



Malaysian Communications and Multimedia Commission

Access List Review

Public Inquiry Report

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This Public Inquiry Report was prepared in fulfilment of sections 55(2), 55(4), 61 and 65 of the Communications and Multimedia Act 1998

Malaysian Communications and Multimedia Commission
MCMC Tower 1,
Jalan Impact,
Cyber 6,
63000 Cyberjaya,
Selangor Darul Ehsan.
Tel: +60 3 86 88 80 00 Fax: +60 3 86 88 10 00
www.mcmc.gov.my

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ABBREVIATIONS AND GLOSSARY

ACCC	Australian Competition and Consumer Commission
AMR-NB	Adaptive Multi-Rate-Narrowband (voice codec)
AMR-WB	Adaptive Multi-Rate-Wideband (voice codec)
BSS	Business Support Systems
BT	British Telecommunications plc.
BTU	Broadband Termination Unit
CDN	Content Delivery Network
CIIP	Common Integrated Infrastructure Provider
CMA	Communications and Multimedia Act 1998
CNII	Critical National Information Infrastructure
DMT	Digital Multimedia Terminal
Dominance Report	Public Inquiry Report on the Assessment of Dominance in Communications and Multimedia Markets, 24 September 2014
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexer
DTTB	Digital Terrestrial Television Broadcast
DWDM	Dense Wavelength Division Multiplexing
EU	European Union
FCC	Federal Communications Commission in USA
FTA	Free to Air
GPON	Gigabit-capable Passive Optical
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
Hetnet	Heterogeneous Network
HSBB	High-Speed Broadband
HSBA	High-Speed Broadband Access
HSBB1	High-Speed Broadband Network, Phase 1
HSBB2	High-Speed Broadband Network, Phase 2
IDA	InfoComm Development Authority of Singapore
IMT Advanced	International Mobile Telecommunications Advanced
IMT-2000	International Mobile Telecommunications 2000
IP	Internet Protocol
IPTV	Internet Protocol Television
ISDN	Integrated Services Digital Network
ITU	International Telecommunication Union
Kbps	Kilo Bit Per Second

KLIA	Kuala Lumpur International Airport
KVMRT	Klang Valley Mass Rapid Transit
LTE	Long-Term Evolution
Mbps	Mega Bit Per Second
MAFB	Malaysian Access Forum Berhad
MCMC	Malaysian Communications and Multimedia Commission
MERS999	Malaysian Emergency Response Services 999
MPEG	Moving Picture Experts Group
MDF	Main Distribution Frame
Metro-E	Metro Ethernet
MMS	Multimedia Messaging Service
MNO	Mobile Network Operator
MSA	Mandatory Standard on Access
MSAP	Mandatory Standard on Access Pricing
MSAP 2012	Commission Determination on the Mandatory Standard on Access Pricing, Determination No.1 of 2012
MVNO	Mobile Virtual Network Operator
MyIX	Malaysia Internet Exchange
NetCo	Network Company, that is responsible to design, build and operate the passive infrastructure of Next Generation National Broadband Network in Singapore
NBN	Australian government-owned corporation (formerly known as NBN Co)
NGN	Next-Generation Network
Ofcom	Office of Communications in the UK
OLT	Optical Line Terminal
OpCo	Operating Company, which implements the active infrastructure of Next Generation National Broadband Network in Singapore and manage the flow of ultra-high speed broadband traffic
OSA	One Stop Agency
OSI	Open Systems Interconnection
OSS	Operational Support Systems
OTT	Over-the-Top
PDM	Poles, Ducts and Manholes
PI Paper	Public Inquiry Paper on the Access List Review, 15 May 2015
PI Report	This Public Inquiry Report on the Access List Review
POI	Point of Interconnection
PON	Passive Optical Network
POP	Point of Presence

PPP	Public Private Partnership
PSSB	Puncak Semangat Sendirian Berhad
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RAN	Radio Access Network
RTM	Radio Televisyen Malaysia
SAO	Standard Access Obligation
SBC	State-Backed Company
SIM	Subscriber Identity Module
SIP	Session Initiation Protocol
SMS	Short Messaging Services
SSNIP	Small but significant non-transitory increase in price
SS7	Signalling System Number Seven
STM	Synchronous Transport Module
SUBB	Sub Urban Broadband Network
TDM	Time Division Multiplexing
TM	Telekom Malaysia
TSoIP	Telephony Service over the IP network
UK	United Kingdom of Great Britain and Northern Ireland, commonly known as United Kingdom
USA	United States of America
VLAN	Virtual Local Area Network
VoIP	Voice over Internet Protocol
VoLTE	Voice over LTE
VULA	Virtual Unbundled Local Access
WiMAX	Worldwide Interoperability for Microwave Access
2G	Second Generation
3G	Third Generation
4G	Fourth Generation

Part A Background

1 Introduction

1.1 Public Inquiry Process

In its Public Inquiry Paper on the Access List Review (**PI Paper**) released on 15 May 2015, the MCMC detailed the approach and methodology it proposed to adopt in this Public Inquiry.

The purpose of this Public Inquiry has been to solicit views from industry participants, other interested parties and members of the public to assist the MCMC to determine whether:

- (a) existing Access List facilities and services should be retained or removed;
- (b) the descriptions of any Access List items that are to be retained in the Access List remain appropriate or should be revised; and
- (c) additional facilities and services should be included in the Access List.

The PI Paper set out the MCMC's preliminary views on these matters and invited comments on the MCMC's preliminary views and specifically sought comment on the questions listed in Annexure 1 of the PI Paper.

The PI Paper explained:

- (d) the legislative context and purpose of conducting the Public Inquiry;
- (e) the scope of the Public Inquiry;
- (f) the proposed outputs of the Public Inquiry;
- (g) the MCMC's preliminary views on potential changes to the Access List; and
- (h) the process of the Public Inquiry.

1.2 Consultation process

The MCMC has consulted widely and openly with all interested stakeholders during this Public Inquiry, including:

- (a) the circulation of an informal questionnaire and presentations to industry about the proposed Public Inquiry;
- (b) the consideration by the MCMC of submissions received by the industry in response to the informal questionnaire;
- (c) the publication of the PI Paper on 15 May 2015;

- (d) a Public Inquiry Clarification session open to the industry and all interested stakeholders on 16 June 2015; and
- (e) the consideration of all submissions received by 12 noon, 10 July 2015 in response to the PI Paper.

1.3 Submissions received

At the close of the Public Inquiry period at 12 noon, 10 July 2015, the MCMC had received written submissions from the following parties.

Table 1: Summary of submissions received

No.	Submitting party	Referred to in this PI Report as
1	Altel Communications Sdn Bhd (on behalf of itself, Net2One Sdn Bhd and MYTV Broadcasting Sdn Bhd)	Altel
2	Measat Broadcast Network Systems Sdn Bhd	Astro
3	Celcom Axiata Berhad	Celcom
4	Digi Telecommunications Sdn Bhd	Digi
5	edotco Group Sdn Bhd and edotco Malaysia Sdn Bhd	edotco
6	Fiberail Sdn Bhd	Fiberail
7	Fibrecomm Network (M) Sdn Bhd	Fibrecomm
8	Maxis Berhad	Maxis
9	Neutral Transmission Malaysia Sdn Bhd	NeuTrans
10	Packet One Networks (Malaysia) Sdn Bhd	Packet One
11	Persatuan Pengendali Internet Malaysia	MyIX
12	Persatuan Penyedia Infrastruktur Telekomunikasi Malaysia	PPIT
13	Sacofa Sdn Bhd	Sacofa
14	Telekom Malaysia Berhad	TM
15	TIME dotCom Bhd	TIME
16	YTL Communications Sdn Bhd	YTL
17	A mobile operator	A mobile operator

A submission from a licensee was submitted after the deadline, and as such, it was not considered by the MCMC.

Having thoroughly reviewed and assessed the 17 submissions received on the PI Paper against its own preliminary views, the MCMC now presents this Public Inquiry Report (**PI Report**) within the 30-day requirement of the closing date of submissions, as stipulated under section 65 of the CMA.

1.4 Structure of this PI Report

This PI Report begins with the general introduction in this Part A and an overview of the current Access List in section 2 at the start of Part B.

The remainder of Part B considers each of the facilities and services currently included in the Access List. For each facility and service, the PI Report sets out:

- (a) an introduction to the issues discussed in the PI Paper in relation to the facility or service;
- (b) a summary of the comments received;
- (c) a discussion of any changes to the MCMC's preliminary views regarding the facility or service, or the MCMC's rationale for maintaining its preliminary views (as applicable); and
- (d) the MCMC's final view on the retention, change or removal of the facility or service.

As with the PI Paper, the facilities and services considered in Part B are organised under the respective markets in which they are supplied, as defined by the MCMC in the Dominance Report.

Where the MCMC has proposed changes to an existing facility or service, the changes relative to the existing description are shown as follows:

- the MCMC proposes to add words that appear in underlined red text; and
- the MCMC proposes to delete words that appear in ~~strikethrough text~~.

Part C considers potential new facilities and services for including in the Access List. The PI Report adopts the same sub-structure for each facility and service in Part B and Part C.

Part D considers whether any facilities or services currently included in the Access List should be removed, beyond the extent discussed in any of the previous sections.

1.5 Legislative Context

The MCMC has set out the legislative context for the present review of the Access List, including the national policy objectives in the CMA, in the PI Paper in some detail. That background is not repeated here, but interested parties are invited to review section 2 of the PI Paper for further details.

1.6 Key Concepts and Methodology

As discussed in sections 3 of the PI Paper, the MCMC has identified and applied the Long-Term Benefit of End Users and Bottleneck Facilities as the key concepts which are of most direct relevance to the ex-ante regulation of wholesale access to telecommunications facilities and services which is the purpose of the Access List.

However, as noted in the PI Paper, the MCMC has also considered other national policy objectives that are relevant to access regulation, including national development, equitable provision of services over ubiquitous national infrastructure, and the promotion of a civil society either as inherent in the Long-Term Benefit of the End User concept or explicitly where necessary to consider such factors separately.

The MCMC's approach in this regard continues the approach adopted in the 2008 Access List Review.

In addition to operator comments on the specific facilities and services considered by the MCMC in the PI Paper, some operators submitted general comments on the concepts and methodologies used by the MCMC. The MCMC responds to those comments as follows:

- (a) Celcom proposed that the current approach to regulating facilities and services through the Access List should be revised to align with the general competition framework for telecommunications, which recognises the effect of market dominance on competition. Celcom acknowledged that this issue might be best addressed through the current CMA review. The MCMC agrees that any change of the Access List framework from a symmetric regulation model like Australia's to an asymmetric regulation model like the European Union's (**EU**) is best considered as part of the CMA review.
- (b) Celcom also submitted that there should be a greater emphasis on balancing the promotion of new services and investment with the need to regulate access to facilities and services once built and commercially operational. The MCMC agrees with Celcom's comments in this regard, but considers that its current approach to access regulation does seek to achieve a balance between encouraging infrastructure investment and facilitating competition in downstream markets where infrastructure competition is unlikely to be feasible.
- (c) PPIT raised a number of issues with the manner in which the MCMC has approached market definitions and findings of dominance in

previous Public Inquiry processes. While the MCMC acknowledges PPIT's dissatisfaction with these matters, the MCMC considers that its approach has been consistent with well-established competition theory and practice. The MCMC continues to rely on those findings, and particularly, the Dominance Report, in the present Public Inquiry.

- (d) TM submitted that the Access List represents over-regulation when compared to global best-practice jurisdictions. The MCMC notes that the Malaysian communications and media sector reflects the continuing dominance of a single operator in controlling several bottleneck facilities and services. For example, an operator wishing to construct a basic service must seek supply of tail transmission (which appears, based on operator submissions to be mostly bundled with trunk transmission), Network Co-Location (which is not being supplied in accordance with the standard access obligations (**SAOs**)) and HSBB Network Services (which are not being supplied in accordance with the SAOs) directly from the incumbent operator. The Access List reflects this lack of competition and control of key bottlenecks by a single firm.
- (e) TM also submitted that the MCMC needs to have more regard to convergence and fixed to mobile substitution. The MCMC confirms that it has regard to such dynamics wherever relevant. However, the MCMC also notes that some bottleneck facilities and services, such as tail transmission and Network Co-Location affect all converged and mobile and fixed services, and a single incumbent retains control of such facilities and services.
- (f) TM considers that the Access List reflects an asymmetric approach focused on fixed network services adopted some time ago which is no longer relevant. To the extent that this issue is not addressed by the preceding comments, the MCMC notes that it has also addressed a number of mobile market issues in this Public Inquiry.
- (g) Lastly, TM has submitted that focusing on the ladder of investment theory is no longer considered international regulatory best practice. The MCMC acknowledges that all theoretical frameworks have their limitations. The MCMC approaches the task of access regulation with a strong focus on the practicalities of competition in the Malaysian communications and multimedia sector. So, for example, it proposes in this PI Report, to regulate End-to-End Transmission Service, notwithstanding a pure ladder of investment approach might suggest that each transmission segment be individually regulated to encourage as many 'rungs' on the ladder of investment as possible. The MCMC also takes note of international best practice regulation, so for example, it has adopted the same view in relation to HSBB Network regulation as is adopted by many regulators in regulating next-generation access networks, by focusing on Layer 2 and Layer 3 unbundling, instead of requiring strict Layer 1 unbundling.

- (h) TIME submitted that the MCMC should only require electronic responses to Public Inquiries, publish all submissions on its website and more actively seek submissions from interested parties such as public utilities, infrastructure operators and building managers. The MCMC thanks TIME for its constructive comments and will consider its submission for future Public Inquiries.

1.7 Focus areas

In the PI Paper, the MCMC indicated five focus areas for the present Public Inquiry:

- (a) **enhancement of access regulation related to the Access List:** to ensure that all industry participants understand and comply with the SAOs which apply to facilities and services in the Access List;
- (b) **incentive-based regulation:** adding and removing facilities and services in the Access List in a manner focused on incentivising access providers to supply those facilities and services to access seekers;
- (c) **more developed regulation of transmission services:** ensuring that access regulation is developed to reflect experience gained from the first period of regulated access to the consolidated Transmission Service and the Wholesale Local Leased Circuit Service;
- (d) **improved access to next generation access network services:** ensuring that next-generation network (**NGN**) regulation reflects the Malaysian experience following the first period of regulated access to high speed broadband (**HSBB**) network services; and
- (e) **fostering investment in access network infrastructure:** ensuring that operators wishing to expand fast broadband access or other fixed transmission infrastructure in Malaysia beyond those premises currently served by an HSBB Network have access to bottleneck facilities which are necessary for such expansions.

The industry has generally supported these key focus areas in their submissions and the results of the Public Inquiry process demonstrate the importance of these focus areas, as discussed below. However, the MCMC would like to acknowledge that individual operators have raised other focuses which are of particular concern to their individual businesses. Taking three examples:

- Astro, amongst others, has submitted that the MCMC should take a more direct, interventionist and comprehensive approach to monitoring and enforcement of access providers' compliance with the SAOs and their Access Reference Documents;

- Celcom, amongst others, has submitted that the MCMC should place greater emphasis on reflecting dominance findings when deciding which facilities and services to include in the Access List;
- Digi, amongst others, have expressed concern that the MCMC's incentive-based regulation approach (particularly its proposed responsive removal mechanism) is too forward-looking and inappropriate in the context of continued dominance of many key bottlenecks by a single access provider; and
- TM has submitted that there should be a greater emphasis on balancing regulation of fixed and mobile access regulation in an increasingly converged communications and multimedia environment.

The MCMC discusses these additional areas of focus in the context of specific facilities and services, below, where relevant. To the extent that operators' submissions relate to matters outside the scope of the Public Inquiry (e.g. broader changes to the CMA, matters governed by the Mandatory Standard on Access (**MSA**) or Mandatory Standard on Access Pricing (**MSAP**), or enforcement and monitoring), the MCMC acknowledges that regulation must be considered on a holistic basis, thanks operators for their continued engagement and looks forward to further engagement on these issues through upcoming Public Inquiries and other forums.

1.8 Matters addressed comprehensively in the PI Paper

Each of the following matters is comprehensively addressed in the PI Paper for each existing or potential Access List facility and service:

- (a) the description of the facility and service;
- (b) the characteristics of the market in which the facility or service is supplied and acquired;
- (c) competition analysis related to the supply and acquisition of the facility or service; and
- (d) details of any proposed changes to the facility or service.

The MCMC has not repeated each of these matters in this PI Report, but instead focused on submissions on these matters and any consequential changes to the MCMC's preliminary views in the PI Paper. The MCMC recommends that interested parties read the PI Paper and this PI Report together for a complete understanding of the conclusions made in this PI Report.

Part B Review of Access List Services

2 Overview of current Access List

The current Access List includes the following listed facilities and services, organised by market(s), each of which is considered in this Part B (Review of Access List Services) of the PI Paper:

- (a) Wholesale origination markets (fixed and mobile)
 - (i) Fixed Network Origination Service
 - (ii) Mobile Network Origination Service
- (b) Wholesale termination markets (fixed and mobile)
 - (i) Fixed Network Termination Service
 - (ii) Mobile Network Termination Service
- (c) Wholesale fixed telephony services market (including VoIP)
 - (i) Wholesale Line Rental Service
- (d) Wholesale access to facilities and upstream network elements market (for the access network)
 - (i) Full Access Service
 - (ii) Line Sharing Service
 - (iii) Sub-loop Service
 - (iv) Bitstream Services
- (e) Wholesale access to facilities and upstream network elements market (for the core network)
 - (i) Infrastructure Sharing
 - (ii) Network Co-Location Service
- (f) Wholesale fixed broadband and data market (business / residential)
 - (i) Digital Subscriber Line Resale Service
 - (ii) HSBB Network Service with QoS
 - (iii) HSBB Network Service without QoS
- (g) Wholesale transmission services markets
 - (i) Transmission Service
 - (ii) Wholesale Local Leased Circuit Service

- (h) Interconnect link markets
 - (i) Interconnect Link Service
 - (ii) Domestic Connectivity to International Service (Connectivity only)
- (i) Wholesale broadcasting transmission market
 - (i) Digital Terrestrial Broadcasting Multiplexing Service.

3 Wholesale origination markets (fixed and mobile)

Fixed Network Origination Service

Introduction

- 3.1 In the PI Paper, the MCMC noted that the Fixed Network Origination Service remains a bottleneck and that there has not been any material changes since the 2008 Access List Review that would justify removing this service from the Access List.
- 3.2 In the PI Paper, the MCMC also responded to operator calls to make the service description more technology neutral by proposing minor variations to the service description set out in paragraphs 7.34 and 7.35 of the PI Paper.

