# MINISTRY OF PUBLIC ADMINISTRATION & INFORMATION

**Discussion on the comments and recommendations to the
Internet Bandwidth Management
consultation document.**

## Introduction

This document summarises points of discussion identified by interested parties through a consultative process.   In the interest of transparency, the document also facilitates the dissemination of the associated responses to those points of interests by the Ministry of Public Administration and Information (MPAI) to all interested stakeholders.

The Ministry would like to first express its gratitude and encouragement at the range of responses received with regard to its consultation document "Internet Bandwidth Management in Trinidad and Tobago".   The consultation process was pursued to encourage wider participation in the development of public policy and any action plans developed in accordance with those policies.   The responses, garnered from a mix of industry participants, private individuals and regional agencies, suggest that to some extent that aim has been achieved, which enriches the input of the issue under consideration going forward.

A comprehensive summary of parties' points of discussion, and the associated responses of the Ministry, is attached at Appendix 1.

## Summary of findings

There seemed to be broad acceptance and support to the thrust pursued by the document.   With one exception, the challenge identified, that of a costly, passive interaction with the wider Internet, has been reiterated by the perspective or respondents who were also willing to share perspectives on ways forward.

To summarise, among the main challenges reinforced after this initial phase of consultation include:

- That a major factor in the high cost of Internet access is the cost of international facilities by which the Internet is accessed;

- That, to a great extent, there is limited (if any) interconnectivity between domestic Internet Service Providers (ISPs) which may be resulting in an increased cost of interaction between parties domestically over the Internet;

- There is the perception that much of the demanded content currently is internationally based, creating a current diseconomy of scale associated with a domestic e-content management industry; and

- There is a need for robust regulatory framework managing the telecommunications sector to facilitate the competitive delivery of Internet-based services.

Other salient points identified by stakeholders include:

- That any initiative to increase domestic interconnectivity would be greatly enforced by a similar regional initiative;

- To adequately compete with the global market for e-content management services, such facilities must meet, at a minimum, critical standards for reliability security etc, as well as attractive pricing packages;

- A range of tax and fiscal incentives should be considered to encourage the roll out of high speed Internet facilities as well as encourage usage;

Common proposed strategies proposed by the stakeholders as possibilities going forward include:

- facilitating the speedy entry and operation of competitive international telecommunications service providers since the liberalisation of the sector is underway;

- domestic and regional peering should be encouraged to facilitate optimal routing of Internet traffic;

- considerable effort should be undertaken, by both the public and private sector, to encourage e-content creation within the Trinidad and Tobago (and the wider Caribbean), for the Trinidad and Tobago (and the wider Caribbean);

- consideration of the appropriate facilities to support the management of e-content, in conjunction with the thrust to encourage e-content creation (particularly by small and medium enterprises). Such may be considered through specialised facilities, ICT-based clusters or a mixture of such initiatives.

**Proposed way forward.**
The results of the consultation suggest that there is broad consensus of initiatives that may be undertaken to address the issue of Internet bandwidth management in

Trinidad and Tobago. There also seems to be broad consensus that such initiatives should be undertaken without compromising the continued development of the competitive marketplace. Accordingly, it is thought that collaboration between the Government and private sector may be essential for the success and sustainability of the initiatives identified.

To further crystallise the key policy proposals that can be discerned from this phase of consultation, as well as any action lines that can be undertaken in the short, medium and long term, the following is proposed:

- that the Ministry engage interested stakeholders in a workshop to finalise a final position paper and action plan for Internet bandwidth management in Trinidad and Tobago.

- That such action plan, once approved by the Executive, act as a blueprint guiding the collaboration of the pubic and private sectors to implement some form of Internet bandwidth management in Trinidad and Tobago

The objectives of the Workshop include:
- Addressing any outstanding concerns that may still persist after the initial phase of the consultation and the Discussion of Recommendations attached at Appendix 1;

- Finalising the draft Internet bandwidth management position/ policy paper;

- Identify the governance framework, operational model, participants and action plan to facilitate domestic Internet routing in the short term; and

- Identify key proposals to encourage content development and management; the role of government and the private sector and the major risks associated with such proposals.

The Workshop is proposed for Wednesday, **November 1st, 2006** at a location to be determined.

Interested parties should contact the ICT Division at fastforward@gov.tt, with the subject **"Internet bandwidth management workshop"** by **October 25th, 2006** to reserve attendance at the workshop. Only participants who have so registered will be invited to the Workshop.

Such reservation should include:
- The name of the reserving party;
- Firm represented;
- The number of persons accompanying the reserving party;
- Any outstanding questions to the preliminary consultation phases.

The Ministry looks forward to the continued collaboration from stakeholders in the national community such that together such challenges can be addressed comprehensively.

**APPENDIX 1**

# DISCUSSION ON COMMENTS AND RECOMMENDATIONS

**Document Name:   Internet Bandwidth Management in Trinidad and Tobago (2006 – 2008)**

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| **Trinidad and Tobago Computer Society** | **Section 8** | We believe that the US is a popular choice for hosting because it is the nearest and cheapest hub for English speaking websites in relation to Trinidad and Tobago. The fact is Trinidad and Tobago does not have the economies of scale to create an affordable and reliable local web hosting environment. | | The Government's perspective geared to the long term goals for wider economic development.

To support a knowledge-driven economy, it must be considered whether the fundamental value adding characteristic of this activity, the ability to develop and manage information, is facilitated.

This paper endeavours to gain feedback from stakeholders on the appropriate key structures necessary to facilitate the development of such activities. |
| | | The "implicit tax" argument is frivolous because even if local web hosting was available, there will still be a need for local users to access international websites in greater quantities than local websites. The document infers that consumers will end up paying an "implicit tax", however such a tax is already subsumed within the Internet subscription fees in the form of 15% Value Added Tax (VAT). | | The precept that "local users [need] to access international websites in greater quantities than local websites" presupposes an inability of local content developers/ entrepreneurs/ marketers to interest our own market.

