Internet Analysis Report - 2004
Protocols and Governance

EXECUTIVE SUMMARY

Details on obtaining a copy of the full report can be found at www.internetmark2.org.

About the Internet Analysis Report – 2004

As someone who has been involved with the international growth of the Internet since the mid 1980's, and with Internet governance bodies in both professional and volunteer capacities, I have been concerned for some time that some of the organisations which are governing and managing the Internet have not evolved sufficiently to deal with the problems which have appeared as the Internet gets older and bigger.

I first heard the Internet protocols described as legacy systems in the 1990s, but, like most people, took no notice and got on with the business of growing it. However, by the turn of the century cracks were beginning to appear. These cracks became larger and larger during 2003, to the point where it became clear to me and others, that something is wrong.

At the same time as some of us were becoming concerned with the technical issues, the World Summit on the Information Society was beginning to debate Internet governance – certainly not an unrelated topic. However, here another concern was evident to me: much of the governance debate was proceeding without full knowledge of what Internet governance actually involves.

My company, Ian Peter and Associates Pty Ltd, works professionally with large governmental and private sector organisations that have problems with organisational structures and old IT systems and uses established project and change management methodologies to analyse associated issues. It seemed to us to be appropriate to use these methodologies to look at today's Internet systems, governance, and user issues.

Searching the literature, we were surprised to find that traditional business analysis appears not to have been applied to Internet matters. As a result, we commissioned the Internet Analysis Report – 2004, of which this is the Executive Summary.

The Internet Analysis Report - 2004 is a comprehensive study of the state of the Internet in 2004. It contains an in-depth analysis of issues facing Internet users, emerging issues with Internet protocols, governance bodies and governance issues, and conclusions and recommendations. Reviewed by a panel of international experts, the report has been highly praised. Full details on obtaining a copy of the report can be obtained at www.internetmark2.org

Ian Peter

1 Problem Definition

1.1 Introduction

The Internet was developed in the 1970s and 1980s, initially as a means to connect mainframe computer systems for timesharing purposes. The system introduced for this fairly basic purpose has expanded to become a global multimedia information and communications system, connecting personal computers, phones, and hundreds of millions rather than the hundreds of devices originally foreseen.

Some of the significant developments not foreseen at the time of the original design include:

- The development and widespread use of networked personal computers
- The use of phones and portable devices on the Internet
- Broadband networks and processing power
- A network to be used for commercial purposes
- The World Wide Web.

Parts of the system are now over 20 years old, and the Internet is required to perform a number of important functions not included in the original design. New protocols have been developed, and various patches have been applied to base protocols, not always evenly. It seems appropriate to examine whether the current system, people, and processes are still appropriate.

Although it is clear that the system which has evolved is extraordinarily useful and needs to be continued, it is not clear whether the current Internet effectively meets its user's needs, on either a technical or a managerial level.

1.2 Issues

The Internet currently has some 600 millions users, or about 10% of the world's population. Although usage is still growing rapidly, both socio-economic and technical issues would appear to be slowing the overall growth rate. Some of the major user issues appear to be:

- The high incidence of viruses and worms arising from security weaknesses, giving rise to tens of billions of dollars of expenditure anually in an attempt to prevent damage
- A rapidly developing lack of trust in the system, caused by fraudulent use of addresses, non-existent companies, and the ease with which criminal activity can go unchecked
- A clogging of email systems with "spam", or junk email, most often emanating from fraudulent hosts and email addresses
- Issues as regards use that does not meet normal societal standards of behaviour
- Perceived "slowness" from a users point of view in accessing sites
- Limited availability in many parts of the world
- Affordability issues, particularly in developing countries
- Availability issues, particularly those pertaining to the ability to communicate via the Internet in native languages.

These and other significant issues are threatening the usefulness of the Internet. Preliminary analysis suggests that some significant improvements are both needed and possible, but not necessarily easily dealt within the current structure. Some of the reasons given include:

- Perceived inertia in the technical management and development by the Internet Engineering Task Force (IETF), giving rise to lack of faith among major players

- Perceived weaknesses in the management and governance structure
- Perceptions that the Internet has become a tool of US Government policy.

