



**Suruhanjaya Komunikasi dan Multimedia Malaysia**  
*Malaysian Communications and Multimedia Commission*

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**MANDATORY STANDARDS FOR  
QUALITY OF SERVICE**

**(DIAL UP INTERNET ACCESS)  
DETERMINATION NO. 3 OF 2002**

***REPORT ON STANDARDS ON  
DIAL UP INTERNET ACCESS  
PERFORMANCE  
FOR THE PERIOD ENDING DECEMBER 2004***

## Background

1. The Malaysian Communications and Multimedia Commission (MCMC) has recently completed a study to assess the performance of dial up Internet services, provided by the local Internet Access Service Providers (IASP). The assessment was conducted on five service providers namely TMNet, CelcomNet, DigiNet, Jaring and TimeNet.
2. The objective of the assessment is to assess the level of service quality through the Key Performance Indicators indicated in the Mandatory Standards for Quality of Service (Dial Up Internet Access Service), i.e.:
  - 2.1 **The standard is the number of attempts before successful connection to the Internet shall be a maximum of three, with no more than 1 minute intervals between each of the attempts.** It is reported as percentage of successful connection with the maximum of 3 attempts.
  - 2.2 **The standard is 95% of attempts made to access an IASP node shall be successful within 40 seconds.** It is reported as the percentage of successful access to IASP node within 40 seconds.
  - 2.3 **The standard is the average file download time for a standard graphic or random text file of approximately 30 kilobytes from a local website shall be no more than 80% of the modem line speed at least 95% of the time.** It is the percentage of downloads which is equal or better than the "calculated download time".

(See Exhibit 1 for calculation of "calculated download time")

## Exhibit 1

The “calculated download time” of not more than 80% of modem line speed is calculated as follows:

Calculated download time =  
**(File size downloaded ÷ Modem Line Speed) x 80%**

Illustration:

Size of file to download = 30290 bytes (x 8 to convert to bit)

Modem line Speed = 31200 bit per seconds

Calculated download time

= (30290 X 8) ÷ 31200 x 80%

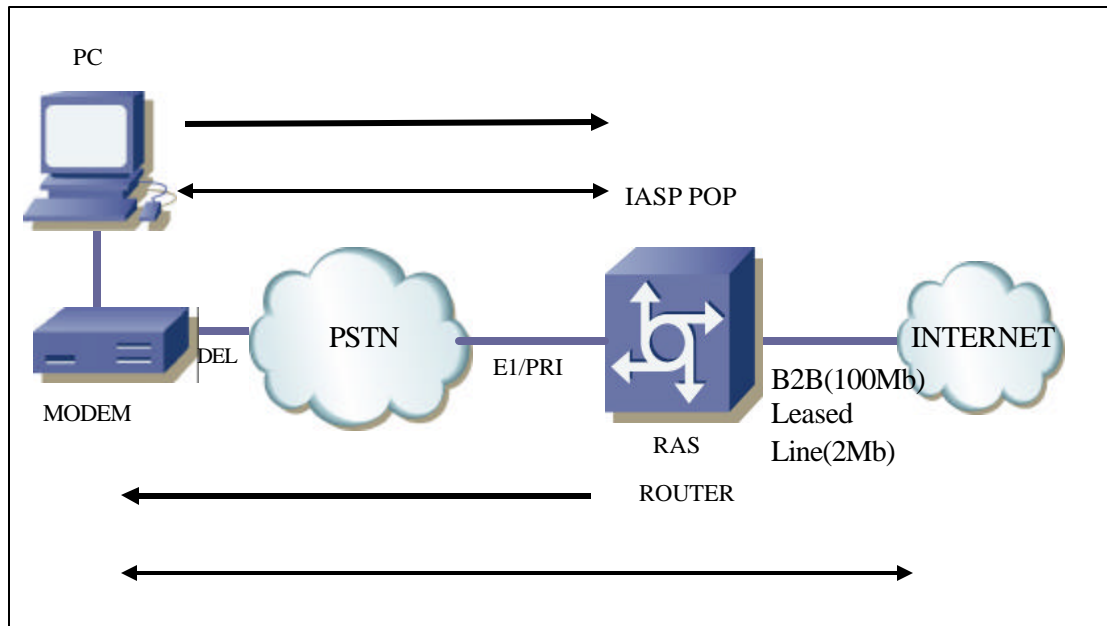
= (242320 ÷ 31200) x 80%

= 9.71 seconds

For example, if 100 downloads were done during the testing, 95 of the downloads must be equal or better than 9.71 seconds in order to comply with the standard.

## Test Setup

3. Below is the illustration of the test setup:



- 5.1 The subscriber access the IASP node by using dialer application that controls the modem attached to the PC. By dialing through his modem, he is connected through an analog phone line or DEL (Direct Exchange Line).
- 5.2 The Public Switch Telephone Network (PSTN) cloud for local telephone system consists of a local exchange interconnected to each other to generate larger PSTN network. Generally, the Remote Access Server (RAS) are connected to the outlets of exchanges by E1 or PRI link.
- 5.3 When you make a connection between your modem and the RAS modem, the two modems perform what is called a "handshaking" procedure.
- 5.4 Modem "handshaking" is a process whereby the two modems negotiate the highest speed at which they can reliably communicate with each other. During "handshaking", the modems compare their own capabilities, and then test the quality of the connection between them to find the highest transmission speed that they can tolerate.

- 5.5 When the modems attempt to exchange information faster than the line can handle (due to physical constraints, signal degradation, interference, and etc) it will result in errors, requiring that information to be re-sent. Since data re-sending slows down the overall transfer rate, modems are generally better off communicating reliably at slower speeds than communicating unreliably at high speeds.
- 5.6 After both modems agreed to the connection speed, data communication protocol is established to allow user information such as user ID and password to flow through the connection for authentication process. The authentication process is done by the Authentication, Authorization and Accounting (AAA) server. If user is valid, RAS will assign all connection parameter required, such as the IP address, gateway address, domain name server etc.
- 5.7 With the all parameter set properly, the subscriber is now able to connect to the Internet.

### **Assessment**

4. The assessments were conducted at two different locations:

<b>Location</b>	<b>Start</b>	<b>Finish</b>
Menara UMNO, Jalan Macalister, Penang	27 September 2004	01 October 2004
Subang Business Center, Jalan USJ 9/5Q, Subang Jaya	14 October 2004	20 October 2004

## Findings

5. Below are the results of the assessments conducted within the specified time period and locations.

IASP	Successful Connection with max 3 attempts (%)		Successful Connection within 40 seconds (%)		Download Time of no more 80% MLS (%)	
	Penang	Klang Valley	Penang	Klang Valley	Penang	Klang Valley
<b>Standard</b>	<b>100.00</b>		<b>95.00</b>		<b>95.00</b>	
Jaring	100.00	100.00	100.00	75.16	55.71	91.75
TMNet	100.00	99.20	99.56	90.18	78.21	70.46
CelcomNet	100.00	100.00	99.52	95.92	97.32	88.46
DigiNet*	-	100.00	-	98.80	-	80.75
TimeNet	95.80	100.00	97.71	95.12	96.43	95.79

\* DigiNet does not have a local remote access server for subscribers in Penang.