Internet Analysis Report - 2004

Protocols and Governance

Presenter – Ian Peter

ITU Lunchtime Seminar, November 11 2004

Basic assumptions

- Internet is getting older and bigger
- It does not appear to be handling all current user requirements
- It was designed for another purpose altogether
- Protocols first described as legacy systems in 1990
- Lack of traditional business analysis in looking at problem

Problem definition

- Base protocols invented in 1970s and 1980s for different purpose altogether – timesharing between computers
- Original purpose did not foresee
  - The development and use of personal computers
  - Use of phones and portable devices
  - Broadband networks and processing power
  - A network to be used for commercial purposes
  - People communicating with each other
  - World wide web
- Are these protocols still appropriate?

Issues

- High incidence of viruses and worms
- Rapidly developing lack of trust because of fraudulent activity
- Clogging of email systems with spam
- Usage outside of societal norms
- Perceived slowness
- Availability and affordability issues
- Capacity to communicate in own language

Are these issues being dealt with effectively? (the internet wasn't designed to deal with any of these issues….)

A word about structure

- Structures arise from original purpose
- Structures retained by habits (cow tracks)
- In expanding we (and the cows) normally follow path of least resistance
- But you can't build a multi-storey hotel on the foundations of a cottage

Internet Analysis Report – 2004   www.internetmark2.org

A word about change

- Structure affects behaviour
- When power=structure, energy is directed to maintaining structure rather than serving needs of stakeholders
- Sometimes a change of structure is the easiest course to change
- A compelling reason for change has to exist
- A compelling reason for change has to be communicated
- Change and transition management is a science
- Stakeholder analysis is a first step

Key questions

- What was original purpose of the structures we are examining?

- Have user needs changed?

- Are current structures appropriate for todays purposes?

- What can we recycle from existing structures in creating tomorrow's Internet?

What the Internet Analysis Report – 2004 covers

- Introduction
- Problem definition and issues
- User requirements
- Relevant history
- Protocol analysis
- Governance analysis

Ian Peter and Associates

- Involved with Internet since 1986
- Co-founder, Association for Progressive Communications
- Member Editorial Board, First Monday
- Member of .ORG Advisory Council
- Management and Change Management consultancy
- Internet history – www.nethistory.info

Past clientele

- UNEP, UNCED
- ICANN
- APNIC
- Telstra, Nortel
- ABC-TV
- Commonwealth of Australia
- State of Queensland Whole of government portal

Internet User requirements

The Internet is for everyone

- The Internet of the future must be
  - Trustworthy
  - Reliable
  - Globally inclusive
  - Vendor neutral
  - Easy to use
  - Affordable
  - Able to change rapidly
  - Innovative and capable of significant expansion
  - Transparently and well managed
  - Involving industry, government and community stakeholders
  - What do we have when we create this?

Internet Analysis Report – 2004   www.internetmark2.org

Internet – a tool for the development of humankind

- Many voices, one world
- The right to communicate in an age of mass media
- The importance of free flow of information
- TCP/IP and DNS are only useful if relevant to higher purpose

Emerging trends

- A unique medium and a puzzle for regulators – neither broadcast nor communications in a traditional sense
- Size, scale and speed – from 600 million to 6 billion
- Global inclusiveness – the IDN issue
- ENUM and convergence
- Wireless and mobility
- Peer to Peer – many to many
- Illegal software, music piracy, pornography
- Affordability and availability as a human rights issue

Scope of Internet Analysis Report - 2004

- Comprehensive business analysis , as an aid to developing future directions and strategies

- A factual document to guide thinking about future directions

- Investigate major user requirements for a 21st century Internet

- Analyse whether current Internet is capable of meeting these objectives

Protocol analysis

Concentrating on:

- TCP/IP (1970s)

    Transport Control Protocol/Internet Protocol

- DNS and WHOIS (1980s)

    Domain Name System

- SMTP (1970s)

    Simple Message Transfer Protocol

- Adjust, amend, replace, pave over?

TCP/IP

- Transmission Control Protocol and Internet Protocol

- Invented 1973

- Added to Arpanet 1983

- OSI wars and different networks

- Adopted as path of least resistance in early 1990s

- Running out of numbers (perceived) – 1990s

- The slow TCP/IPv4 TCP/IPv6 upgrade

TCP/IP issues

- Traffic prioritisation
- Unsuitability for financial transactions
- Stalled IPv6 adoption
- Security issues
- Performance issues particularly with higher speeds
- Do these protocols make sense for current needs?

Summary – TCP at least should be replaced in 5-7 year timeframe

DNS and WHOIS

- The world's largest distributed database

- Originally to allow computers and operators to find each other easily

- WHOIS database stores names and addresses of domain owners and contacts

- DNS maps names and hosts of websites to numbers

- No equivalent in telephony

Issues with DNS and Whois

- Cannot handle multiple languages (the ascii vs unicode problem)
- Language is effective for computer-computer (original design) but not human-human (the modern communication need)
- Refresh rates and size
- Use of domain names for branding
- Paradoxical centralised architecture
- Whois and privacy
- Security and DNSSec
- Domain name legal and IP issues
- Consequences of original design purposes for another structure

SMTP and Email

- Email is broke. According to Pew and others
    - 25% of users lessening use because of spam volume
    - 70% of users adversely affected by spam
    - 30% believe filtering could cause loss of mail
    - 76% bother by offensive content
    - 80% bothered by deceptive or dishonest content

Annual cost between $10 and $87 billion

SMTP and email issues

Designed for an honest age within structure of computer timesharing

"like borders without passports or bank vaults without locks"

Issues -

- Anyone can pretend to be anyone
- Forgery is simple
- Mass marketability
- Mass of competing protocols
- Old systems not upgraded – backwards compatibility

Can anything be done?