There is a lack of easy to read material analysing the current state of the Internet. There is also a lack of comprehensive user and business analysis. The Internet Analysis Report – 2004 addresses these needs.

1.3 Scope of study

1.3.1 Objectives

The key objectives of the Internet Analysis Report - 2004 are:

- To conduct a comprehensive business analysis of the Internet at the end of 2004, as an aid to determining future directions and strategies
- To produce a factual document giving the history and the current state of development of the Internet, to guide thinking about future directions
- To investigate the major user requirements for a 21st century Internet
- To initially analyse whether the current Internet is capable of meeting these objectives.

2 Summary of findings (Executive Summary)

2.1 History

Contrary to common opinion, neither the Pentagon nor 1969 hold up as the time and place the Internet was invented. A project which began in the Pentagon that year, called Arpanet, gave birth to the Internet protocols sometime later (during the 1970's), but 1969 was not the Internet's beginnings.

Larry Roberts, who was employed by Bob Taylor to build the Arpanet network, states that Arpanet was never intended to link people or be a communications and information facility. Arpanet was about time-sharing.

Time sharing tried to make it possible for research institutions to use the processing power of other institutions computers when they had large calculations to do that required more power, or when someone else's facility might do the job better. It never really worked as an idea – for a start, all the computers had different operating systems and versions and programs, and using someone else's machine was very difficult: but as well, by the time some of these problems were being overcome, mini-computers had appeared on the scene and the economics of time sharing had changed dramatically.

So it's reasonable to say that ARPANET failed in its purpose, but in the process made some significant discoveries which were to result in the creation of the first Internet. These included email developments, packet switching implementations, and development of the Transport Control Protocol – Internet Protocol (TCP/IP).

TCP/IP, the backbone standards which many people claim are the basis of determining what the Internet is, were developed in the 1970s in California by Vinton Cerf, Bob Kahn, Bob Braden, Jon

Postel and other members of the Networking Group headed by Steve Crocker.

The sort of computers Arpanet was dealing with had very little power by today's standards. Only computer scientists used them. Computers with the power of modern day pocket calculators occupied whole floors of buildings. These monsters could only be afforded by large institutions.

It would take until the late 1970s for the personal computer to appear. Even so, for personal computers as well as mainframes, communication with other computers, and particularly other brands of computers, was an afterthought. It probably took the decade from 1983 to 1993 before anything like a sensible situation for computers to connect to the Internet emerged.

Ray Tomlinson is credited with inventing email in 1972, but in fact email is much older than that. Like many of the Internet inventors, Tomlinson worked for Bolt Beranek and Newman as an Arpanet contractor. He picked the @ symbol to denote sending messages from one computer to another. So then, for anyone using Internet standards, it was simply a matter of nominating <username>@<hostcomputername>. Email soon became the Internet's first "killer application".

In many ways, Internet adoption was about the path of least resistance. In the beginnings, governments wanted a completely different set of standards called OSI – but industry and governments could not agree on the details. There was a real mess out there, and no agreement on how to get out of it.

The dominant standards body that should have been interested in this problem was CCITT (Consultative Committee on International Telegraphy and Telephony) of the International Telecommunications Union (ITU), but they were essentially not interested in computers and software in the beginning, and when they did become interested,

became committed to the ill-fated OSI track. So the Internet community had to devise its own way of dealings with standards.

This is probably where internet governance began to grow and formalise as a unique identity. A system called RFCs (Requests for Comment) was set up by Steve Crocker, and out of the network of engineers submitting and commenting on RFCs the Internet Engineering Task Force (IETF) evolved as a standards body.

Then the World Wide Web came along, and offered a much improved user interface and some substantial new applications. Every year from 1994 to 2000, the Internet saw massive growth. The Internet era had begun. The rest of the story is likely to be well known to most readers of this document.

