The Trouble Makers Reloaded

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Introduction

The pressing statements related to the Internet Governance debate regarding future IG regimes to preserve the key principle of Internet architecture - "end-to-end networking" are based on a number of issues that effect not only the countries in general but also have a huge impact on the various stakeholders as outlined in the Internet Governance Working Definition both technical as well as with relevance to the legal or regulatory frameworks.

Technical issues and their relevance

The technical issues rise due to the significance and limitations of the basis and standard of data communication within the Internet itself, i.e. the TCP/IP or Transport Control Protocol/Internet Protocol. The TCP/IP is responsible for managing data transfer over the internet in the form of data packets that are routed from the source to the destination computers interconnected through a very large global and distributed network established by millions of Local Area Networks interconnected to Wide Area Networks interoperable and accessible globally.

The TCP/IP Revolution

The open standards based TCP/IP infrastructure replaced the former NCP (Network Control Protocol) due to its advanced architecture and limitless connectivity power at that time. The TCP/IP is based upon the concept of Packet Switching where by all data at the source is converted into Data Packets, transported over the Internet through TCP/IP and is then reassembled back into its original source at the destination point on the Internet.

Is TCP/IP too intelligent or simply dumb?

The transportation facilitated by TCP/IP is neutral to the source and the destination points as the transport layer itself is not concerned with what the data is, what it does, how did the computer at the origin actually create the document, whether it is a superset of various bundled applications or a subset application itself of a much larger system, how will it be used by the destination sources. This phenomenon and neutrality of the Internet is termed as "end-to-end networking" that leaves all the aspects of innovation, complexity and intelligence to be initiated, developed and managed by the origin or destination ends of the network.

Not Free as in Free Beer, Free as in Freedom of Communication?

This phenomenon can either be termed as freedom of communication or even called the freedom of intellectual practice and innovation as the Internet itself is not concerned with what creativity and intention development is going on at the source points of the destination or origin thus being neutral in between these two points. This gives the freedom to the developers and innovators at the end-points to develop any type of application and simply transfer data to the other side without any interference by the network operators on the Internet.

Secondly, it gives rise to the opportunity of maintaining either identity or anonymity over the network as the network source and destination ends are only verified by their unique IP's (Identification Proxy address and no two computers in the world can have the same IP) that can further be verified in terms of Geo-locations i.e. which regions are these IP's accessing the network from. This anonymity itself can sometimes be useful whereas can be the cause of much trouble under national security policies or global terrorism. Thus "To Be or Not To Be" is a matter of current Internet Governance debates.

The Incredible Hulk of the 21st Century
Another important feature of the Internet is dynamic routing that actually maintains the robustness of the internet to withstand any type of attack, fundamentally a Nuclear Attack, as identified by its US Military Creators ARPANET (Advance Research Project Agency Network) that the US was threatened during its cold war era with the former United Soviet States of Russia (USSR). In reality, the Internet is an offspring of the ARPANET where as the mother network still exists undercover for US Military use only as the "DARPANET" with only an addition of the Defence keyword to its actuality.

The interesting dynamics of Dynamic Routing
More technically speaking, dynamic routing is enabled through the use of Internet Routers that maintain the shortest route to the destination sources maintaining IP address route tables. These routes maintained by routers may be in huge numbers and if any route service is unavailable due to any particular reason including router failures, through dynamic switching, the most relevant or second shortest route is adopted to the destination, thus, if the whole of Japan or Australia would go offline from the Internet, the world would still be online, this accuracy of my statement, itself is debatable as an evidence of a total shutdown of the Internet even as means to test its robustness, has not yet been made available.

However, such test results from DARPANET itself have never been publicly published either. What if the source of all this was in the hands of just one nation, that is the real basis of the Internet Governance debate, who controls who and what over the Internet.

Who controls what? Is TCP/IP and Creativity on the loose? PART-1
The IP addressing itself is a complex array of numbers of three types of classes A, B, C (the classes help formulate the type and number of nodes accessible under a particular IP range). It is imperative for a common man to remember the various IP addresses in order to access various endpoint destinations through the Internet but this is evidently not possible as we cannot practically or eventually memorize over 4 Billion addresses thus and alternative scheme for naming or referencing these numbers (that are ridiculous to the common man) was needed. This was achieved through inventing the Domain Name System (DNS), a masking service that hides the real IP address behind human readable English Language based alphabetic characters sometimes by identifiable words.

The Birth of Internet Governance
Soon after the public offering of the Internet, the official Internet caretaker Department of Commerce (DoC) and the National Science Foundation (NSF) shared responsibilities with the private corporate sector by engaging a company titled Network Solutions (NSI) in 1994 to manage and distribute the DNS to end users though this initiative was not accepted by the various Internet stakeholders. Various stakeholders including local and international public and private entities became part of what was perceived as the "DNS War" refusing NSI's control over the DNS system and this particular point in history gave birth to what we term today as the debate on Internet Governance. The "DNS War" was countered by DoC and NSF by the establishment of the Internet Company for Assigned Names and Numbers (ICANN).