Submissions Received

- 3.3 Altel submitted that although currently it is more of an access seeker, it does foresee itself to be a likely access provider as well. Altel has not faced any major difficulties in acquiring or supplying the service. Altel opined that the Fixed Network Origination Service should remain in the Access List and agreed with the proposed changes to the service description by the MCMC.
- 3.4 Celcom acquires the service and may supply the service in the near future. Celcom stated that there is no difficulty in acquiring or supplying the service as both access seekers and access providers agree with reasonable terms and conditions as per the SAOs at regulated prices. Celcom is of the view that the service should remain in the Access List due to its bottleneck characteristics. Generally, Celcom is agreeable to the proposed service description by the MCMC. However, Celcom commented that while the description of "Message Communications" is acceptable, to include "any other technology" in the description does not appear to be applicable to Fixed Network Origination Service because the service is for the provision of Freephone 1800 service and toll-free 1300 service, which are limited to voice calls only. Celcom mentioned that it did not experience any difficulty in acquiring Fixed Network Origination Service as an access seeker on the basis of technology.
- 3.5 Digi acquires Fixed Network Origination Service and is of the view that the fixed telephony market in Malaysia is not competitive due to high barrier to entry, TM's high market share and the limited role and impact of innovation

such as VoIP services in the market. Digi is supportive of the inclusion of any other fixed network technology which is currently available or “which may be developed in future” in the description as proposed by the MCMC.

- 3.6 Maxis acquires and supplies the Fixed Network Origination Service and has not been experiencing any difficulties in acquiring or supplying the service as the service is regulated. Maxis also commented on the geographic aspects of origination charges raised by other operators in the PI Paper, but acknowledged that this is an issue to be discussed further during the review of the MSAP. Maxis highlighted that not all access seekers have Point of Interconnection (**POI**) / Point of Presence (**POP**) in each region, therefore making it difficult for the access provider to implement near-end handover and to apply only a single rate origination price.
- 3.7 Maxis is also of the view that the Fixed Network Origination Service should remain in the Access List due to it being a bottleneck service.
- 3.8 Maxis submitted that the proposed description of Fixed Network Origination Service by the MCMC is too wide and ambiguous. Maxis opined that future technologies need to be analysed and defined on case-by-case basis instead of trying to regulate something which has yet to come into existence. Maxis suggested deleting the words “and any other technology.....” from the service description for the Fixed Network Origination Service and replacing them with the words “not limited to”. Maxis believes that this is sufficient to cover any other technologies that can be used to support the service in the future.
- 3.9 Maxis also highlighted that pursuant to the Mandatory Standards for the Provision of Mobile Content Services, content type of SMS and MMS is currently required to be delivered via short codes platforms. Therefore, providers of mobile content services are prohibited from using peer-to-peer SMS or international gateway to send SMS which promote mobile content services. As such, it is not foreseen that there will be commercial offering for MMS and SMS using 1800 or 1300 platforms and the proposed amendment to the description of Message Communications is redundant. Maxis proposed to delete “and any other technology.....” from the description of Message Communications.
- 3.10 In addition, Maxis also expressed concerns regarding billing challenges for non-voice fixed origination services. Typically, SMS charges are paid by the sender (Message Originated) or zero rated. There is no situation whereby the access provider pays a fee resulting from SMS received.
- 3.11 So far, Maxis has not faced any difficulties in acquiring the Fixed Network Origination Service on the basis of technology used to implement the service.
- 3.12 Packet One acquires and provides the Fixed Network Origination Service. It has not experienced any impediment in acquiring or providing the service and supports retention of the service in the Access List. Packet One supported the proposed changes to service description of the Fixed Network Origination Service with inclusion of IP interconnection. Packet One also

raised a number of matters regarding pricing which are outside the scope of this Public Inquiry but which may be considered as part of a future MSAP review. However, Packet One is concerned about the inclusion of Message Communications in this scenario because it has yet to come across any origination that involves message, audio or video.

- 3.13 TM acquires and provides the Fixed Network Origination Service. TM is not facing any difficulty in acquiring or supplying the service. TM raised a number of matters regarding pricing which are outside the scope of this Public Inquiry but which may be considered as part of a future MSAP review.
- 3.14 TM submitted that it supports the retention of the Fixed Network Origination Service in the Access List. TM suggested deleting the words “which is currently available or which may be developed in the future that” as both access seekers and access providers must mutually agree the technology used in the provision of the service. Currently TM has no difficulty in acquiring the service on the basis of technology used to implement the service.
- 3.15 TIME acquires and provides the Fixed Network Origination Service. TIME raised a number of matters regarding pricing which are outside the scope of this Public Inquiry but which may be considered as part of a future MSAP review.
- 3.16 TIME suggested for the MCMC to re-evaluate the requirements for POIs to be set up in all regions for fixed and mobile network operators as TIME finds setting up POIs in all regions is unnecessary task for new fixed and mobile operators. TIME proposed that the MCMC streamline the policy pertaining to POIs in order to expedite the conclusion of access agreements without disadvantaging existing or new operators.
- 3.17 TIME is of the opinion that Fixed Network Origination Service should remain in the Access List and had no comments on the proposed service description. TIME also does not face any difficulty in acquiring the service on the current Public Switched Telephone Network (**PSTN**) and IP based technology.
- 3.18 YTL acquires and provides the Fixed Network Origination Service with no impediments and did not experience any difficulty in gaining access or supplying the service. YTL raised a number of matters regarding pricing which are outside the scope of this Public Inquiry but which may be considered as part of a future MSAP review. YTL is agreeable to the service description proposed by the MCMC.

Discussion

- 3.19 All operators agreed that the Fixed Network Origination Service should remain in the Access List.
- 3.20 While not all operators agreed with the need for the MCMC’s proposed clarifications to the service description for the Fixed Network Origination

Service, all operators agreed with the intention behind the proposed clarifications, that it should be beyond doubt that the service is technology neutral.

- 3.21 With regard to submissions from Celcom, Maxis and Packet One about the scope of "Message Communications", which are covered by the Fixed Network Origination Service, the MCMC acknowledges that SMS, MMS and other multimedia services may not be sent as part of an originating service in the current environment, including due to regulations which apply to 1300 and 1800 services. However, as the Access List is intended to be a future-looking regulatory instrument which must be technology neutral and cater for an increasingly converged call and messaging environment, the definition of communications covered by the Fixed Network Origination Service must be sufficiently broad to address potential future developments.

MCMC Views

- 3.22 The MCMC confirms its preliminary views and proposes to adopt the following amendments to the service description for the Fixed Network Origination Service and the definition of Message Communication which is used in that service description:

Changed Definition

"Message Communications" means communications that provide only text with or without associated images, audio clips and video clips. Examples of Message Communications include Short Message Service and Multimedia Message Service and any other technology which is currently available or which may be developed in future that involves the carriage of text communications with or without associated images, audio clips and video clips.

Fixed Network Origination Service

- (a) A Fixed Network Origination Service is an Interconnection Service provided by means of a Fixed Network for the carriage of Call Communications from an 'A' party to a POI. The Fixed Network Origination Service comprises transmission and switching (whether packet or circuit) for Fixed Network-to-Fixed Network, Fixed Network-to-Mobile Network and Fixed Network-to-international outgoing calls insofar as they relate to freephone 1800 number services, toll free 1300 number services, and other similar services which require Any-to-Any Connectivity.
- (b) The functionalities of the Fixed Network Origination Service include:
- (i) transmission and switching (whether packet or circuit); and
 - (ii) the signalling required to support the Interconnection Service.
- (c) Examples of technologies used in the provision of the Fixed Network Origination Service include PSTN, Integrated Services Digital Network (ISDN), ~~and~~ other IP based networks and any other fixed network technology which is currently available or which may be developed in future that involves the carriage of Call Communications.

Mobile Network Origination Service

Introduction

- 3.23 In the PI Paper, the MCMC noted that it considers that the rationale for including the Mobile Network Origination Service in the Access List remains valid and operators had not expressed any disagreement with the basic service description.
- 3.24 In the PI Paper, the MCMC expressed the preliminary view that the Mobile Network Origination Service should remain in the Access List, subject to minor amendments to the service description to reinforce the technologically neutral nature of the service.

Submissions Received

- 3.25 Altel submitted that although currently it is more of an access seeker, it does foresee itself to be a likely access provider as well. Altel has not faced any major difficulties in acquiring or supplying the service and supports the proposed changes to the description of the service.
- 3.26 Celcom acquires and supplies the service with no impediments. Celcom highlighted that Message Communications does not appear to be applicable to Mobile Network Origination Service since freephone 1800 service and toll-free 1300 service are limited to voice calls only.
- 3.27 Digi acquires and supplies the Mobile Network Origination Service with no serious impediment and is supportive of the inclusion of LTE and any "other mobile technology which is currently available or which may be developed in future" in the description as proposed by the MCMC.
- 3.28 Maxis acquires and supplies the Mobile Network Origination Service with no difficulties. Maxis is of the view that adding the words "not limited to" is sufficient to cover any other mobile network technologies to support the service in future. Maxis does not support adding Long-Term Evolution (**LTE**) as one of the examples in the service description as LTE is already part of International Mobile Telecommunications – Advanced (**IMT Advanced**). Maxis proposed to delete "Long Term Evolution (LTE), and any other mobile technology" from the service description while adding IMT-Advanced to the service description.
- 3.29 Similar to its view and proposal for the description of Fixed Network Origination Service, Maxis highlighted its concern about the inclusion of "Message Communication" in the carriage of "Call Communication" and proposed to amend "Call Communications" to "voice telephony" in the description of Mobile Network Origination Service.
- 3.30 Packet One acquires the Mobile Network Origination Service with no impediments. Packet One highlighted its concern about the inclusion of Message Communications in the description of the service because it has yet to come across any origination that involves message, audio or video.

- 3.31 TM acquires the Mobile Network Origination Service with no difficulties. TM proposed adding "LTE-Advanced" in the description of service and deleting the "which is currently available or which may be developed in the future that" because it is of the view that the service description already covers existing and future technology.
- 3.32 TIME acquires the Mobile Network Origination Service and has similar pricing-related concerns as voiced in their submission for the Fixed Network Origination Service and proposed for the MCMC to re-evaluate the requirements for POIs to be set up at all regions for fixed and mobile network operators. TIME is agreeable to the MCMC's proposed changes to the service description.
- 3.33 YTL highlighted that it is unable to acquire the Mobile Network Origination Service due to stringent conditions imposed, such as minimum quantity and other qualitative condition that benefit the access providers. YTL submitted that the proposed changes to the description of the service have considered technical, functional and market place changes in the future.

Discussion

- 3.34 All operators agreed that the Mobile Network Origination Service should remain in the Access List.
- 3.35 While not all operators agreed with the need for the MCMC's proposed clarifications to the service description for the Mobile Network Origination Service, all operators agreed with the intention behind the proposed clarifications, that it should be beyond doubt that the service is technology neutral.
- 3.36 With regard to the submissions from Celcom, Maxis and Packet One about the scope of "Message Communications", which are covered by the Mobile Network Origination Service, the MCMC acknowledges that SMS, MMS and other multimedia services may not be sent as part of an originating service in the current environment, including due to regulations which apply to 1300 and 1800 services. However, as the Access List is intended to be a future-looking regulatory instrument which must be technology neutral and cater for an increasingly converged call and messaging environment, the definition of communications covered by the Mobile Network Origination Service must be sufficiently broad to address potential future developments.
- 3.37 The MCMC thanks Maxis and TM for recommending that the MCMC clarifies the use of the terms LTE-Advanced and IMT Advanced in the service description for the Mobile Network Origination Service. As both terms are commonly used, the MCMC proposes to include both terms in the service description.

MCMC Views

- 3.38 The MCMC proposes to adopt the following amendments to the service description for the Mobile Network Origination Service (noting that the

updated definition of Message Communication referred to in the MCMC Views on the Fixed Network Origination Service is also used in the service description for the Mobile Network Origination Service):

Mobile Network Origination Service

- (a) *A Mobile Network Origination Service is an Interconnection Service for the carriage of Call Communications from a 'A' party to a POI. The Mobile Network Origination Service supports Mobile Network-to-Mobile Network, Mobile Network-to-Fixed Network and Mobile Network-to-international outgoing calls insofar as they relate to freephone 1800 number services, toll free 1300 number services, and other similar services which require Any-to-Any Connectivity.*
- (b) *The functionalities of the Mobile Network Origination Service include:*
 - (i) *transmission and switching (whether packet or circuit); and*
 - (ii) *the signalling required to support the Interconnection Service.*
- (c) *Examples of technologies used in the Mobile Network Origination Service would be:*
 - (i) *Global System for Mobile Communications (GSM);*
 - (ii) *International Mobile Telecommunications 2000 (IMT-2000 or 3G); ~~and~~*
 - (iii) *Worldwide Interoperability for Microwave Access (WiMAX);*
 - (iv) Long-Term Evolution (LTE);*
 - (v) International Mobile Telecommunications – Advanced (IMT-Advanced, or LTE-Advanced); and*
 - (vi) any other mobile technology which is currently available or which may be developed in future that involves the carriage of Call Communications.*

4 Wholesale termination markets (fixed and mobile)

Fixed Network Termination Service

Introduction

- 4.1 The MCMC noted in the PI Paper that the rationale for regulating the Fixed Network Termination Service has not changed from the 2008 Access List Review, as there have been no changes in the state of competition in relation to the service and operators have not raised concerns with the basic definition of this service.
- 4.2 In the PI Paper, the MCMC responded to operator calls to make the service description more technology neutral by proposing minor variations to the service description set out in paragraph 8.39 of the PI Paper.

Submissions Received

- 4.3 Altel submitted that although currently it is more of an access seeker, it does foresee itself to be a likely access provider as well. Altel has not faced

any major difficulties in acquiring or supplying the service and supports the proposed changes to the description for the service.

- 4.4 Celcom acquires the Fixed Network Termination Service and may supply the service (IP-based) in the near future. Celcom has not faced any difficulties in the acquisition or supply of the service as both access seekers and providers agree to provide the service with reasonable terms and conditions as per SAOs at regulated prices. Celcom also agrees with the proposed changes to the service description.
- 4.5 Similar to its submission for Fixed Network Origination Service, Digi highlighted that the fixed telephony market in Malaysia is not competitive.
- 4.6 Maxis acquires and supplies the Fixed Network Termination Service and has not experienced any difficulties as the service is regulated. Maxis agreed that the service should remain in the Access List. However, Maxis has similar concerns as outlined in its submission for the Fixed Network Origination Service. It is of the view that the current definition of the Fixed Network Termination Service is already technology neutral and the proposed service description by the MCMC is too wide and ambiguous as it seems to attempt regulation of future technology that has yet to come into existence. Maxis proposed to include "but not limited to" and delete "which is currently available or which may be developed in future...".
- 4.7 Packet One acquires and supplies the Fixed Network Termination Service and has not experienced any difficulties in doing so. Packet One has asked the MCMC's clarification of the reason for not referring to the Telephony Service over the IP network (**TSoIP**) in the service description, given it was previously referred to in the description. Consistent with the MCMC's discussion at paragraphs 8.10 to 8.13 of the PI Paper, Packet One also submitted that the Over-the-Top (**OTT**) VoIP applications are currently not a competitive substitute for traditional telephony products. Packet One suggested that VoIP be clearly defined in the Access List to avoid any confusion about whether references to VoIP are to operator-supplied VoIP as compared with alternative VoIP applications.
- 4.8 TM acquires and supplies the Fixed Network Termination Service without impediments. TM also raised potential cost issues with the supply of the Fixed Network Termination Service which may be considered as part of a future review of the MSAP. TM suggested deleting the words "which is currently available or which may be developed in the future that" from the proposed service description as TM is of the view that the description is already technologically neutral.
- 4.9 YTL acquires and supplies the Fixed Network Termination Service without impediments. YTL stated that the proposed description for the service has considered technical, functional and market place changes in the future. However, it noted that the service description does not address origination and termination of OTT services.

Discussion

- 4.10 All operators agreed that the Fixed Network Termination Service should remain in the Access List.
- 4.11 While not all operators agreed with the need for the MCMC's proposed clarifications to the service description for the Fixed Network Termination Service, all operators agreed with the intention behind the proposed clarifications, that it should be beyond doubt that the service is technology neutral.
- 4.12 With regard to Packet One's submissions on references to VoIP, the MCMC confirms that references to VoIP in the current and proposed Access List service descriptions are references to VoIP technology deployed by operators and that, as discussed in paragraphs 8.10-8.13 of the PI Paper, the MCMC does not view OTT VoIP applications as a substitute to the Fixed Network Termination Service.
- 4.13 With regard to Packet One's submissions on references to TSoIP, the MCMC confirms that paragraph(c) of the Fixed Network Termination Service, which says that examples of technologies used in the provision of the Fixed Network Termination Service include IP based networks, covers the termination of calls to a Called Party on a number associated with a TSoIP service.
- 4.14 With regard to YTL's observation that the service descriptions for fixed and mobile origination and termination services do not address origination and termination of OTT services, the MCMC confirms that currently, operators are not required to provide direct interconnection and termination of OTT services, nor are they required to provide origination services to OTT end consumers to the extent they supply such OTT services to end consumers themselves.

MCMC Views

- 4.15 The MCMC confirms its preliminary views and proposes to adopt the following amendments to the service description for the Fixed Network Termination Service (noting that the updated definition of Message Communication referred to in the MCMC Views on the Fixed Network Origination Service is also used in the service description for the Fixed Network Termination Service):

Fixed Network Termination Service

- (a) *A Fixed Network Termination Service is an Interconnection Service provided by means of a Fixed Network for the carriage of Call Communications from a POI to a 'B' party. The Fixed Network Termination Service comprises transmission and switching (whether packet or circuit) for Fixed Network-to-Fixed Network, Mobile Network-to-Fixed Network and incoming international-to-Fixed Network calls and messages which require Any-to-Any Connectivity.*
- (b) *The functionalities of the Fixed Network Termination Service include:*
 - (i) *transmission and switching (whether packet or circuit); and*

- (ii) *the signalling required to support the Interconnection Service.*
- (c) *Examples of technologies used in the provision of the Fixed Network Termination Service include PSTN, Integrated Services Digital Network (ISDN), ~~and~~ other IP based networks and any other fixed network technology which is currently available or which may be developed in future that involves the carriage of Call Communications.*

Mobile Network Termination Service

Introduction

- 4.16 In the PI Paper, the MCMC noted that the rationale for regulating the Mobile Network Termination Service remains valid and expressed the preliminary view that the Mobile Network Termination Service should continue to be regulated in the Access List, subject to minor amendments to the service description to reinforce the technological neutrality of the service.
- 4.17 The MCMC considered whether competition from OTT solutions had increased to the point that SMS, MMS and video call termination no longer needed to be included as part of the Mobile Network Termination Service. The MCMC expresses a preliminary view that OTT solutions did not impose a competitive constraint on those operator-supplied services because, once an end user had chosen to send an SMS or MMS, the termination rates were fixed and OTT operators could not act as a competitive substitute at that point.