It is MPAI's hope that the development of a knowledge-based society would encourage a nation which is as interested in its own content/ identity as that of partners/ neighbours. |
| | | The document cites a gaining worldwide acceptance of Internet usage, however this | | The statistic referenced came from the MORI Opinion Leaders Wave 5 (2005) |

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| | | may not be an accurate reflection of the local environment. Proof is found within the document in Section 8.4.2 where Internet penetration rate is set at 17%. Internet usage/penetration relies upon Government initiatives taken to stimulate such activity. | | Survey.  This presented a substantial increase from the statistic at 2003 (8%).<br><br>A stated objective of **fastforward** is to encourage 50% of homes would have computers and regular users of the Internet by 2008.  GoRTT has identified a number of initiatives (referenced in the document) aimed to achieve this benchmark, and it is in view of that end game scenario that the concepts expressed are ultimately geared. |
| | | If Trinidad and Tobago **is** "losing money" the document does not provide the details necessary for the reader to understand to what extent it is occurring. Such information is critical to understanding both the reasoning and feasibility of this proposal. | - | From a macro-economic perspective, a fundamental indicator of economic sustainability and well being is the balance of:<br>1)  inflows,<br>2)  outflows, and<br>3)  Internal activity.<br><br>This document posits that the current, passive approach to accessing the Internet economy is an activity that encourages economic outflows, without encouraging associated economic inflows.<br><br>Further, the table in section 8.4.2 clearly articulates projections of the order of magnitude of the economic drain. |
| | 8.2.4 | There is no description of how the regional cooperation for the creation of central regional hubs will be implemented or even if any such discussions have taken place with any CARICOM leaders. What will be their | | The Honourable Prime Minister of Grenada Dr Keith Mitchell, the CARICOM Prime Minister with responsibility for Science and Technology, recently lamented the fact that CARICOM was not |

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| | | interests or support in this project? We do not know the situation in these countries, their technological levels, the telecommunication situation, their local level of legislation in this area and whether they share similar concerns with regards to bandwidth management. | | doing enough to ensure there was a policy of science, technology and innovation. Accordingly, there is a conscious effort on his part to bring these initiatives forward. His efforts include: **- The Caribbean Centre for Development Administration (CARICAD)**[1] which has been involved in the campaign for CSME through the Regional Technical and Advisory Support Facility (TASF) on e-Government[2] ; - The CARICOM Regional Organization for Standards and Quality (CROSQ) is prsuing initiatives to facilitate the maximizing the use of ICT's in the region. <br><br> While there is much work to still be done, in this context, the discussion of regional NAPs has already been ventilated is thus inline with the general thrust of discussions of the regional Heads. |
| | 8.2.4.1 | This section describes a low Internet penetration rate reflective of a situation whereby the local web hosting may not really be necessary in the immediate future. Once again, it is highly reliant upon Government initiatives and their success. Do these initiatives necessarily increase the amount of local content? The attraction is generally | | Regarding the profile of the Internet user, the comments above are again applicable. |

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[1] http://www.caricad.net
[2] http://www.unpan.org/tasf

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| | | for accessing the global Internet with foreign content.<br><br>There is no information of such initiatives taking place in the rest of CARICOM. | | There are policies and measures set in place which will eventually bring this viable industry to fruition. This is evidenced by work underway in the development of NICT plans of Barbados and Jamaica among others. |
| | 8.2.4.3 | local content is often desirable to persons outside of Trinidad. If local hosting is to be encouraged, the overseas infrastructure links must be reliable and fast enough to allow them to connect to the local servers. | Ultimately, the way forward **MUST** include strengthening the overseas infrastructure links to ensure reliable i**ncoming** bandwidth. | Agreed, this point has been identified as a consideration in document. |
| | 8.3 | it is a false argument to say that lack of local content and services is due to the lack of local web hosting facilities. From the end user's perspective it is easy to upload content via blogs, wikis and other content management systems available online, sometimes even at no cost. How can we compete with this? | | Valid points. However, when there is the consideration for services which need reduced latency, or environments where the service level agreements require some level of information security, there is a legitimate concern that the existing framework may not be able to support these value added considerations.<br><br>Also, is it preferable to always outsource these services to an extra regional (more expensive) economy, as opposed to developing the capacity within the region?<br><br>MPAI is of the belief that maximisation of the socio-economic impact of the "information society" requires the development of indigenous capacity within the nation and region. |
| | 8.4<br>**The effects of hosting** | The preponderance of bandwidth on certain routes suggested in the document, i.e. by | | |

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| | **content via the United States rather than hosting locally** | historical and economic causes, implies that there is nothing that could have been done to prevent the current telecommunication shortfall. Citizens were made to believe that the Cable & Wireless deal in the late eighties would have addressed or solved this problem, but due to its failure of providing reliable incoming bandwidth in the early 1990's content had to be hosted abroad. Therefore lack of foresight by the then Government and the monopolistic provider mentioned exacerbated the current Situation. | | It may be disingenuous to believe that this reflects an issue of "lack of foresight" by an Administration of the 1980's as the economics of the Internet…the main theme of the document's introduction…did not exist at the time.

Further, the implications on national economies only became evident in the international arena in the late 1990's.

Of critical importance is the realization that there is an opportunity now to act strategically as we move forward. |
| | **8.4.1 The effect on Internet download and response times** | Again, regardless of whether domestic hosting can improve the response times of receiving local content, it is still important to invest in the international gateway to garner the benefits of local hosting eg. As an outsourcing destination etc. | | Again agreed.

