# MALAYSIAN COMMUNICATIONS AND MULTIMEDIA COMMISSION

# PUBLIC INQUIRY PAPER ON ACCESS PRICING OF VOIP SERVICES BASED ON PRE-FIX NUMBER 0154

**18 April 2007**

**This Public Inquiry paper was prepared in fulfilment of sections 55(2), 55(4) and 61 of the Communications and Multimedia Act 1998.**

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# 1. INTRODUCTION

## 1.1 Context

The Malaysian Communications and Multimedia Commission (MCMC) had started issuing numbers with 0154 pre-fix in 2004 for provisioning of voice services over the internet protocol (IP). This was followed by the issuance of Guidelines on Telephony Service over IP in July 2005, which set out technical network attributes, inter-network call routing and customer arrangements and numbering allocation and use.

In September 2005, the MCMC had carried out a costing study, which included costing for services provided over the IP network. The MCMC was mindful at that time that there were no clear established methodologies for costing IP services. Nevertheless an attempt was made by the MCMC by applying the same methodology that was adopted for fixed and mobile services on IP network. This was done with a view to determine or provide indicative pricing for voice calls originating from and terminating onto IP network. Based on the IP models developed, an origination rate of 0.29 sen per minute and termination rate of 0.22 sen per minute was derived.

During the Public Inquiry on Access Pricing in September 2005, these prices were published in the public inquiry paper and views were sought from the public on the methodology adopted and whether or not the prices for IP services should be regulated. All responses received had disagreed with the access prices proposed by the MCMC. Therefore, the MCMC had decided neither to regulate nor publish indicative access prices for voice over IP (VoIP) services on the basis that the nature of VoIP services is innovative, sensitive to assumptions about the service take-up, the service architecture and technological developments. The MCMC recognised that market forces are the best means to achieve an effectively competitive VoIP industry. In addition, due to the absence of a consensus regarding the architecture and asset assumptions required for costing VoIP services, the MCMC considered that it was not possible to determine a reliable access price.

To date, the MCMC understands that access agreements are yet to be concluded between VoIP service providers and PSTN and mobile service providers. As such, the MCMC would like to address the issue of access prices for VoIP services.

The purpose of this public inquiry is to seek views from the public on the proposed way forward.

## 1.2 Submissions to this paper

The MCMC invites members of the public to participate in this Public Inquiry by making written submissions on matters that are discussed in this paper. Submissions in response to this paper should be substantiated with reasons and where appropriate participants are encouraged to provide evidence or reference to the relevant sources of information.

Written submissions both in hard copy as well as electronic form should be provided to the MCMC by **12 noon on 1 June 2007** and addressed to:

The Chairman
Malaysian Communications and Multimedia Commission
63000 Cyberjaya
Selangor Darul Ehsan

Attention: Ms. Janakky Raju/Ms. Long Hui Ching
Tel: +60 3-8688 8000
Fax: +60 3- 8688 1001
Email: accessprice@cmc.gov.my

The MCMC reserves the right to publish extracts or entire submissions received from the public in response to this Public Inquiry in a public domain that can be accessed by others. If any party wishes to make a submission containing commercially sensitive information, a "public" version of the submission should also be provided and any commercially sensitive information should be provided under a separate cover clearly marked "**CONFIDENTIAL**".

The MCMC would like extend its appreciation in advance to all interested parties for participating in this consultative process.

## 1.3 Purpose of this Public Inquiry

Pursuant to Ministerial Direction on Access Pricing, Direction No. 1 of 2005, the Commission determined the Commission Determination on the Mandatory Standard on Access Pricing, Determination No. 1 of 2006 (MS on Access Pricing 2006) which prescribed maximum prices for some facilities and services in the Commission Determination on Access List, Determination No. 1 of 2005 (Access List 2005).

In the MS on Access Pricing 2006, maximum prices were prescribed for Fixed Network Origination and Termination Services which originates/terminates on PSTN network for the carriage of voice communications only.

The purpose of this Public Inquiry is to invite interested parties to submit to the MCMC their comments on issues identified in this paper which relate to access pricing and the setting of mandatory prices for Fixed Network Origination and Termination Services which originates/ terminates on IP network and where 0154 numbering is used.

### 1.4 Structure of the paper

The remaining parts of this paper are structured in the following manner:

Part 2 provides background on VoIP services in Malaysia.

