

**MORATEL INTERNATIONAL PTE LTD**

RESPONSE TO THE

CONSULTATION PAPER ISSUED BY THE INFO-COMMUNICATIONS DEVELOPMENT  
AUTHORITY OF SINGAPORE

**THE INTERNET PROTOCOL TRANSIT AND PEERING LANDSCAPE IN SINGAPORE**

3 March 2015

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Attn: Aileen Chia (Ms)  
Deputy Director-General (Telecoms and Post)

Dear Madam

### **MORATEL'S COMMENTS: IP TRANSIT AND PEERING LANDSCAPE IN SINGAPORE**

We refer to the consultation paper issued by IDA on 13 February 2015. We thank IDA for the opportunity to offer our comments on the topic.

#### **Statement of interest**

Moratel International Pte Ltd is a wholly owned Singapore subsidiary of PT Mora Telematika Indonesia, an Indonesian telecoms operator. In addition to its terrestrial networks in the main islands of Java and Sumatra, the company owns the MIC1 and MIC2/B3JS submarine cable systems connecting Singapore to Indonesia, the BDM submarine cable system connecting the Indonesian island of Batam to Dumai, and the JIBA submarine cable system connecting Jambi to Batam.

Moratel, an IDA Facilities-based Operator (FBO) licensee, is participating in this consultation to offer its comments on the IP transit and peering landscape in Singapore. Moratel constructed its own submarine cable systems<sup>1</sup> connecting Indonesia to Singapore for telecommunications and IP connectivity. In addition to providing telecommunications services between the two countries, Moratel also purchases transit in Singapore, and has peering arrangements with both incumbents and international telecommunications operators in the country.

Our comments to IDA's consultation paper follow.

#### **Global IP transit prices**

1. The IDA consultation paper explains that "the further a city is away from [the Western Europe and North America] hubs, the more expensive the sourcing of Internet traffic, especially if [the] majority of the Internet traffic to/from the city is bound or sourced from these hubs."
2. Moratel argues that physical distance does not explain IP transit prices completely. IP transit prices were higher in the early days of the Internet in Singapore as there was limited capacity to these Internet hubs. Prices have since fallen significantly neither because Asia has drifted closer to the Western Europe/Northern America continents, nor has Internet traffic levels to these hubs have fallen<sup>2</sup> over the years. Prices fell because of increased competition with new submarine cable builds; the increased capacity afforded by new submarine cable systems has driven prices down.

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<sup>1</sup> MIC1 and MIC2/B3JS.

<sup>2</sup> It has actually increased with richer content and modern applications. A lot of submarine cables in Singapore terminate in Western Europe and North America, carrying Internet traffic to the exchanges located in these hubs.

### Domestic Internet access prices

3. The IDA consultation paper suggests that “price levels are less homogeneous and are dependent [on] the different stages of development of each country. Prices in developed cities including Singapore, Hong Kong and Tokyo have converged to lower levels, implying lower dependency on large capacities to/from the United States and Europe”.
4. Moratel argues that a country/city’s state of development does not explain price levels completely. Consider the following,
  - a. The United States is a developed country and the world’s foremost economic power. The consultation paper suggests that prices in developed cities are lower, however, Internet access in the US has often been described as slow and expensive<sup>3</sup>. In addition, most Internet traffic are terminated and consumed within the country so capacity to/from the US is not a factor.
  - b. 7-days *unlimited* Internet access in Thailand costs 299 Baht<sup>4</sup> (S\$12.50). A SingTel hi! Card requires a S\$15 *add-on*<sup>5</sup> for data that is limited to 6GB data over 3 days. Thailand’s GDP per capita, PPP adjusted is US\$14,394 while Singapore’s GDP per capita, PPP adjusted is US\$78,763<sup>6</sup>. Using GDP per capita as a measure of a country’s state of development, Singapore is at a much later stage of development as compared to Thailand. Applying the same argument in the consultation paper, Internet prices in Singapore should be lower than that in Thailand, however, the comparison of prices above shows that it is not true. Prices in Thailand are also not lower because of a lesser dependency on large capacities to/from the US and Europe—the number of submarine cable systems connecting Asia to the US and to Europe is growing.
5. Moratel argues that the level of competition in a market provides a better explanation of price levels. For example, the lack of competition in the US broadband industry has often been cited as the reason why Americans pay more for Internet access. The incumbents in Singapore have managed to hold Internet access prices high even *without* much differentiated service offerings<sup>7</sup> as they enjoy the benefits of incumbency.

