



**INFORMATION PAPER ISSUED BY THE  
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**PUBLICATION REQUIREMENT FOR ALL INTERNET SERVICE PROVIDERS**

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## **PART I: INTRODUCTION**

### **Objective of the Publication Requirement**

1. Internet Service Providers (“ISPs”) have traditionally advertised their fixed and mobile broadband Internet access plans (hereinafter referred to as “broadband plans”) by emphasising the theoretical maximum download speeds. These download speeds are usually qualified using the term ‘up to’ e.g., *up to* 10 Mbps. This has often created disputes between end users and ISPs over the download speeds that ISPs have advertised, and whether the end users have been misled or short changed. Without sufficiently clear information on the broadband Internet access speeds that end users can expect to experience typically, it can also be difficult for new end users to make informed choices on which broadband plans to subscribe to, even in a competitive market. IDA has received feedback from broadband end users who are dissatisfied that they do not experience the access speeds which are close to the advertised theoretical maximum download speeds, and that the advertisements of these broadband plans do not clearly state the access speeds that end users can typically expect.

2. Internationally, regulators such as those in the United Kingdom (“UK”) and Hong Kong have introduced some measures to enhance information transparency on typical broadband Internet access speeds. The UK’s Office of Communications (“OFCOM”) and Hong Kong’s Office of the Telecommunications Authority (“OFTA”) have introduced voluntary codes of practice for their ISPs to disclose the typical broadband Internet access speeds that they provide and the surfing conditions under which such speeds are likely to be achieved. Some ISPs there have started to voluntarily disclose the typical broadband Internet access speeds that they provide.

3. Given that the maximum theoretical broadband Internet access speeds advertised by the ISPs are often not achievable, it is reasonable for ISPs to provide end users with information on the typical speeds achievable, prior to end users subscribing to these broadband plans. IDA believes that the ISPs should provide more accurate and complete information about their own services to end users, in order to empower end users to use this information to select a broadband plan that

best meets their needs. It would also help to manage end users' expectations and minimise disputes.

4. In March 2011, IDA announced its requirement for all ISPs to measure and publish the typical broadband Internet download speeds<sup>1</sup> for broadband plans offered to end users (the "Publication Requirement").

### **Key Aspects of the Publication Requirement**

5. IDA has imposed the Publication Requirement on residential fixed broadband plans, including digital subscriber line ("DSL"), cable and fibre broadband services (regardless of whether the ISPs own or lease the underlying platform), and consumer<sup>2</sup> mobile broadband plans that include 3G or 4G mobile data services accessed via mobile handsets or via dongles. Certain categories of broadband plans will be excluded from the Publication Requirement, such as broadband plans with advertised theoretical speeds below 2Mbps, broadband plans that are explicitly offered free of charge to end users, pay-per-use/pre-paid broadband plans and legacy broadband plans that are no longer promoted or offered.

6. At present, business broadband plans are not included under this Publication Requirement as business users often access Internet using different technology platforms (e.g., via leased line or managed data/network service such as IP-VPN), require customised solutions, and are likely to require Service Level Agreements ("SLAs") with ISPs. IDA will continue to monitor the developments in the business broadband service market and assess if there is a need to extend the Publication Requirement to business broadband plans in the future.

7. The details of the Publication Requirement that all ISPs shall comply with are elaborated in Part II.

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<sup>1</sup> While upload speeds may also be important to some end users, IDA believes that for the majority of end users, download speeds play a more crucial role in determining their choice of broadband plan than upload speeds at present.

<sup>2</sup> Consumer mobile Internet broadband access service plans include individual end user plans that are offered to the general public and corporate discount plans that are offered to and subscribed by individual end users who are employees of the qualifying companies.

8. IDA will not prescribe the methodology that ISPs should use to measure and compute the typical download speeds for publication, so long as the measurement and computation methodologies used by the ISPs are clearly explained and published for end users' information. This will allow some flexibility for ISPs to adopt a measurement methodology that best reflect their operating environment and conditions.

9. However, IDA has imposed some minimum parameters that the larger ISPs or Specified ISPs (those with more than 10% of the subscriber base in the relevant market) must adopt in their measurement methodologies to facilitate a broad common baseline across these Specified ISPs. IDA has also specified additional publication requirements for these Specified ISPs, so that more complete information could be provided to end users. The details of the minimum parameters for the measurement methodology and the additional publication requirements for Specified ISPs are elaborated in Part III.