Submissions Received

- 4.18 Altel submitted that although currently it is more of an access seeker, it does foresee itself to be a likely access provider as well. Altel has not faced any major difficulties in acquiring or supplying the service and supports the proposed changes to the description for the service.
- 4.19 Celcom acquires and supplies the Mobile Network Termination Service with no difficulties. Celcom also agrees with the changes to service description as proposed by the MCMC.
- 4.20 Digi acquires and supplies the Mobile Network Termination Service with no serious impediment. Digi is supportive of the inclusion of LTE and any "other mobile technology which is currently available or which may be developed in future" in the description as proposed by the MCMC.
- 4.21 Maxis acquires and supplies the Mobile Network Termination Service with no serious impediment. Maxis proposed to exclude SMS, MMS and video call termination from the scope of the Mobile Network Termination Service because commercial negotiations are working well among the mobile operators and the messaging services have been significantly substituted by the multiple choices of OTT messaging services which do not require termination from the mobile operator. In addition, Maxis stated that MMS and video calls are niche services that do not merit regulation as the rate to be charged is much higher than the actual rate practised by the operators. Maxis also highlighted that although the ACCC regulates mobile network

termination to include SMS, the EU position is to only regulate voice call termination on individual mobile networks.

- 4.22 Maxis is of the view that the current description of service is already technology neutral and the proposed changes to the description are too wide and ambiguous because it is attempting to regulate future technologies which has yet to come into existence. Maxis is of the view that future technology should be analysed and defined on a case-by-case basis and including the words "not limited to" in the description should be sufficient to address such technologies. Maxis proposed to delete LTE as a separate example because LTE is part of IMT-Advanced and also to delete "any other mobile technology which is currently available or which may be developed ...". Maxis proposed that International Mobile Telecommunications – Advanced (IMT – Advanced) should be included as an example instead.
- 4.23 Packet One is acquiring the Mobile Network Termination Service with no impediments. Packet One submitted that it does not agree that OTT services do not constitute adequate competition to SMS, MMS and video calls and indicated that according to research referred to in its submission, it is predicted that in 4 years' time, SMS revenue will decline on average by around 40% across Europe and Middle East while mobile voice is predicted to decline by 20%. The main cause for this is competitive pressure from OTT alternatives.
- 4.24 TM acquires the Mobile Network Termination Service with no impediment. TM suggested deleting the words "which is currently available or which may be developed in the future that" from the proposed amended service description as TM is of the view that the description is already technologically neutral. However, TM strongly supported the inclusion of LTE and LTE-Advanced in the definition as TM noted that it is likely that Malaysia will introduce Voice over LTE (**VoLTE**) in 2015 or 2016. TM raised pricing issues related to VoLTE which may be considered in a future MSAP review.
- 4.25 TM strongly supported the continued inclusion of SMS in the description of the Mobile Network Termination Service. TM highlighted that although the recent Mobile Terminating Access Service declaration considered the ability of OTT services to act as a substitute for SMS services, the ACCC rejected this view and decided to declare SMS termination service in Australia. TM also cited other countries which regulate SMS termination including Denmark, France, Indonesia, Poland and Turkey.
- 4.26 TIME acquires the Mobile Network Termination Service with no impediments. TIME has no comment on the proposed service description.
- 4.27 YTL plans to acquire the Mobile Network Termination Service. YTL highlighted that many service providers have not been forthcoming in supplying the service or the service is provided with stringent conditions such as imposing quantitative quotas which can be construed as constructive denial of access. YTL suggested that the MCMC to find suitable

tool to address this issue. YTL submitted that the service description has considered technical/technological, functional and market place changes.

Discussion

- 4.28 The MCMC thanks operators, including Maxis, Packet One and TM, for their continuing engagement on the question of whether services, particularly SMS, MMS and video calls, should continue to form part of the Mobile Network Termination Service. The MCMC confirms that having considered competing submissions on these issues, the MCMC continues to hold the view that these services should form part of the Mobile Network Termination Service for the reasons described in detail at paragraphs 8.54 to 8.57 of the PI Paper.
- 4.29 In response to Maxis' submission that the components of the Mobile Network Termination Service are commercially supplied and do not require regulation, the MCMC notes that the bottleneck characteristics of the Mobile Network Termination Service persist as discussed in the PI Paper. YTL's submissions are instructive in this regard.
- 4.30 Further, on YTL's submissions, the MCMC reminds all access providers that:
- (a) discriminating against an access seeker which competes with the access provider's retail arm is prohibited by the SAOs in section 149 of the CMA, which require equivalent and non-discriminatory access to listed services, including as between the service self-supplied by the access provider to itself and the service supplied by the access provider to the access seeker; and
 - (b) forced bundling, also known as "conditional access", is prohibited under section 5.13.22 of the MSA.

MCMC Views

- 4.31 The MCMC proposes to adopt the following amendments to the service description for the Mobile Network Termination Service (noting that the updated definition of Message Communication referred to in the MCMC Views on the Fixed Network Origination Service is also used in the service description for the Mobile Network Termination Service):

Mobile Network Termination Service

- (a) *A Mobile Network Termination Service is an Interconnection Service for the carriage of Call Communications from a POI to a 'B' party. The Mobile Network Termination Service supports Mobile Network-to-Mobile Network, Fixed Network-to-Mobile Network, incoming international-to-Mobile Network calls and messages which require Any-to-Any Connectivity.*
- (b) *The functionalities of the Mobile Network Termination Service include:*
 - (i) *transmission and switching (whether packet or circuit); and*
 - (ii) *the signalling required to support the Interconnection Service.*

- (c) *Examples of technologies used in the Mobile Network Termination Service would be:*
- (i) *Global System for Mobile Communications (GSM);*
 - (ii) *International Mobile Telecommunications 2000 (IMT-2000 or 3G); ~~and~~*
 - (iii) *Worldwide Interoperability for Microwave Access (WiMAX);*
 - (iv) Long-Term Evolution (LTE);*
 - (v) International Mobile Telecommunications – Advanced (IMT-Advanced, or LTE-Advanced); and*
 - (vi) any other mobile technology which is currently available or which may be developed in future that involves the carriage of Call Communications.*

5 Wholesale fixed telephony services markets (including VoIP)

Wholesale Line Rental Service

Introduction

- 5.1 In the PI Paper, the MCMC expressed the preliminary view that the Wholesale Line Rental Service should continue to be regulated in the Access List without modifications.
- 5.2 The MCMC also noted with concern, submissions from operators that they have been unable to acquire the Wholesale Line Rental Service due to forced bundling of the Wholesale Line Rental Service with other services such as Transmission Services, refusal to supply the Network Co-Location Service as required to acquire the Wholesale Line Rental Service and difficulties associated with the access provider providing preferential access to its retail arm.

Submissions Received

- 5.3 Celcom does not acquire or supply Wholesale Line Rental Service. However, Celcom believes that the Wholesale Line Rental Service can potentially increase retail competition in fixed markets. Celcom has not attempted to seek access to the service and is not aware of any relevant changes in the wholesale fixed telephony services markets that would justify regulating equal access and/or carrier pre-selection alongside the Wholesale Line Rental Service.
- 5.4 Maxis submitted that it has not successfully acquired the Wholesale Line Rental Service because the service that is currently offered by the incumbent operator is technically and functionally different from the Wholesale Line Rental definition in the Access List. Maxis also stated that it does not supply the service due to the limited coverage and capacity of its fixed PSTN services and because no access requests have been received.

- 5.5 Maxis highlighted that it does experience difficulty in acquiring the Wholesale Line Rental service offered by the incumbent fixed operator as it is only supplied for the purpose of providing retail broadband services (including voice over broadband) and the access seeker is not allowed to provide normal voice/PSTN services. The incumbent operator also requires the access seeker to concurrently subscribe to both Wholesale Line Rental Service and Bitstream Service together.
- 5.6 Maxis agreed that Wholesale Line Rental Service should remain in the Access List. However, Maxis suggested regulating the service together with equal access and carrier pre-selection service for a more effective regulation. Maxis referred to international jurisdictions which regulate the service in this manner. Maxis also submitted that the ACCC defines Wholesale Line Rental as a voice service.
- 5.7 Packet One does not acquire or provide the Wholesale Line Rental Service. However, Packet One opined that there is not much relevance for implementing Equal Access because the trend indicates that dependencies on voice, whether fixed or mobile, will be declining due to consumers' tendency to rely more on data in the future.
- 5.8 TM submitted that the Wholesale Line Rental Service has little relevance to Malaysia's situation and is not of material interest to Malaysian access seekers. TM is of the view that "pure" resale or service provision is unlikely to generate a viable long-term business and the economic value added from pure resale is small and viability depends on the retail/wholesale margin, price distortions and strength of the reseller.
- 5.9 TM highlighted four reasons for the removal of Wholesale Line Rental Service from the Access List:
- (a) the Wholesale Line Rental Service is superseded by the broadband deployment including the HSBB and High-Speed Broadband Network, Phase 2 (**HSBB2**) projects. Continuation of including Wholesale Line Rental Service in the Access List is backward looking and may encourage competitors to invest in stranded assets;
 - (b) take-up of the Wholesale Line Rental Service in markets that mandated it was never high and take-up for the service in Europe and other developed markets which introduced it are falling due to fixed to mobile substitution and migration to broadband/VoIP;
 - (c) high costs of implementing the Wholesale Line Rental Service could outweigh the competitive benefits. TM stated that there will be costs to build or adopt interfaces for access seekers to order and for customer support etc. which TM will have to recover; and
 - (d) fixed line services are regulated via Rate Rules and set below the full cost of provisioning. The introduction of the Wholesale Line Rental Service provides little opportunity for further price reductions. TM submitted that making fixed line services even more

uneconomic may discourage continued investment and rollout which is not in the long term benefit of the end users.

- 5.10 TM also highlighted that with the rollout of HSBB network, access seekers could, subject to commercial agreement, provide voice services using the open access wholesale service over the HSBB network which is similar to the Wholesale Line Rental Service.
- 5.11 Therefore, TM concluded that continued regulation of the Wholesale Line Rental Service in Malaysia will not meet the Long-Term Benefit of the End User test and introducing it in isolation is likely to be unsuccessful, too expensive, will be incapable of facilitating competition and will reduce incentives for fixed network investment. Furthermore, TM commented that there are various other issues associated with the Wholesale Line Rental Service such as technical difficulties, complex processes and high costs and the issue of insufficient last mile copper to cater for the service.
- 5.12 TIME does not acquire nor supply the Wholesale Line Rental Service. TIME does not find it economically attractive to acquire the service as compared to retail offers of the incumbent. Further, it is unable to co-locate its transmission equipment at the incumbent's premises since these locations are identified as Critical National Information Infrastructure (**CNII**). This barrier to co-locate transmission equipment at incumbent premises i.e. exchanges and submarine cable landing stations, makes it even more economically unfeasible to build retail services over the incumbent's wholesale offerings.
- 5.13 YTL supplies the Wholesale Line Rental Service and there is a possibility of YTL acquiring the service. YTL commented that it faced difficulties in acquiring the service as the main supplier is now a competitor in both fixed and mobile markets. YTL also raised pricing concerns which may be considered as part of a future review of the MSAP.

Discussion

- 5.14 The MCMC thanks operators for continuing to assist the MCMC in developing its views on the relevance of the Wholesale Line Rental Service in the industry.
- 5.15 The MCMC notes submissions from Maxis, TIME and YTL about difficulties in acquiring the Wholesale Line Rental Service. The MCMC repeats its comment at paragraph 4.30 that:
- (a) discriminating against an access seeker which competes with the access provider's retail arm is prohibited by the SAOs in section 149 of the CMA, which require equivalent and non-discriminatory access to listed services, including as between the service self-supplied by the access provider to itself and the service supplied by the access provider to the access seeker; and
 - (b) forced bundling, also known as "conditional access", is prohibited under section 5.13.22 of the MSA.

- 5.16 Issues in acquiring the Network Co-Location Service are discussed in detail below. However, the MCMC acknowledges that the Network Co-Location Service is a key input required by access seekers to take advantage of other Access List facilities and services including Wholesale Line Rental Service on an unbundled basis (without requiring access seekers to acquire transmission from the access provider), and that issues in acquiring the Network Co-Location Service are therefore likely to prevent or restrict the acquisition of the Wholesale Line Rental Service and other Access List facilities and services.
- 5.17 These points are all relevant to answering some of the suggestions made in TM's submission. Further, in response to the above-listed submissions, the MCMC notes specifically that:
- (a) access providers must not require the acquisition of Bitstream Services or other services as a condition of supplying the Wholesale Line Rental Service;
 - (b) access providers must supply access to regulated facilities and services which access seekers need to acquire to be able to use the Wholesale Line Rental Service;
 - (c) the MCMC acknowledges that the supply of facilities and services necessarily results in technological, operational and cost impacts to the access provider (which is the case regardless of whether the supply is at the wholesale or retail level and regardless of whether the supply is regulated or commercially offered). The MCMC considers these impositions on access providers as part of the Public Inquiry Process and welcomes operators' views for this reason. The MCMC also invites operators to continue engaging on the difficulties they face in supply and to provide more detailed information about costs and margins, detailed technical issues with supply to particular access seekers and operational steps they have taken and need to take to supply Access List facilities and services; and
 - (d) while operators are invited to continue engaging with the MCMC and the MCMC will continue to take all relevant information into account in all regulatory decisions, access providers must supply all facilities and services to which the SAOs apply.
- 5.18 In response to submission from TM that the Wholesale Line Rental Service should be removed in favour of regulating services supplied over the HSBB Network, the MCMC notes that:
- (a) the HSBB Network does not yet cover all of Malaysia, though coverage is set to expand as outlined in TM's submission; and
 - (b) operators in the communications and multimedia sector require scale to build viable businesses and to compete, which is to the long-term benefit of end users, so access seekers require wholesale

inputs to voice services on all networks, legacy and HSBB to build scale.

- 5.19 There has also been no supply of the HSBB Network services in the Access List, so the MCMC does not regard them as viable substitutes to the Wholesale Line Rental Service even if the above objections were overcome.

MCMC Views

- 5.20 The MCMC confirms its preliminary view that that the Wholesale Line Rental Service should remain in the Access List without any modifications. The Wholesale Line Rental Service will continue to be described as follows:

Wholesale Line Rental Service

The Wholesale Line Rental Service is a Service which allows an Access Seeker's Customer to connect to an Access Provider's Public Switched Telephone Network, and provides the Access Seeker's Customer with an ability to make and receive Call Communications.

6 Wholesale access to facilities and upstream network elements markets (for the access network)

Local Access Services

Introduction

- 6.1 The following wholesale local access services are currently regulated in the Access List: the Full Access Service, the Line Sharing Service, the Sub-loop Service and Bitstream Services.
- 6.2 The MCMC expressed the preliminary view in the Access List that there remains a strong rationale for maintaining the local access services without modifications in the Access List in respect of premises not served by the HSBB Network.
- 6.3 The MCMC also expressed the preliminary view that once the HSBB network has been deployed to particular premises, it is not appropriate to regulate access to local access services in respect of those premises. If implemented, the MCMC's proposal will operate in conjunction with the deferment in the Ministerial Direction on High-Speed Broadband and Access List, Direction No. 1 of 2008 until 15 September 2015, and the MCMC's proposed changes to the Access List will be the sole provision for ensuring that local access services do not apply in respect of premises to which the HSBB Network is connected after that date.

Submissions Received

- 6.4 Astro submitted that it is possible for access seekers to acquire the Sub-loop Service as an input to a commercially attractive business. It suggested that access seekers that choose the Sub-loop Service are likely to target the most commercially attractive areas either by targeting specific exchanges and deploying all cabinets served by them or by targeting the more attractive cabinets within an exchange area. The feasibility would

depend on population density, number of lines, residential or business customers as well as availability of cheap backhaul. Astro made reference to the European Commission's requirement for national authorities to introduce sub-loop unbundling in connection with access to next-generation access networks. Astro also made reference to particular European jurisdictions which it submitted has strongly regulated sub-loop unbundling services. Given the role of the MCMC to promote competition, Astro suggested that consideration should be given towards removing potential barriers (and including supporting processes) towards successful deployment of sub-loop unbundling.

- 6.5 Astro also urged the MCMC to consider the regulation of local access to unbundled fibre at the local loop and stressed the role of regulators in other jurisdictions to push industry to find new and innovative wholesale products that may address the challenges associated with unbundling at the local loop level. For example, the European Commission approved the UK's Virtual Unbundled Local Access (**VULA**) product in place of local loop unbundling as a temporary measure recognising that it is the best option under the present market conditions of next-generation access network in the UK. The European Commission commented that VULA does not provide operators the same freedom as local loop unbundling, and said that this remedy should be replaced as soon as possible when the necessary technical and economic conditions allow for the unbundling of the fibre loop.
- 6.6 Finally, Astro submitted that Bitstream Services do not offer additional functionalities that cannot be obtained through the HSBB Network Service with QoS. This is because both HSBB Network Service with QoS and HSBB Network Service without QoS provide wholesale access at the Ethernet protocol level (layer 2 of the OSI Model). Further, the HSBB Network Service with QoS is a more complete and flexible solution for multicast and triple-play services with the associated QoS requirements. In comparison, Bitstream Services are a basic and limited form of wholesale service.
- 6.7 Celcom is neither an access seeker nor access provider for the Full Access Service, Line Sharing Service, Sub-loop Service or Bitstream Services. But Celcom intends to seek access. Celcom submitted that a financially stable operator may not have concerns about the costs of deploying its own infrastructure. The Sub-loop Service would provide the opportunity to connect to the last mile of the HSBB network and thus, the costs to the access seeker of deploying its own infrastructure would be part of an essential investment. Celcom cited the UK and the European Regulators Group as examples of jurisdictions that regulate unbundled Layer 1 access to the "last mile".
- 6.8 Maxis has not successfully acquired the Full Access Service, Line Sharing Service, Sub-loop Service or Bitstream Service. It has also not supplied these services as an access provider due to the limited coverage and small scale of their network, and because there have not been any requests received from other access seekers. Even though the services are provided by TM through an access agreement, Maxis is unable to acquire the

services due to a high wholesale price and possible margin squeeze, a minimum number of ports which it must subscribe to, the fact that Network Co-Location is not allowed and the bundling of Bitstream Services with the Wholesale Line Rental Service.

