

## **REVIEW OF QOS STANDARDS FOR BROADBAND INTERNET ACCESS**

### **OBJECTIVE**

1. To share with industry and public IDA's decision following its review of the responses received to its consultation paper on the "Review of QoS Standards for Broadband Internet Access".

### **BACKGROUND**

2. IDA issued a consultation paper on 22 June 2000 to seek comments from the industry and public on the proposed quality of service (QoS) indicators for broadband access services in Singapore. Specifically, IDA sought feedback on the introduction of two additional QoS indicators, namely, Network Latency and Bandwidth Utilisation.
3. At the close of the consultation on 31 August 2000, IDA received responses from Concert Global Networks (Singapore) Pte Ltd; Enron Broadband Services; Pacific Internet Limited; StarHub Pte Ltd & StarHub Internet; and SingTel Ltd & SingNet. Singapore Cable Vision submitted its feedback to IDA subsequently. Responses were also received from 3 members of the public. IDA thanks all respondents for their considered and constructive views and comments.

### **SUMMARY OF RESPONSES**

4. Generally, industry players would prefer IDA not to set any QoS standards on access speeds for broadband service while members of the public wanted IDA to tighten the standards. The broadband service providers generally felt that the regulatory framework for the broadband access services is unnecessary, given that they, in an already competitive environment are motivated to maintain high quality service standards and ensure that customer requirements are met. In particular, Concert and StarHub felt that the proposed new QoS standards would impose an unnecessary burden and the requirement to submit regular reports will be a costly administrative burden on the broadband service providers.

Concert also proposes IDA not to impose the new standards on non-dominant service providers.

### **Comments on the Proposed QoS Standards**

#### ***(a) Network Latency***

5. SingTel and Pacific Internet have pointed out that the proposed round trip time of < 300 msec for the international portion of the broadband network is only applicable to internet traffic routed via submarine cables and not satellite links. Because of the number of satellite hops the signal has to travel and the poor atmospheric conditions, the network latency for all satellite transmissions will always exceed 300 msec. Pacific Internet has proposed that the standard be revised to < 500 msec if satellite transmission links are used for international connectivity.
6. Members of the public viewed that the proposed QoS standards for network latency are not adequate enough to support interactive broadband applications (e.g. video streaming, Internet telephony and online games etc). Basically, they felt that the round trip time for the local and international portion of the broadband network can be further reduced to < 50 msec and < 200 – 250 msec respectively.

#### ***(b) Bandwidth Utilisation***

7. As with the proposed regulatory QoS framework, the industry players regarded IDA's setting of bandwidth utilisation requirements as unnecessary government management of a competitive market. Both Concert and Enron Broadband Services expressed that IDA should not mandate quantitative standards for bandwidth utilisation. They felt that IDA is building a role which is too heavily involved in the operational and commercial detail.
8. Service providers, particularly StarHub and SCV, have also expressed concern with regard to IDA's bandwidth utilisation requirement of 75% loading for 95% of the time during peak hours for all network links. StarHub envisaged that the cost of maintaining a 25% 'traffic free' bandwidth would increase the price economics to both the service

provider and the customer. SCV, on the other hand, felt that the non-time nature of the cable modem service would result in an over-investment of bandwidth which is not justifiable by the price of service.

9. Members of the public have suggested that the broadband access service providers be required to reveal their amount of purchased bandwidth so as to help consumers determine which service provider is the best choice, in terms of service, quality and pricing. There are also comments from members of the public that IDA should engage the broadband service provider when the bandwidth utilisation level reaches 80% - 85% loading, instead of the proposed 90% loading.

### **Comments on the Proposed Penalty for Non-Compliance**

10. Many of the industry players implored IDA not to impose penalties on the service providers for failure to comply with the minimum QoS standards. If the penalty framework is deemed necessary, StarHub suggested that it be imposed after the broadband market becomes mature, given that the service providers are still in their infant stages of technologies and infrastructure service deployment. Contrary to the industry players, members of the public supported the establishment of the penalty framework. However, they expressed that the proposed fine of S\$5,000 is ineffective to serve any deterrent effect on the broadband service providers. Particularly, they felt that the fine should be heavy enough to prompt potential offenders into fast and quick response should they fall short of expectations. One member of the public proposed a fine of one month subscription fee multiplied by the subscriber base of the broadband service provider. The fine is to be imposed on the offending service provider every week until it meets the QoS requirements.