#### **Effective Date of the Publication Requirement**

10. The Publication Requirement will take effect from 1 April 2012.

#### **Factors That Affect Broadband Internet Access Speeds**

11. Notwithstanding IDA's Publication Requirement, IDA acknowledges that various factors can affect the broadband Internet access speed experienced by an end user and some of these factors may be beyond the ISPs' control. For example, the location of the web content and the capacity provided by the content owner may negatively affect one's surfing experience if the content owner has not provided adequate capacity to meet the demand. Other factors like the device being used to surf the Internet (e.g., PC, mobile handset), the number of concurrent end users accessing the same content at that time and the types and number of concurrent applications running on one's device can also slow down one's Internet access speeds. For mobile broadband plans, access speeds may be further constrained by the inherent nature of wireless technologies. One's mobile broadband Internet surfing experience may be affected by the strength of radio signals at different locations.

Different building structures may also weaken radio signals thus affecting users' surfing experience. End users should bear these factors in mind when accessing broadband Internet services.

## **PART II: MINIMUM MEASUREMENT AND PUBLICATION REQUIREMENTS FOR ALL INTERNET SERVICE PROVIDERS**

### **Broadband Plans for which All ISPs Must Measure and Publish Typical Speeds**

12. At the minimum, IDA requires all ISPs offering residential fixed or consumer mobile broadband plans to publish the typical speeds<sup>3</sup> of each of the applicable residential fixed and consumer mobile broadband plan<sup>4</sup>, alongside the theoretical maximum speeds.

13. As a start, the following categories of plans for both residential fixed and consumer mobile broadband services will be excluded from the requirement to measure and publish typical speeds:

- a) Broadband plans with advertised theoretical broadband Internet speeds of below 2Mbps, recognising that most plans advertised and offered by ISPs have theoretical speeds of 2Mbps or above;
- b) Broadband plans that are explicitly offered free of charge to end users, recognising that since these plans are offered for free, IDA will allow ISPs greater flexibility to provide these services on reasonable effort basis. Broadband plans that are bundled with other services and that are not explicitly offered free of charge, must comply with IDA's requirement and ISPs must publish the typical speeds for such plans;
- c) Pay-per-use and pre-paid broadband plans with no monthly recurring broadband service subscription charges and no minimum contractual period, recognising that unlike monthly subscription plans, end users have the ability to stop usage at any time if they are not satisfied with the service quality provided under pay-per-use/pre-paid plans; and

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<sup>3</sup> For the purpose of this requirement, typical speeds will refer to the typical broadband Internet access download speeds likely to be experienced by end users. IDA reserves the right to include upload speeds when the theoretical upload speeds are also promoted and advertised, or when such typical upload speed information becomes important to end users.

<sup>4</sup> See footnote 2

- d) Legacy plans that ISPs no longer advertise, actively promote or offer to new subscribers (i.e., these plans are either slowly being phased out, or only available to existing users who wish to continue with the same service plan).

14. IDA believes that the above scope forms a reasonable starting base-line to improve information transparency for most of the residential fixed and consumer mobile broadband plans marketed and advertised by ISPs today. ISPs may include the above categories of broadband plans on their own volition to enhance information transparency of their services to their end users. IDA reserves the right to include these categories of broadband plans under the measurement and publication requirement, if the need arises in the future.

15. For consumer mobile broadband plans that are advertised based on the same theoretical maximum download speeds (e.g., 7.2 Mbps) but are differentiated by the amount of bundled data usage only, ISPs need only measure and publish the typical speeds of one such broadband plan. However, ISPs must publish this typical speed alongside the theoretical maximum download speed for all the relevant consumer mobile broadband plans, wherever the theoretical maximum download speeds are published in the advertisements, websites, or other publicity materials.

### **Publication of Typical Speeds by All ISPs in Advertising and Publicity Materials**

16. ISPs will have the flexibility to determine how they wish to compute the figures for publication, and whether they wish to publish a single figure or a range, for each applicable residential fixed or consumer mobile broadband plan, so long as the figures that they publish are representative of their end users' experience.

17. The typical speeds must be prominently published on the ISPs' websites, brochures, digital and press advertisements, and any other publicity or marketing materials in a clear, easily accessible and easily understood manner, preferably alongside the theoretical speeds. All publicity or marketing materials containing figures on typical speeds must include a prominent footnote or weblink directing end

users to the ISPs' website or publications where details on the methodology can be found.