One should also note the granting of at least seven (7) telecommunications concessions to facilitate the provision of independent international telecommunications facilities. (see www.tatt.org.tt.) |
| | **8.4.2 The effect on the national macro economic posititition** | Table 1 states that the average monthly cost of bandwidth of 1.544 Mbps to the consumer is $12,000.00 USD for both TSTT and ISPs. However, is this a fair market value based on the actual cost? What is the actual cost that TSTT pays for external bandwidth? Could this be an area of monopoly abuse? | | RE; TSTT's projected cost; the comments are appreciated.

The objective was indeed geared to identifying the cost to TSTT, however the information was not forthcoming. Accordingly, as the table is really to identify the scale/ magnitude of the cost, the benchmark price (at the time) for VSAT circuits was used as a proxy of what the cost may be. |

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| | | Also the document states that only way to limit the "hidden cost" of the utilization of the international carriage is to review how the internet access is managed locally. An alternative would be the liberalization of the international telecommunication market, such that other companies may run fiber optic lines to Trinidad and Tobago.<br><br>Again, the "one stop point of interconnection" of the ISPs infers that the demand for external web content is not as great as internal local web content, which is simply not the case. | | The international market was liberalised as of 30th December 2005. It is assumed that concessionaires are pursuing the necessary due diligences before the launch of their services.<br><br>As evidenced in the document, information suggests that in regions worldwide, as Internet penetration grows, the need for domestic-focussed content becomes more relevant and demanded. |
| | **8.6.1 – 8.6.5 – Techniques for Improving Efficient Utilization of Bandwidth** | While the techniques are useful and some already implemented by many local ISPs already, one method for improving efficient utilisation of bandwidth is for local and government websites (be it hosted locally or overseas) to be designed with web standards. Web standards are technologies, established by the W3C and other standards bodies, that are used to create and interpret web-based content. These technologies are designed to future-proof documents published on the Web and to make those documents accessible to as many as possible. A key part of web standards is the separation of content from its presentation (colours, fonts, layout, positioning) using Cascading Style Sheets. | local websites (especially government websites) should be redesigned to accommodate web standards which can save time and money for website creators, and provide a better experience to the website's visitors.<br><br>Ultimately, the way forward **MUST** include :<br>● expanding our external bandwidth links and allowing local companies to land their own fiber optic cables and to get access to existing fiber optic cables already landed in Trinidad and Tobago.<br><br>● improve broadband internet penetration throughout Trinidad and Tobago. Without Internet access, there would be little incentive to create content and the | These points are noted. There are Public service policies and guidelines already set out to address this. They are detailed and comprehensive in nature and address these concerns. When finalised, it is the intention to publish these as well.<br><br>As stated, the international telecommunications market is already liberalised. "Local companies" may indeed "land their own fibre optic cables" today.<br><br>It is thought that this would be the interest of the over 10 ISP's (including TSTT) which operate in the liberalised domestic market. |

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| | | | existing content will not be accessible.<br><br>The Government must consider treating ICT infrastructure as vital as roads, electricity and water. | Indeed GoRTT does consider such infrastructure vital as is evidenced by the promulgation of the Telecommunications Act (2001) as amended, the liberalisation of all aspects of the telecommunications sector, and in fact, the document under discussion. |
| | | | | |
| **Association of independent internet service providers**<br><br>**Members**:<br>- CableNett,<br>- Caribbean Interactive Multimedia Limited,<br>- Cari-Direc,<br>- Carib-Link,<br>- Illuminat,<br>- Interserve,<br>- ITAL,<br>- Lisa Communications,<br>- Open Telecom,<br>- Opus Network,<br>- Wow.net, | | The identified solutions included increased local content development and local content hosting, as well as the development of a centralized IXP both within CARICOM countries and in Trinidad and Tobago.<br><br>Although these initiatives should be encouraged by the national government in order to reap the obvious 'net economies of scale, the AIISP position strongly leans towards resolving critical, immediate issues in the short term and solicits the Government of Trinidad and Tobago and by extension the Ministry of Public Administration and Information to place high on its agenda the following:<br><br>We are definitely in support of some Ministry suggestions such as deployment of a local Internet exchange point and we would encourage the Ministry to move forward with | 1. Timely regulatory sanctions against telecommunication companies who indulge in anti-competitive practices, and thereby bring order to the sector as proposed by the Telecommunications Act (2001).<br><br>The AIISP refers the Ministry to the anti-competitive SMARTChoice offer by TSTT, which has been unresolved since the Association raised the issue over 12 months ago.  One of our members has already been compelled to cease connectivity operations.<br><br>2. Provision of tangible technical and legal mechanisms for implementing ISP sector initiatives such as local loop unbundling by the incumbent. | Preliminary framework for such is already enshrined in the Unified Concession to provide telecommunications networks and services and broadcast services (available at the Telecommunications Authority website: www.tatt.org.tt; alternatively at www.fastforward.tt)<br><br>Noted.  The appropriate agency to express this complaint, and act to mitigate against said, is the Telecommunications Authority of Trinidad and Tobago.<br><br><br>Noted.  The Telecommunications Authority is considering such frameworks. |

