

APNIC has contributed to the World Summit on the Information Society (WSIS) and IGF processes since their inception by participating in preparatory and regional meetings in addition to both the Geneva and Tunis Summits and the subsequent IGF meetings.

APNIC holds Internet governance workshops to encourage further participation in the IGF by the Asia Pacific Internet community.

	13-15 January	Asian Regional Conference, WSIS Geneva Phase Tokyo, Japan
2003	15-18 July	WSIS Intersessional Meeting Paris, France
	10-12 December	World Summit on the Information Society Geneva, Switzerland
2004	24-26 June	PrepCom-1, Tunis Phase Hammamet, Tunisia
	14-17 June	Fourth Meeting of WGIG Geneva, Switzerland
2005	19-30 September	PrepCom-3 Geneva, Switzerland
	13-15 November	PrepCom-3 Tunis, Tunisia

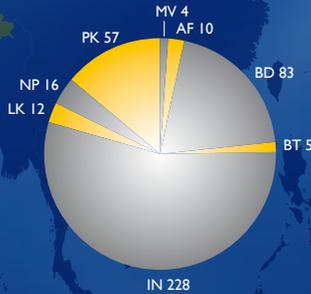


2005	16-18 November	World Summit on the Information Society Tunis, Tunisia
2006	30 October- 2 November	Inaugural Internet Governance Forum Athens, Greece
2007	3 September	Towards IGF 2008, APNIC 24 New Delhi, India
	12-15 November	Internet Governance Forum Rio de Janeiro, Brazil
	25 February	Partnership towards IGF in Asia, APNIC 25 Taipei, Taiwan
2008	26 August	Internet governance hui, APNIC 26 Christchurch, New Zealand
	3-6 December	Internet Governance Forum Hyderabad, India

APNIC in South Asia

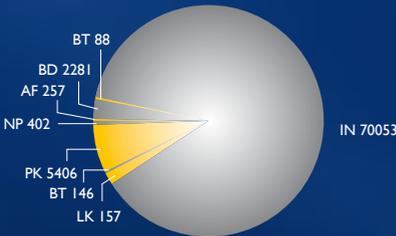
APNIC serves the following South Asian economies: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. In total, 16.3% of APNIC's resource holders come from the South Asian region.

Number of APNIC account holders in South Asia

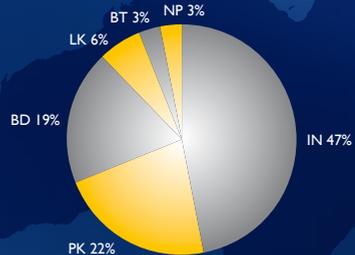


ISPs and businesses in South Asia hold a total of 1.21 /8s ("slash 8s") of IPv4 (equivalent to 20.3 million addresses) and 35 /32s of IPv6. Each /32 of IPv6 provides for as many network hosts as there are addresses available in the entire IPv4 address space.

Total number of /24s used by South Asian economies



Distribution of IPv6 delegations in South Asia



Note: Afghanistan and Maldives have not yet requested IPv6 resources

Community outreach

To assist the rapid development of Internet services, APNIC has placed special emphasis on training, conducting 77 training events in South Asia since the first APNIC training event in the region was held in 1999 in Mumbai, India.

APNIC appointed its first dedicated South Asia Liaison Officer in 2004 and has fully or partially funded the installation of six root DNS servers in South Asia (in Chennai, Colombo, Delhi, Dhaka, Karachi, and Mumbai).

APNIC has signed MoUs (Memorandums of Understanding) with a number of associations in South Asia, including:

- Internet Service Providers Association of Bangladesh (ISPAB)
- Internet Service Providers Association of India (ISPAI)
- Internet Service Providers Association of Nepal (ISPAN)
- Internet Service Providers Association of Pakistan (ISPAK)
- Lanka Internet Service Providers Association (LISPA)
- South Asia Network Operators Group (SANOG)

APNIC also has established working relationships with the National Internet Exchange of India (NIXI), Nepal Internet Exchange (NPIX), Internet Society (ISOC), and the Networkers' Society of Pakistan (NSP).