These origins are important to our understanding because they help to explain how the Internet evolved. In particular, what we discover from a basic understanding of history is that the original protocols were introduced for a world which

- Had no personal computers
- Operated at very slow speeds
- Did not contemplate secure financial transactions
- Did not foresee non-English language users
- Was more concerned with computer to computer, rather than inter-personal communications
- Was willing to accept the trustworthiness of every participant
- Was for use by highly skilled and economically affluent people only.

It would be abnormal if protocols of this age and this difference of purpose were not, to all intents and purposes, legacy systems.

2.2 User requirements and future needs.

Our future Internet, rather than having 600 million users, may have close to 6 billion. So we may be only 10-20% of the way there, and there is a lot of growth to come. This will place new demands on the infrastructure and the way it is held together. Those experimenting with future networks with increased speed are already suggesting significant problems will exist coping with the increased size, scale and speed of the Internet.

The Internet Analysis Report - 2004 identifies both problems and future trends which need to be taken into consideration in looking at a future Internet.

Problems include:

- Identity fraud and other criminal activity
- Spam
- Viruses/worms
- Exposure of children to unacceptable material
- Hacking
- Speed
- Capacity to communicate in one's own language
- Affordability
- Accessibility in less economically developed areas and for socially disadvantaged groups

Some of the future issues and trends that need to be considered and which are outlined include:

- ENUM and convergence with telephony based systems
- the growth of wireless and mobility

- size, scale and speed issues
- the growth of peer to peer applications.

When these and other factors are considered, a statement begins to emerge about tomorrow's Internet.

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.*

This statement is to be built on to provide a more comprehensive overview of where the Internet must go.

2.3 Protocol issues

2.3.1 TCP/IP protocol

TCP (The Transport Control Protocol) in particular has come in for significant criticism, and a growing body of experts believe it will need to be replaced. Indeed, if it were easy to replace a fundamental Internet Protocol, this may have been done some time ago. It's the complexity of the change management problem that has delayed action rather than lack of recognised need for change.

Particular issues with TCP/IP include:

- Traffic prioritisation
- Unsuitability for financial transactions
- Security issues
- Performance issues with larger and faster networks.

The study concludes that TCP – if not TCP/IP - needs to be replaced, probably within a five to ten year time frame. The major issue to overcome is the migration issue which is discussed below.

2.3.2 DNS and WHOIS

Each host on the Internet can be located via an IP number. The Domain Name System (DNS) maps the numbers to names of hosts or websites (eg www.google.com, www.hotmail.com). Thus, when a user enters a name, the Internet knows which number to send the query to by looking up the DNS database.

It should be noted that the other widespread user of distributed network infrastructure, the telephone system, operates quite differently. It has no domain name equivalent with trade mark implications in normal uses – to contact a telephone address, you simply enter the number.

The DNS was introduced in 1984, several years before commercial traffic was able to be part of the Internet. At the same time, a public database called Whois was introduced, essentially to allow technical managers of hosts to contact their peers. This is the Internet equivalent of a telephone directory, but also serves a number of related purposes.

One issue with DNS is that it has not been possible to use native languages in email addresses, domain names, and the WHOIS database. This poses significant barriers to adoption for non-English speaking people.

The main problems here are that

- ASCII (the American Standard Code for Information Exchange) is used in the DNS. ASCII is incapable of supporting the complexities of foreign language.
- No-one wants to substantially change the DNS**.**

Internationalised domain names (IDNs) have become a fundamental part of and an iconic symbol for the digital divide issue. ICANN has been criticised at its regular Public Forums for not giving the matter sufficient attention, failing to make significant progress, and being negative in its analysis of this issue. The Internet Analysis Report – 2004 examines this issue in detail.

Other issues with DNS include:

- Slow refresh rates, which pose particular difficulties with emerging standards such as ENUM and prohibit some interesting applications
- Issues with WHOIS and privacy

- Issues with security in DNS.

These are again problems that need to be addressed in a five year timeframe at the outside – some of them would be best handled more quickly if possible.

2.3.3 SMTP and Email protocols

To all intents and purposes, email is already broke, and must be fixed. The Internet's first and greatest killer application is now problematic.