- 6.9 Maxis strongly agreed with the MCMC's view that the local access services should be retained in the Access List as these services are still significantly essential in order to facilitate downstream competition at the retail level of the fixed broadband markets. In addition, they are also bottleneck services. Maxis reiterated its view submitted in the initial informal submissions to the MCMC. It submitted that as customers cannot be forced into upgrading or buying HSBB retail services, the exclusion of the local access services in respect of premises where the HSBB is connected effectively removes those premises from competition, to the detriment of consumers. This would limit access seekers to less profitable markets, and hence, proposed that the MCMC reconsider and allow local access services to be provided in the HSBB areas where TM is concurrently providing HSBB and Streamyx services. Further, Maxis commented on TM's view that it is expensive to maintain BSS/OSS services. Maxis submitted that it is possible to use existing systems and not invest in a totally new system, which can be more efficient and not act as a barrier to raise costs for access seekers.
- 6.10 Maxis views that Layer 1 unbundling is a possible option for the "last mile" which enables a full range of access solutions for the access seeker, depending on the business potential in the area and selected high potential revenue areas could cater for Layer 1 unbundling. Maxis submitted that in Singapore, the NetCo Interconnection Code 2009 caters to Layer 1 services, and has pricing provisions for both residential and non-residential areas, as well as BSS/OSS connection services, patching services, co-location services, redundancy and mandated services information.
- 6.11 Maxis reiterated its view that a customer cannot be forced into buying or upgrading HSBB retail services and further, customer needs for broadband services, functionality and costs also vary between customers. Hence, Bitstream Service would be more suitable for customers who require medium speed broadband access (e.g. 1 Mbps to 8 Mbps) whereas HSBB is usually required for customers who need high speed broadband access e.g. up to 100 Mbps.
- 6.12 TM provides the Full Access Service, Line Sharing Service, Sub-loop Service or Bitstream Services as an access provider. TM submitted that it faces difficulties and challenges in establishing fulfilment, assurance and billing support systems, and TM finds it uneconomical with high cost expenditure and no demand from access seekers. In the case of Sub-loop Service, TM submitted that with technical innovations such as vectoring, regulators in a number of European jurisdictions are phasing-out or restricting copper sub-loop unbundling. There has generally been a retreat from unbundling and switching to Bitstream Services and the increased importance of HSBB-type services in Europe. Hence, TM proposes that the MCMC should remove the local access services from the Access List.

- 6.13 TM submitted that it is uneconomical for the access seeker to have Layer 1 access in HSBB areas as a POI would need to be established to unbundle the fibre and copper. The access seeker would also need to invest at the lowest ladder of investment which may incur substantial costs to provide HSBB services.
- 6.14 Finally, TM also submitted that there is no additional functionality for Bitstream Services that are not obtained through the HSBB Network Service with QoS and Bitstream Services do not provide any QoS.
- 6.15 TIME does not acquire or supply Full Access Service, Line Sharing Service, Sub-loop Service or Bitstream Services. TIME does not have plans to acquire the services due to the high economic barriers to offering the related downstream retail services. TIME has also not received any inquiries from other access seekers to offer the services.
- 6.16 TIME submitted that it is not economical to acquire unbundled Layer 1 access due to the high costs of deploying its own infrastructure at or near the access provider's Optical Line Terminal (**OLT**) or Digital Subscriber Line Access Multiplexer (**DSLAM**). These costs are due to the high trenching costs and long lead-times to obtain the necessary permits and/or lack of "Layer 0" infrastructure sharing by the incumbent. TIME recommended the studies by Ofcom on unbundling of Layer 1 access in the context of next-generation access networks.
- 6.17 YTL does not acquire the Full Access Service, Line Sharing Service, Sub-loop Service or Bitstream Services. On whether it is economical to acquire unbundled Layer 1 access to the "last mile" between the OLT or DSLAM and the end user premises, YTL submitted that whilst OPEX can be saved, CAPEX is still expensive. It depends on the scale of deployment whether it is sufficient to defray the costs, as well as on the prices of HSBB Network access.

Discussion

- 6.18 The MCMC thanks all operators for their submissions and notes the differences in submissions, from Astro, Celcom and Maxis who consider all local access services to be viable, to YTL, which provided a balanced view of the particular considerations which are required to establish viability of particular services, to TIME and TM who respectively consider the Sub-loop service and all local access services to be unviable.
- 6.19 The MCMC has carefully considered the range of views expressed and considers that there remains a strong rationale for maintaining the local access services in the Access List in respect of premises not served by the HSBB Network, and for continuing the effect of the Ministerial deferral of local access services for premises that are served by the HSBB Network for the reasons discussed at paragraphs 10.39 to 10.54 of the PI Paper.
- 6.20 Astro's and TM's conflicting submissions on Layer 1 unbundling precisely demonstrates the issues faced by regulatory unbundling proposals for Layer 1 unbundling of HSBB networks. While the European Commission has

exhorted National Regulatory Authorities to move to Layer 1 unbundling, Layer 2 service delivery remains the most practical approach to unbundling of HSBB Network Services for the present time. As TM relies on the European precedent in its submissions, the MCMC understands that TM approves of Layer 2 unbundling as an appropriate alternative to lower layer regulatory unbundling and expects TM to supply Layer 2 access to the HSBB Network as it is required to do under the SAOs.

- 6.21 On TM's submission regarding the costs of supplying local access services, the MCMC reiterates its comments at paragraphs 5.17(c) and 5.17(d).
- 6.22 On TM's submission about European regulators moving away from unbundling in response to the emergence of vectoring technologies, the MCMC invites further information from TM about specific instances in which TM is deploying vectoring technology and notes that, as demonstrated by the sections of Astro's submission quoted above, the move away from unbundling is neither viewed as a long-term solution nor is it uniform. However, to the extent that vectoring does interfere with TM's ability to unbundle specific lines, the MCMC requests that this issue be brought to its attention proactively.
- 6.23 On Maxis' submission that customers cannot be forced into upgrading or buying HSBB retail services, local access services should be provided in the HSBB areas where TM is concurrently providing HSBB and Streamyx services, the MCMC notes that access providers, including TM, are only relieved from providing local access services for individual premises which are actually connected to the HSBB Network. It is not enough that the premises are passed by the HSBB Network. So, for example if House No 1 on a street has chosen to upgrade to the HSBB Network, the access provider is only required to provide access seekers with HSBB Network Services which are included in the Access List. If House No 2 on the same street is eligible to be connected to the HSBB Network but has chosen not to upgrade yet, the access provider must supply all local access services to any access seeker who requests the local access service, in compliance with the SAOs. The MCMC proposes to make minor changes to the wording of paragraph 5 of the Access List, as set out below, to clarify this issue.

MCMC Views

- 6.24 The MCMC confirms its preliminary views that each of the local access services should remain in the Access List subject to exclusions that apply to the HSBB Network which are considered below.
- 6.25 The descriptions of the local access services will remain as follows:

Full Access Service

- (a) *The Full Access Service is a Facility and/or Service for the use of Unconditioned Communications Wire between the Network Boundary at an end user's premises and a point on a network that is a potential POI located at or associated with a Customer Access Module and located on the end user side of the Customer Access Module.*

- (b) *The Full Access Service includes the use of optical fibre cable and associated transmission services between an Intermediate Point and the POI, associated tie cable services, shared splitting services, interfaces to operational support systems and network information.*

Line Sharing Service

- (a) *The Line Sharing Service is a Facility and/or Service for the use of the non-voiceband frequency spectrum of Unconditioned Communications Wire (over which wire an underlying voiceband PSTN service is operating) between the Network Boundary at an end user's premises and a point on a network that is a potential POI located at, or associated with, a Customer Access Module and located on the end user side of the Customer Access Module.*
- (b) *The Line Sharing Service includes the use of optical fibre cable and associated transmission services between an Intermediate Point and the POI, associated tie cable services, shared splitting services, interfaces to operational support systems and network information.*

Bitstream Services

- (a) *Bitstream with Network Service*

The Bitstream with Network Service is a Facility and/or Service for the provision of Layer 2 connectivity for the carriage of certain communications (being data in digital form and conforming to Internet Protocols) between customer equipment at an end user's premises and a POI at the Access Seeker's premises, where:

- (i) *the Customer's equipment is directly connected to an Access Provider's network; and*
- (ii) *the Access Seeker, but not the Access Provider, assigns the Customer with an IP address.*

Bitstream with Network Service includes shared splitting services, interfaces to operational support systems and network information.

- (b) *Bitstream without Network Service*

The Bitstream without Network Service is a Facility and/or Service for the provision of Layer 2 connectivity for the carriage of certain communications (being data in digital form and conforming to Internet Protocols) between customer equipment at an end user's premises and a POI at the Access Provider's premises, where:

- (i) *the Customer's equipment is directly connected to an Access Provider's network; and*
- (ii) *the Access Seeker, but not the Access Provider, assigns the Customer with an IP address.*

Bitstream without Network Service includes shared splitting services, interfaces to operational support systems and network information.

Sub-loop Service

- (a) *The Sub-loop Service is a Facility and/or Service for the use of Unconditioned Communications Wire between the Network Boundary at an end user's premises and a point on a network that is a potential POI located at or associated with a Customer Access Module and located on the end user side of the Customer Access Module. For Sub-loop Service, the Customer Access Module is housed in a roadside cabinet.*

- (b) *The Sub-loop Service includes the use of optical fibre cable and associated transmission services between an Intermediate Point and the POI, associated tie cable services, shared splitting services, interfaces to operational support systems and network information.*
- 6.26 The MCMC also confirms its preliminary view that paragraph 5 of the Access List, which states that the Bitstream Services and Digital Subscriber Line Resale Service do not apply in respect of premises to which the HSBB Network is connected, should be expanded to also include the Full Access Service, Line Sharing Service and Sub-loop Service. However, the MCMC proposes a minor variation to the wording of that paragraph to address the issue discussed at paragraph 6.23, above. Paragraph of the Access List will be amended as follows:

Implementation of services

~~(2) Paragraphs 6(16), 6(17) and 6(19) shall have application except where subject to deferment by the Ministerial Direction on High-Speed Broadband and Access List, Direction No. 1 of 2008.~~

Full Access Service, Line Sharing Service, Bitstream Services, Sub-loop Service and Digital Subscriber Line Resale Service shall have application except in respect of premises to which High-Speed Broadband Network is actively connected and at which the Operator of the High-Speed Broadband Network only offers retail services over the High-Speed Broadband Network.

7 Wholesale access to facilities and upstream network elements market (for the core network)

Infrastructure Sharing

Introduction

- 7.1 In the PI Paper, the MCMC noted that several operators submitted having experienced difficulties in accessing Infrastructure Sharing elements. The MCMC noted that these accords with the MCMC's finding in the Dominance Report that access to such infrastructure remain uncompetitive. The MCMC considered that this reinforces the need for Infrastructure Sharing to continue to be regulated.
- 7.2 In the PI Paper, the MCMC expressed the preliminary view that Infrastructure Sharing should continue to be regulated in the Access List subject to clarification of the scope of the concept of 'associated tower sites' and the addition of other passive infrastructure such as lead-in ducts and manholes (which is separately considered in section 13, below).

Submissions Received

- 7.3 Altel is likely to be in a position as an access seeker to acquire Infrastructure Sharing. It has not had any major difficulties in the negotiation process for the service, and has not experienced the implementation process yet. In relation to the service description, Altel submitted that the scope of tower access needs to be clarified, and

secondly, the scope of "associated tower sites" should include space and land surrounding the tower to cater for the access seeker's cabin or outdoor equipment, including space for the cable gantry connecting to the tower and generator set.

- 7.4 Altel also submitted that the description of "Physical Access" in the service description for Infrastructure Sharing should be amended to use the term "electrical supply" instead of "power". (This submission was made in the context of the MCMC's discussion of potential amendments to the service description to accommodate PDM access, but as power or electrical supply is not relevant to PDM access, the MCMC has addressed the submission in this section).
- 7.5 Celcom acquires and supplies Infrastructure Sharing. Celcom faces challenges as an access seeker in obtaining infrastructure sharing from SBCs and delays by state-appointed OSAs in processing applications. Celcom submitted that Infrastructure Sharing works well between the mobile operators, and hence, between the operators, it is not an issue that should be dealt with under the Access List. However, Celcom submitted that the issue appears to reside with access to fixed infrastructure sharing by the broadcasters, and where TM is the dominant operator. Finally, Celcom submitted that there is no necessity to comprehensively list the elements comprised by "associated tower sites".
- 7.6 Digi submitted that it faces challenges in obtaining access from the dominant SBCs in the states of Kelantan, Melaka, Negeri Sembilan and Sarawak. In addition, Digi submitted that many SBCs impose excessive charges, and these commercial terms are also not open to scrutiny and oversight by the MCMC. In addition, Digi submitted that when building its infrastructure, it faces additional arbitrary fees to fiberize sites, requirements to use OSA-appointed contractors, varying rules across different states and the trend of companies claiming to be OSAs but act as vendor for ancillary services. In terms of in-building access, Digi faces challenges in gaining access where it is provided by third party operators, such as MAHB and Sunway. Finally, Digi proposed that the definition of specified network facilities be expanded to include "posts" as defined in the CMA.
- 7.7 edotco is an access provider of Infrastructure Sharing. edotco submitted that the state of competition in this market has taken a significant downturn in the wake of the SBCs and their authorised business partners, which build and/or own telecommunications infrastructure in a particular state. It also submitted that there are five possible types of business models practised by the relevant states. edotco commented that whilst the SBC model could potentially lead to greater efficiencies and service improvements in an open access environment, it feared that the model could actually risk some companies (whether government owned or private) being in a position to use their market power to create uncompetitive outcomes. Hence, it agreed with the continued retention of Infrastructure Sharing in the Access List, without any amendments. Further, edotco does not view that it is necessary to amend the definition of

“associated tower sites” as the current definition is adequate to address the intention of the regulation and there is no practical benefit to be gained from enlarging it, as it would introduce an additional layer of complexity, additional terms and conditions as well as additional resources that would be required to implement it.

- 7.8 Fiberail supplies and acquires Infrastructure Sharing. As an access provider, it is required to bear additional power requirements from access seekers. However, as an access seeker, it faces difficulty in gaining access to sites, lack of security at the other operators’ sites which allows vandalism and theft of its equipment and also difficulty in negotiating the terms of right-of-way. Finally, Fiberail viewed that the current definition of Infrastructure Sharing is sufficient and there is no need to comprehensively list the elements comprised by the term “associated tower sites”.
- 7.9 Maxis acquires and supplies Infrastructure Sharing. Maxis shares its towers, and approximately two thirds of its towers are used by other operators. Maxis submitted that it does not face major difficulties with the mobile operators, however, it has issues dealing with some SBCs and NFPs, such as late delivery or non-delivery of sites, exclusivity arrangements, etc. In addition, it also submitted that it has had issues with gaining in-building access to third party premises such as KLIA2, KVMRT, Sunway Group, etc. With regard to TM’s view, noted in the PI Paper, that access seekers have refused to share the costs of generator and battery backup power, Maxis commented that TM’s electricity costs for Infrastructure Sharing are higher than the regulated prices of the Electricity Supply Act, hence, the mark-up was presumably to cover the costs of generator or battery backup power. Finally, Maxis supported defining “associated tower sites” and proposed for it to include space and land surrounding the tower where the access seeker may place its cabin, outdoor equipment, cable gantry system and includes way-leaves and rights for the access seeker to dig the land or lay its fibre or cable. It clarified that right-of-way and right to dig the land should be considered to be part of Infrastructure Sharing.
- 7.10 In addition, Maxis also strongly suggested that PDM not be included as part of Infrastructure Sharing. Maxis’ comments on this matter are considered in more detail in section 13, below.
- 7.11 Packet One is an access seeker for Infrastructure Sharing. Packet One viewed that since the last review in 2008, there has not been a lot of improvement especially in dealing with SBCs. It submitted that it faced difficulties such as high fees for permit renewal, prohibition of rooftop structures and exclusivity in relation to rental of infrastructure space. Hence, Packet One strongly agreed that Infrastructure Sharing should remain in the Access List. Finally, it supports the inclusion of further details for the definition to be more comprehensive.
- 7.12 PPIT submitted that, generally, its SBC members are access providers of Infrastructure Sharing. Nevertheless, it noted that some SBCs are also NSP licensees and would be access seekers, as well. PPIT submitted that supply of Infrastructure Sharing is on commercially negotiated terms and until

they are finalised, no access can be granted. It also noted that local authorities have different terms and conditions for approving permits for telecommunications structures as there is currently no uniform law approved by the Government. Further, land, as provided under National Land Code, is under the State and local authorities have the right to decide on parties that own towers in the state as well as the assessment charges. In addition, local authorities have considerations such as avoiding cluttering of skyline or duplicity of sites. Hence, PPIT views that despite there being barriers to entry, those barriers are not necessarily imposed by SBCs, and further, SBCs would provide Infrastructure Sharing as long as the site has available space and there are no loading issues. Finally, it considers the proposal by Altel at paragraph 11.50 in the PI Paper (to further define the term "associated tower sites") as reasonable, and submitted that the MCMC should also include "mastheads, rooftop space, poles and other structures that are utilised for telecommunications services" at the end of paragraph (b).