ISPAI

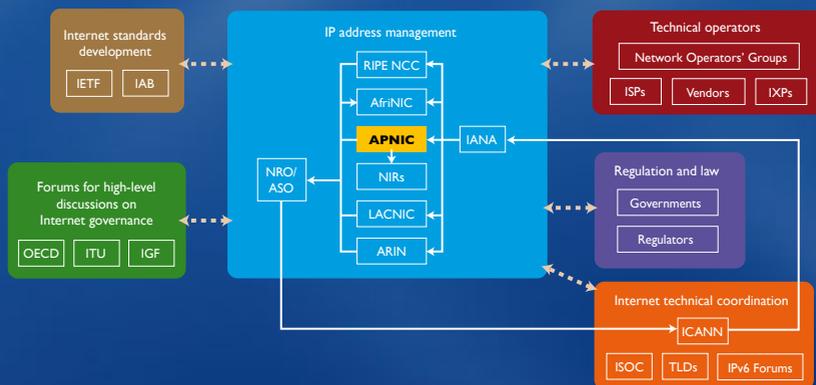


SANOG

APNIC from a global perspective

APNIC is an important part of the global Internet community and has strong relationships with other regional and global organizations.

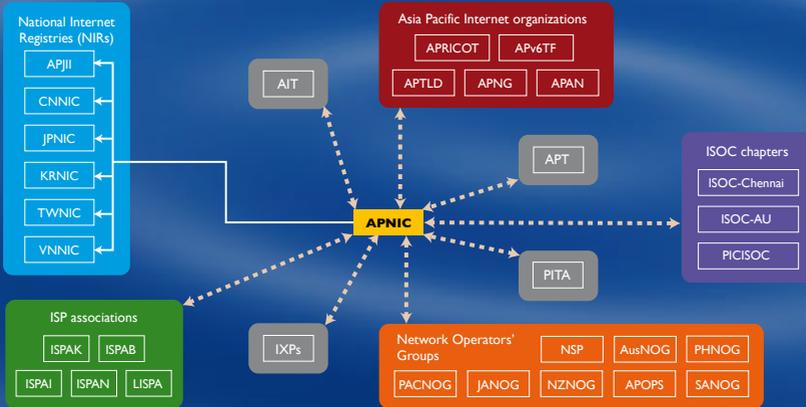
These organizations work together within a model of enhanced cooperation and multistakeholder coordination to ensure the continued stability and security of the Internet.



- AfriNIC** African Network Information Centre
- AIT** Asian Institute of Technology
- APRICOT** Asia Pacific Regional Internet Conference on Operational Technologies
- APT** Asia Pacific Telecommunity
- APTLD** Asia Pacific Top Level Domain Association
- APv6TF** Asia Pacific IPv6 Task Force
- APNG** Asia Pacific Networking Group
- APAN** Asia Pacific Advanced Network
- APJII** Asosiasi Penyelenggara Jasa Internet Indonesia
- APOPS** Asia Pacific Operators Forum
- ARIN** American Registry for Internet Numbers
- AusNOG** Australian Network Operators' Group
- ASO** Address Supporting Organization
- CNNIC** China Network Information Center
- IAB** Internet Architecture Board
- IANA** Internet Assigned Numbers Authority
- ICANN** Internet Corporation for Assigned Names and Numbers
- IETF** Internet Engineering Task Force
- IGF** Internet Governance Forum
- ISOC** Internet Society
- ISP** Internet Service Provider

The Asia Pacific context

APNIC has strong ties with many Internet-related organizations in the Asia Pacific region and regularly participates in regional dialogues. MoUs with several of these organizations help coordinate activities.