In a survey examining email usage in 2003, the Pew Internet Project found that

- 25% of email users stated that the ever increasing volume of spam has reduced their overall use of email
- 70% of email users claimed spam had affected the quality of their on line experience
- 30% of users expressed fears that filtering approaches would cause loss of wanted mail
- 76% of users are bothered by offensive or obscene content in spam email
- 80% of users are bothered by deceptive or dishonest content in spam email.

Costs associated with spam have been estimated by various research firms at between $10 billion (European Union, 2004) and $87 billion (Nucleus Research, 2003) per annum. Spam volume is now estimated to exceed legitimate email volume; in May 2004, 76 percent of inbound e-mails scanned by email security provider MessageLabs Ltd were spam, up from 67 percent a month earlier.

ICANN claims spam issues as out of scope. *"… issues of concern to Internet users, such as the rules for financial transactions, Internet content control, unsolicited commercial email (spam), and data protection are outside the range of ICANN's mission of technical coordination"* (ICANN website). IETF has been very slow at doing anything in this field, preferring to leave investigation of the issues to a separate Internet Research Task Force (IRTF) group.

As a result, there is a general belief that nothing technical can be done to prevent spam. However, our analysis suggests that the existing protocols are significant contributors to the problem, and protocol reform could see spam volume drop by at least 80%.

SMTP, the basic email standard, is the online equivalent of borders without checkpoints and passports, or bank vaults without doors and locks. Some of the SMTP security weaknesses are:

- It allows anyone to connect with anyone without any system to say who they are
- It is simple to forge messages and pretend to be someone you are not with no checking whatsoever
- Not being one to one like telephone calls, it is easy to mass market to millions of email addresses at very low cost to the email sender.

These issues have been known for some time. Various attempts to provide improved protocols have been undertaken, but essentially have resulted in a mass of conflicting systems and standards. As a result, change is becoming more complex to initiate.

Email upgrades are complicated by

- Old systems which are never upgraded
- Incorrect applications of email systems

- The variety of applying protocols (eg http for webmail, smtp, nntp, pop etc)
- The ubiquitous nature of email
- IETF difficulties in handling big problems.

The Internet Analysis Report – 2004 analyses recent IETF work in this area and concludes that both governance issues and protocol reform need to be addressed to provide a more comprehensive solution.

2.4 Governance bodies

2.4.1 The International Engineering Task Force

Founded in 1986, the Internet Engineering Task Force describes itself as "a loosely self-organized group of people who contribute to the engineering and evolution of Internet technologies specifications". The IETF is unusual in that it is not a corporation and has no board of directors, no members, and no dues.

IETF's own internal analysis (RFC 3774 – IETF Problem Statement) has revealed significant problems, including:

- IETF is unsure about what it is trying to achieve
- Cannot determine what its scope should be
- Is unsure who its stakeholders are
- Cannot prioritise actions effectively
- Loses sight of overall architecture.

IETF governance contrasts substantially with the other two standards organisations involved with Internet standards. ITU has the strongest governance structure, being responsible eventually to member state representatives, and W3C standards work is determined and prioritized by a member organization.

So in this respect, IETF is peculiar. And this peculiarity brings with it certain problems because, in reality, few issues if any are purely technical and have no policy repercussions. This is shown out in case studies outlined in the Internet Analysis Report - 2004 where IETF of necessity has had to move outside its technical mandate but has not been effective in doing so.

Two of the case studies, covering DNSSEC and IPv6, also indicate extremely long time frames within IETF for protocol development and implementation. No-one can attribute these long time frames to

technical complexity alone. Poor methodologies, volunteerism, under-resourcing, unprofessional behaviour and management issues have all contributed to delays, according to the IETF Problem Working Group.