- 7.13 Sacofa is an access provider of Infrastructure Sharing. It has no difficulty in supplying Infrastructure Sharing as, it submitted, there is no barrier to accessing its infrastructure subject to tower loading and availability of space. Sacofa agreed that the elements included in the term "associated tower sites" should be made clear.
- 7.14 TM acquires and supplies Infrastructure Sharing, and supports the continued regulation of Infrastructure Sharing. This is because, it submitted, regulation provides consistent terms and conditions across all tower providers, allowing TM to seek access on a fair and reasonable manner and if there are issues with obtaining access, there is an avenue for the operators to submit complaints to the MCMC.
- 7.15 TM also highlighted that even though OSAs could be potentially useful for infrastructure providers, in some states certain OSAs that are appointed to process applications relating to telecommunications infrastructure development act in a discriminatory manner where approvals are only for certain "preferred entities", or where the OSA either deals exclusively with the SBC, or is itself a SBC. Hence, for this reason, TM also supports the proposal from edotco in the PI Paper for there to be a common set of practice standards or guidelines applicable across all states.
- 7.16 Apart from that, TM submitted that it has had other difficulties in relation to providing access seekers 24 x 7 access to TM's sites, the theft of equipment at other access providers' tower sites, electrical supply issues and costs, and it submitted that it has had difficulty sharing the costs of common access roads to towers on hill stations.
- 7.17 TM commented that different operators have different configurations of what an "associated tower site" is, and if this was to be fully clarified, there would need to be different configurations in the description. Nevertheless, TM submitted that the phrase should include references to electricity costs and access to hill sites.

- 7.18 TIME is not a direct access seeker of Infrastructure Sharing, as it provisions fibre-based services on behalf of mobile operators from tower sites to their Radio Network Controller sites or mobile exchanges. It faces difficulties in supplying such services, such as high fees charged for right-of-way by tower owners, who are typically SBCs. Further, it also faces difficulties in gaining access to, or having to pay high fees for access to, locations such as KLIA and LRT tracks. TIME agreed with the MCMC's proposal to amend the list of elements comprised by the term "associated tower sites" and suggested including a typical definition used in access agreements, which cover space and land surrounding the tower where the access seeker may place its cabin or outdoor equipment including space for the cable gantry connecting to the tower and generator set.
- 7.19 YTL is an access provider and access seeker for the Infrastructure Sharing. YTL faces difficulties as an access seeker as follows - the process of obtaining access is slow and prolonged by the access provider. YTL has had difficulty obtaining rights-of-way with the landowner imposing excessive charges, site vandalism and interruptions to the power supply. Finally, YTL agreed that the description should be amended, and submitted that it should include the element of power supply.

Discussion

- 7.20 Operators' submissions on Infrastructure Sharing have demonstrated a broad consensus that Infrastructure Sharing should remain in the Access List, including for the reasons outlined by the MCMC in the PI Paper.
- 7.21 In response to Digi's and Maxis' submissions in relation to in-building access provided by third party operators, to the extent that the third party operators are licensees and are providing Infrastructure Sharing, they are obliged under the SAOs to provide access to the facility, on request from the access seekers, on equitable and non-discriminatory terms and conditions. The MCMC also proposes an amendment to the definition of "Common Antenna System" to make this point clear.
- 7.22 In response to Celcom's comments that issues between mobile operators need not be dealt with under the Access List, the MCMC reminds all access providers that they must comply with the SAOs and provide access to listed facilities and services on request by an operator on equitable and non-discriminatory terms, including operators supplying support services to mobile operators and operators seeking to share infrastructure for non-mobile services.
- 7.23 In response to PPIT's comments, the MCMC notes that regardless of the reasons for a facility or service being a bottleneck, the existence of a bottleneck is a strong indication that regulated access to the bottleneck facility is required. The MCMC also notes that notwithstanding state laws and policies, SBCs supplying Infrastructure Sharing are also NFPs licensed under the CMA and must make every effort to apply state laws and policies in a manner that is compatible with the national policy objectives in the CMA and that furthers the Long-Term Benefit of the End User.

- 7.24 The key issue raised in the PI Paper and operators' submissions regarding the service description for Infrastructure Sharing is whether and how to define the term "associated tower sites". The MCMC notes that some operators do not think it is necessary to define the term. However, based on a generally broad consensus and the issues that some access seekers have experienced in gaining required inputs as part of Infrastructure Sharing, the MCMC has considered that there is benefit in defining "associated tower sites". While there were a range of views on what elements should be incorporated into that definition, the MCMC considers that it is most important to define the term to include right-of-way and land access which is essential to an access seeker making use of the other elements of the service.
- 7.25 The MCMC notes the following specific matters in respect of other suggestions from operators:
- (a) Digi's proposal that the network facilities be expanded to include "posts" as defined in the CMA: the MCMC does not propose to expand the scope of Infrastructure Sharing, but only to clarify elements which should already form part of the service;
 - (b) Maxis' proposal that the term expressly refer to right-of-way and the right to dig for the purposes of laying fibre or cable: the MCMC agrees that this should form part of the defined term;
 - (c) PPIT's proposal that the term include "mastheads, rooftop space, poles and other structures that are utilised for telecommunications services" at the end of paragraph (b): the MCMC reiterates its view that it is not proposing to expand the scope of Infrastructure Sharing, but only to clarify elements which should already form part of the service;
 - (d) TM's proposal that the term include access to hill sites: as the service is for access to a site, the MCMC does not consider it appropriate or necessary for the service description to stretch beyond the site. However, the MCMC encourages all access seekers to adopt a constructive approach to sharing such costs where they arise;
 - (e) TM's submission that different operators adopt different configurations: certain things are common to all access providers of Infrastructure Sharing, even if described differently and the MCMC's proposed changes below should be sufficiently broad to describe all Infrastructure Sharing sites; and
 - (f) Altel's proposal that the term "power" be replaced with "electricity supply", TM's proposal that the term include electricity costs and YTL's submission that it include power supply: the service description already refers to "power", there does not seem to be any confusion with the term, and the MCMC is of the view that nothing more is required in this regard.

- 7.26 In response to operators' concerns about security, the MCMC notes that the service description already requires the supply of security as part of the service. However, the MCMC is interested in engaging further on this issue to the extent it can assist in resolving security concerns. If an access seeker considers that an access provider is not supplying the same security to itself and the access seeker, the access seeker is encouraged to submit a complaint under section 69 of the CMA. However, to the extent that security issues are a common problem for both access seeker and access provider, operators are encouraged to continue working together to improve security and exchange best-practice information.

MCMC Views

- 7.27 The MCMC proposes to change the service description of Infrastructure Sharing to incorporate a new defined term, Associated Tower Site and to amend the definition of Common Antenna Systems, as follows:

New Definition

"Associated Tower Sites" means land owned, leased or tenanted by an operator surrounding or on which the tower is situated, including necessary right-of-way and permission to dig.

Changed Definition

"Common Antenna System" means a system of Facilities comprising antennas and cabling to the antennas inside a building, which is owned or operated by an Operator, including one or more Mobile Network Operators, in association with in-building coverage.

Infrastructure Sharing

- (a) *Infrastructure Sharing is a Facility and/or Service which comprises the following:*
- (i) *Provision of physical access, which refers to the provision of space at specified network facilities to enable an Access Seeker to install and maintain its own equipment; or*
 - (ii) *Provision of access to in-building Common Antenna Systems and physical access to central equipment room.*
- (b) *Specified network facilities include towers and ~~associated tower sites~~ Associated Tower Sites.*
- (c) *Physical access includes power, environmental services (such as heat, light, ventilation and air-conditioning), security, site maintenance and access for the personnel of the Access Seeker.*
- (d) *Provision of space at Associated Tower Sites includes space where the Access Seeker may place its cabin or outdoor equipment and space required for cable gantry connecting to the tower and generator set.*

Network Co-Location Service

Introduction

- 7.28 In the PI Paper, the MCMC stated that it considers that the rationale for regulating the Network Co-Location Service remained valid, as operators claimed that the service was an essential input for providing both wholesale and retail services and no operator suggested that the service be removed from the Access List or that the scope of the service be reduced. Consequently, the MCMC expressed the preliminary view that the Network Co-Location Service should continue to be regulated in the Access List without modifications.
- 7.29 A number of operators expressed concerns surrounding refusals by access providers to provide the Network Co-Location Service on the grounds that there were security concerns or that the co-location facilities are part of the CNII, which is a matter further discussed below.

Submissions Received

- 7.30 Altel submitted that it is likely to take the position of an access seeker to acquire the Network Co-Location Service and has not had any major challenges in negotiating access to the service in access agreement negotiations. However, it is yet to experience the implementation process for the service.
- 7.31 Celcom submitted that it is both an access seeker and access provider for the Network Co-Location Service. Celcom stated that it has not been able to acquire the service at the access provider's submarine cable landing station because the access provider claims that it would compromise security. Celcom agrees that the service is essential to some of the facilities and services in the Access List.
- 7.32 Digi submitted that the Network Co-Location Service is relevant to ensuring effective and practical interconnection. It has been denied access to co-locate its infrastructure at the incumbent's submarine cable landing stations. It was also denied access to the incumbent's nearest manhole since PDM is not currently regulated under the Access List. Digi also stated that it is compelled to use the incumbent's transmission service for the purposes of access to its submarine cable landing station which in turn requires Digi to incur additional unnecessary costs to Digi.
- 7.33 edotco submitted that it is an access provider for the Network Co-Location Service and does not make it difficult for the potential access seekers in procuring access to the requisite service. With regards to providing access to passive infrastructure, edotco stated that it is committed to the principles of open, non-discriminatory access as laid down by the MCMC. It agrees with both the market description and competition analysis for this market as well as the MCMC's preliminary view that the service is not subject to sufficient competition, especially since access to a particular exchange building may not always be substitutable for access to another building. Some degree of regulatory intervention is therefore necessary

and, as such, edotco finds merit in retaining the service in the Access List and in accordance with the current scope.

- 7.34 Fiberrail acquires and supplies Network Co-Location Service. Fiberrail reiterated its comments from its initial informal submission to the MCMC, and submitted that it is denied entry when the building owner or developer enters into an exclusive arrangement with a single operator. Hence, it is denied the opportunity to provide services in the affected building. Even if it is granted access through an interconnect with the single monopoly operator, issues such as high cost, maintenance and operational issues, demarcation of network issues as well as service availability to end customers arise.
- 7.35 Fibrecomm submitted that it is both an access seeker and access provider for the Network Co-Location Service and currently does not experience any difficulty in acquiring or supplying the service. It has made submissions on pricing issues which may be considered as part of a future review of the MSAP.
- 7.36 Maxis is an access seeker and access provider for the Network Co-Location Service. Maxis agreed with the retention of the Network Co-Location Service in the Access List as it is an important element of access to other network facilities and services in the Access List, such as Access to Network Elements, the Wholesale Local Leased Circuit Service, the Transmission Service, the Domestic Connectivity to International Services (Connectivity Only) and HSBB Network Services. However, Maxis has not successfully acquired the Network Co-Location Service due to functional limitations of the scope of the service in the Access List, which does not include the access route (e.g. PDM) to the co-located space. Hence, it is not possible to use the Network Co-Location with PDM to self-provide supporting infrastructure and consequently, it has to use co-location with purchased transmission from TM at a higher cost. Generally, there are no major issues on the Network Co-Location Service with other operators, and as an access provider, Maxis also supplies the Network Co-Location Service to other access seekers.
- 7.37 Maxis submitted that it faces difficulty in acquiring the Network Co-Location Service from TM due to two obstacles:
- (a) Access is not allowed by TM to co-locate in exchanges or submarine cable landing station. Amongst the reasons given are that the exchanges and submarine cable landing stations are high security and critical areas. However, Maxis noted this does not appear to be an issue in key submarine cable landing hubs like Singapore or Hong Kong or even to Sacofa's submarine cable landing station; and
 - (b) Access routes to co-located space are not regulated in the Access List, hence, Maxis is unable to deploy its own infrastructure into the co-located space. Instead, TM encourages Maxis to meet TM outside

the manhole or to acquire the full transmission services from TM at a higher cost.

- 7.38 Packet One submitted that it acquires the Network Co-Location Service as an access seeker and thus far has not faced major issues.
- 7.39 Sacofa submitted that it is both an access seeker and access provider for the Network Co-Location Service and does not face any difficulty in acquiring or supplying the service.
- 7.40 TM submitted that it is both an access seeker and access provider for the Network Co-Location Service. TM submitted that it faces certain operational difficulties concerning space. Its main concern is that restrictions are required on co-locating equipment at its premises, since a number of its locations are identified as CNII. TM is of the opinion that such issues need to be considered by the MCMC in any access requirements. Currently, TM is providing virtual co-location to access seekers and it finds the service viable in its current situation.
- 7.41 TIME submitted that it is both an access seeker and access provider for the Network Co-Location Service and highlighted that it is facing difficulties to gain access at TM's submarine cable landing stations and exchanges. Its requests were rejected on the basis that the requested sites are deemed as CNII locations and in some cases due to space capacity constraints.

Discussion

- 7.42 The MCMC notes the industry consensus that the Network Co-Location Service must remain regulated through the Access List and that its supply is critical to the ability of access seekers to acquire other facilities and services in the Access List and to compete effectively.
- 7.43 The MCMC thanks operators for their extensive submissions on failures to acquire the Network Co-Location Service in the form requested by access seekers.
- 7.44 Further to Maxis' submission that in several key jurisdictions, Network Co-Location is regulated and supplied by incumbent operators, the MCMC notes that such regulation and supply is common to all jurisdictions with liberalised communications sectors. The MCMC is confident that all licensees, who are all regulated in Malaysia, will be able to formulate operational security processes and supply the full scope of the Network Co-Location Service. If any operator has any concerns about this, it must raise them with the MCMC expeditiously so that the MCMC can resolve these concerns and access providers can begin complying with the SAOs as they are required to do under section 149 of the CMA.
- 7.45 The MCMC notes the forms of virtual co-location and in-span co-location described by TM and others in their submissions. These are not substitutes for supplying other forms of the Network Co-Location Service where requested by access seekers. Supplying an alternative form of Network Co-Location Service does not satisfy obligations under section 149 of the CMA,

creates barriers to infrastructure investment, harms downstream competition and is not to the Long-Term Benefit of End Users.

- 7.46 The SAOs in section 149 of the CMA require equivalent and non-discriminatory access to listed services, including as between the service self-supplied by the access provider to itself and the service supplied by the access provider to the access seeker. As TM must be self-supplying physical co-location to itself, it must also supply it to access seekers on request.
- 7.47 The MCMC confirms that its proposal to regulate Uncompetitive Duct Infrastructure will apply to ducts and manholes at exchanges and submarine cable landing stations as described in more detail in section 13, below.

MCMC Views

- 7.48 The MCMC confirms its preliminary view that the Network Co-Location Service should remain in the Access List without amendments as follows:

Network Co-Location Service

- (a) *The Network Co-Location Service is a Facility and/or Service which comprises:*
- (i) *physical co-location, which refers to the provision of space at an Access Provider's premises to enable the Access Seeker to install and maintain equipment necessary for the provision of the Access Seeker's services through the Facilities and/or Services of any Operator. Physical co-location includes physical space, power, environmental services (such as heat, light ventilation and air-conditioning), security, site maintenance and access for the personnel of the Access Seeker;*
 - (ii) *virtual co-location, which refers to the provision of facilities or services at an Access Provider's premises to enable the acquisition by the Access Seeker of Facilities and Services in the Access List, where equipment is owned and maintained by the Access Provider; or*
 - (iii) *in-span interconnection, which is the provision of a POI at an agreed point on a physical cable linking an Access Provider's network facilities to an Access Seeker's network facilities.*
- (b) *Network premises at which co-location is to be provided includes switching sites, submarine cable landing centres, earth stations, exchange buildings, other Customer Access Modules (including roadside cabinets) and such other network facilities locations associated with the provision of a Facility or Service in the Access List, and includes co-location provided at any location where main distribution frame is housed.*

8 Wholesale fixed broadband and data market (business / residential)

Digital Subscriber Line Resale Service

Introduction

- 8.1 In the PI Paper, the MCMC considered operator comments concerning the legacy nature of the Digital Subscriber Line Resale Service, which is delivered over copper. The MCMC reached the preliminary view that despite the increasing transition to fibre-based networks, the Digital Subscriber Line Resale Service is still a key input into retail fixed broadband and data market services, particularly where the HSBB Network has not been rolled out.
- 8.2 The MCMC expressed the view that the Digital Subscriber Line Resale Service would have pro-competitive effect even with the rollout of the HSBB Network, as the Digital Subscriber Line Resale Service allows operators to establish a user base prior to the HSBB Network rollout and continue servicing those end users once the HSBB rollout is complete. This is particularly relevant as retail data contracts are for long periods of time and end users are likely to remain with the same service provider both pre and post HSBB Network rollout.
- 8.3 In the PI Paper, the MCMC expressed the preliminary view that the Digital Subscriber Line Resale Service should continue to be regulated in the Access List without modifications.

Submissions Received

- 8.4 Celcom is not an access seeker or access provider for the Digital Subscriber Line Resale Service. It could potentially acquire this service as an access seeker.
- 8.5 Maxis has not successfully acquired the Digital Subscriber Line Resale Service as an access seeker under an access agreement, due to onerous terms and conditions included by TM, such as minimum ports commitment (e.g. 1000 Digital Subscriber Line (**DSL**) ports commitment), minimum ports per location (e.g. 32 DSL ports per DSLAM) which have hindered Maxis from acquiring the service. However, it has acquired wholesale DSL on a commercial basis, on a small scale, which includes transmission back to its Technical Operating Centre at a high cost. Maxis has not supplied the Digital Subscriber Line Resale Service due to its limited coverage and small scale of its DSL ports, and because there have not been requests from other access seekers for the service. In relation to TM's comment that it is expensive to maintain BSS/OSS services, Maxis submitted that it is possible to use existing systems and not invest in a totally new system as doing so would be more efficient and not act as a barrier to entry to raise the costs for the access seeker.

- 8.6 Maxis highlighted similar difficulties in acquiring the Digital Subscriber Line Resale Service as those faced in acquiring local access services, which are discussed above. Hence, Maxis agreed with the MCMC's preliminary view to retain the Digital Subscriber Line Resale Service in the Access List.
- 8.7 Packet One is not an access seeker or access provider of the Digital Subscriber Line Resale Service.
- 8.8 Sacofa does not acquire or supply the Digital Subscriber Line Resale Service.
- 8.9 TM supplies the Digital Subscriber Line Resale Service as an access provider. TM faces difficulties and challenges in establishing the required fulfilment, assurance and billing support system, and TM finds it uneconomical with high cost expenditure and no demand from access seekers. TM considers that the MCMC should remove Digital Subscriber Line Resale Service from the Access List as in addition to the lack of demand, it is outdated. Instead, TM submitted that the MCMC should focus on encouraging investment in next-generation access networks.
- 8.10 TIME does not acquire or supply Digital Subscriber Line Resale Service. TIME submitted that previously it found the price offered and the imposed commitment for Digital Subscriber Line Resale Service by the incumbent economically unattractive. Lately, TIME has decided to focus on fibre-based networks and considers that copper network as sub-standard, and does not consider acquiring Digital Subscriber Line Resale Service or consider offering it as a service to other access seekers.
- 8.11 YTL does not acquire the Digital Subscriber Line Resale Service and submitted that the difficulty experienced is the low bandwidth.