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| | | this initiative. We can also solicit our membership to provide resources. However, the first step in this regard should be a quantitative analysis of local ISP to local ISP traffic. Our preliminary, non-statistical assessment is that we will address less than 10% of the country's bandwidth constraints and the resulting hindrance to broadband growth with full deployment of a local Internet exchange point. In short, such an initiative becomes important, but in no way sufficient | 3. Enforcement of accounting separation to avoid cross subsidization and other anti-competitive practices which can distort the off-island bandwidth market and create major diseconomies.<br><br>The above matters are viewed by our membership as being most critical to the growth of the sector.<br><br>In addition, fiscal incentives should also be considered as key mechanisms that can help to jump-start the industry. Such fiscal incentives could include:<br><br>• removal of VAT for Internet connectivity (esp. broadband)<br><br>• removal of VAT and duties on customer premise equipment such as modems, wireless antennae, etc. | Noted. The Telecommunications Authority is considering such frameworks.<br><br>While all of these recommendations are creditable, and thus warrant urgent review, these are all concerns of the "access network" The document in question sought to focus considerations on adaptations to the "core" or "backhaul" network(s) of T&T.<br><br>The proposals for tax and fiscal incentives are noted with interest. |
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| **Telecommunications Services of Trinidad and Tobago** | Response: **Section 8** – "…there are two major limiting variables that directly affect the implementation of a hosting industry in Trinidad and Tobago."' | Not the case. This view is simplistic and does not consider wider economic views on the ability to create and manage content locally on the same scales as more developed nations; availability of hardware and expertise; and connectivity. | | |
| | **Section 8.2.1** "…The oligopoly being created at the core of the Internet is not likely to become more transparent or customer friendly without appropriate regulatory oversight". | The Ministry should recognize that below-cost access services are mainly responsible for the migration of traffic to the Internet being economically damaging. If access services were efficiently charged for, then despite Internet traffic being migrated to Internet carriage, as described by the paper under the section titled "An unexpected threat to traditional international telecommunications", domestic carriers would be able to recover their costs from the retail access services they offer their customers. However, as long as access prices are below costs of provision, the problem described by the Ministry exists and is exacerbated. While the Ministry is seeking to addresses the charges of foreign carriers, the Ministry is failing to look at the below-cost charges that exist under its own purview. | This is simply a reflection of the direction in which technology is evolving. To ensure the national economic framework of Trinidad and Tobago is not unnecessarily disadvantaged, the Authority needs to promote the adoption of market-oriented rates for ALL telecommunications services, and do not permit any subsidies to remain in existence, as the persistence of these subsidies would be to the dire detriment of Trinidad and Tobago. | On the comment regarding "below cost access". This issue is not relevant to the document in question and the issue under discussion.

The Ministry is of the view that there should be no anomalies existing in the marketplace that distort competition in any segment of the telecommunications sector, however, the appropriate agency with the jurisdiction to address such issues in the market is the Telecommunications Authority of Trinidad and Tobago.

On the suggestion here that once this "deficit" is recouped, this problem disappears. This is an interesting position as the paper posits that, from the perspective of the core network, if all traffic were to migrate to IP, and international interconnection frameworks tend to mirror the peering model, international landed minutes stand to cost |

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| | | | | the Core network foreign currency as opposed to earning foreign currency. |
| | **Section 8.2.4.1** " Increase Computer and Internet Penetration Rates" | Suggest "Computing or Internet capable devices" | | Noted. |
| | Encourage the development of indigenous content. | The capability to build computers from imported parts should also be encouraged where the built machines encourage greater participation in hardware design and support as well as the opportunity for reduced costs. | | Noted. |
| | | | - | - |
| | **Section 8.2.4.2** "alternative high speed local access technologies" | Need to differentiate this issue of "alternative technologies" from higher bandwidth in the local loop | | Noted. |
| | **Key point 2:** | The development of content focused services is key from a governmental perspective.<br><br>The provision of opportunities for industry to interact electronically with government (via government portals, authority key servers / trusted parties) is equally important.<br>Other government assisted strategies, tax credits on specific computer training and certification for companies and/or individuals, tax breaks for computer companies, greater use of indigenous software by government, focus of intellectual property rights should be considered.<br><br>It is highly unrealistic that the Authority has the power to determine the rates that ISPs | | Noted.  GoRTT is in parallel pursuing a number of initiatives, as outlined in the NICT strategy *fastforward* which address these specific questions.<br><br>Recommendations for tax and fiscal incentives are noted.<br><br><br><br>Perspective noted. |

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| | | pay for bandwidth to external parties. While the Authority may have sight of such charges, these external parties are not governed by the regulatory framework of T&T, and hence the Authority has little or no say in what charges these parties apply for their services. | | |
| | **Section 8.4** "…ISPs connect to the Internet via expensive international bandwidth solutions such as VSAT and fibre…most data traffic flows out over these expensive connection even if intended for a local destination…" | Not accurate. | | If the description of the status quo is inaccurate, it would be appreciated if TSTT proffer a description which is more accurate. |
| | "Another aspect of the external bandwidth challenge in facilitating a domestic hosting industry is the need for upgrade of external links if hosting is implemented in the traditional sense, that is, remote from the US backbone, in locations such as Trinidad and Tobago. To illustrate the concern, consider the following; if a company began the domestic hosting of local content which is however geared to the international market, the Trinidad & Tobago based hosting provider will find that | This would take an enormous amount of capacity going outbound for this to become a factor. In fact, this phenomenon would encourage more efficient use of inbound telecommunications facilities, as presently, Internet use is generally asymmetric – download requirements are substantially greater than upload requirements, and hence a lot of capacity heading outbound from Trinidad and Tobago is unutilized. Domestic hosting of local content as described would see more even usage of upstream and downstream international capacity leaving Trinidad and Tobago. | - | Noted. |

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| | while it saves foreign exchange in investing in a US based hosting agent, the cost of U.S. bandwidth, which will be reflected in subscription costs to its ISP, will increase as there will be a need to strengthen the inbound telecommunications facilities." | | | |
| | **Section 8.4.2 Table** | Why are TSTT's costs identified but the same treatment is not meted out in respect of Columbus, CableNett or other ISPs? Either identify costs of all participants or keep all confidential. Discriminatory behaviour. | | Noted. Any such perception of unequal treatment is unfortunate. The table will be corrected to be equally non-explicit regarding the data for all operators. |
| | **Figure 3 – Demand-supply curve** | The illustration is extremely simplistic and needs to be re-examined, as at price $P_m$, which is defined as the price due to excess bandwidth, the quantity of supply is close to 0, and is far less than demand. | | This belies a misunderstanding of the graphs… a generic supply demand curve. The Prices $P_m$ etc. refer to those prices on the Demand curve (as buyers of access to the global Internet, the country remains buyers in this sense) that can be expected based on the associated supply dynamic. |
| | | Furthermore, high prices may also be as a result of lack of supply, and not necessarily due to monopolistic behaviour, as proposed by the diagram. | | Noted. The textual description shall be modified to more accurately reflect the graphical representation: that monopolistic behaviour may be attributed specifically to situations where prices are higher than expected for specified ranges of quantities of supplied bandwidth …characterised by Area B. |