### Business case of IP peering v IP transit

6. The breakeven analysis presented in Figure A1 of the IDA consultation paper applies to an incumbent or a large operator. For a new entrant or a smaller operator with lower traffic volume, the “cost of peering” and “effective peering range” labels are switched—peering for the new entrant/smaller operator is beneficial when prices are high and traffic volume is small. Thus, incumbents and larger operators will never have the incentive to peer with new entrants/smaller operators as their business cases are not aligned.
7. Moratel argues that the study should not be reduced to a simple breakeven analysis between free peering and paid transit; a better approach would be to consider **both** the decisions *to peer* and *not to peer*. In addition to monetary benefits (eg, lower cost), the decision *to peer* gives the operators involved greater control over the routing of traffic (instead of relegating it to the transit supplier) and provides potential for better network performance (each hop over a router or network incurs a cost in network performance, in particular latency).

<sup>3</sup> <http://www.nytimes.com/2014/10/31/upshot/why-the-us-has-fallen-behind-in-internet-speed-and-affordability.html>

<sup>4</sup> <http://store.dtac.co.th/en/happytouristsim>

<sup>5</sup> [http://info.singtel.com/personal/phones-plans/mobile/prepaid/data-bundles#addons\\_data-plans](http://info.singtel.com/personal/phones-plans/mobile/prepaid/data-bundles#addons_data-plans)

<sup>6</sup> <http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>

<sup>7</sup> New entrants/smaller operators have had to bundle Virtual Private Networks (VPNs) access and free static IP addresses etc to attract customers.

8. The decision *not to peer* allows an operator with the end-users (“eyeballs” in the lingo of the net neutrality debate) to charge for access to the network. In addition, it also increases network traffic at the intermediary (usually a transit supplier), thereby permitting the eyeballs incumbent to enjoy economies of scale, greater bargaining power and possibly extracting better pricing from the intermediary<sup>8</sup>. The intermediary ends up being hostage in the *not to peer* decision between the incumbent and the new entrant/smaller operator even though it is not party to it; the incumbent can even command a premium for traffic from the intermediary (now a higher level) to its end-users.
9. In the Singapore context, the incumbents—who are also the eyeballs networks—have incentive to favour the “not to peer” decision. Other operators in Singapore without larger bargaining powers (even international Tier-1s and -2s) are at the mercy of the incumbents to buy transit just to reach their end-users. This results in higher prices for local transit as compared to global transit where the competition is greater. The creation of a whole new product category—local IP transit—is testimony to this undesirable situation. Moratel feels that this stymies competition and innovation as it increases the barriers to entry for new entrants; both network- and content-providers.
10. Without volume purchase, economies of scale and much bargaining power (eg, number of end-users in the network), transit forms a significant proportion of operating costs for a new entrant/smaller operator. If the traffic volume does not permit<sup>9</sup> the new entrant/smaller operator to purchase transit from more than one provider, it will have no choice but to purchase from an incumbent to ensure fast access speeds for local end-users. Without mandatory peering of local routes, the incumbents claim premium for local Internet traffic and are shielded from world prices.