Who controls what? The Trouble Makers. PART-2
The credit goes to ICANN for deliberating the Internet Governance and involvement of various global actors like governments, business and civil society organizations including the United Nations and International Telecommunications Union ITU.

The various functions of the Internet are made possible due to development of standards implemented by various functionaries, for example, the Internet Engineering Task Force (IETF) safeguards the Internet whereas another systematic hierarchy of safeguards exist under the ICANN for issuing and maintaining the IP addressing on the Internet as per the following order:

- Internet Assigned Numbers Authority (IANA), a supplementary arm of ICANN that manages the distribution of blocks of IP numbers to the Regional Internet Registries' (RIR).

These RIR's are responsible for distributing the IP numbers ranges to IXPs and large organizations. Further end users of this ecosystem are ISPs, companies, and individuals. The current RIRs are:

- American Registry for Internet Numbers (ARIN)
- Asia Pacific Network Information Centre (APNIC)
- Latin American and Caribbean IP Address Regional Registry (LACNIC)
- Reseaux IP Européens Network Coordination Centre (RIPE NCC)
- African Registry (AFRINIC)

With reference to the earlier debate about 4 Billion IP addresses being controlled by ICANN are in themselves of huge importance to the Internet Governance debate as the number of network computer servers and hosts connecting to the Internet websites are increasing at a great speed and the IP classes will soon fall short of catering to the needs of stakeholders in the near future. In order to cope with this emerging situation and secondly with the non-availability of most domain names and extensions due to an increasing consumption rate, it is evident that new forms of IP addresses with larger ranges then previously allocated as well as DNS extensions are needed. The Internet Governance debate is also catering to advocating decentralization as well as IP and DNS management activities that are underway at ICANN. Collectively these hold great important to the overall process.

It costs to make the Internet available
With ICANN controlling the Internet on behalf of a developed country like the US and major game players of internet service availability with their origins in the developed world impose a threat to the cheap availability of Internet and the services built around it. The process of connectivity on the Internet does not start at the users end. It first starts at a much higher stage in the hierarchy of the overall Internet technical and regulatory frameworks. Even though the Internet extends to almost all corners of the world, International Interconnection Costs are very high and these high cost services are made available to the developing world at the same prices they are being offered to developed nations thus increasing the Digital Divide.

Costs increase the Digital Divide
Before the Internet, the interconnectivity circuit was based on developing countries controlling access to and gaining revenues by allowing their citizens to use telephones. With the emergence and shift over to the Internet as means for global text, voice and video communications, developing countries are loosing the stronghold on telephony income they previously held and are falling into the traps of highly expensive interconnectivity circuits controlled by developed world entities. This problem arises due to the non-availability of Internet Backbones in the developing world leading towards paying for costs for international circuits. At the end of the ecosystem, there is an individual user who connects through a local ISP. His preferences are based on economic affordability as well as low cost availability of Internet Services irrespective of who interconnects with what.

The Poor Individuals
Individual end users can only access the Internet through their local ISPs that are making the service available at costs affected by the cost of Internet Bandwidth provided by International Bandwidth Providers and circuits. If the costs are high, the end users receive expensive bandwidth. This is a major hurdle in making local content as well as interconnectivity widely available in the developing world. The effect of this can actually be felt by realizing what happens when the cost of using one hour of Internet is equivalent to the daily wages of a farmer in rural southern India? Will they be even able to buy computers to access the Internet or do they yet have electricity in their villages.

The same goes for urban regions, even though there is wide availability of computers and Internet, expensive connectivity discourages wide adoption of the offerings that the Internet Revolutions brings to the common man.

Evil Daemons and Dragons Lurking amidst Human Development?
The evil daemons and dragons are the prevailing costs that are being passed down from the developed to the developing world governments, telecom authorities and companies, ISPs and then to the end users that risks Internet usage due to low income economic positions of these countries. It is hard to give Internet preference over the basic necessities of life like water, food and health and shelter.

According to the (WGIG, p.15), the ITU estimates that, between 1993-98, net flows of telecommunications settlement payments from developed countries to developing amounted to approximately US $40 billion. If this same amount would have been directed into the developing world, it would have been a very different story.

More consumers means more money
The high population numbers further pose an interest to developed world Internet circuit providers and thus we will continue to face very high price offering for Internet access in the future as well. This impedes 'equitable distribution of resources' and 'access for all'. It also affects various political and developmental aspects; including 'investment and funds for development', 'international cooperation' thus it is critical to the 'stable and secure functioning of the Internet'.

The unbalanced equation? VOIP a blessing or a threat?
The issues regarding availability of Voice Over Internet Protocol usually referred to as VOIP itself has emerged as a gift as well as a threat to developing nations. The governments of such nations are more interested gaining revenue from the telecom needs of such a large population number whereas with the emergence of VOIP, this revenue stream is further under threat. The extreme of this situation can be witnessed in countries of South Asia including banning of VOIP and making available such services at very high licensing costs, sometimes in millions of dollars not affordable by start-up business or small and medium enterprise entrepreneurs. This ban is directly extended on to local ISPs by the authorities.