Discussion

- 8.12 The MCMC finds that Maxis' submission provides useful information about the lack of supply and acquisition of the Digital Subscriber Line Resale Service. It appears that such lack of acquisition is primarily due to lack of supply, not a lack of demand.
- 8.13 The MCMC reiterates the views it expressed in the PI Paper, that in areas where the HSBB Network has not yet been rolled out, the Digital Subscriber Line Resale Service provides a key entry point for operators seeking to compete at the retail level of the fixed broadband and data market. Accordingly, for premises that are not actively connected to the HSBB Network, there remains a clear basis for regulating the Digital Subscriber Line Resale Service.

MCMC Views

- 8.14 The MCMC confirms its preliminary view that the Digital Subscriber Line Resale Service should be maintained in the Access List without any change to its service description, as follows:

Digital Subscriber Line Resale Service

- (a) *The Digital Subscriber Line Resale Service is a Service for the provision of connectivity for the carriage of certain communications (being data in digital form and conforming to Internet Protocols) to customer equipment insofar as it relates to IP addresses directly and indirectly connected to the Access Provider's network. The Digital Subscriber Line Resale Service uses Digital Subscriber Line technology for carriage over the Communications Wire between the Network Boundary at an end user's premises and the Customer Access Module of the Access Provider's network.*
- (b) *The Digital Subscriber Line Resale Service is limited to the wholesale provision of the digital subscriber line service ordinarily provided by the Access Provider to end users.*
- 8.15 The MCMC also confirms its preliminary view that Bitstream Services and Digital Subscriber Line Resale Service continue to not apply in respect of premises to which HSBB Network is connected, subject to modification as discussed in paragraph 6.26 above.

HSBB Network Service with QoS

Introduction

- 8.16 In the PI Paper the MCMC noted that it considered the rationale for its regulation of the HSBB Network Service with QoS remained, as it is important to ensure that operators had access to new networks at multiple layers of the network stack.
- 8.17 The MCMC also disagreed with TM's suggestions that TM's Public Private Partnership (**PPP**) agreement with the Malaysian government precluded the operation of the CMA or the Access List and invited TM to suggest amendments to the HSBB Network Service with QoS service description if TM considered that it was faced with technological barriers in complying with the SAOs. The MCMC also noted that operators who have signed commercial agreements with TM for a layer 3 service still desire the layer 2 service.
- 8.18 In the PI Paper, the MCMC expressed the preliminary view that the HSBB Network Service with QoS should continue to be regulated in the Access List subject to amendments to the service description set out in paragraph 12.58 of the PI Paper, to facilitate the listing of a layer 3 equivalent elsewhere in the Access List. In addition, the MCMC also sought operators' views on potential updates to the bit rates, contention ratios and QoS metrics specified in the service description for the HSBB Network Service with QoS.

Submissions Received

- 8.19 Astro would acquire HSBB Network Service with QoS as an access seeker. It commented that listing the service in the Access List and having the terms and conditions on the MSA may not be sufficient, as the implementation of Layer 2 access product based on the experience in UK,

Denmark and Austria, is complex. Hence, Astro recommended that a cross-industry discussion such as under the Malaysian Technical Standards Forum Berhad with participation by the regulator is necessary.

- 8.20 Astro submitted that HSBB Network Service with QoS should be retained in the Access List in addition to Layer 3 HSBB Network Service, as both wholesale products have different trade-offs and suit different requirements. Layer 2 requires the access seeker to do IP-level routing and configuration, and hence new or smaller access seekers might prefer a Layer 3 product to avoid the complexity. By comparison, some services, such as Virtual Private Networks for business services, multicast IPTV broadcasts would require a Layer 2 based approach.
- 8.21 Astro agreed with the amendments to the service description for the HSBB Network Service with QoS and proposed that the service should provide as many opportunities for differentiation as possible, and that the QoS requirements should be capable of evolving with new technologies and applications and be modular. Specifically, it provided the following:
- (a) Speeds: For asymmetric bandwidth, Astro proposed increments of 25/5 Mbps, 25/10 Mbps, 50/20 Mbps and 100/40 Mbps in between the proposed 10/1 Mbps and 100/10 Mbps. It also recommended symmetric bit rates, like for the Layer 3 HSBB Network Service, and that it should have options for access seekers to meet the needs of businesses;
 - (b) QoS: For the QoS Class 1 for IPTV, Astro proposed the parameters of Technical Report: Triple-play Services Quality of Experience Requirements (TR-126) as established by the Broadband Forum, for Standard Definition Television (MPEG-2 and MPEG-4 H.264) and High Definition Television (MPEG-4 H.264);
 - (c) Contention ratio: Astro cautioned against overprovisioning the service as it removes the flexibility for the access seeker to offer and price a product flexibly to adjust to customer demand, especially in the early stages of deployment, and to differentiate their offering based on service quality. Hence, Astro proposed to add other contention ratios ranging from 1:20 to 1:50; and
 - (d) Additional condition: Astro proposed that access providers should not bundle ancillary broadband amenity services with the regulated product.
- 8.22 Celcom submitted that it does not acquire HSBB Network Service with QoS as it is not offered by any operator including the incumbent. It agreed with the MCMC's proposed amendments to the service description, and supported the retention of Layer 2 HSBB Network Service with QoS even if the Layer 3 HSBB Network Service is included in the Access List. Celcom recommended that the incumbent and dominant operator be specifically mentioned in relevant guidelines or instruments.

- 8.23 Celcom provided feedback on the service description of HSBB Network Service with QoS as follows:
- (a) POI: Celcom proposed to include the option to be connected to the incumbent's nationwide coverage via a single POI/POP;
 - (b) Bit rate for VoIP service: Celcom sought clarification on the symmetric bit rate of 135 kbps and proposed that based on ITU-T Recommendation G.711, the highest bit rate should be 64 kbps. It provided also that codec used are ITU-T Recommendations G.711, G.729 and G.722 for fixed services and AMR-NB and AMR-WB for mobile;
 - (c) Bit rate for broadband service: Celcom recommended that the upstream bit rate should not be less than 50% of the downstream bit rate. This is based on ITU-T Recommendation G.984.1 Gigabit-capable Passive Optical (**GPON**): General characteristics. In addition, there is an increase of end users providing web hosting and data sharing services. It further noted that on Active Ethernet or Active Optical Networks, the bit rates are usually symmetric; and
 - (d) Contention ratio: Celcom proposed two additional contention ratios, i.e. symmetric 25:1 and 50:1 to be available for QoS Class 3, 4 and 5.
- 8.24 Digi submitted that it may acquire the HSBB Network Service with QoS at Layer 2 to provide last mile deployment of Femtocells and other Hetnet technologies. Digi noted that in comparison with Layer 3, the HSBB Network Service at Layer 2 can provide service differentiation. Digi recommended that once POIs are available at residential and business areas, they must be offered and made available to access seekers immediately.
- 8.25 Maxis submitted that it has not been successful in acquiring the HSBB Network Service with QoS since 2009, as TM has been of the view that their service is technically different than the HSBB Network Service with QoS and hence has refused to offer the listed service to any access seeker. Instead, Maxis acquires a commercial High-Speed Broadband Access (**HSBA**) Service, which is essentially a Layer 3 service hard bundled with transmission. Maxis has not supplied the HSBB Network Service with QoS due to its limited coverage and scale, and because there have not been any requests from other access seekers.
- 8.26 Maxis submitted that countries such as UK, Singapore, Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands and Spain regulate Layer 2 wholesale access services.¹ Ofcom in the UK also described high-level characteristics for the VULA product, which are local access, service agnostic access, uncontended access, control of access and control of

¹ Body of European Regulators for Electronic Communications, Draft BEREC Report on Common Characteristics of Layer 2 Wholesale Access Products in the European Union, 21 May 2015. <http://berec.europa.eu/eng/document_register/subject_matter/berec/public_consultations/5009-draft-berec-report-on-common-characteristics-of-layer-2-wholesale-access-products-in-the-european-union>

customer premises equipment. In addition, it highlighted that it is important to have equivalence of inputs with the access provider for both the Layer 2 and Layer 3 HSBB Network Service, meaning that the retail arm of the access provider purchases the regulated product under the same terms and conditions as the access seekers.

8.27 Maxis also supported the retention of the Layer 2 HSBB Network Service with QoS if Layer 3 HSBB Network Service is included in the Access List. It submitted that the Layer 2 HSBB Network Service provides access seekers with flexibility to change IP packet routing, IP addressing and to provide dedicated VLANs for enterprise customers. Maxis commented that it is difficult to say whether the Layer 2 or Layer 3 HSBB Network Service is more important, as access seekers may have different preferences. However, it emphasised that it is important to ensure that access seekers have appropriate access at multiple layers of the network stack to allow the growth of a customer base and investment in network elements and consequently to move up the ladder of investment resulting in greater service innovation and competition in the market over time. In addition, Maxis submitted that a more detailed network diagram should be provided in the PI Report to clearly demarcate between the Layer 2 HSBB Network Service with QoS and Layer 3 HSBB Network Service.

8.28 Maxis provides the following comments on the proposed amendments to the service description:

- (a) Contention ratio: Maxis recommended the removal of contention ratios, as they artificially inflate the demand for bandwidth by pre-determining fixed bandwidths for each class of service. Maxis submitted that with Network Management Systems, both access provider and access seeker have visibility on the traffic trending at the POP, which is sufficient for capacity planning. It submitted that NBN (formerly known as NBN Co) in Australia and Ofcom have also not included contention ratios as part of the product offering by access providers, leaving the communication provider to decide on the best way to dimension their network.
- (b) Bit rates: Maxis commented that symmetric bit rates should be provided up to 1 Gbps. 32/32 kbps bit rate should be provided for VoIP services, and it proposed that the bit rate increments from 32/32 kbps up to 1/1 Gbps should be selected by access seeker.
- (c) Equivalence of Inputs and QinQ: Maxis recommended the inclusion of an equivalence of inputs requirement and the implementation of QinQ which, it explained, is a network standard allowing traffic originating from the access seeker to be encapsulated with an additional outer VLAN called a Service VLAN on top of the default Customer VLAN.
- (d) High-level characteristics: Maxis also recommended that high-level characteristics such as flexibility on access, service agnostic access,

uncontended access, control of access and control of customer premises equipment be included in the service description.

- 8.29 Packet One acquires HSBB Network Service with QoS, and has not faced any major issues. It submitted that it is acceptable to have both the Layer 3 HSBB Network Service and Layer 2 HSBB Network Service with QoS listed, as the appropriate service for each access seeker is dependent on each service provider's requirement. Packet One viewed that all services should be offered with QoS, and bit rates should be left to operators to negotiate based on their needs.
- 8.30 Sacofa does not acquire or supply the HSBB Network Service with QoS but it submitted that it may acquire it in the future.
- 8.31 TM does not acquire HSBB Network Service with QoS as an access seeker, but would be interested to seek access to other operators' HSBB networks in locations where TM does not have its own infrastructure and to wireless broadband services. TM proposed that wholesale service description for the HSBB Network Service should not be overly prescriptive towards a single service provider with a single technology and instead it should be generically applicable to the industry irrespective of technology. It clarified that its HSBB offering, HSBA is a hybrid layer 2 and 3 service to enable wholesale customers to deliver triple play services to their end users, was designed prior to the 2009 Access List variation, based on TM's PPP agreement with the Malaysian Government. TM submitted that no changes should be made to the HSBB Network Service with QoS service description and in fact, it should be deleted, as TM has successfully provided HSBB services based on the PPP agreement. It also submitted that there is no market failure with regard to this service.
- 8.32 TIME does not acquire or supply HSBB Network Services, though it has considered acquiring the service in the past. It has an arrangement with Astro and its service can be classified as an HSBB Network Service with QoS at Layer 3. TIME viewed that asymmetric regulation should be imposed on an access provider who deploys HSBB networks with funds partly or fully subsidised by the government. It also agreed that Layer 2 HSBB Network Service with QoS should be retained even if a Layer 3 HSBB Network Service is included in the Access List. This is because the Layer 2 HSBB Network Service with QoS could provide better network service offerings for point-to-point configurations.
- 8.33 YTL does not acquire the HSBB Network Service with QoS. YTL proposed the inclusion of two more bit rates, in addition to the current bit rates in the service description: 30 Mbps and 50 Mbps.

Discussion

- 8.34 Services supplied over HSBB networks will become increasingly critical as HSBB networks expand and replace legacy networks. This fact is recognised by all operators, as shown by submissions on local access services and the Digital Subscriber Line Resale Service. Consequently, the MCMC is very concerned to ensure that the HSBB Network Service with QoS at Layer 2 is

supplied in accordance with its service description. The MCMC confirms that such supply is a requirement of the SAOs and the MCMC does not consider the PPP Agreement between the Malaysian Government and TM to pose any barrier to such Layer 2 supply.

- 8.35 On the topic of supply generally, the MCMC thanks Astro for its recommendation of a cross-industry discussion such as under the Malaysian Technical Standards Forum Berhad with participation by the MCMC. The MCMC may consider this, if needed, in the future.
- 8.36 On the topic of concurrent regulation of Layer 2 and Layer 3 services, the MCMC confirms its preliminary view that there is justification and benefit to list both services concurrently, as confirmed by submissions from Astro, Digi, Celcom, Maxis, Packet One and TIME. The submissions included reasons such as the fact that different access seekers, applications and end user customers require different inputs and regulating both services maximises the possibility of service differentiation and innovation over time.
- 8.37 With regard to bandwidths and bit rates, the MCMC notes that in comparable jurisdictions there are a range of bandwidths offered or regulated on HSBB networks which the MCMC has taken into consideration, though there is no single standard that is common across jurisdictions, and different access providers and regulators tend to define speeds with reference to the requirements of access seekers and end users in a particular jurisdiction. Operators have submitted a variety of proposed regulated bandwidths for the Malaysian context. The MCMC notes in particular, Astro's view that in general upload speeds should be a third of download speeds, Celcom's view that upload speeds should not be less than 50% of download speeds given the characteristics of Passive Optical Network (**PON**). Maxis' submission that bit rates should be symmetric and TM's response to MCMC queries, that it presently supplies the symmetric bit rates and it may need to reconfigure its network to supply the asymmetric bit rates.
- 8.38 Taking into account the differing views of operators, the MCMC intends to amend the service description for the HSBB Network Service with QoS to include:
- (a) a 32 kbps symmetrical rate and 64 kbps symmetrical bit rate to take into account Maxis' submission and Celcom's submission;
 - (b) asymmetrical bit rates between 1 Mbps / 256 kbps and 100 Mbps / 50 Mbps; and
 - (c) symmetrical bit rates between 64 kbps and 100 Mbps,
- as described in further detail below.
- 8.39 The MCMC notes that 100 Mbps is the maximum speed that TM is offering to its retail customers. It is therefore an appropriate maximum speed to be offered at wholesale. Access List regulation is intended to provide access

seekers with equivalent access to a wholesale facility or service supplied by an access provider to its own downstream business.

- 8.40 The MCMC considers that, having considered varying views from operators and international practice across a wide range of jurisdictions, asymmetric bit rates must form part of the HSBB Network Service with QoS and TM must offer such asymmetric bit rates to access seekers on request. Despite the relative increase in end user uploads compared to downloads, particularly amongst business customers, it remains common for many end users to download significantly more content than they upload. It would be uneconomic and unnecessarily wasteful in such circumstances to only supply symmetric bandwidth as excessive upload capacity would be unused. PON networks such as TM's HSBB Network are capable of supporting such asymmetric bit rates as demonstrated by widespread availability of asymmetric bit rates on HSBB networks internationally. The MCMC views the imminent deployment of the HSBB2 and Sub Urban Broadband Network (**SUBB**) as an important opportunity for TM to begin configuring its networks accordingly.
- 8.41 With regard to QoS, the MCMC acknowledges Astro's proposal that QoS parameters should be added based on TR-126, published by the Broadband Forum. Given the variety of access seekers for HSBB Network Services and the variety of applications which might be supplied over HSBB networks, the MCMC considers it best, in general, to continue defining QoS by reference to latency, jitter and packet loss as is the approach taken by the ITU and the approach that the MCMC has adopted to date. However, the MCMC notes that one particular QoS characteristic in TR-216 is latency of $\leq 200\text{ms}$ for IPTV applications. Given the compatibility of this measure with the QoS definition approach adopted by the ITU and the direct relevance of this to a key application over the HSBB Network, the MCMC considers it reasonable to adopt this characteristic.
- 8.42 With regard to contention ratios:
- (a) the MCMC notes the recommendations from Astro and Celcom to specify additional contention ratios;
 - (b) the MCMC agrees with Maxis' submission on alternative mechanisms which might be used to avoid unnecessary allocation of bandwidth by the access provider. The MCMC views that the QoS parameters provided are sufficient to provide guidance to the access provider to dimension the network according to overall demand. Hence, it is not necessary to specify the contention ratios.
- 8.43 With regard to Astro's submission that access providers should not bundle ancillary broadband amenity services with the regulated product, the MCMC reiterates that as stated in the PI Paper, forced bundling, also known as "conditional access", is prohibited under section 5.13.22 of the MSA. Access seekers facing such issues should raise a complaint with the MCMC under section 69 of the CMA.