Part 3 discusses general issues pertaining to VoIP interconnection, costing, pricing and compensation.

Part 4 contains the MCMC's proposal and timelines for implementation.

## 2. BACKGROUND

The landscape of the telecommunications network has been evolving rapidly and the key driver of this evolution is IP technology. With the emergence of IP technology, service providers are integrating wide range of services comprising of voice, video and data on a single network using IP transmission. In time to come, IP based networks may replace the circuit switched network of the PSTN where everything may become part of a data network. When such transformation takes place, one cannot distinguish whether open data packets are voice or video or ASCII (American Standard Code for Information Exchange) text. This will force the traditional telecommunications service providers to make architectural changes to their network that will render them capable of providing IP telephony. With such developments taking place, VoIP services look poised to revolutionise the communications industry.

In order to facilitate the provisioning of VoIP services, the MCMC had issued the Guidelines on Telephony Services over IP services (Ref: MCMC/G/02/05) in July 2005. The said guideline addresses technical attributes of VoIP services, licensing requirements, technical compliance requirements, customer access arrangements, and quality of service and compliance procedures.

A public inquiry was carried out in 2005 on, amongst others, the review and expansion of the Commission Determination on Access List, Determination No. 1 of 2001 (Access List 2001) and the proposed amendment to the Commission Determination on Mandatory Standard on Access, Determination No. 2 of 2003 (MSA 2003). Following on from the public inquiry, the Commission determined the Access List 2005 and the Commission Determination on Mandatory Standard on Access, Determination No. 2 of 2005 (MSA 2005). The scopes of fixed network origination and termination services were expanded to include VoIP networks. This was done mainly to facilitate any-to-any connectivity for consumers irrespective of the underlying technology. Following this, the MCMC carried out a costing study for VoIP services based on pre-fix number 0154. Data for this purpose was collected from the key VoIP service providers at that time to represent the VoIP market in Malaysia. However, VoIP services were still at inception stage then and as such, service providers were unable to provide sufficient data, particularly data on call volume that is essential to derive per minute cost. To overcome this, the MCMC had to make assumptions about the volume of calls and postulate the growth of the industry in order to derive per minute cost. The business models and the network configuration of each of these service providers were taken into consideration to form a generic model that represents VoIP services in Malaysia. From this model, per minute cost was derived for VoIP services.

A public inquiry on access pricing was carried out in September 2005. In the paper, the MCMC had introduced criteria to determine whether or not the price for a service should be regulated. The criteria that were proposed for regulatory intervention are as follows:

a. Whether there are high and permanent barriers to entry in the market for provision of the given access facility/service; and

b. Even in the presence of high entry barriers, market interaction among existing rivals might ensure that the market will over time tend toward effective competition.

The criteria above were applied cumulatively and access prices for services were only regulated when there are high barriers to entry and the market is not likely to be competitive over time.

Previously, for the period starting from July 2003 to 2005, the MCMC had adopted Long Run Incremental Cost (LRIC) as the appropriate costing methodology for facilities and services in the Access List 2001. However, at that point in time, there were only nine facilities and services on the Access List 2001 and most of these services were well established. After the review of Access List 2001 was carried out in February 2005, the access list was expanded to include more facilities and services. In addition, as stated above, the scope of the fixed and mobile services was expanded to include VoIP networks. In light of that, the MCMC could not adopt LRIC as the costing methodology for all facilities and services in the Access List 2005, as set out in the Public Inquiry Paper on Access Pricing issued on 2 September 2005. This was because LRIC is only appropriate when applied to well-established, traditional services and not to new services like VoIP. Therefore, the MCMC had introduced the following criteria to ascertain the appropriateness of the costing methodology to be adopted, i.e. whether LRIC or other costing methodologies.

a. For well established facilities/services with bottleneck characteristics, where competitive entry can be ruled out because of their natural monopoly characteristics, LRIC might appear to be a more appropriate methodology than Fully Distribute Cost (FDC); and

b. For innovative facilities/services without bottleneck characteristics, implementation of Total Service Long-Run Incremental Cost (TSLRIC) might not only have some drawbacks as regards to the encouragement of investment and the maintenance of a level playing field in downstream markets.

TSLRIC can also be difficult to implement given the degree of uncertainty about network technology requirements and demand level for new services.