IETF's decisions to address its problems in an open forum are to be applauded, as are its attempts to engage a wide global audience of engineers in its consensus based decision making structures. However, IETF is a classic technocracy. While it appears to be reasonably capable of managing the day to day concerns as regards maintenance of standards, it does not have the capacity to tackle major tasks or major change. To solve these problems, IETF would need to

- Have a clear relationship to a governing body with the competence and representative nature to deal with policy considerations which are outside the scope and expertise of IETF
- Have means of introducing non technical skills sets such as project and change management to its affairs
- Be resourced to provide dedicated rather than volunteer effort in working on major priorities
- Have a clear scope, mission, and relationship within an overall technical management structure for the Internet, and with other Internet bodies of a non-technical nature which fulfil complementary roles in determining policy and assisting adoption of standards
- Learn to communicate effectively with business, community and government stakeholders.

2.4.2 Other standards bodies – ITU and W3C

To an outsider, The International Telecommunications Union (ITU) appears to have all the efficiency and capacity to get things done that ICANN appears not to have. However, that perception may well be illusory; and anyone who has been involved in development of

standards such as X.400 could point to equally problematic issues in ITU.

It should be remembered that, at the time IETF was established in 1986, telecommunications companies were not major players in the emerging Internet. They became more involved from 1990 on, as a commercial Internet got underway. It should also be remembered that in the 1970s the US telecommunications giant, AT&T, could not see a business case for involvement in the Internet. This perhaps is the most telling criticism of the staid and solid elder statesman that ITU is – it may find it difficult to be nimble or innovative in seeing future directions.

ITU, like IETF, is undergoing considerable internally driven reform to try to better cope with the demands of a rapidly changing communications technology landscape. There would appear to be room for some of the strengths of ITU to be better utilised alongside those of IETF and ICANN in the future, particularly as telephony and Internet based applications continue to converge.

W3C is the third "standards body", and effectively addresses issues with the World Wide Web architecture. It separated from IETF in 1994 as it believed IETF to be incapable of dealing with its particular range of issues.

2.4.3 ICANN related bodies

It is important to realize that ICANN doesn't control everything in Internet technical co-ordination. An interesting history associated with the early growth of the Internet led to a number of quite independent structures being established. These include:

- Country domain administrators, who in many countries were early technical volunteers who have no formal relationship with national governments. In some developing countries, country administrators are located overseas and are not

national citizens. Although a form of techno neo-colonialism remains in the administration of some country domains, and some hostility to co-operation with government authorities exists in others, most country domains are now forming appropriate locally defined relationships with their governments and their local constituencies.

- Regional Internet Registries (RIRs) such as APNIC (Asia Pacific) and RIPE (Europe), which were set up before the ICANN/US Government contract was in place and retain substantial independence while administering the IP numbering system.
- Root server operators, many of them volunteers. The central root server is administered by Network Solutions, and any changes need the approval of the US Dept of Commerce, not ICANN.

ICANN has a series of relationships with these separate bodies which it is attempting to formalise.

2.4.4 ICANN

The Internet Corporation for Assigned Names and Numbers (ICANN) exists in its current form largely because the US Government wanted it to be so.

Its structure is an evolving reactive mechanism. Anyone analysing its current structure without regard for the history of how it came to be would have to regard ICANN as

- eccentric in structure
- illogical in scope, and
- incomplete in terms of Internet governance.

The initial proposal for a body to administer the domain name system suggested establishment under Swiss law. However at the beginning of October 1998 the US Government's National

Telecommunications and Information Administration (NTIA) responded to this proposal by announcing the Internet Corporation for Assigned Names & Numbers (ICANN). It would operate under an agreement with the NTIA with oversight by the US congress. The new body was asked to ensure competition in delivery of domain name services. Thus ICANN became a corporation under US law, with a contract to operate from the US government, despite concerns of many stakeholders.

ICANN claims its mission to be technical co-ordination. (ICANN website). However, because of the eccentricities and incomplete nature of Internet governance structures, ICANN has consistently worked in areas that cannot be regarded as technical co-ordination.

For instance, in 1999 it succeeded in establishing a Uniform Dispute Resolutions Policy (UDRP) for the top level domains; hardly a technical co-ordination task, but certainly a useful one for development of the new media.

Similarly eccentric is the role of ICANN in creating a competitive environment in DNS, part of its contract with US Department of Commerce. This would normally be seen as a regulatory body's responsibilities, not a technical co-ordination task.