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| | Section 8.4.3 | Network security contains many more components than described. It includes authentication of users, protection of data and computing resources, and integrity of both users and data, among other factors. This report has trivialized a critical matter, which would need further examination and discussion among key stakeholders. | | Noted. These factors will be included as factors which are to be considered in reviewing network security. However, this was not the point behind this section.<br><br>This section's point of argument was actually that legally, because of the US Patriot Act (2001), there is the concern among legal minds that data stored in US loci may be subject to review by the US Homeland Security Agency without the data owner's knowledge.<br><br>Does such an environment merit concern for commercially sensitive data? |
| | Key Point 3: | TSTT does not agree with the description of the status quo. As described above, there are a lot of other factors that would affect the pricing of services, as well as some key matters have not been looked at in its entirety | - | It would be appreciated if TSTT could articulate what these other considerations are. |
| | Key point 4. | Hosting can become a viable opportunity. It is not presently.<br><br>Development of a mature hosting service is a bit of a chicken and the egg situation. Capability (service providers, authors, business practices) have to meet with capacity and costs. Economies of scale will continue to be a deterrent. | Government can provide incubators for eBusinesses that include: 1) hosting; 2) office facilities; 3) competitive prizes that encourage entrepreneurship in the field, etc | TSTT's apparent philosophical agreement is appreciated.<br><br>All recommendations are noted as possible ways forward.<br><br>TSTT's proposal that GoRTT "provide" a hosting framework within incubators is noted with interest. |

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| | | | The introduction of a peering facility can be tied to the establishment of regional NAPs. | Noted. |
| | **Key point 5.** | Most of the strategies identified are implemented<br><br>Cache servers have been the least successful. | | Noted.<br><br>It would be appreciated if TSTT clarifies its suggestion that there is domestic ISP connection implemented currently, and whether this interconnection facilitates any to any routing. |
| | | | | |
| Ajmal Nazir | Section No: 8.0-8.2.3 | The description of the status quo is correct. However a fundamental understanding or an emphasis of why this has happened is lacking.  Simply put historically and currently, most of the investment coupled with long term vision had been and is held by not only these large US based organizations such as MCI, but it is also fully supported through not just words but legal framework of the governments, in our case the US.  Although admittedly as a developing nation our hands may be tied in regards to heavy investment but a long term vision and policy is not restricted.<br><br>Your status quo is accurate in regards to bandwidth and Tier 1 backend connectivity, and how the developing nations are having to pay twice, for traffic from us to the internet and then from the internet to us. | However, I feel the last section 8.2.3 regarding the threat to international telecommunications can do with a little elaboration, as much as you or the author may see this as a threat, I see this as an opportunity and a challenge. | Noted.<br><br>The threat referred to was not based on protecting any particular business model or telephone technology.  The threat is based on the presumption that, as all telephony migrates to VoIP, if the prevailing international peering/ interconnection model is transferred to the telecommunications space, all international telecommunications will mirror the economic model of the Internet: always out flowing payments from smaller economies into the larger tier 1 carriers.<br><br>Noted. |
| | | let us take a look at the international voice market, where the example of Jamaica was | The local strategy should be to explore how we can move with the times, | |

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| | | given as an example.  There are two ways a call from the US can reach someone in Trinidad using the internet:<br>1.the US and the Trinidadian recipient subscrib<br>2.a VOIP gateway is sitting in Trinidad is interfa<br><br>A fundamental flaw in 2 is that, in Trinidad it is not legal to interface a VOIP gateway like that to the PSTN, | So if the government was to encourage and make it easy for local businesses to offer these services, a local Vonage type of companies would evolve, where Trinidadian subscribers would subscribe to the local companies, paying money to the local companies, and hence reducing the outflow of revenue.<br><br>Even in this case, the VOIP, traffic travelling over the Internet, will cause an outflow of funds through international bandwidth.  This we can't avoid, only minimize,… however we can avoid making the same mistake twice and acting today rather then in a years time<br><br>Liberalising the domestic telecommunications environment is the key catalyst,. | Actually the current regulatory regime is sufficiently technology agnostic that it does not prohibit the establishment of a VoIP telephone company operating in T&T.<br><br>The firm merely needs to acquire the appropriate concession (type 1, 2 or 3 fixed/ mobile telecoms concession) and meet the appropriate Quality of Service measure (e.g. voice transmission of at least Mean Opinion Score (MOS) of 4) |
| | Section No: 8.2.4 -8.2.4.4 | I totally agree with the situation and what needs to be done.  The introduction of formal application to offer ISP services is acting as a major hindrance in this<br><br>I don't think much of power line data services, it really has not taken off anywhere.  Wireless is a different case, there is a lot of activity going on here, it is the cheapest and quickest form of infrastructure available to deploy to achieve mass coverage of service.  …One of the biggest issues with Wireless communication is the management of the RF spectrum and requiring formal | It has been statistically proven that those markets where there is little or no approval required for ISP's to operate, the market has developed quicker with higher penetration.  I can provide case studies on this if required. | Noted.   The Telecommunications Act (2001) as amended mandates that all telecommunications service providers (irrespective of voice or data) gain a concession.  This may be a too edged sword:  while there is the additional regulatory burden, there is the potential to take advantage of regulatory rights afforded to concessionaires.<br><br>See sections 23 through 26 of said Telecommunications Act. |