## **IDA'S CONSIDERATION OF THE MAIN POINTS RAISED**

### **Stage of Industry Development**

11. IDA's view is that the broadband market has not reached a stage of maturity where there is a plethora of service providers. It is therefore premature for IDA to rely solely on market-driven incentives. Hence,

the purpose of setting minimum standards is mainly to ensure that consumers are provided with certain minimum quality standards when using broadband access services. This is in line with IDA's vision for Singapore to be an e-commerce hub. Also, IDA does not differentiate between dominant and non-dominant carriers when setting QoS standards. All broadband service providers should have the same responsibility in ensuring customer satisfaction.

### **Reasonableness of the QoS Standards**

12. At the end of the consultation process, IDA commissioned a consultant to review the proposed QoS parameters. The objective was to gather empirical data to determine whether the set of parameters are sufficiently stringent to meet the user's requirements. As part of the review exercise, network probes were deployed in strategic locations inside the various broadband service providers' networks to gather network statistics information, specifically in the areas of network latency and bandwidth utilisation. In addition, broadband service providers including SingTel Magix, SingNet, Pacific Internet, PCCW and SCV were required to submit their QoS performance on network latency and bandwidth utilisation on a trial basis, for the period 1 March to 31 May 2001.

#### ***(a) Network Latency***

13. IDA considered the service providers' request to increase the proposed round trip time of <300 msec for Internet traffic routed via satellite and the public's request to reduce the round trip times in general. After reviewing the trial results, IDA views that the proposed benchmark for network latency of =<300ms for the international portion of the broadband network is reasonable.
14. From the self-reported statistics submitted by SingTel Magix, SingNet, PCCW, Pacific Internet and SCV, the service providers have shown that IDA's proposed benchmarks for network latency are achievable. In addition, based on the consultant's experience, domestic performance in terms of network latency can be expected to be 85-100ms and international performance can be expected to be 250-300ms to the USA.

**(i) Bandwidth Utilisation**

15. To address service providers' concern that the requirement to observe 75% loading for 95% of the time during peak hours for all network links would too be onerous, IDA has clarified with the service providers that maintaining a 25% bandwidth buffer in its terrestrial links is not the mandatory requirement. Service providers, however, have to closely monitor their links when this loading is exceeded. The broadband access service provider would only be mandated by IDA to purchase additional bandwidth if the bandwidth utilisation of the terrestrial links exceeds the stipulated 90% loading level for a period of at least 3 months and if there is no better alternative plan to maintain the QoS. IDA is of the view that the 90% loading is a reasonable level for the service providers to take immediate action before the users start to experience congestion and service degradation problems. This should not therefore result in any substantial increase in business costs or over-investment in the broadband network.

**Reasonableness of Penalty for Non-Compliance**

16. IDA's view is that the proposed \$5,000 fine should not be seen as the only deterrent in light of a fully liberalised telecommunications market. While the quantum of the fine is not high, IDA believed that the adverse publicity that goes with the fine and the potential loss of customer base would act as sufficient deterrent. Also, IDA has plans to publish the broadband service providers' QoS performance on the web-site so as to facilitate customers making informed choice. This will then spur the broadband service providers to achieve higher quality of service to win and retain customers in the competitive environment.

**IDA'S DECISION**

17. Based on the industry and public feedback, the empirical findings and the consultant's views, IDA's assessment is that the proposed new QoS standards on network latency and bandwidth utilisation as specified in Annexes A and B should be adopted.

18. Since these are new QoS standards, service providers would be given a grace period of 3 months from 1 July till 30 September 2001, to fine-tune their networks (where necessary) to comply with IDA's standards. The standards would be for compliance and a penalty of S\$5,000 per standard / month would be imposed for each infringement.
19. Notwithstanding this, IDA welcomes inputs from industry and the public any time should they view that circumstances have changed and that a review is warranted.
20. IDA will conduct independent audit on service providers network to ensure that the standards set are strictly adhered to.