Public policy matters where ICANN is active include intellectual property issues and security. Public policy matters where ICANN is not active include spam and consumer protection. Once again, the logic of involvement and non-involvement is not easy to follow.

Perhaps partially as a result of this mission confusion, ICANN does not handle public policy well or effectively. An example of this was its recent attempts to gain widespread public input in to the WHOIS database and privacy issues.

2.4.5 Governance conclusions

The problem with ICANN, and with IETF, is one of defining scope within a schema that effectively manages all needs of the 21st century Internet. No such schema exists, and that is why bodies such as ICANN and IETF are continually operating in areas outside of their level of competence in order to keep things afloat.

If there is a problem in Internet governance, it is the gaps between the competencies of existence governance bodies and the needs of Internet industry, governmental, and community users. As user needs in a broad sense do not come within the range of concern of any particular Internet governance body, it is inevitable that mistakes are being made and crucial issues are not being addressed.

2.5 Conclusions and Recommendations

There are many problems facing the Internet at the current time. Those closest to each problem are making substantial efforts in isolation from other major issues to address their particular problems, often however seeking short term fixes rather than longer term solutions. A co-ordinated approach across all areas seems necessary for resolution.

IETF and ICANN have been unable to deal with the range of issues and concerns adequately. This is acknowledged as an issue by many people who are aware of the problems.

The question then becomes how to proceed to reform.

2.5.1 Governance reform

The WSIS governance debate will be ongoing until at least mid 2005, and at that point of time is only likely to consider what governance structures should be in the future. This study acknowledges that an appropriate forum exists to examine governance issues, and suggests that some of the information in the

Internet Analysis Report - 2004 might assist in discussions of how to appropriately reform governance. It is not simply a matter of removing ICANN from the somewhat benign influence of the US Dept of Commerce; it is necessary to consider the range of issues involved in creating tomorrow's Internet as an effective and equitable tool for human development. That requires some refocussing of discussion to address some wider issues and needs.

2.5.2 Protocol reform

What is not being discussed as comprehensively is how to reform protocols. The Internet Analysis Report – 2004 concludes that protocol reform is necessary.

Project management structures are both the normal and the most effective way to handle major change projects of this nature. A separate short term structure should be established for this purpose. It would consist of:

- A dedicated full time project team, containing the best engineering, project management, research, change management and communications expertise available to scope and deal with this problem. Other skills sets will also be necessary as the project progresses.
- A Project Steering Committee with major stakeholder involvement to review progress and determine direction.

The exact makeup of both the Project team and the Steering Committee needs further investigation with major stakeholders. A preliminary range of potential activities and involvement possibilities are outlined in the full study and at www.internetmark2.org.

The entire process is unlikely to be completed in less than three years. There are compelling reasons to suggest it must be completed within seven. At the end of a successful implementation, the project would hand over responsibility to an appropriate Internet governance

structure which will most likely have emerged from WSIS and beyond.

It may be suggested that current Internet organisations should deal with this change. This study believes that would be ineffective, as:

- They have substantial operational issues to deal with which stretch their resources
- Their technical-only governance is inappropriate for the task
- Volunteer structures are inappropriate
- Their track record in handling major change in a timely fashion is not good
- They lack the range of disciplines and the skills base for handling change of this magnitude.

For these reasons the existing governance and standards bodies, although they should be encouraged to be active participants, should not be the only voices at the table for this future development initiative.

2.5.3 Change management issues with protocol reform

Knowledgeable insiders in stakeholder Internet industry companies and research institutions are aware to varying degrees of the need for improvement in the base protocols. However, executive decision makers at this stage are probably not aware of the need for reform. The Internet Analysis Report – 2004 is designed to assist in raising awareness, and contains a detailed analysis of the change management issues involved in protocol reform.

Some large industry players may initially perceive benefit in blocking or delaying change in order to protect dominant market positions, or to gain opportunities from proprietary approaches.

There will doubtless be robust debates within some industry players about the market affect of change in this area.