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| | | approval/permission to operate on a certain bands. | TATT can go a long way by opening up the bands which are internationally unlicensed, this would again fuel the entrepreneur, to use the technology that has already been developed, to invest in new processes and businesses models, creating a roadmap for quicker penetration. | TATT is already pursuing similar lines of thought. Please note the "Broadband Wireless Access Spectrum Plan" available at www.tatt.org.tt. |
| | Section No: 8.3– 8.4.3 | I strongly believe that all the figures in Table 1 to be totally inaccurate. | Without commenting TSTT bandwidth capacity, I can tell you now that I find it extremely difficult to believe that we only have 45MB of VSAT bandwidth, in my opinion we have 3 times this number.<br><br>What I can tell you categorically is that:<br>• 1MB of VSAT bandwidth does not cost $12,000USD, the current market rate is $2300-$2800USD for half duplex.<br><br>• Fiber is sold in E1 circuits that is 2MB full duplex at a cost of $2000USD and not $12,000USD (although the customer inside Trinidad never sees these prices due to crippling mark ups) | Noted. As sources are reviewed to ensure accuracy on update, these projected rats will also be considered. |
| | | However, this does not contradict your major point, that we are depleting local funds to pay for international bandwidth. | The situation can be drastically improved if alternative fiber was available, competition would drive down the price, which means that we would not need to pay the high VSAT rates and hence pay cheaper fiber rates. Although we are still paying foreign based companies and hence cash outflow, we are reducing this. I am aware that with | Noted. The Ministry also anxiously awaits the arrival of competitive fibre concessionaires. |

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| | | | recent 7 concessions given, this will now happen. | |
| | | The fact it has taken so long for this to happen in the first place has caused a lot of capital to flow out of the country through VSAT charges which could have been avoided if fiber was available at a reasonable markup price, and then this same capital could have been invested back into Trinidad's ICT.<br><br>Again, we can't change the situation of how the international agreements are set, where we pay for both sides of the link, although we can hope that in time something may rectify the imbalance. | We can do a lot to minimize how much we rely on this connectivity and also make sure we are not paying any more then we need to. | Agreed. |
| | Section No: 8.5-8.5.1.3 | The cost of tt domain is ridiculous, and totally unjustifiable, the administration cost is minimal, and I am aware of parties that would do this for next to nothing, there is no reason why we should be charging more then $20TT per domain name. | All I can say for this section is that, all you need to do is to provide an IAX, then all the local hosting, warehousing and content based industry will flourish, until then, there is nothing you can do that would encourage this. It is simple economics, it is way too expensive unless we have a local IXP. | Noted and welcomed |
| | Section No: 8.6-9.6.6.1 | All of the techniques mentioned are already deployed by every single ISP, like stated before, entrepreneurs are extremely resourceful as long as you do not restrict them. Since you don't need a concession for oversubscription, caching, mirroring, etc… they are all doing it. | IXP, this is the one single most important thing that we need to introduce into Trinidad, it will give berth to the whole data warehousing, local hosting, etc.. industry, creating jobs, knowledge and a new breed of engineers. In addition to this it will go along long way to reducing our high | Noted.<br><br>What would be recommended as the preferred governance framework for the IXP?<br>1) GoRTT install and manage, or<br>2) Public/ Private sector |

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| | | Compression: Peribit, and many other solutions<br><br>Dynamic Allocation: This is known as traffic shaping, and there are many appliances for this, CISC, Xpand, peribit, Pacetshaper, Allot, linux server<br><br>Cache Engines: Squid, Blue Coat, PeerApp, NetApp, etc… | backbone costs and reliance on connectivity to the US.<br><br>Businesses can be set up without ever requiring the expensive connectivity infrastructure for an internet backbone, these businesses will connect to the IAX and focus on providing a local service to the local market. The report and case study makes it clear. So my question is why has it not be done? It requires $5000USD router to run BGP and then for all the ISP's to connect to it. | partnership?<br><br>If the latter, how should this be managed, and where should this facility ideally be located in the near, medium and long term? |
| | General comments | | With the amount of satellite bandwidth being consumed by Trinidad at the moment, it easily possible for us to lease a satellite Transponder or two on a long term contract at a reduced price, e.g 36MHz transponder can be leased at a cost of about $100,000USD per month. We have the customer base for this. It can be used for a multitude of services. What this will do is reduce the over all cost to our economy, create local jobs as we will need local knowledge to operate/maintain it.<br><br>Taking a step further from this, we can use the transponders to provide connectivity between the Caribbean islands, this will act like a IAX for all the islands in the sky. If the CARICOM governments can agree on such a program, very quickly you are looking at a large number of transponders to meet the requirements and demand, it will be much cheaper then what the | Noted.<br><br><br><br><br><br>A cost benefit analyses of the best way to connect the lower eastern Caribbean (via fibre, terrestrial wireless or satellite) should indeed be undertaken in the near future. |

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| | | | current cost to the US resellers is. It will be the first step towards the pan Caribbean Space program. Once you can fill up about 10 transponders, which with the number of satellite broadcast channels in the Caribbean will not be a problem, you can look into your very won satellite.<br><br>As a rough guide, the cost to build and launch a satellite is about $250millionUSD, it will stay up their for about 15 years, with typical running costs of about $8million. In collaboration with all the other Caribbean countries this can be a major success.<br><br>The benefits of this are endless, and beyond the scope of this writing. | |
| Bevil M. Wooding Congress WBN http://www.congresswn.org | 8.2.3: "If this becomes the norm, international telecommunications will effectively become a loss making, capital draining activity for developing economies, or those geographically removed from the US backbone NAPs." | This assessment is only true if developing countries continue to play by the same rules as developed countries. | The challenge for developing countries and small-island states in particular, is to devise strategies that take into full account the uniqueness of their economic and social environments. Only then can the present threat begin to be understood as a significant opportunity and future platform for national and regional development. | Very good point. It is hoped that this discourse is the first step into a wider debate in this regard. |
| | | In fact, the pathway to leveraging the potential of the current telecommunications can only be successfully navigated and full economic benefit realised in the context of national consensus and regional cooperation. | I therefore believe the description of the status quo needs to include the current context of limited and uncoordinated national dialogue on telecommunications and the absence of effective regional machinery for telecommunications governance, management and policy | Noted. Such sentiment will be considered in subsequent drafts of the document. |