Notwithstanding the above criteria, the MCMC had proceeded to carry out modeling for VoIP services based on pre-fix number 0154 using LRIC methodology and had arrived at origination rates of 0.29 sen per minute and termination rate of 0.22 sen per minute on the VoIP networks. These rates were then published in the Public Inquiry Paper on Access Pricing and views were sought on whether these rates should be adopted or otherwise.

The submissions that the MCMC received from the public inquiry suggested that LRIC is not an appropriate methodology for VoIP services as the services are relatively new and there appears to be no general consensus as to acceptable network architecture for the delivery of VoIP services. Also, since multiple services are provided using the same network, the asset base to be used to derive a cost based per minute termination rate is unclear.

In addition, the submissions received did not support the proposal by the MCMC to use the same termination rate for PSTN and VoIP services. The MCMC had considered these views and had concluded that VoIP services based on pre-fix number 0154 should not be regulated. The MCMC had recognised that market forces are the best means to achieve effective competition in VoIP industry. In addition, since it was generally agreed that LRIC was not the suitable methodology for VoIP services, the MCMC had decided not to publish indicative rates for VoIP services as these rates were based on LRIC.

From the time the Access List 2005 and MSA 2005 were determined by the Commission until today, the MCMC understands that negotiations on access agreements for the origination and termination services in respect of VoIP services based on pre-fix number 0154 have yet to be concluded between the VoIP service providers and PSTN and mobile service providers. Based on our preliminary and informal inquiries, it appears that the negotiating parties are having great difficulty agreeing to a commercially negotiated and agreed access pricing for the origination and termination services. The delay in concluding the access agreements indicates that there may be some form of market failure that warrants regulatory intervention.

## 3. ISSUES RELATED TO VOIP INTERCONNECTION

### 3.1 IP Interconnection

Interconnection in the IP world is characterized by peering and transit arrangements. Peering means that two IP networks of comparable size will have bilateral and technical arrangements to exchange traffic and related routing information. Typically there is no payment involved in peering arrangements and this type of arrangement is known as bill and keep or settlement free or sender keeps all. When packets received are not terminated on the IP network that receives the packets, transit arrangements are used. Transit means bilateral business and technical arrangement where an IP network operator agrees to carry another party's IP traffic to a third party. In transit arrangements, small IP networks pay to interconnect with large IP networks.

Traditionally, there has been little or no regulatory oversight for interconnection between IP networks. The agreement between IP network operators has been subject to commercial agreements. These commercial agreements are generally subjected to non-disclosure clauses, making it difficult for others to understand access terms and conditions.

In IP networks, it is not practical to attribute cost to another network's customers based on the principle of cost causation. Instead, each network operator recovers its cost from their respective customers. It has also been a general practice in the world of IP to bundle the cost of transmission and content, making it difficult to distinguish the cost associated with each element. Operators of IP network recover cost based on bandwidth and throughput of the link provided to customers. In addition, it is common for IP network operators to recover cost in accordance with the characteristics of the services provided to consumers.

The peering and transit arrangements in the IP network are different from the calling party pays arrangement in the PSTN and mobile interconnection. Most countries have mandated the PSTN and mobile operators to offer interconnection and as is typical in a calling party pay regime, the flow of interconnection payment is based on principal of cost causation whereby the cost should be recovered from those whose actions caused the cost to be incurred. Since the called parties are forced to accept all calls, the operators of the called party are entitled to payment in the form of interconnection or access charges.

The conventional cost recovery mechanism is based on average per minute cost.

With the emergence of voice services provided over the IP network, the two worlds of telecommunications and internet is beginning to converge, leaving regulators grappling with ways to deal with such issues that arise from such convergence.

Regulators such as the Federal Communications Commission (FCC) in the United States have proposed to evolve the compensation model of the PSTN to similar models used in internet to ensure consistency. Opponents of this compensation mechanism reject the principle of cost causation and calling party pays as they are of the view that the caller is not the sole causer of cost. They also argue that by adopting the internet model of compensation, the monopoly in the terminating market will cease to exist and a consistent compensation model will alleviate regulatory arbitrage.

**Q1. The MCMC seeks views on the statements above on the key issues pertaining to IP interconnection and the compensation mechanism.**

**Q2. The MCMC also seeks comments on whether it is appropriate to evolve the compensation model of the PSTN to that of IP network in the Malaysian environment.**

## 3.2 Cost Drivers for VoIP

In conventional economic theory, aligning prices to the underlying cost will ensure correct incentives for efficient use of network and provide the appropriate signals for build or buy decisions. The main cost drivers for fixed and mobile interconnection is call volume and distance. The underpinning argument for distance based charge is that the longer the distance over which communications is carried out, the greater the utilization of network elements, thus the higher the operating and capital cost.