18. The publication of the typical speeds must also be updated regularly and must reflect the typical speeds from the latest measurement period. ISPs must measure and update typical speeds on a quarterly basis at the minimum. IDA will allow the published typical speeds in print materials such as brochures, billboards or other marketing collaterals to be from an earlier measurement period, as these materials may not be reprinted or updated frequently. However, the measurement period must be clearly stated, and the print materials must include a prominent footnote or weblink directing end users to the ISPs' website or publications where the details on the methodology and the most updated test results can be found.

### **Publication of Measurement and Computation Methodologies by All ISPs at Websites**

19. The following detailed information must be made publicly available at the ISPs' websites:

- a) the types of end user device(s)<sup>5</sup> and the network configuration or set-up used for measurement;
- b) the number of test clients used and the sample size of measurements per residential fixed or consumer mobile broadband plan;
- c) the list of local/international websites used or location of server(s), and the size of the file transfer tested to local/international servers, depending on the measurement methodology adopted;
- d) computation of the typical speeds for each residential fixed or consumer mobile broadband plan;

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<sup>5</sup> ISPs should use devices that are representative of end user experience. For example, ISPs may use PCs, laptops, mobile handsets, dongles, integrated hardware/software probes, robots and any other devices which can simulate end users' experience.

- e) explanation of “typical” in non-technical language; and
- f) qualifications or explanations of other factors that may affect the broadband Internet access speeds experienced by end users (if any).

20. When disclosing their computation methodology, ISPs should explain what they mean by “typical” speeds and how this is likely to be representative of their end users’ experience, either by specifying the extent to which their end users can expect to achieve the published typical speeds, e.g., by stating that end users should be able to achieve the typical speeds X% of the time, or by any other qualifications.

**Explanation at All Points-of-Sale to be Provided by All ISPs**

21. All ISPs must at least disclose the typical speeds for the relevant broadband plans to all end users before entering into contracts with end users based on their preferred subscription plans. ISPs should also disclose where end users can obtain details on the computation and measurement methodologies for the published typical speeds, and the most updated test results.

**Summary of Minimum Requirements for All ISPs**

22. The table below summarises the minimum requirements applicable to all ISPs:

IDA’s Minimum Requirements for All ISPs	
<b>Parameters that ISPs Must Measure and Publish</b>	Typical broadband Internet access <u>download</u> speeds likely to be experienced by end users (ISPs are encouraged to include upload speeds as well)
<b>Broadband Plans for which All ISPs Must Measure and Publish Typical Speeds</b>	All residential fixed and consumer mobile broadband plans with advertised theoretical maximum download speeds of 2Mbps & above (excluding broadband plans explicitly declared to be free, pay-per-use plans, pre-paid plans and legacy plans which ISPs are no longer promoting/offering to new users)

<p><b>Channels where Typical Speeds must be Published</b></p>	<p>Prominently on ISPs’ websites, digital &amp; press advertising materials, and any other publicity or marketing materials  (with weblinks or footnotes that refer end users to the ISPs’ website or publications where the details on the methodology and the most updated test results can be found)</p>
<p><b>Frequency of Measurement and Refreshing the Published Typical Speeds</b></p>	<p>Quarterly, with the latest measurement results &amp; methodologies</p>
<p><b>Publication of Measurement and Computation Methodologies at Websites</b></p>	<ul style="list-style-type: none"> <li>• The type of end user device(s) and the network configuration or set-up used for measurement</li> <li>• The number of test clients used and the sample size of measurements per residential fixed or consumer mobile broadband plan</li> <li>• The list of local/international websites used or location of server(s), and the size of the file transfer tested to local/international servers, depending on the measurement methodology adopted</li> <li>• Computation of the typical speeds for each residential fixed or consumer mobile broadband plan</li> <li>• Explanation of “typical” in non-technical language (e.g., by stating that users should be able to achieve the typical speeds X% of the time, or any other qualifications)</li> <li>• Qualifications or explanations of other factors that may affect the speeds experienced by end users (if any)</li> </ul>
<p><b>Explanation at All Points-of-Sale</b></p>	<ul style="list-style-type: none"> <li>• The typical speeds for the relevant broadband plan, in addition to the advertised theoretical maximum download speeds</li> <li>• Where the end user can obtain more details on the measurement of typical speeds</li> </ul>

### **PART III: MINIMUM PARAMETERS FOR THE MEASUREMENT METHODOLOGY AND ADDITIONAL PUBLICATION REQUIREMENTS FOR SPECIFIED INTERNET SERVICE PROVIDERS**

#### **Minimum Parameters for the Measurement Methodology**

23. Specified ISPs (i.e., ISPs with a subscriber base of more than 10% in the respective retail residential fixed or consumer mobile broadband markets) are required to use a methodology that incorporates the following broad parameters to measure the typical speeds<sup>6</sup>.