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| | | | development. | |
| | | This is critical to an understanding of telecommunications challenges being faced here in Trinidad and Tobago as well as in the wider Caribbean region. | Reference should be made to the current pricing and tariff negotiation methodology as well as to the vendor and procurement profile if one is to present a full picture of the current landscape. | Such is referred to only tangentially in the current document. Efforts shall be made to explicitly discuss the current state, and what may be needed from developing states and regions. |
| | 8.2.3: "Going forward, to encourage a more meaningful participation in the Internet economy, governments of developing states should consider developing initiatives to re-engineer how they interact with the wider Internet." | "closing" the gap cannot be achieved without the deliberate, systematic and strategic development and facilitation of a truly indigenous "net-producer" telecommunications services industry.<br><br>This development and facilitation responsibility is not, however, the exclusive responsibility of Government. The Private Sector and Education system in particular will have to play key roles in bringing this to pass. Government main responsibility is ensuring the enabling environment, including policies, regional and international arrangements and appropriate incentives | I completely agree with the underlying point in this statement and advocate stronger language be used here to underscore its importance. I suggest the following revision:<br><br>"Going forward, if governments of developing states are to reduce the dependence on external control over one of the most significant levers to development - telecommunications - and encourage a more meaningful participation in the Internet economy, they must consider investing in developing and supporting initiatives to re-engineer how they interact with the wider Internet." | The recommended language shall indeed be considered. |
| | Key point 3: | I believe the description of the status quo is generally accurate. I also agree with the general points made, however, there is an important prevailing mindset that also needs to considered when one examines the host-local vs host-foreign debate.<br><br>"A Domestic hosting industry can go a long way in achieving these milestones. To | Obviously, there are numerous challenges that must be overcome, including,<br><br>• bandwidth costs<br><br>• reliable infrastructure (facility, hardware, essential services)<br><br>• development of local content | These requirements are noted, the enabling frameworks for some of which are being actively pursued by the MPAI through the *fastforward* initiative. |

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| | | facilitate this, world-class hosting infrastructure must be created in emerging economies so that locally generated content will be hosted predominantly in the region and not outside it, thereby saving lucrative foreign exchange revenues and safeguarding information sovereignty." <br><br> to facilitate this first requires a consumer provider and a consumer public that believe local content and local infrastructure are reliable and desirable. <br><br> The statistics regarding number of hosts in a US city vs number of hosts in the Caribbean and Africa are quite telling. While it is undeniable that US ISPs enjoy both the economies of scale and the robustness of infrastructure of the North-American market, the fact that the majority of US providers do not have "world-class" hosting solutions and don't serve up "world-class" content is often neglected. <br><br> Yet the psychology of developing state businesses, consumers and even governments often seem to reflexively incline toward the belief that the foreign is the better. This is reflected in the proclivity for foreign goods and services over indigenous products and can also be seen in the near universal use of dot-com domains over local addresses like ".co.tt" and ".co.jm" | •      fulfillment infrastructure (movement of goods and services <br><br> Several of these have been identified and adequately elaborated upon in the paper. <br><br><br> However, the solution, like the problem, goes far deeper than the absence of enabling infrastructure. Attention must be paid to shifting the prevailing mindset regarding the value foreign goods and services versus local. | The need for better sensitisation of the general public, and private enterprise in particular is noted. |
| | Key Point 4: | I agree with the analysis of the gap and the | Thus, I believe that from a practical stand- | Noted, and shall be considered in future |

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| | | general nature of these key activities. The nature of the investment required to set up an effective local hosting facility to compete with equivalent facilities in the U.S. is such that it have the capacity to support both local (T&T) and regional markets. | point, the paper should make reference to Government's commitment taking a leadership role in the local-hosting shift.<br><br>Furthermore, I believe this leadership role should extend to CARICOM in the form of, for example, a Regional e-Government Services Centre. | versions of the draft document.<br><br><br>Again, strongly noted, and shall be considered in future deliberations. |
| | | This can serve as a model and a catalyst to the aggregation of regional content and ultimately, regional Internet traffic. Again, the implication is that a regional, as opposed to a local, approach is employed. It is entirely possible that proof-of-concepts be localized.<br><br>However, if the main objective is the radical transformation of the Internet usage status quo, then it can only be achieved by a well-coordinated, collective, collaborative regional strategy.<br><br>Standing alone simply does not provide the market economies to allow for meaningful or sustainable transformation of the current landscape. | Thus, in response to the question "Is hosting a viable industry in Trinidad and Tobago?", the answer is a conditional "Yes".  Yes, if<br><br>• high-speed bandwidth is available at better than globally competitive rates<br><br>• hosting facilities are constructed equivalent to international standards<br><br>• early-adopters come on stream providing high-value, high-visibility content and services that  bolster public-confidence<br><br>• beyond website-hosting, the facility provides application hosting and other network management services<br><br>• paralleled with a public-sensitization / support | This checklist is insightful of a perspective of the various streams that have to be undertaken to push this forward.<br><br>They are noted with interest, and shall be included in further deliberations on this specific issue, as well as others so related. |