In IP network, packets do not require a dedicated time slot on a wire and are routed over different routes to take advantage of idle capacity in the network, making it difficult to identify node utilization. As such, there is no direct correlation between distance and network utilization to cost of providing services.

**Q3. In your opinion, is there a correlation between distance and cost for VoIP services?**

In addition, it has been postulated that interconnection for VoIP calls should be based on capacity, as in the peering and transit arrangements as capacity has a more meaningful relationship to the cost than time. Using capacity to price VoIP calls is deemed to be consistent with economic efficiency. [1] If minute based cost is adopted for VoIP calls, this may provide opportunities for VoIP operators to engage in arbitrage or find ways to avoid interconnection charges all together.

Apart from that, other drivers have been identified for VoIP services such as quality of service, reliability and security.

**Q4. Which do you think is a better cost driver for VoIP calls: capacity or per minute based cost?**

**Q5. Apart from the cost drivers identified above, are there any other significant cost drivers for VoIP calls?**

## 3.3 Setting Cost-Based Charges for VoIP Interconnection

The InfoDev and International Telecommunication Union had jointly developed and published the ICT Regulatory Toolkit and section 4 of this toolkit is about New Paradigms: Voice over IP and IXPS. In section 4.5.4 of the toolkit, three forms of cost reflective interconnection pricing have been identified for VoIP services. The three forms are as follows:

### 3.3.1 End user payments

This method would be similar to the subscription of internet services where the full cost is recovered from consumers. The cost will not be based on per minute charges but rather on a per line basis depending on the bandwidth. Such cost recovery mechanism is a major shift from the conventional cost recovery methods for voice services.

### 3.3.2 Unbundling

VoIP operators who use the local loop of PSTN operators to provide services should only be subjected to the real cost of the assets utilised by the VoIP operator. This includes the appropriate allocation of joint and common costs between the VoIP and PSTN operator.

[1] See the presentation by NERA titled Interconnection Today and Tomorrow: How VoIP will affect today's interconnection regulatory practices? Capacity-based interconnection; VoIP clearinghouses and other commercially negotiated agreements, European Regional Seminar titled Telecommunications Liberalization-Challenges and Opportunities for the CEE, CIS and Baltic States.

### 3.3.3 Cost based VoIP origination and termination charges

This approach subjects the VoIP operator to pay the same origination and termination charges as other operators who use similar network facilities and services. The charges paid by the VoIP operator should reflect the underlying economic cost of the services provided by the operator who is providing access.

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| **Q6.** | **Apart from the three forms identified above, are there any other forms of cost reflective interconnection prices for VoIP services in the Malaysian environment?** |

## 3.4 Payment between VoIP and PSTN and Mobile Operators

When there is interconnection between VoIP operators and PSTN operators, the interconnection takes place between the VoIP operator's gateway and the PSTN operator's tandem switch or the mobile operator's switching centre. There are many ongoing debates as to the type of payment between VoIP and PSTN and mobile operators. Some of the discussions are outlined below and feedback is sought on these issues.

### 3.4.1 Reciprocal Payment

Since the voice services provided by the VoIP, PSTN and mobile operators are similar, it is arguable that VoIP operators should be entitled to reciprocal rates for terminating calls that originate on PSTN or mobile network. In September 2005, the MCMC had proposed in the Public Inquiry Paper on Access Pricing to fix the same rate for both PSTN and VoIP services, which would have resulted in reciprocal payment. However, most operators disagreed with the proposal. Nevertheless, the MCMC would like to seek feedback whether reciprocal payment obligations should be adopted in Malaysia.

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| **Q7.** | **Do you think that the payment between VoIP, PSTN and mobile operators should be reciprocal?** |

### 3.4.2 Calls that Originate from IP Network

In terms of calls that originate from the IP network, it usually originates from high speed broadband link and the cost of the high speed broadband link is borne fully by the customer. As such, the general view is that the VoIP operator does not incur any additional cost for originating the service and therefore should not be compensated for originating the call.