Yes, but,

- ## ICANN says it's out of scope

  "issues of concern to Internet users, such as the rules for financial transactions, content control, unsolicited commercial email (spam) and data protection are outside of the range of ICANN's mission of technical co-ordination"

- ## IETF cannot address the issue effectively

  (see MARID case study later in this presentation)

What can be done

- ASPEN formula – Authentication, Accreditation, Reputation

- Industry collaboration

- New standards

- Cf Web and email

- Pave over SMTP?

Summary of protocols

Major issues exist in scaling to future.

More research needed on most appropriate approaches to reform/migration.

Patent issues.

Change management issues are significant.

Project structures are recommended.

Governance analysis

- Evolutionary rather than structural
- Evolved from structures to serve obsolete purposes
- Inter-related bodies
- Volunteerism

  - *"Eccentric in structure"*
  - *"Illogical in scope"*
  - *"Incomplete in terms of Internet governance"*
  - *Why…*

The ICANN umbrella

- Self-governing standards organisations (ITU, IETF, W3C, IEEE, OASIS etc)
- Self-governing Regional Internet Registries (APNIC, RIPE, ARIN etc) (RIRs/NROs/ASOs)
- Self-governing root server operators
- ccTLDs (see separate slide)

None of these are the subject of the ICANN/US Government contract. Root servers have separate contract with DOC, others have none.

IETF
(Internet Engineering Task Force)

- One of three more central standards bodies (others are ITU and W3C)

- Founded in 1986

- No Board of directors, no members, no dues

- loosely self-organised group of people

- A classic technocracy

- Evolved from "smoke filled room"

- Needs to change structure rather than make changes within structure

IETF internal analysis

- Having difficulties adopting to larger size
- No clear definition of mission
- Unsure what it is trying to achieve
- Unsure who its stakeholders are
- Cannot prioritise actions effectively
- Loses sight of overall architecture
- Change management rarely managed
- Standard project management rarely followed
- Long timeframes
- Poor takeup of standards
- No user input mechanism
- Difficulty with complex and large scale problems

IETF Case studies

- IPv6
  - Began 1991
  - Ready to implement 1996 in scaled down version
  - Added to root 2004

- DNSSec
  - Need obvious in 1990
  - IETF work began 1995
  - May be ready for deployment in 2005

- MARID (see over)

MARID case study in IETF

- IETF's first major effort in addressing spam problems
- Began 2004 when it was obvious industry was going to do something
- Merging of Microsoft proposal with open source proposal for sender authentication (Sender ID)
- Microsoft lodged defensive patents covering wide range of related activities
- "IANAL" – no-one knew what to do
- Workgroup disbanded
- Some hope, but….

Very few issues are technical only. When non-technical issues arise IETF has no means to determine policy direction.

W3C and ITU (and IEEE)

- Related standards organisations
- Different models for governance structures
- Work with IETF as appropriate
- Need to govern more than technical standards

More structures outside of ICANN

- Root server operators report direct to US government, not through ICANN
- Regional Internet Registries (RIRs) established before ICANN and US Government control and retain large degree of independence through Number Resource Organisation (NROs)
- Effective regional stakeholder involvement in RIRs.

ccTLDs (Country top level domains)

- Originally individuals in technical community

- In some cases now controlled by governments or in association with governments

- Some remaining techno neo-colonialism

- Role of governments varied and unclear

The core ICANN

- Corporation under US Law
- Operates under contract with DOC (US Government)
- "Advisory Committee to US Govt?"
- Various MOUs with other associated bodies
- States that it is a "technical co-ordination body"

Where ICANN steps outside of technical co-ordination

- Regulates competitive environment in DNS

- Establishing UDRP (Uniform Dispute Resolution Policy) and its role in intellectual property issues

- Anything else suggested under DOC contract

The ICANN Public Policy Roles

- Active in intellectual property areas
- Active in security areas
- Active on privacy issues
- Inactive on consumer protection
- Inactive on spam

How effective has ICANN been on public policy areas it has been involved in? (WHOIS case study)

Summary on governance

- What we have is
  - Eccentric in structure
  - Illogical in scope
  - Incomplete in coverage
- WSIS is appropriate forum to determine what is needed
- Structures need to be appropriate to purposes and user requirements
- Don't throw away what made it grow – openness, low cost of participation

Next steps

- Create even base of knowledge of issues among stakeholders

- Examine interdependencies between protocol reform and governance

- Awareness raising

- State of Messaging Report

- Further work on approaches to protocol reform

What readers are saying about the Internet Analysis Report - 2004

"excellent work - a good and informative paper"

"very clear and insightful"

"lays out its case in simple, understandable terms"

"what I found valuable about it was the breadth of the approach, introducing readers to a wide range of barriers that the Internet faces in increasing the breadth and depth of its current coverage"

Obtaining a copy

- Go to www.internetmark2.org
- Order form available today
- Credit card bookings on line
- Purchase Orders
- ***** Special discount*****

Questions?

Email: ian.peter@ianpeter.com