The State of the Internet Routing Infrastructure

"Growing the Internet for a more inclusive Information Society"

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Network Operations Groups (NOGs)

- Regional gatherings of Internet Service Providers (ISPs)
    - Sharing & distribution of knowledge & information
    - Improving technology & making operational advances
    - Training & Education
    - Scaling with the Internet's rapid growth

- Most regions and several countries now have NOGs

- Quite often organised in conjunction with Regional Internet Registry (RIR) meetings
    - RIR members & public meet to create policies related to Internet Resource management based on consensual process

Internet Growth

- Key Metric: Number of Entries in Internet Routing Tables

- Growth rate is back to that of late 1990s

    Expanding Internet

    Many providers are expanding infrastructure to address the growth

- With growth comes "deaggregation"

    More providers passing smaller chunks of routing information to the global infrastructure

    Indicates greater diversity and choice of connectivity

    Further increases routing system growth rate

IPv4 address exhaustion

- IANA pool of available IPv4 address space will exhaust by end of 2010

    By mid/late 2011 the RIRs will have distributed most remaining IPv4 addresses to end users

    Dual strategies of IPv6 deployment and IPv4 address translation

- Industry examining variety of proposals on how to distribute remaining available IPv4 resources

    Active discussions aimed at global consensus amongst all operator stakeholders

    Industry is discussing specific policies exclusively for the last block to be given to each RIR

- The policies for IPv4 and IPv6 distribution are managed by the RIRs

    Public meetings, public participation, open to all

IPv6 Migration

- With IPv4 exhaustion looming, more uptake of IPv6

- IPv4 will be used for several years yet

- IPv6 is already being added to existing infrastructure

    With mechanisms for the two to work with each other

    No deadline for IPv6 switchover

    Internet migrates from one protocol to the other over several years

    Equivalent to migration from legacy fixed line/telco connection model to a public IP network carrying all services and applications

Convergence

- Since the Internet became available commercially 15 years ago, growth has been rapid

- Institutions and organisations supporting the Internet have scaled to match

  Network Operations Groups (more)

  Standards Development (more)

  Regional Internet Registries (5 regions)

- Internet protocols have scaled and adapted to match

  Support for huge numbers of ISPs and destinations

  Support for IPv6 to co-exist with and eventually supersede IPv4

  More types of services, applications and features seamlessly added

Conclusion

- Rapid growth of the Internet continues

- Network capabilities and infrastructure are expanding to address the needs

    Industry is adaptable and flexible, like the Internet itself

- Internet Operations Community

    Many organisations caring for technical wellbeing and growth of the Internet

    Global involvement, global impact

Proposed Actions

- Internet Community venues are all multi-stakeholder fora

  - Encourage more to participate

- Rapid Internet growth demands more skills

  - Encourage training on Internet technologies specifically

- Business needs to plan for IPv6

  - What is every industry's business plan for Internet communications beyond 2010?