**Q8. The MCMC seeks views on whether the statement that VoIP operators do not incur any additional costs for originating the service and hence should not be compensated is an accurate reflection of the VoIP operations in the Malaysian context. Please describe your views with your reasons. If your views are that additional costs are incurred, please also describe and provide details of the additional cost elements that are incurred.**

### 3.4.3 Termination on Mobile Network

With regards to interconnection between the IP and mobile networks, VoIP traffic can be terminated on mobile networks as IP traffic and can be treated in the same way as data services. Therefore, VoIP operators should not be subjected to normal voice termination rates.

**Q9. Should VoIP calls that terminate on mobile network be treated as data services or normal voice services? Please explain your reasons.**

## 4. PROPOSED WAY FORWARD

Having considered the issues discussed in Part 3 of this paper, the MCMC is mindful that the per minute cost approach the MCMC had previously adopted may not be the best approach to reflect the underlying cost of VoIP calls. At the same time, some of the issues being debated are relatively new and there are no established positions.

Going forward, the MCMC would like to propose an interim solution to address VoIP interconnection. The proposed interim solution consists of 2 positions as follows:

### 4.1 Commencing Another Costing Study for VoIP Services Based on Pre-fix Number 0154

The first position considered is whether it will be beneficial to carry out another modeling exercise for VoIP services based on pre-fix number 0154. If such study is undertaken, the MCMC will be in a position to explore the issues discussed in Part 3 of this paper.

However, the MCMC is mindful that this approach will take time as consultants may need to be engaged to assist the MCMC to carry out this exercise. In addition, the data gathering and development of a model that is representative of the Malaysian 0154 service providers' business will take time. An optimistic estimate to complete such study is 6 months. Thereafter, there is a need to carry out a public inquiry which may take another 3 months.

In addition, the MCMC is aware that cost modeling for VoIP services is relatively novel and there are no established positions, despite the extensive ongoing debate on the appropriate method. In the meantime, there is an urgent need to address issues faced by the service providers in Malaysia. Otherwise, consumers using VoIP services based on pre-fix number 0154 will not be able to enjoy any-to-any connectivity and the lower cost of services.

Based on the above, the MCMC's preliminary position is not to carry out another costing study for the time being.

### 4.2 Prices Based on a "Glide Path" Approach

The second position considered is to intervene to determine mandatory prices for VoIP services based on pre-fix number 0154. As explained in Part 1, the apparent delay in concluding access agreements indicates that there may be some form of market failure that warrants regulatory intervention. Hence, the next issue to be addressed is the appropriate mandatory pricing to be adopted. The MCMC will not use the prices published in Public Inquiry Paper on Access Pricing as these prices were based on LRIC. The submissions received and conclusion reached then was that LRIC is not the appropriate methodology for innovative services such as VoIP services.

As an interim solution, the MCMC would like to propose a "glide path" approach between the termination rates for the PSTN services and the LRIC rates for VoIP services based on pre-fix number 0154. The MCMC proposes that the local PSTN termination rates be adopted as a starting point for VoIP services based on pre-fix number 0154 in 2007, and in 2008, the price will decline.

The MCMC is of the view that prices that are higher than LRIC will provide encouragement for new service providers to invest in IP networks and for the existing service providers to migrate to IP based networks. This will subsequently lead to ubiquitous IP networks that will result in long-term benefit to end-users.

Below are the prices proposed for VoIP services based on pre-fix number 0154:

| **Year** | **Service** | **Proposed 24 hour weighted average rate** |
|---|---|---|
| **2007** | **VoIP Origination and Termination Service** | **2.63 sen per minute** |
| **2008** | **VoIP Origination and Termination Service** | **1.5 sen per minute** |

The MCMC would like to propose this option as an interim solution until 2008. Thereafter, when a review of the Commission Determination on Mandatory Standard on Access Pricing, Determination 1 of 2006 is carried out, this issue may be revisited.

**Q10. Do you agree with MCMC's preliminary position not to carry out another costing study for the time being? Please provide your reasons.**

**Q11. Do you agree with the proposal where prices are based on "glide path" approach and with the rates proposed? If not, please provide reasons and other alternatives.**

## 4.3 Timelines and Next Steps

This Public Inquiry will take 45 days and the MCMC intends to implement the outcome of this Public Inquiry as soon as possible to avoid further delays in negotiations. As such, access prices for the VoIP origination and termination rates may be implemented in mid July 2007.

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| **Q12.** | **Do you agree with the timelines proposed above? Do you anticipate any issues in adhering to the timelines specified above?** |