ISPAK	Internet Service Providers Association of Pakistan
ISPAL	Internet Service Providers Association of India
ISPAN	Internet Service Providers Association of Nepal
ITU	International Telecommunications Union
IXP	Internet eXchange Point
JANOG	Japan Network Operators' Group
JPNIC	Japan Network Information Center
KRNIC	Korea Network Information Center
LACNIC	Latin American and Caribbean Internet Address Registry
LISPA	Lanka Internet Service Providers Association
NRO	Number Resource Organization
NSP	Networkers Society of Pakistan
NZNOG	New Zealand Network Operators' Group
OECD	Organisation for Economic Co-operation and Development
PHNOG	Philippines Network Operators' Group
PITA	Pacific Islands Telecommunication Association
PACNOG	Pacific Network Operators' Group
RIPE NCC	Réseaux IP Européens Network Co-ordination Centre
SANOG	South Asia Network Operators' Group
TLD	Top Level Domain
TWNIC	Taiwan Network Information Center
VNNIC	Vietnam Network Information Center

APNIC communications

The APNIC Secretariat keeps the Asia Pacific Internet community up-to-date with the latest information about Internet resource management and IPv4 and IPv6 technology developments via:

- The APNIC website and online services
- APNIC publications such as *Apster*
- APNIC meetings and conferences
- Widespread training and education activities
- Presentations and participation at Asia Pacific and international meetings and conferences

APNIC produces regular reports and statistics on IPv4 and IPv6 delegations within the Asia Pacific region. These reports are publicly available for use in research and analysis. You can use them to analyse IP addresses delegated to networks in your economy:

<http://www.apnic.net/stats>

APNIC's IPv4 and IPv6 research and development activities include data gathering and analysis, producing results that are referenced globally by bodies such as ICANN, ITU, and OECD.

<http://www.apnic.net/research>

Internationally renowned for his research on IPv4 depletion and IPv6 transition mechanisms, APNIC's Chief Scientist, Geoff Huston, recently contributed his expertise towards the 2008 OECD report, *Internet Address Space: Economic Considerations in the Management of IPv4 and in the Deployment of IPv6*.

Research and analysis

As the source of IP address distribution in the Asia Pacific region, APNIC can analyse IP addressing trends at their origin.

Key trends:

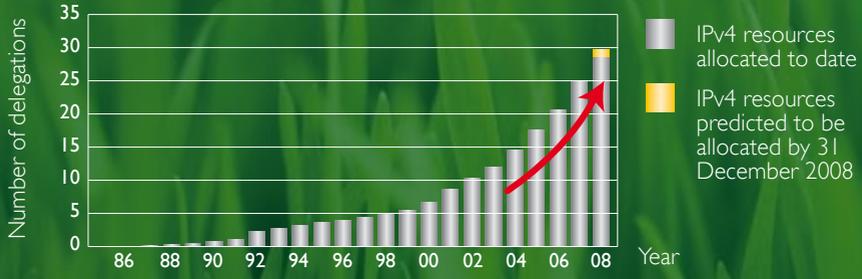
- Currently, more address space is being allocated in the Asia Pacific region than is being allocated in any other region, reflecting the rapid rate of Internet development in this part of the world.
- Since the RIRs have been managing IP address resources, China has overtaken the USA in terms of the rate of RIR allocations.
- Recently, the growth in mobile Internet services has been reflected in an increased rate of allocations to mobile service providers.
- The rate of IPv4 consumption in South Asia has increased significantly since 2006.
- APNIC has experienced a 35% growth in requests for IPv4 over the last two years.
- The rate of IPv6 allocations in the Asia Pacific region has more than doubled since 2006 indicating an increased awareness of IPv4 exhaustion.



Managing nearly 500 million addresses

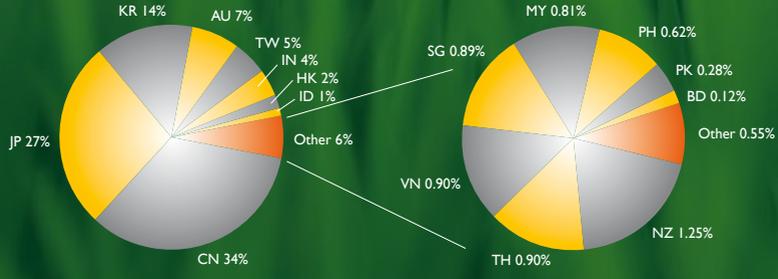
As of October 2008, APNIC managed registrations equivalent to 29.1 "slash eight" (/8) blocks of IPv4 address space in total, equal to over 488 million addresses. Based on the current trend of IPv4 distribution in the Asia Pacific region, by the end of 2008, APNIC will be managing almost 30 /8 blocks of IPv4 addresses (approximately 500 million addresses).