24. When designing and implementing their measurement methodologies, Specified ISPs should ensure that the methodology adequately represents their end users' usage profiles and experiences. To ensure a minimum standardisation of the measurement methodologies amongst Specified ISPs, IDA has set out the broad parameters of the measurement methodology below. These are the minimum parameters required by IDA and they apply to both residential fixed and consumer mobile broadband plans unless stated otherwise. The parameters are as follows:

- a) Measurement during peak and off-peak periods: At the minimum, Specified ISPs are required to take measurements during both peak and off-peak periods for the relevant fixed residential broadband plans. Specified ISPs may identify the peak and off-peak periods on a per plan basis to be more reflective of their users' traffic profile, or to adopt a common peak and off-peak period for all fixed residential broadband plans based on the peak and off-peak periods of the entire network for the measurements, if Specified ISPs assess that the results would still be representative of their end users' experience. For consumer mobile broadband plans, Specified ISPs are not required to differentiate between peak and off-peak periods in their measurements.

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<sup>6</sup> See footnote 3

- b) Measuring local and international typical speeds: In the event that Specified ISPs advertise their broadband plans with separate local and international theoretical maximum download speeds, or highlight only the theoretical local *or* international maximum download speed, Specified ISPs must measure both the local and international typical speeds separately. This applies to both residential fixed and consumer mobile broadband plans.
- c) Measuring typical speeds for mobile broadband plans: For consumer mobile broadband plans, to take into account the mobile nature of mobile broadband services, Specified ISPs are required to measure the typical speeds for both “stationary” and “mobile” conditions, where stationary tests will measure the typical speeds at fixed locations, and mobility tests will measure the typical speeds when on the move at a reasonable vehicular speed, i.e., at least 50km/h.
- d) Sample size: For residential fixed broadband plans, Specified ISPs are required to collect at least 200 unique data points<sup>7</sup> per plan. These 200 data points can be taken from both peak and off-peak periods and this sample size will apply for every measurement period (i.e., every quarter). Specified ISPs are encouraged to collect more data points to ensure a more robust test. For consumer mobile broadband plans, Specified ISPs are required to collect at least 200 unique data points for stationary testing and mobility testing combined, per consumer mobile broadband plan, for every measurement period.
- e) Frequency of measurement period: At the minimum, Specified ISPs are required to conduct one set of measurements every quarter.
- f) Computation methodology: Specified ISPs have the flexibility to adopt a statistically representative figure (e.g., mean or median) to reflect the typical speeds, so long as the figures that they publish are

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<sup>7</sup> A data point could refer to the speed measurement from a single data session or each file transferred to a server. ISPs are allowed to define what constitutes a data point under their own measurement methodology.

representative of their end users' experience and disclose their computation methodology upfront.

- g) Test equipment: To adequately reflect end users' experience, Specified ISPs should use devices representative of end users' experience to take the measurements. For example, Specified ISPs may use PCs, laptops, mobile handsets, dongles, integrated hardware/software probes, robots and any other devices which can simulate end users' experience.
- h) Location of test equipment: Specified ISPs should ensure that the test clients are geographically spread out.
  - i) For residential fixed broadband plans, Specified ISPs should ensure that the tests are evenly distributed geographically for each measurement period; however, the locations of the tests can remain the same for subsequent measurement periods.
  - ii) For consumer mobile broadband plans, the mobility testing should be conducted via a drive test for every measurement period. For both mobility and stationary testing, Specified ISPs should ensure that the drive test routes or test clients are evenly distributed geographically for any given measurement period and that these locations must change for subsequent measurement periods.
- i) Mix of local and international websites/servers: Specified ISPs should ensure that their methodology includes a balanced mix of local and international websites/servers, such that the results are representative of their end users' local/international traffic patterns and experience.
- j) Specified ISPs may outsource the design and implementation of the measurement of typical speeds, provided all the minimum parameters set by IDA are adhered to.