However, market leaders will face crucial losses of markets if change does not occur within a reasonable time frame. Involvement in the new generation Internet will eventually be seen as a market plus; but the issues must be understood and clearly communicated for this to happen.

Some defensive actions can be expected in current Internet bodies, and some feeling of loss of control and that they should be in charge of change. The more positive involvement of individuals who initially react this way is more likely in a middle adoption phase, when the project clearly has impetus.

Government officials from a wide variety of backgrounds will have interest in new governance structures and in public policy issues which may emanate from projected changes. However they will be less interested in the protocol issues and content to leave that to others to develop.

Information is the key to success here. Unless the problems are recognised and acknowledged, and compelling reasons to effect change are understood, action to rectify the problems will not occur.

2.5.4 Technical Options

It appears necessary at this preliminary stage to look at some sort of gateway structure through which people pass to adopt “Internet Mark 2”. For a substantial period of time, Internet Mark 2 will need to co-exist and co-operate with the legacy Internet. However eventually people will pass through the gate to the other side.

And, although differing opinions exist, it also appears to be necessary to nominate a point in time at which the gates shut, and interoperability with the old system disappears.

Other options to be examined would include a layered super-structure on top of existing protocols, or an overall peer to peer architecture that effectively bypasses problematic protocols gradually.

2.5.5 Risks and dependencies

The risks associated with inaction on these issues substantially exceed those involved in moving forward. The risks associated with delay are also substantial.

Significant problems with base protocols are already evident. Given that the necessary changes cannot be implemented overnight, it is appropriate that a major effort to address these problems begin now.

The Internet Analysis Report – 2004 concludes that there are substantial inter-dependencies between protocol reform and governance. The dilemma facing the Internet community is that protocol reform has dependencies on governance reform, but cannot await completion of reform processes.

Protocol reform and governance reform must therefore be addressed in parallel, with some clear understandings among all parties concerned of the need to co-operate fully in ensuring that the next generation protocols and the next generation governance eventually come together in an appropriate manner.

The Internet Analysis Report – 2004 recommends some initial actions in addressing protocol issues. A preliminary range of funding, sponsorship and involvement possibilities are suggested at www.internetmark2.org.

About the Author

Ian Peter became involved in the early beginnings of the Internet in Australia and Asia-Pacific from 1986. Currently a resident of Brisbane, Australia, he is involved with worldwide Internet organisations, provides strategic advice on Internet issues, and maintains a key interest in the early history of the Internet.

In 1993 he founded Ian Peter and Associates Pty Ltd, which works in the areas of strategy, policy, analysis and project management for a wide range of organisations. The company has a proud history of successfully managing change in large organisations, and of innovative approaches to business transformation across a wide range of areas including information technology management, human resource management, and communications management.

Past clients have included the United Nations Environment Program (UNEP), United Nations Conference on Environment and Development (UNCED), Internet Corporation for Assigned Names and Numbers (ICANN-DNSO), Asia Pacific Network Information Centre (APNIC), Telstra, Nortel, Ergon Energy, ABC-TV, Commonwealth of Australia and Queensland Government whole of government initiatives.

Contact details.

Ian Peter

Ian Peter and Associates Pty Ltd

PO Box 10670 Adelaide St

Brisbane 4000 Australia

Tel 617 3870 1181 Mobile 614 1966 7772

Email ian.peter@ianpeter.com

Website www.ianpeter.com

Obtaining a copy of the full report.

The Internet Analysis Report 2004 is a comprehensive study of the state of the Internet in 2004. The study contains an in-depth analysis of issues facing Internet users, emerging issues with Internet protocols, governance bodies and governance issues, and conclusions and recommendations. Reviewed by a panel of international experts, the report has been highly acclaimed for its persuasive and comprehensive coverage of Internet issues.

Details on obtaining copies of the full Internet Analysis Report - 2004 are available from www.internetmark2.org. Licences for organisational use or individual copies are available for purchase, either by credit card payment or by approved Purchase Order. For further details visit the website or contact ian.peter@internetmark2.org.