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| | | | campaign designed to shift mindsets to "local is as good and most time better than foreign"<br><br>• paralleled with introduction of necessary policy and trade machinery | |
| ` | Key Point 5: | I am in general agreement with the analysis My organisation is engaged in the internet-based broadcasting of live as well as pre-recorded events as well as distribution of training and teaching material via the internet on a routine basis.<br><br>A significant amount of this content is targeted to regions, such as Africa, where dial-up access is still the norm.<br><br>Consequently, we have had to deploy several of the bandwidth management strategies discussed from our headquarters here in Trinidad and Tobago.<br><br>The implementation, from an end-user standpoint can be considered to be successful.  However, the cost and hassle of securing even minimal levels of local bandwidth would easily discourage the lesser motivated.<br>Our current implementation, involves from our base in Trinidad<br><br>• Weekly video broadcasts of 2 – 3 hours to an audience of over 150 | Government can assist in the implementation in the method by continuing it work through the *fastforward* initiative and other strategies aimed at galvanizing the local ICT community.<br><br> In addition Government could share the leadership responsibility in articulating a regional strategy for Internet Governance and ICT generally. | The need to "galvanise the local ICT community" is again strongly noted. |

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| | | users based in the US, Barbados, Jamaica, St Lucia, Bahamas, Belize, South Africa, England, Wales, New Zealand, Germany, Kazakhstan, Canada and the US<br><br>• Hosting of an Internet-Radio<br><br>• On-Demand audio and video content<br><br>• Online Event Registration<br><br>The gymnastics required to secure the bandwidth to support this, even minimally, forced us to move to a hybrid local/ foreign hosting arrangement.  The preference would be to have local produced content, served from our local servers to our global audience. The costs to achieve this are simply too prohibitive at this time. | | |
| Caribbean Telecommunications Union, | General | 1. The paper titled "Internet Bandwidth Management …" seeks feedback and proposals for facilitating a more proactive relationship with the wider internet thus encouraging an environment conducive to indigenous content development and innovative services.<br><br>2. Under 3. Scope of Application, telecommunications service providers could also be a category listed. | The title, aim and objectives are at odds since the title focuses entirely on infrastructure issues and not at all on content development which requires strategic systems and mechanisms to identify, assess, collate and package local content for dissemination over the infrastructure. | Comments are noted.  However, Indigenous content development is but one of many courses of action identified as treating with what remains an economic (as well as infrastructural) question.<br><br><br>Comment noted. |

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| | Key point 1 | The terms "peering" and NAPs (Network Access Points) introduced in section 8.2.1 can more accurately be explained. | For example, with peering it is not explained how the capital costs of interconnection are met. | Different models of cost recovery apply, depending on the jurisdiction and / or peering partners. An indication of such shall be included in further publications. |
| | | Also, the term NAP is more often used to refer to a facility at which multiple peering networks interconnect rather than to an access point for a lower tiered ISP to a higher tiered network. | | Equally, authors use the term "NAP" to refer to the location where both types of interconnection are facilitated. |
| | | the abbreviation IMS should be correctly explained to stand for IP Multimedia Subsystem | | Noted. |
| | | the "unexpected threat" as described does not mention the minor benefit of reduced cost termination of traffic into the USA for the "remote" carrier. | The remote carrier might also consider the option of establishing an affiliate on US soil if the regulatory environment allows. | While the fact that termination rates are reduced, MPAI believes that such is not as potent a point when compared to the fact that instead of gaining revenue from inbound traffic, there will instead be a drain on revenue if the current IP interconnection model is applied to international telecommunications. |
| | | 8.2.4.1. There is a US$100.00 laptop programme which may aid in increasing the penetration rates. | | Noted. |
| | | Active competition in broadband access provision (e.g. wireless, cable or local loop unbundling) and diversity in the international connectivity facilities (e.g. competing submarine fibre facilities) will facilitate price | | Agreed and noted. |

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| | | reductions and promote greater access. | | |
| | Key point 2 | 1.      The point of these discussions appears to be that of content, traffic and tariff asymmetry and how these imbalances may be corrected.<br>…<br><br>3.      Access to affordable local and regional broadband facilities which guarantee a good consumer experience (Quality of service) must be given higher priority.<br><br>4.      Governments must drive the development of local content industry in concert with the private sector and NGOs. It will not happen spontaneously. Local content development (especially from the perspective of our national heritage) should have been an on-going activity even without having the benefit of the internet. | 2.      The CSME should provide impetus for regional NAPs/IXP to facilitate intra-regional traffic flows. | Agreed and noted.<br><br><br>The promulgation of the Telecommunications Act (2001 as amended), and the subsequent issuance of Concessions for both fixed and international telecommunications networks and services should assist in facilitating point (3)<br><br>Comment noted.  However, the role of Government to facilitate this 'drive' needs to be appropriately developed.. |
| | Key point 3 | 8.4.2    The narrative referring to Table 1 seems concerned with the costs of international facilities which ISPs must recoup however (especially in the case of TSTT) the data in the table are marked-up prices which are likely much higher than the costs to be recovered. In addition, the table calculations or notes do not mention that significant volume discounts apply which would render the calculations of total monthly and annual costs to be overstated. | | A concern shared by contributors above, and thus noted. |

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| | Key point 4 | A fair assessment.<br>1.     The point of the CSME providing an impetus for regional NAPs/IXP to facilitate intra-regional traffic flows is reiterated here. If a business case can not be developed for Trinidad & Tobago for national hosting facilities, collectively, there is merit for regional facilities and a regional approach to the body of Caribbean content.<br><br>2.     Quality of service and security issues must be addressed comprehensively to build a brand in which consumers can have confidence. | | Perspective is noted with interest.<br><br><br>Such has been identified by other contributors, and as such is noted. |
| | Key point 5 | A fair assessment. The CTU supports the concept of regional Internet exchange points. | | Noted. |
| | | | | |