### **Additional Publication Requirements for Specified ISPs**

25. In addition to the detailed information specified in paragraph 19 on the publication of the measurement and computation methodologies, Specified ISPs must also make publicly available the following information either at their websites or publications such as brochures:

- a) the peak and off-peak periods when the measurements were taken for residential fixed broadband plans (to be updated if the periods change);
- b) the general geographical locations of test clients for residential fixed broadband plans and stationary testing for consumer mobile broadband plans (e.g., Woodlands, Jurong, Orchard, Sengkang, Paya Lebar, etc);
- c) a general description of the locations/test routes for mobility testing for consumer mobile broadband plans (e.g., Woodlands, Jurong, Orchard, Sengkang, Paya Lebar, etc); and
- d) the time period or testing period for both stationary and mobility testing for consumer mobile broadband plans.

26. For broadband plans where separate theoretical local and international maximum download speeds are advertised, Specified ISPs are required to publish the typical local and international speeds separately, in all advertising materials and on their websites. In the event that Specified ISPs advertise only a theoretical local speed *or* theoretical international speed, IDA will allow the Specified ISPs to publish the corresponding typical local or typical international speeds only in all their advertising materials, so long as it is made clear in these materials. However, both the typical local and international speeds must be made available on the ISPs' websites with the fuller details of their measurement methodologies.

27. Additionally, for consumer mobile broadband plans, if Specified ISPs advertise only a theoretical stationary or theoretical mobility maximum download speed, IDA will allow Specified ISPs to publish the corresponding typical speeds from stationary or

mobility testing only in all their advertising materials, so long as it is made clear in these materials. In the event that Specified ISPs do not make a distinction between a stationary or mobility theoretical speed, then the ISPs may publish *either* the typical mobility *or* typical stationary speeds in all advertising materials. However, the typical speeds from both stationary and mobile testing (as single figures or as ranges) must still be published on the ISPs’ websites. This will also apply to consumer mobile broadband plans that are advertised based on the same theoretical speeds (e.g., 7.2 Mbps) but are differentiated by the amount of bundled data usage only. All Specified ISPs must include weblinks or footnotes in their advertising materials to refer end users to the ISPs’ website or publications where details on the typical stationary and mobility speeds and the most updated test results for both speeds can be found.

28. For clarity, the additional requirements for Specified ISPs are summarised in the table below:

IDA’s Additional Requirements for Specified ISPs	
<b>Additional Parameters that ISPs Must Measure and Publish</b>	<ul style="list-style-type: none"> <li>• If separate theoretical local and international maximum download speeds are advertised, Specified ISPs must publish the typical local and international speeds separately, in all advertising materials and at their websites. However, if Specified ISPs advertise <i>only</i> a theoretical local speed or theoretical international maximum download speed, IDA will allow the ISPs to publish the corresponding typical local or typical stationary speeds only in all their advertising materials, so long as both the typical local and international speeds are still made available on their websites.</li> <li>• For consumer mobile broadband plans, if Specified ISPs advertise <i>only</i> a theoretical stationary or theoretical mobility maximum download speed, IDA will allow Specified ISPs to publish the corresponding typical speeds from stationary or mobility testing only in all their advertising materials. If ISPs do not make a distinction between a stationary or mobility theoretical maximum download speed, then the ISPs may publish <i>either</i> the typical mobility <i>or</i> typical stationary speeds in all advertising materials. However, both the typical mobility and stationary speeds must still be made available on the ISPs’ websites.</li> </ul>

<b>Additional Requirements for Publication of Measurement and Computation Methodologies at Websites</b>	<ul style="list-style-type: none"><li>• The peak and off-peak periods when the measurements were taken for residential fixed broadband plans (to be updated if the periods change).</li><li>• The general geographical locations of test clients for fixed residential broadband plans and stationary testing for consumer mobile broadband plans (e.g., Woodlands, Jurong, Orchard, Sengkang, Paya Lebar, etc).</li><li>• A general description of the locations/test routes for mobility testing for consumer mobile broadband plans (e.g., Woodlands, Jurong, Orchard, Sengkang, Paya Lebar, etc).</li><li>• The time period or testing period for both stationary and mobility testing for consumer mobile broadband plans.</li></ul>
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