#### **Local Internet traffic transiting foreign networks (“tromboning”) within and outside Singapore**

11. Although the NGNBN alleviates last-mile barriers of entry for new operator entrants, most end-users are still on the incumbents’ networks. Triple-play<sup>10</sup> and quad-play<sup>11</sup> service bundles from these incumbents increase switching costs for consumers. Without regulatory intervention, the incumbents will take advantage of their dominant positions to charge new entrants/smaller operators for access to the end-users in their network.
12. The IDA consultation paper suggests that “operators have the incentives to route their traffic locally where they can... the impact on QoS is unlikely to be discernible by most end users because the increase in latency for geographical international tromboning within the region is unlikely to be significant... most traffic should not be trombone beyond the region because it is not a cost-effective solution... operators would have the commercial incentives to route locally-bound traffic locally.” Moratel does not agree with this analysis.
13. Latency was not discernable by most end users when narrowband connections with higher last-mile latencies were more prevalent. Latency became more glaring with the proliferation of NGNBN broadband fibre Internet access and faster 4G mobile Internet access. The differences are stark: <5ms for Internet traffic directly exchanged between network operators in Singapore and ~40ms or ~70ms for Internet traffic transiting/tromboning through Hong Kong or Japan respectively. The negative effects on performance are immediately apparent in software-as-a-service, high bandwidth (eg, multimedia streaming) and low-latency (eg, trading, gaming) applications when it forms a higher percentage of the total latency experienced by the end-user.

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<sup>8</sup> This intermediate operator is usually a common transit provider to both the incumbent and the new entrant/smaller operator.

<sup>9</sup> You need volume to enjoy better pricing.

<sup>10</sup> Broadband Internet access bundled with television and telephone service.

<sup>11</sup> Triple-play with mobile Internet broadband service.

The situation is akin to connecting an expressway exit to a dirt road—the result is reduced performance for end-users and lower returns on the NGNBN expressway.

14. The IDA consultation paper then makes an abrupt reference to Ookla’s NetIndex and Akamai’s measurement of connection speeds in the midst of the “local traffic tromboning” discussion. If the intention was to use “broadband throughput speeds” as a proxy for the effects of tromboning, then the choice of instrument is not appropriate. Ookla locates its speedtest servers both in the operators’ networks<sup>12</sup> and at the local Internet exchange (SGIX). Akamai locates its edge servers in the incumbents’ networks for access to the greatest number of end-users, and at the local Internet exchange (Equinix). Thus, using Ookla’s NetIndex and Akamai’s measurements show *only the speeds on the expressways and exclude the connection to the dirt road*. A better instrument to observe tromboning from would be to trace the route that packets take from the incumbents’ network to another operator (or vice-versa) that does not purchase transit from the incumbent.
15. Other than network performance, cost is also an important consideration when routing network traffic. If a connection is too expensive, it may not be feasible to use a connection even though performance would have been better. For example, Internet traffic between Moratel Indonesia and users of a certain incumbent operator traverse *through Singapore* to Hong Kong or Japan *and back* as the cost of global transit in Singapore is lower than that of domestic transit. Clearly, tromboning can be more cost-effective (and technically trivial) than purchasing domestic transit from the incumbents. Surely too without considering traffic of other operators, Indonesian network traffic alone must be more than the “5% or less” of the Internet traffic estimated by IDA to be tromboned overseas. Singapore end-users suffer tromboning of not just local traffic, but that of traffic to other locations (Indonesia in this example).
16. New entrants/smaller operators who are not able to enjoy lower prices through volume global transit purchases may be forced to purchase transit from the incumbents at a higher price. This corroborates with the results of the IDA consultation paper that “there may be comparatively less commercial advantage for the established ISPs to establish IP peering arrangements with the smaller ISPs.” The SGIX<sup>13</sup> website shows none of the incumbents having an open peering policy. New entrants/smaller operators have no choice but to purchase transit from the incumbents to reach their end-users when they need their network traffic to stay local.
17. Without regulatory intervention, incumbents have the incentive to charge for traffic prioritisation and to throttle speeds—neither of which is too sophisticated nor too expensive to implement in the age of falling electronics prices. When viewed from this perspective, “tromboning” is the manifestation (albeit low-tech) of paid prioritisation and throttling—the weaker operator has its traffic sent through a slower/longer connection (ie, overseas) as it would not pay for domestic transit from the incumbents. This is not in the spirit of Net Neutrality. In addition, end-users suffer reduced performance.
18. The IDA consultation paper later suggests that “three new IP interconnection business models, Deep Caching, Assured Delivery and Secure Machine-to-Machine [communications]... offer potential for ISPs more control over their service delivery to end users”. Moratel feels that these new models combined with the non-mandatory local peering landscape may exacerbate the problem instead.
  - a. Deep Caching: Caches installed by Content Delivery Networks (CDNs)<sup>14</sup> and content-providers<sup>15</sup> are usually located in the incumbents’ networks as they have the largest number of eyeballs. New entrants/smaller operators may be denied access to these