Total IPv4 delegations (cumulative)



The geographic distribution of IPv4 in the Asia Pacific broadly mirrors the historical distribution of economies that began investing early in Internet infrastructure. In more recent times, other economies in the region, most notably India, have experienced rapid Internet growth. As a result, IPv4 allocation rates to those economies have increased.

Total distribution of IPv4 (by economy)



IPv4 address exhaustion and beyond

Current predictions indicate that the remaining IPv4 address pool will be exhausted around 2011. The Internet technical community recognized over a decade ago that IPv4 is a finite resource, and in response developed techniques designed to delay IPv4 exhaustion.

Techniques and policies, such as Network Address Translation (NAT), reclaiming and recycling unused IPv4 addresses, and optimizing IPv4 addresses currently in use, have successfully slowed the consumption of IPv4 addresses.

APNIC ensures that IP address management policies adapt to meet the needs of the changing Internet environment. The APNIC community is working together to modify IPv4 policies to prepare for the exhaustion of the unallocated IPv4 pool.

In addition to techniques to manage the remaining IPv4 pool, IPv6 was developed as a long-term replacement for IPv4. IPv6 provides an extremely large address space that should allow almost unlimited Internet growth. It also has the potential to create new business opportunities and lead to the development of innovative products and services.

AS numbers

AS numbers are a vital part of the Internet's core routing system, the Border Gateway Protocol (BGP).

Existing two-byte AS numbers are predicted to run out in early 2011. As part of a globally coordinated policy, all the RIRs will issue four-byte AS numbers by default from 1 January 2009. This is the next phase of a transition from two- to four-byte numbers that began on 1 January 2007. For more information, see:

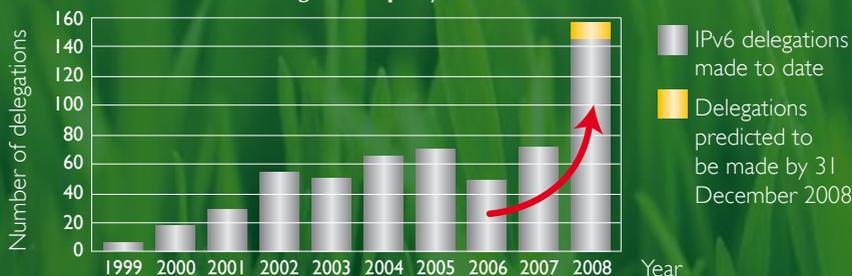
<http://icons.apnic.net/asn>

Strong growth in IPv6

The Internet community recognizes that the steady deployment of IPv6-based networks is important to ensure the future success of the Internet.

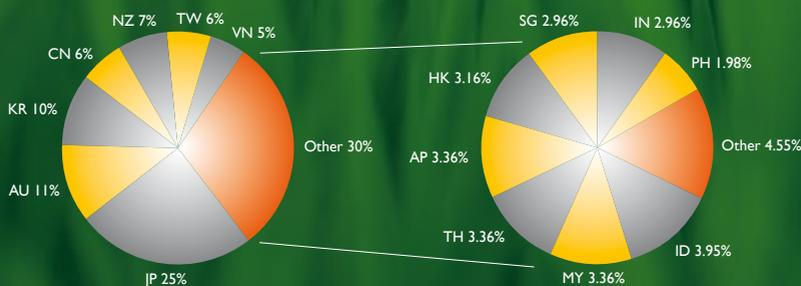
Since 1999, APNIC has made 501 IPv6 allocations and assignments to networks, totalling more than 24,200 /32s of IPv6 address space. Each /32 in IPv6 provides for as many network hosts as there are addresses available in the entire IPv4 address space.

IPv6 delegations (per year)



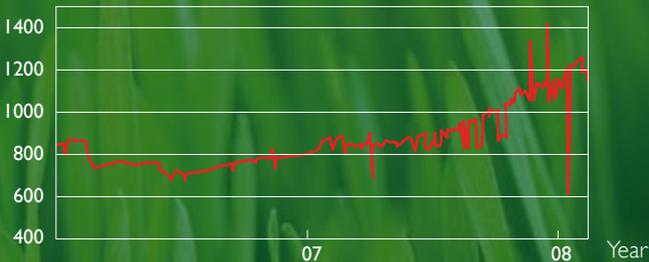
Although deployment of the IPv6 network has been a slow process, demand for IPv6 addresses doubled during 2008. This higher demand suggests increased levels of acceptance and a willingness by network operators to deploy IPv6 networks.