- 8.44 With regard to Celcom's and TIME's recommendations regarding the inclusion of specific regulations or guidelines for the incumbent and dominant operator, TM, the MCMC notes that the Access List is not based on an asymmetric ex-ante regulatory model. However, given that TM is the dominant access provider of HSBB Network Services by a significant margin, there should be no doubt that all HSBB Network Service obligations in the Access List apply to it.
- 8.45 With regard to Celcom's submission that access seekers should have an option to connect to the incumbent's HSBB Network nationwide through a single POI or POP, the MCMC notes that access seekers must also invest in infrastructure. The Access List is only intended to regulate access to bottleneck facilities which would be uneconomical to duplicate, such as the 'last mile' access network. Where it is economically feasible to duplicate infrastructure, such as in aggregated backhaul links between major POIs, access seekers are expected roll out their own infrastructure or acquire access to infrastructure on a commercial basis. However, the MCMC notes that to roll out competitive infrastructure, access seekers are required to have access to regulated inputs such as:
- (a) the ability to co-locate equipment at multiple POIs, which is why the MCMC is particularly concerned that TM must supply access to the full scope of Network Co-Location Services (as discussed above); and
 - (b) transmission over trunk routes, which is why the MCMC proposes to continue regulating trunk transmission separately from tail transmission (as discussed below).
- 8.46 In response to Digi's recommendation that once POIs are available at residential and business areas, they must be offered and made available to access seekers immediately; the MCMC confirms that this is already the position. Discriminating against an access seeker which competes with an access provider's retail arm is prohibited by the SAOs in section 149 of the CMA, which require equivalent and non-discriminatory access to listed services, including as between the service self-supplied by the access provider to itself and the service supplied by the access provider to the access seeker.
- 8.47 Similarly, in response to Maxis' submission that the MCMC should require equivalence of inputs between supplies made by TM to its own retail arm and to access seekers, the MCMC notes that TM is already required to comply with this principle due to the requirements in section 149 discussed above. Further enforcement of this principle may be considered as part of the upcoming MSA review. Access seekers may also raise any non-compliance with the principle through the complaint mechanism in section 69 of the CMA.
- 8.48 The MCMC acknowledges Maxis' submission that a more detailed network diagram should be provided in the PI Report to clearly demarcate between the Layer 2 HSBB Network Service with QoS and Layer 3 HSBB Network

Service. The diagrams in the PI Paper were intended only as illustrative aides. This PI Report focuses on the final description of Access List facilities and services as they will appear in the Access List.

- 8.49 The MCMC refers to Maxis' submission on QinQ or transparent VLAN facilities. The MCMC considers that this is an implementation-level detail which, while important to an access seeker for the reasons outlined by Maxis, should not form part of the service description but may be considered as part of the upcoming MSA review.
- 8.50 The MCMC has considered Maxis' recommendation that the MCMC include high-level characteristics of the service in the service description, such as flexibility on access, service agnostic access, uncontended access, control of access and control of customer premises equipment be included in the service description. The MCMC considers that these matters already form part of the SAOs or are inherent in the existing service description except for express control of customer premises equipment. The MCMC considers that such control may not be practical given that TM's broadband termination units (**BTUs**) are intended to accommodate multiple service providers. In this regard, TM's customer premises equipment is more similar to NBN's fibre network terminating devices over which NBN retains control of Openreach's customer premises equipment.
- 8.51 The MCMC notes TM's submission that it would be interested to seek access to other operators' HSBB networks in locations where TM does not have its own infrastructure. On the topic of access to wireless broadband services, the MCMC notes that in the Dominance Report it stated that:²

The MCMC disagrees with Telekom Malaysia's views that the speed and coverage of wireless services have now reached such a level that they are effective substitutes for fixed products. The MCMC does not consider that a residential end user would consider a wireless broadband product as a viable substitute for a fixed connection if, for example several Gigabytes of files or documents or a high definition movie had to be downloaded.

The MCMC considers that Telekom Malaysia's information regarding the growth of wireless broadband products does not necessarily lead to a conclusion that wireless is a substitute for fixed broadband; it is a more likely conclusion that mobile or wireless broadband is growing as a separate market in its own right.

- 8.52 The MCMC notes TM's submission that its current commercial HSBB Network offering, HSBA is a "hybrid layer 2 and 3 service". The MCMC considers that this is the first time TM or any other operator has attempted to define HSBA as anything other than a Layer 3 service. The MCMC is concerned that TM may be seeking to avoid supplying the newly proposed Layer 3 HSBB Network Service by creating this new characterisation. This concern is discussed further in section 15, below.

² MCMC, Public Inquiry Report – Assessment of Dominance in Communications Market, 24 September 2014, p.48.

- 8.53 The MCMC disagrees with TM's submission that the HSBB Network Service with QoS should be deleted for reasons discussed extensively in the PI Paper.

MCMC Views

- 8.54 The MCMC confirms its preliminary view that the HSBB Network Service with QoS should be renamed and amended and sets out further details below of those amendments, based on the submissions discussed above:

Layer 2 HSBB Network Service with QoS

- (a) *The Layer 2 HSBB Network Service with QoS is an access and transmission Facility and/or Service for the provision of Layer 2 connectivity for the carriage of certain communications (being data in digital form and conforming to Internet Protocols) between customer equipment at an End User's premises and a POI at the Access Seeker's premises, where in respect of the service:*
- (i) *the customer equipment is directly connected to an Access Provider's High-Speed Broadband Network;*
 - (ii) *the Access Seeker selects the bit rate;*
 - (iii) *the Access Seeker selects the QoS Class; and*
 - ~~(iv) *The Access Seeker selects the Contention Ratio; and*~~
 - (iv) *the Access Seeker assigns the Customer with an IP address.*
- (b) *The Layer 2 HSBB Network Service with QoS includes shared splitting services, interfaces to operational support systems and network information.*
- ~~(c) *Nothing in this service description is intended to limit:*~~
- ~~(i) *the number of concurrent Layer 2 HSBB Network Services with QoS acquired by an Access Seeker from an Access Provider associated with a single Customer;*~~
 - ~~(ii) *Further, an Access Seeker may acquire HSBB Network Service without QoS from an Access Provider associated with a Customer for which the Access Seeker is acquiring and the HSBB Network Services with QoS concurrent acquisition of Layer 2 HSBB Network Service with QoS and other HSBB Network Services by an Access Seeker from an Access Provider associated with a single Customer; or*~~
 - ~~(iii) *the number of HSBB Network Services that may be acquired by a single Access Seeker (or permit an Access Provider to require an Access Seeker to acquire any minimum or maximum number of HSBB Network Services, either in a single location or at multiple locations, as a condition of an Access Provider supplying the Layer 2 HSBB Network Service with QoS).*~~
- (d) *The Layer 2 HSBB Network Service with QoS shall be supplied to the Access Seeker as follows:*
- (i) *At pre-defined speeds which are capable of providing the bit rates specified below, as selected by the Access Seeker:*

Bit rate		Note and example applications
Downstream	Upstream	
<u>Unconstrained</u>	<u>Unconstrained</u>	<u>Access Provider does not constrain the speed of the service itself but would provide an unconstrained network service which the Access Seeker rate shapes (that is, determines the speed). This option is only available with QoS Class 5.</u>
<u>32 kbps</u>	<u>32 kbps</u>	<u>VoIP service</u>
<u>64 kbps</u>	<u>64 kbps</u>	
<u>135 kbps</u>	<u>135 kbps</u>	
<u>1 Mbps</u>	<u>256 kbps</u>	<u>Residential and Entry Level Business broadband services</u>
<u>1 Mbps</u>	<u>1 Mbps</u>	
<u>6 Mbps</u>	<u>1 Mbps</u>	
<u>6 Mbps</u>	<u>6 Mbps</u>	
<u>10 Mbps</u>	<u>5 Mbps</u>	
<u>10 Mbps</u>	<u>10 Mbps</u>	
<u>20 Mbps</u>	<u>5 Mbps</u>	
<u>20 Mbps</u>	<u>10 Mbps</u>	
<u>20 Mbps</u>	<u>20 Mbps</u>	<u>Medium Level Business broadband services</u>
<u>25 Mbps</u>	<u>5 Mbps</u>	
<u>25 Mbps</u>	<u>10 Mbps</u>	
<u>25 Mbps</u>	<u>25 Mbps</u>	
<u>30 Mbps</u>	<u>5 Mbps</u>	
<u>30 Mbps</u>	<u>10 Mbps</u>	
<u>30 Mbps</u>	<u>30 Mbps</u>	<u>Enterprise Grade Business broadband services</u>
<u>50 Mbps</u>	<u>10 Mbps</u>	
<u>50 Mbps</u>	<u>20 Mbps</u>	
<u>50 Mbps</u>	<u>50 Mbps</u>	
<u>100 Mbps</u>	<u>40 Mbps</u>	
<u>100 Mbps</u>	<u>50 Mbps</u>	
<u>100 Mbps</u>	<u>100 Mbps</u>	

(ii) In accordance with the following classes (each a "QoS Class"), as selected by the Access Seeker:

QoS Class	Latency	Jitter	Packet Loss	Notes and example applications
0	≤ 100 ms	≤ 50 ms	≤ 10 ⁻³	Real-time, jitter sensitive, high interaction – VoIP
1	≤ 400-200 ms	≤ 50 ms	≤ 10 ⁻³	Real-time, jitter sensitive, interactive – IPTV
2	≤ 100 ms	-	≤ 10 ⁻³	Transaction data, highly interactive – signalling
3	≤ 400 ms	-	≤ 10 ⁻³	Transaction data, interactive – business data
4	≤ 1 s	-	≤ 10 ⁻³	Low loss only (short transactions, bulk data) – video streaming
5	-	-	-	Best efforts – traditional applications of default IP networks

~~(iii) At the following contention ratios which correspond to the QoS Class selected by the Access Seeker in paragraph (ii):~~

Contention Ratio		Available with QoS Class
Downstream	Upstream	
1:1	1:1	0, 1, 2
1:1	10:1	1
10:1	10:1	3, 4
20:1	20:1	3, 4, 5

HSBB Network Service without QoS

Introduction

8.55 In the PI Paper, the MCMC noted that the HSBB Network Service without QoS was first added to the Access List in 2009, when high-speed broadband networks were in their infancy in Malaysia and regulatory experience with such networks was limited. The MCMC noted that it considers that there are two aspects to this service that are unusual in high-speed broadband regulated services:

- (a) the upstream network boundary of the HSBB Network Service without QoS which is an aggregation router or aggregation device (which is closer to the end user than either POI used for the HSBB

Network Service with QoS and its proposed Layer 3 equivalent);
and

- (b) the requirement that the access seeker control the bit rate of the service.

- 8.56 The MCMC noted that global experience and TM's submission indicated that it is not appropriate for access providers to support interconnection at a point in the network below the exchange while giving the access seeker control of the active equipment to control the bit rate. Furthermore, low uptake of this service coupled with access seeker support for the inclusion of a Layer 3 HSBB Network Service indicates that there are market preferences for regulated access to network layers that correspond with earlier steps on the ladder of investment.
- 8.57 The MCMC considered in the PI Paper that effective access to the HSBB Network can be currently maintained if there is a Layer 2 HSBB Network Service with QoS and a Layer 3 HSBB Network Service in the Access List.
- 8.58 The MCMC cautioned that in the future there may be a need to reinstate a Layer 2 HSBB Network Service without QoS as operators progress up the ladder of investment, but reached the preliminary view that currently the state of competition, together with the principle of proportionate regulation, suggest that the HSBB Network Service without QoS should be removed from the Access List.

Submissions Received

- 8.59 Astro would acquire the HSBB Network Service without QoS as an access seeker. It submitted that the HSBB Network Service without QoS offers access that is as deep as is possible within an active network and allows for interconnection both locally and regionally. Astro commented that access seekers are not a generic group, and that the lack of Layer 2 access arrangements is due to more to a lack of access rather than a lack of interest. In addition, Astro submitted that there should be a parallel effort to incentivise access seekers that have already made significant infrastructure investment to gain access to a Layer 2 service. More importantly, the emphasis on the Layer 3 Network Service should not be at the expense of enforcing access to the Layer 2 Network Service. Hence, Astro requested the MCMC to reconsider the MCMC's proposal to remove the HSBB Network Service without QoS from the Access List, and proposed that rather than to remove the service, that the MCMC consider specifying the requirement to come up with a Reference Offer only upon reasonable request.
- 8.60 Celcom does not acquire or supply the HSBB Network Service without QoS. It submitted that it is unable to consider the MCMC's questions on this service as this has not been offered by any operator, including the incumbent. Celcom agreed with the approach proposed by the MCMC in moving the scope of regulation 'up' the network stack by including the Layer 3 HSBB Network Service and removing the Layer 2 HSBB Network Service without QoS to facilitate greater competition.

- 8.61 Digi may acquire the HSBB Network Service without QoS at Layer 2 to provide last mile deployment of Femtocells and other Hetnet technologies. In comparison with Layer 3, Digi noted that the HSBB Network Service at Layer 2 can provide service differentiation. Digi recommended that once POIs are available at residential and business areas, they must be offered and made available to access seekers immediately.
- 8.62 Maxis has not successfully acquired the HSBB Network Service without QoS as it is not offered by TM. Maxis has not supplied the HSBB Network Service without QoS due to its limited coverage and scale, and because there have not been any requests from other access seekers. Maxis supports the inclusion of the Layer 3 HSBB Network Service in the Access List, but it does not support the removal of the Layer 2 HSBB Network Service without QoS. Maxis submitted that, as an access seeker, a variety of Layer 2 and Layer 3 solutions are required depending on customer demographics and needs. With the replacement of copper networks with fibre-based networks, Maxis submitted that it is important to ensure that access seekers have appropriate access to new networks at multiple layers of the network stack to allow them to grow their customer base, invest in network elements and move up the ladder of investment, resulting in greater service innovation and competition in the market over time.
- 8.63 Packet One does not acquire or supply the HSBB Network Service without QoS, and agrees with the MCMC's preliminary view, on the basis that it considers all inter-operator services should be subject to QoS.
- 8.64 TM does not acquire or supply the HSBB Network Service without QoS. It submitted that it is possible that the proposed Layer 3 HSBB Network Service could encourage and facilitate competition, however, in TM's view, a better solution is its current commercial offering. TM strongly agreed with the MCMC's preliminary view to remove the HSBB Network Service without QoS from the Access List.
- 8.65 TIME does not acquire or supply the HSBB Network Service without QoS. It does not find acquiring the HSBB Network Service with QoS from the incumbent to be economically or technically viable. TIME agreed with the MCMC's preliminary view that the service should be removed from the Access List as the service does not guarantee voice and multimedia quality; however, it urged the MCMC to consider asymmetric regulation, as mentioned above.
- 8.66 YTL does not acquire the HSBB Network Service without QoS currently but does not preclude the possibility in the future. YTL submitted that investment costs required to take advantage of the service are related to scale of each deployment and its viability. Whilst it agrees to the inclusion of the Layer 3 HSBB Network Service, it does not support the removal of the Layer 2 HSBB Network Service without QoS. YTL submits that removing the Layer 2 HSBB Network Service without QoS will remove flexibility and the option for access seekers to acquire it and YTL can envisage situations where it would require it in the near future. For example, when ducts are listed in the Access List, this would allow access seekers to invest and have

their own local networks, and the scale of these deployments would make procurement of HSBB Network Service without QoS viable. YTL also did not agree that the access provider can cite technical reasons as the basis to not provide the service as it would defeat the purpose and objective of accessing bottleneck facilities. Finally, YTL suggested that the MCMC conduct a detailed analysis and require the access provider concerned to comply.

Discussion

- 8.67 The MCMC acknowledges access seekers' concerns with the MCMC's proposal to remove the HSBB Network Service without QoS from the Access List. However, on balance, the MCMC confirms its preliminary view that as the MCMC considers regulation is required at higher levels of the HSBB Network stack, it is correspondingly unlikely that access seekers will be able to build a customer base and 'jump' to the level of investment required to support acquisition of the HSBB Network Service without QoS in a timeframe that requires the MCMC to continue regulating access to that service.
- 8.68 A proportionate response to regulation therefore requires the removal of the HSBB Network Service without QoS from the Access List at this time. However, the MCMC will continue monitoring competition as it relates to the HSBB Network and may consider relisting the service in due course.
- 8.69 In relation to YTL's submission that regulated duct access may allow an access seeker to build scale that enables the acquisition of the HSBB Network Service without QoS, the MCMC notes that:
- (a) no operator submissions provided evidence on the scale of customer base or revenue in any specific geographic area that would support a finding that the operator could support the infrastructure investment required;
 - (b) the limited supply of the Digital Subscriber Line Resale Service and Bitstream Services supports the above inference; and
 - (c) duct access is proposed in relation to Uncompetitive Duct Infrastructure which mainly relates to lead-in ducts and manholes, whereas the duct access that would be required to support acquisition of the HSBB Network Service without QoS is access to mainline ducts which the MCMC found in the Dominance Report to be largely competitive (though the MCMC does propose to include some mainline ducts and manholes as discussed in section 13 below).

MCMC Views

- 8.70 The MCMC confirms its preliminary view that the HSBB Network Service without QoS should be removed from the Access List.

9 Wholesale transmission services markets

Transmission Service

Introduction

- 9.1 In the PI Paper, the MCMC noted that the rationale for regulating the Transmission Service remains unmodified except as noted below, as this service is an essential input into a wide range of downstream services provided by access seekers.
- 9.2 The MCMC confirmed that it is open to deregulating the Transmission Service on a route-by-route basis subject to sufficient evidence of competition to deregulate a given route. It proposed a two-step test for deregulation and requested operator comments on that proposal.
- 9.3 The MCMC also proposed the addition of a new regulated service, the End-to-End Transmission Service, in the Access List and proposed a consequential amendment to rename the current Transmission Service as the "Trunk Transmission Service" and make minor consequential amendments and clarifications to the service description.
- 9.4 The MCMC noted that the technologically neutral expression of the Transmission Service means that different types of technology used to provide transmission links such as Dense Wavelength Division Multiplexing (**DWDM**) technology are included in the access obligations if that functionality currently exists in the access provider's network.

Submissions Received

- 9.5 Altel is an access seeker in relation to the Transmission Service and submitted that in recent negotiations, access providers have revised the definition of the Transmission Service and have introduced 'port and tail' segment, which is claimed to be non-regulated. Being a new licensee, Altel submitted that it had no choice but to agree to the revised definition. However, Altel believes that such definition is not adopted by all licensees. Altel believes that the Transmission Service should be retained in the Access List and supported MCMC's proposed change to the description of service.
- 9.6 On the proposed two-step test for removal of the Transmission Service regulation on particular routes, Altel does not believe that the number of independent operators is sufficient to determine the degree or level of competition. Altel opined that the term "independent operators" needs to be applied diligently and that the basis for removal of regulation can be further strengthened by including broader evidence extracted from factors such as barriers to entry, pricing and countervailing buyer power.
- 9.7 As for the second step in the two-step test, Altel is of the view that the wording proposed by the MCMC implies that it is not compulsory but an option to include the other factors. Altel believe that it is more effective to have an obligation to include the other factors. In addition, Altel also

submitted that the factors mentioned by the MCMC in the second part of the test are not extensive enough to build a broader base of evidence of competition or lack thereof. Altel proposed other factors such as degree of rivalry between the competing firms, the nature of change and innovation in the market growth and the presence of strong facilities-based entrants. Altel also proposed that the technique and analytical tools employed be constantly updated and refined to ensure continued relevance and usefulness and for the MCMC to be transparent in undertaking the test by adopting two way communications with stakeholders.