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<sup>12</sup> SingNet, MyRepublic, NewMedia Express, and ViewQwest.

<sup>13</sup> <http://www.sgix.sg/list-of-members/>

<sup>14</sup> Eg, Akamai and Verizon Digital Media Services (fka Edgecast) whose business model is to co-locate caches in (dominant) operator networks.

<sup>15</sup> Eg, Google and Yahoo!.

facilities hosted locally if they do not pay the incumbents for domestic transit. Operators who enjoy lower global transit prices will send the network requests through global transit operators whose caches may not be in Singapore. End-users suffer reduced performance even though the content is already available locally in Singapore.

- b. Assured Delivery and Secure M2M: If an end-point of a service is in an incumbent's network—which is most likely the case as this it is an advantage of incumbency—the incumbent may charge for traffic prioritisation and the non-throttling of network traffic. Other operators have no choice but to agree to the incumbents' pricing in order to meet stringent customer-defined service levels (eg, latency, jitter and service availability).

### **Conclusion: Toward open peering of local Internet traffic**

19. In this response, Moratel argues that it is the increased level of competition in the market that has allowed operators in Singapore to enjoy lower global IP transit prices. Physical distance does not explain transit prices completely as the distance between Singapore and Western Europe/North America has not shortened over the years as global transit prices fall.
20. Competition also provides better explanation of domestic Internet access prices. Without competition, incumbents in a country can hold Internet access prices high without the need for much differentiated service offerings through innovation.
21. Moratel argues that regulator intervention to ensure that domestic Internet traffic stays local is required. In sum,
  - a. The incumbents have been shielded from world prices as they control access to the majority of end-users in Singapore. Thus, the incumbents have been able to charge operators who need to meet specific service levels a “premium” so that domestic Internet traffic stays local. We can expect this situation to persist for a long time as switching costs for end-users are high due to triple- and quad-play service bundles from these incumbents to lock in their customers.
  - b. The premium charged by the incumbents stymies local innovation and competition as it raises the costs for new entrants and smaller operators who do not have the volume and bargaining power to compete.
  - c. The entry of CDNs and content providers who are likely to purchase IP transit from the incumbents for their large number of end-users will increase the bargaining power of the incumbents. The incumbents will not only have the end-users but also the content hosted in their networks. New entrants/smaller operators cannot expect to access these local resources without paying a premium.
  - d. New business models such as Assured Delivery and M2M identified by IDA have the potential to increase incumbents' bargaining power as they control access to the end-users.
22. Local Internet traffic should be regulated with equal access for all operators; mandatory open peering for local routes should be required at local Internet exchanges. The Interconnection Framework should be applied to ensure “the deployment of an integrated ‘network of networks’ that provides any-to-any communication throughout Singapore.”
23. Local Internet traffic should not be considered a “premium” that allows incumbents in their dominant position to charge more for “differentiated” faster access; it is unfair, discriminatory and can hardly be considered as innovative. Mandatory open peering for local routes will subject the incumbents to greater competition, thereby lowering prices for consumers while forcing the incumbents to innovate in the process.

24. For your kind consideration.

Sincerely,

**TAN SHAO YI**  
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Moratel International Pte Ltd