Total IPv6 delegations per economy



IPv6 deployment rates around the world began to increase steadily in mid-2006, with indications that this growth is accelerating. During the last 12 months, the number of IPv6 routes announced to the global Internet has grown by 30%.

Number of IPv6 routes announced to the global Internet



Note: The drop in IPv6 routes in the first half of 2006 reflects the decommissioning of the experimental 6bone network.

Source: <http://bgp.potaroo.net/v6/as2.0/index.html>

IPv6 involves all stakeholders

APNIC provides essential support to the Asia Pacific Internet community's collaborative efforts to make a smooth transition to IPv6. During this time, all stakeholders have a role to play.

APNIC urges all Internet stakeholders to work within the model of enhanced cooperation to develop a coherent strategy to support the transitional framework from IPv4 to IPv6.

For more information on how you can support IPv6 transition mechanisms, contact the APNIC IPv6 Programme Manager, Miwa Fujii at **ipv6@apnic.net**.

You can participate

The APNIC community is open to anyone with an interest in Internet number resources in the Asia Pacific region.

Your voice and APNIC policies

IP addresses and AS numbers are shared resources, available for use by anyone who needs them. APNIC policies ensure these resources are distributed fairly and consistently across the whole Asia Pacific region.

Over time, technology improvements change the needs of the Internet community. If APNIC's policies do not meet your needs, you can propose changes to existing policies or suggest new policies.

Anyone can submit a policy proposal using the online policy proposal form or sending an email to policy@apnic.net. Policies are discussed at face-to-face APNIC meetings. Between meetings, policies are discussed on APNIC's public mailing lists. APNIC also conducts training across the region for the technical staff at ISPs and provides forums such as ICONS, where they can exchange information.

<http://www.apnic.net/policy>

APNIC meetings

The APNIC community meets twice per year for policy development, decision-making, education, information sharing, and networking – both professional and social. We invite you to join the community at the next APNIC meeting:

<http://meetings.apnic.net>

If you can't attend in person, you can participate online using our live transcripts, webcasts, and audiocasts, or at special remote participation events.

The logo for APNIC 26, featuring the text "APNIC 26" in a white, sans-serif font on a dark green background. To the right of the text, the dates "25 - 29 AUGUST 2008" and the location "CHRISTCHURCH - NEW ZEALAND" are written in a smaller, white, sans-serif font.

APNIC 26

25 - 29 AUGUST 2008
CHRISTCHURCH - NEW ZEALAND

See what you can achieve...

At APNIC's most recent meeting, APNIC 26, the exhaustion of the IPv4 unallocated pool and the transition to IPv6 were key themes. The community reached consensus on six policy proposals regarding:

- The management of the remaining unallocated IPv4 address pool
- The new four-byte (32-bit) AS numbers that will replace two-byte AS numbers (due to be exhausted about the same time as IPv4)

The community also:

- Requested that ICANN sign the DNS Root
- Endorsed the inclusion of IPv6 readiness questions in the 2009 APNIC stakeholder survey
- Elected Naresh Ajwani as a representative on the NRO Number Council to monitor global Internet number policy development

Other meetings to take advantage of the convergence of the Asia Pacific Internet community in Christchurch were the AP* retreat ('AP star'), which was attended by Asia Pacific Internet organizations, and the IPv6 technical workshop. The workshop was organized by InternetNZ, in conjunction with REANNZ, Cisco, Packet Clearing House, NZRS, auDA, and FX Networks.

Your participation is vital. The decisions made at APNIC meetings directly impact how resources are allocated. Have your say!