Obsession to prevent Freedom of Speech
In light of the above approach by authorities, it has been seen in many cases of countries like that of China and Pakistan that authorities have also implemented filtering and ban on various kinds of content availability including filters on blogs. The news has been of great heated debate and will constitute future discussions that to what extent will local authorities in their countries of origin implement content regulatory policies filtering such activities. This could imply the creation of running side-by-side Internet "Clones" detaching the nation from the original Internet thus falling out of the real Internet ecosystem totally disrupting end-to-end networking.

Will TCP/IP be always as open as it was? Can the Internet be patented?
The best feature of TCP/IP not then perceived, was its open nature, being based upon open standards, it is widely interoperable with other services over the Internet as well as provides the opportunities to break dominance of emerging proprietarily technologies and platforms. But this issue, itself poses a threat to TCP/IP because the latest enhancements to its various layers by the proprietary software industry players have posed a threat of possible patentability to the basic infrastructure that makes the availability of the Internet possible. The Proprietary Software Industry may claim stake in the ownership of the Internet by claiming infringement damages where their technology enhancements are applicable. This gives rise to the possible issue of "Patenting the Internet"

Who controls what? Evolution of a new Socio-Economic Ecosystem. PART-3
The "end-to-end networking" facilitation gave a new socio-economical impact to humanity by introducing the concept of building industries at the ends that would develop intellectual or knowledge products and eventually evolve into a huge economic system catalysed by the very Internet infrastructure that humanity had just embarked upon a few decades ago. Intellectual creations, expressions and contributions received a new meaning formulating in to industries of mass economic wealth just due to this one grand invention. The Internet has also emerged as the reason of cause as well as answer to reducing the Digital Divide whereas actually achieving this is still a very long story and focus of the Internet Governance debate.

Breaking the CRUX
The World Summit on the Information Society helped the nations of the world realize the emergence of an Information Society globally but amidst these efforts, there are well established Knowledge Economies since the post 1990 era that have immensely benefited from the internet and continue to hold their dominance over the Internet circuit unless the developing nations find means of coping with their plights by investing heavily in Internet Backbones. The cost of doing so will be unimaginably high but it will not result in the public tax payer's money being put to waste as in the case of buying high prices Internet bandwidth from International Circuit monopolists.

Who can benefit from the Knowledge Economy?
The developing nations to realize the need of Internet Backbones and make their availability possible will see victory rather than those that keep focusing their efforts on heavily charging their citizens for VOIP and interconnect charges to the Internet. Some countries in Asia have had access to the Internet since 1995 but still lack E-Commerce and E-Business infrastructures as a result of failure to cope with formulating new policies and regulations or suitably amending previously formulated trade, finance and telecom related policies and legislations that could have evidently helped them join the Information Revolution along with the developed nations. The result of their negligence to do so is being faced by their citizens in an era of the Knowledge Economies that is emerging post Information Society.

Cabling the Knowledge Economy
Where the Internet continues to evolve and grow, Internet Governance debates are also rising in the context of cable operators interfering with the end-to-end nature of the Internet. Cable network operators emerged offering Cable Television services to end users but as the Internet evolved and these cable network operators chose to incorporate Internet services into their cable network offerings gave way to future services such as Broadband Internet and TV thus controlling the choice of who, when and where connects to their cable networks or vice versa. Cable network operators operate via a network of optic fibre cables laid by themselves within their regions of operation.

These networks can be connected to immediately and costs to access them are very low as compared to Internet network connectivity providers secondly the Internet network operators have no ruling or affect over the cable network operators. For end users, they gain access to high speed Internet with an array of additional services that otherwise would never have been possible especially at the cost extended to them by cable network operators. Secondly, in some cases, end users can connect to the cable network operators, freely share files including audio, video, games, documents etc thus forming mini Intranets of their own. These may grow in the future to citywide or nationwide networks thus breaking away from the core Internet infrastructure changing its primary role to a supplementary one.

Furthermore, these small cable networks may create monopolies of their own with their users and share materials of critical destruction thus giving rise to a new form of terrorism or implicit knowledge sharing.

Temporarily ending an interesting debate
From the above discussion, it is indeed evident that "end-to-end connectivity" is a very important factor for the sustainability of the Internet and equitable access by stakeholders. End-to-end connectivity initiated the possibilities for equitable distribution of resources and access for all. It also affects various political and developmental aspects of developed and developing nations and some cases disrupting the current regulatory frameworks in practice.

Huge investment in international connectivity will continue to deprive developing nations of investment and funds for supporting their real socio-economic development issues unless they develop their own Internet Backbones either by themselves or by establishing international cooperation with like minded developed or developing nations. Thus end-to-end networking and net neutrality are critical to promoting freedom of expression, access to knowledge while encouraging the stable and secure functioning of the Internet by taking the Internet Governance debate to a new level of intervention and interest.

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