Attend an APNIC meeting

Critical Internet Resources

One of the main themes for IGF 2008 is 'Critical Internet Resources'. The following main sessions and workshops are of particular interest to the Internet number community in the Asia Pacific region:

December 3 9:30 - 11:00

Legal Aspects of Governance of Critical Internet Resources Functions (Workshop)

December 4 9:00 - 10:30

IPv6: The Solution for the Future Internet (Workshop)

December 5 9:30 - 11:00

Global, Regional, and National Arrangements (Main session)

December 5 11:00 - 12:30

Transition from IPv4 to IPv6 (Main session)

Internet governance issues in the Asia Pacific region

Other workshops arranged by Asia Pacific organizations of interest to the APNIC community are:

- Challenges facing Internet operators in developing countries
- Getting the Pacific online – Access Challenges, Issues & Opportunities
- Access to Local Culture and Language (ALCL)
- Internet and Climate Change: How we can collaborate?
- Resurrection of Online Dispute Resolution
- Building a Global Capacity Building Curriculum Framework and Primer for Internet Governance
- Implications of development policy for emerging economies

For more information, please see the IGF website at:

<http://www.intgovforum.org>

Challenges facing Internet operators in developing countries

At IGF 2008, APNIC is the principal organizer of the “Challenges facing Internet operators in developing countries” workshop. Partner organizers of the workshop are AfriNIC, AFNOG, ARIN, LACNIC, PCH, PITA, and SANOG. On behalf of the organizers, APNIC invites you to attend the workshop and add your experiences to the session.

December 4 | 11:30 - 13:00

Challenges facing Internet operators in developing countries

The workshop at the IGF in Hyderabad will look at the challenges network operators face when providing access in developing countries. The workshop will examine issues that impact an operator’s ability to provide access, including:

- Challenges posed by geography
- International connectivity costs
- Government regulation
- Financial constraints

The workshop will:

- Investigate the role of Network Operators’ Groups (NOGs) in strengthening education and professional exchange
- Examine infrastructures, such as Internet eXchange Points (IXPs), that can help provide access to the Internet
- Present case studies where Internet operators and their partners in government, business, and civil society have overcome or are facing challenges in providing Internet access to their communities

Challenges for developing economies

The issues to be discussed in the “Challenges Facing Internet Operators in Developing Countries” workshop were initially explored at APNIC 26 in August 2008. The session was webcast live on the Internet, and the archived transcripts, videos, and presentation files are freely available at:

<http://www.apnic.net/meetings/26/program/hui>

Here, the panellists identified the following key challenges facing network operators:

- Geography (sparse populations over large areas, mountainous terrain)
- Finance (grassroots projects, cost of importing technical equipment)
- Human resources (educating operators, skilled operators leaving developing countries for well-paid jobs in developed countries)
- Regulation (access to wireless bandwidth, VoIP restrictions)
- Bureaucracy (need to get approval from authorities at many stages, need to apply to funding agencies)
- Cost (use and misuse of bandwidth due to spam, peer-to-peer traffic)



Addressing the challenges

Solutions proposed by the APNIC 26 panellists to the challenges identified included:

- Deploying wireless rather than wired networks
- Using alternative transport across areas with poor transport infrastructure (such as elephants through thickly forested land)
- Using and repurposing of available lower-tech general equipment rather than expensive single-purpose equipment
- Using alternative power sources (such as solar panels) to make infrastructure self-sufficient
- Utilizing staff who can write effective funding proposals
- Supporting meetings, conferences, and training events in developing countries to inspire and help build capacity in those countries



Join us at the following APNIC meetings. If you cannot attend in person, you can join us online via videoconference, webcast, audiocast and online chat:



APNIC 27 (In conjunction with APRICOT 2009)

18-27 February 2009 Manila, Philippines



APNIC 28

24-28 August 2009 Beijing, China



APNIC 29 (In conjunction with APRICOT 2010)

24 February - 5 March 2010 Kuala Lumpur, Malaysia

<http://meetings.apnic.net>

If you would like to learn more about APNIC activities, feel free to talk to the following contacts when you see them at IGF 2008 in Hyderabad:



Akinori Maemura

APNIC Executive Council Chair



Kuo-Wei Wu

APNIC Executive Council Treasurer



Kusumba Sridhar

APNIC Executive Council member



Ma Yan

APNIC Executive Council member



Paul Wilson

Director General



German Valdez

Communications Area Manager



Samantha Dickinson

Policy Development Manager



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External Relations Manager



Sylvia Cadena

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