- 9.8 Altel agreed to the responsive removal process subject to its comments above, but raised concerns about the absence of a process to include facilities or services in the Access List.
- 9.9 Celcom is an access seeker as well an access provider of the Transmission Service. Celcom highlighted that it is facing difficulties in acquiring this service as the access provider has made changes to their service offering after the MCMC issued a pricing determination to lower prices. The access provider claims that it now offers a service that comprise of a port and tail segment and a trunk segment to connect to both tail segments. Celcom also raised other issues within pricing of the Transmission Service.
- 9.10 Celcom is agreeable with the MCMC's proposal on responsive removal of the Transmission Service on a route-by-route basis where there are 3 or more independent providers and subject to the other factors listed by the MCMC. However, Celcom proposed that the MCMC adopt a more detailed process, similar to the process adopted by the ACCC in relation to the Domestic Transmission Capacity Service. Celcom is not aware of any transmission route that should be removed and it is not agreeable to the proposed changes by MCMC to the existing Transmission Service, to cover trunk transmission only. Celcom considers the existing Transmission Service to be end-to-end.
- 9.11 Digi submitted that Transmission Service is increasingly important to cater for escalating capacity demands due to the shift in the behaviour of mobile broadband usage. It noted that the backhaul transmission is critical in delivering good quality mobile broadband to the masses. Digi submitted that the Transmission Service is essentially a bottleneck and regulatory intervention in the form of ex-ante regulation is critical. Digi believes that the Transmission Service should continue to be regulated on a national basis with no exclusion of routes for the following reasons:
- (a) there are limited number of access providers aside from the collectively dominant TM that are able to serve widespread routes;
 - (b) Transmission Service is usually procured to connect clusters of sites rather than on a link-by-link basis;
 - (c) to maximise the cost/benefit equation, necessary economies of scale would be needed and excluding some routes from the scope of regulation would reduce the economies of scale benefits.

- 9.12 Digi submitted that the two-step test for removal of the Transmission Service regulation proposed in the PI Paper could include a broader quantitative and qualitative assessment, similar to the revised methodology adopted by ACCC in its Final Report on the review of the declaration for the Domestic Transmission Capacity Service in March 2014. Digi believes that the proposed two-step may entail several setbacks as the existence of three or more independent operators may not necessarily indicate that there is sufficient competition. In addition, Digi submitted that information asymmetry is another issue that could prohibit accurate quantitative and qualitative assessments.
- 9.13 On what it considered as changes to the description of the Transmission Service, Digi recommends that the scope of the service remain, on an end-to-end basis, as stipulated in the Access List Determination 2009 for the following reasons:
- (a) the Transmission Service defined in the Access List Determination 2009 formed the basis of the varied access agreement since then. To Digi, there is no ambiguity to the definition and the benefits of redefining the Transmission Service are unclear;
 - (b) unbundling the “trunk” and “tail” elements of the Transmission Service may be unfeasible as access seekers are likely encounter bottleneck in co-locating their equipment at the access provider’s exchange in order to link the “trunk” element procured from the access provider to the “tail” element to be supplied by the access seeker itself; and
 - (c) the access seeker would incur additional wholesale prices for the “tail” elements if they are classified as Wholesale Local Leased Circuit Services, where the MSAP stipulates separate prices for the Wholesale Local Leased Circuit Services and this would unnecessarily increase cost burdens for transmission.
- 9.14 Digi proposes that the MCMC provides more clarity to the definition of Transmission Service and confirms it to be inclusive of all necessary network elements such as trunks, ports and tails. Digi also requested the MCMC to consider mandating prices for the higher bandwidth capacities and guaranteed latency.
- 9.15 Fiberail acquires the Transmission Service and supplies the service as an access provider. The difficulty faced by Fiberail in acquiring the Transmission Service is mainly due to the lack of network coverage and technical compatibility. Fiberail agrees with the MCMC’s proposal to remove Transmission Service on specific routes, if there are two or more independent providers. Fiberail identified Kuala Lumpur – JB causeway and Kuala Lumpur–North as routes that are competitive. Fiberail agreed with the proposed changes to the service description and the proposed approach to removing routes through a Public Inquiry.
- 9.16 Fibrecomm acquires the Transmission Service from other providers as well as supplying the service to other access seekers. Fibrecomm highlighted

some difficulties that they face in acquiring and supplying the Transmission Service:

- (a) the issuance of permits to work are controlled by SBCs instead of a neutral party, i.e. a local authority, which indirectly creates a conflict of interest. Thus, the service provider is required to deal with two parties and hence, there are delays to the service delivery; and
- (b) pricing from Peninsular Malaysia to Sabah and Sarawak is currently being controlled by the incumbent. Thus, customers are unable to get higher bandwidth with attractive costing to enjoy higher performance of Internet access.

9.17 Fibrecomm suggested removing regulation of the Transmission Service if there are two or more independent providers, as they do not believe that having three providers would work in Malaysia. Fibrecomm believes that regulation of Transmission Service should be removed in urban/city areas where there are more than two independent providers. Fibrecomm highlighted that the Penang Development Corporation may impose some restrictions on access providers and noted that in areas such as Cyberjaya, Putrajaya, Technology Park Malaysia, Iskandar Development Region and cable landing stations, access seekers do not have strong buying power due to a lack of competition.

9.18 Fibrecomm is not agreeable to the proposed new description of the Transmission Service as they believe that the trunk transmission can be defined at various technology platforms with multiple bandwidths. If the service is provided using the latest technology, the cost of supply will be higher and Fibrecomm submits that it would not be able to comply with the regulated prices. Fibrecomm opined that a Public Inquiry is the ideal approach to removing routes from the scope of Transmission Service.

9.19 Maxis stated that it acquires the Transmission Service as an access seeker and supplies a limited amount of the Transmission Service (e.g. Full Span Interconnect Link Service) as an access provider due to limited coverage/capacity.

9.20 Maxis submitted that the MCMC and TM's new opinion that it covers only the trunk transmission portion seems unusual. Maxis highlighted on-going disputes between the industry and TM on the scope of Transmission Service i.e. whether it should include ports and tails segments or not. Based on the description of Transmission Service and the definition of "Customer" in the existing Access List, all the other operators are of the view that ports and tails segments are included in the scope of the Transmission Service. However, after the Commission Determination on the Mandatory Standard on Access Pricing, Determination No.1 of 2012, Maxis submitted that TM has included additional segment of ports and tails into the scope of the existing Transmission service. On top of that, the total distance of the existing circuit has also been increased by 20% to 30% (estimated) which has caused a significant increase of cost (instead of potential cost saving)

to access seekers. Several negotiations and arguments have been on-going between Maxis (and the other access seekers) and TM and are still unresolved to-date.

- 9.21 Maxis does not see the rationale for the MCMC to consider removal of certain routes from the scope of Transmission Service in the Access List, since TM has been found dominant in both national (collectively with Fiberail and Fibrecomm) and Peninsular Malaysia to East Malaysia markets. Maxis also pointed out that TM has not allowed other access seekers to co-locate in their exchange buildings and there are no other access seekers exchanges that are located side-by-side or close to TM exchanges (e.g. within 100m). Maxis noted that ducting is Capex intensive and distances beyond 100m, though seemingly short, may actually be a barrier of market entry. As such it would be unlikely that there are any competitive routes for the Transmission Service and Maxis does not believe that any particular transmission routes should be removed from the scope of the Transmission Service.
- 9.22 Maxis strongly agreed with MCMC's preliminary view to retain the Transmission Service in the Access List. Maxis believes that it is extremely important to include Metro Ethernet (**Metro-E**) as an example of the technology used to provide the Transmission Service since about ninety percent (90%) of the Transmission Service supplied by the access provider is on Ethernet technologies. Maxis submitted that the exclusion of Metro-E from the scope of the Transmission Service would be a serious commercial disadvantage to access seekers. Maxis stated that the existing Metro-E pricing offered by TM is not only determined by bitrate and speed basis, but the price also varies by the location and there are no clear guidelines on how the pricing is derived by TM.
- 9.23 Maxis proposed several changes to the mechanism proposed by the MCMC for the removal of Transmission Service regulation on given routes. One of the suggestions is that the MCMC request the access provider to submit a letter of undertaking to the MCMC on the terms and conditions if the service is deregulated. In terms of evidence that there are three or more independent access providers, Maxis proposed that the MCMC considers various aspects such as whether the operators have been declared jointly dominant, the market share of the largest operator, presence of at least two other access providers in close proximity, a requirement that the Transmission Service is being provided in the identified location(s) by at least three operators, there is direct connectivity from the other Access Provider exchanges, there is sufficient demand and the level of price competition in the identified locations. In carrying out the two-step test, Maxis urged the MCMC to form a preliminary view after the criteria in the removal mechanism are met and after comprehensive assessment including price trends, rollout of other access providers, market share of access providers, locations etc. to ascertain that there is effective competition. Maxis also expressed reservation that the mere presence of three operators can result in a preliminary view of competition and believes that a deeper investigation is warranted.

- 9.24 Maxis provided the methodology used by Ofcom in the UK for the fixed market where even if there were three Principal Operators (operators large enough to impose competitive constraints) present in exchanges, but BT retained a market share equal or greater than 50%, Ofcom imposed regulation on BT. Maxis noted that such positive developments have not taken place in Malaysia. Maxis also highlighted the approach adopted by the ACCC in Australia for the assessment of competition in the transmission market. Maxis noted that the ACCC considers exchanges (and not just routes) because in transmission services, trenching is very costly.
- 9.25 Sacofa is an acquirer and supplier of the Transmission Service. Sacofa is not agreeable to the proposed removal mechanism but concurs with the MCMC's proposed changes to the service description.
- 9.26 TM stated that it acquires Transmission Service as an access seeker and supplies the Transmission Service as an access provider. TM submitted that it is facing a number of challenges in supplying Transmission Service as follows:
- (a) there are areas where there is no existing network infrastructure and there is a need for TM to significantly invest in new network infrastructure. If the requirements and take-up are very low, it is not financially viable for TM to deploy the service especially when the requested contract term is only for 12 months; and
 - (b) when there is insufficient information on the requirements for the Transmission Service, especially forecasting, it is difficult for TM to perform network and infrastructure dimensioning to provide the service to the access seekers within the specified timeframe. TM stated that unfortunately the current practice is that most ordering from access seekers is on an ad-hoc basis.
- 9.27 TM is of the opinion that in the current industry environment, the proposed approach to removal of regulation is unworkable, as it may be difficult to identify three or more independent providers on the same competitive routes. TM believes that the access seekers seek transmission capacity from a small number of access providers in order to maximize returns by investing in the more lucrative mobile business. This is more likely to be the case when regulated prices are set too low and it does not make commercial sense for licensees to invest.
- 9.28 Therefore, TM suggested that the proposed two-step test should not be rigid and inflexible, but rather any assessment should be on the level of competition in a broader market, consistent with broader practice and the competition law in Malaysia. TM submitted that if the MCMC wishes to maintain the position of having a specific number of transmission providers as a criteria, then TM considers that the identification of two or more transmission providers in the same end-to-end routes is a more realistic mechanism for removal. TM recommended that the MCMC adopt a test similar to the ACCC's test for transmission capacity. TM also submitted that it is impractical, administratively complex and very costly for the MCMC to

conduct a Public Inquiry for each area. TM thinks that it is necessary to streamline the process for the removal of mandated access, especially in relation to transmission capacity.

- 9.29 TM opined that only well-established bottleneck services should be listed in the Access List. TM proposed three specific routes to be removed from the scope of Transmission Service as follows:
- (a) Penang - Kuala Lumpur;
 - (b) Kuala Lumpur – Johor Bahru; and
 - (c) Inner Klang Valley (WP Kuala Lumpur, Petaling Jaya, Klang and Sepang districts of Selangor).
- 9.30 TM also submitted that over the past six years, in addition to increased fibre deployments in Peninsular Malaysia, inter-Sabah and inter-Sarawak routes have also become more competitive due to offerings of East Malaysia operators Sacofa and Celcom Timur. TM suggested that such routes be excluded from the Access List.
- 9.31 On the proposed changes to the service description, TM stated that the existing definition should be retained. It considers that the proposed definition deviates from original intent of both the Transmission Service and the Wholesale Local Leased Circuit Service. TM stated its belief that the purpose of Transmission Service is for upstream markets and not for downstream markets. In addition, it considers that the proposed construct will result in more transmission equipment being installed by both access providers and access seekers. TM highlighted that the current concerns with the service arose due to the MSAP that regulates only trunk segment, and not the tail portion. TM noted that it has already adopted Wholesale Local Leased Circuit Service tail pricing to have a complete end-to-end pricing as part of its Transmission Service offering.
- 9.32 TM opined that the Public Inquiry process would be the most suitable approach to removing routes from the scope of the Transmission Service. However, it is concerned about the considerable length of time between Access List reviews (e.g. 7+ years between 2008 and 2015) which are not consistent with global best practice. As such, it suggested that alternative means in the interim are needed. It suggested that the removal of certain areas and routes from the scope of access regulation should be done initially in the Public Inquiry process such as data gathering and then afterwards by notification.
- 9.33 TIME acquires and supplies the Transmission Service. When TIME has to provide network services to multiple nationwide branches of an enterprise customer, due to its limited coverage, TIME has to seek access from TM. TIME highlighted that since the revision of MSAP in 2012, TM has redefined the service to include only the trunk portion and therefore, TIME is of the view that the MCMC's proposal to regulate the End-to-End Transmission Service is a step forward to resolving on-going disputes. In addition, TIME also highlighted that there are differences in the type of interfaces that fall

within the purview of the Transmission Service and some operators exclude the Ethernet interface.

- 9.34 TIME agrees with the MCMC's proposal to remove regulation when there are three or more independent providers provided that Fiberail, Fibrecomm and TM are considered as one group. However, TIME believes that when there are three or more transmission providers on a particular route, the prices offered will be driven down by competition and therefore, the MCMC could shift its deregulation efforts to other matters.
- 9.35 YTL acquires as well as provides the Transmission Service. YTL highlighted that it is facing difficulty in interfacing with IP and fibre based transmission services, there are availability issues and escalation in cost. YTL does not agree with MCMC's proposal to remove routes on which there are three or more independent providers from the scope of the service. However, it agrees with the proposed service description. In terms of removal mechanism, YTL proposed that factors such as prices and capacity supplied should also be considered.

Discussion

- 9.36 The MCMC thanks all operators for their detailed and considered submissions on this key service.
- 9.37 The MCMC acknowledges operator submissions that the Transmission Service already includes trunks and tails and that the MCMC should not redefine the service. It is apparent from these submissions that differences in the industry's understandings of the Transmission Service became apparent at the time after the 2012 MSAP Review. Notwithstanding reservations from operators, the MCMC confirms that:
- (a) the current Transmission Service, which the MCMC proposed to rename to the Trunk Transmission Services is only intended to cover transmission over the trunk segment;
 - (b) the trunk segment excludes points connected to end user locations or access seeker locations; and
 - (c) the MCMC's proposed changes to the service description are intended to clarify this point, and the MCMC does not consider them to change the MCMC's original intention in listing the Transmission Service.
- 9.38 This approach to regulating the Transmission Service is important because a key feature of access regulation is the concept that access seekers will invest in infrastructure over time as part of the ladder of investment. This requires modular access to bottleneck facilities so that, over time, access seekers can move from acquisition to self-supply of specific inputs to a downstream service, increasing their efficiency in supply, creating service differentiation opportunities and promoting competition at both the wholesale and retail levels.

- 9.39 Consolidating the supply of the Transmission Service such that it can *only* be acquired and supplied on an end-to-end basis would not support any of the described outcomes. It would not facilitate increased competition as access seekers would not have replaced acquisition with self-supply and they themselves would not become access providers. The prospect of reduced regulation over time (including the responsive removal mechanism being proposed by the MCMC in this Public Inquiry) would therefore become unlikely.
- 9.40 The MCMC acknowledges that some operators have specific concerns with this approach.
- 9.41 First, some operators are concerned that unbundling of trunk and tail transmission will require access seekers to co-locate equipment in access providers' exchanges which will be difficult, particularly due to access providers' failure to supply the Network Co-Location Service. The MCMC has commented on its concerns regarding failures to supply the full scope of the Network Co-Location Service in section 7. However, access seekers' concerns about reliance on the Network Co-Location Service are also addressed by the MCMC's proposals to:
- (a) amend the Wholesale Local Leased Circuit Service to allow an access seeker to acquire "onward transmission via a Trunk Transmission Service provided by the same Access Provider" as part of that service instead of terminating it on an Interconnect Link Service (thus allowing the access seeker to optionally bundle the Transmission Service and Wholesale Local Leased Circuit Service but move to unbundled acquisition over time); and
 - (b) add the End-to-End Transmission Service to the Access List.
- 9.42 Second, some operators are concerned that access seekers would incur additional costs for acquiring the Transmission Service and Wholesale Local Leased Circuit Service separately. The MCMC notes that this already appears to be occurring. However, the MCMC agrees that this situation needs to be further reviewed as part of the next review of the MSAP so that all operators are able to make submissions on appropriate pricing of regulated services based on a common understanding of the scope of the services.
- 9.43 On the proposed two-step test for removal of the Transmission Service regulation on particular routes, the MCMC again expresses its appreciation of operators' detailed and well-reasoned submissions. The MCMC proposes to address operators' submissions by adopting a broader test to determine whether there is competitive supply of the Transmission Service on a given route. The MCMC describes its revised test below and notes the following matters in response to specific submissions:
- (a) the MCMC confirms that all access provider proposals to remove routes from the scope of the Transmission Service must be in writing and supported by evidence;

- (b) the MCMC confirms that it will apply a robust approach to defining whether competing access providers on a given route are truly independent of each other;
- (c) the factors that the MCMC will consider in its revised test are not limited to the examples set out in the test adopted below and the MCMC will consider all relevant information submitted by operators;
- (d) it may be true that the current state of competition in Malaysia would make it difficult to identify three independent access providers of the Transmission Service on a particular route. However, if that is the case, that is not an argument for the MCMC to lower the competition test to require only two independent access providers. Instead it is an incentive for access providers to supply associated services, such as the Network Co-Location Service, which would allow competing operators to deploy the Transmission Service;
- (e) the requirement for a flexible, comprehensive and transparent process can be achieved through the conduct of a Public Inquiry in relation to each proposal to remove a transmission route from the scope of the Transmission Service as initially proposed in the PI Paper. It is not practical to consider all matters raised by operators by adopting a streamlined process without undertaking a Public Inquiry;
- (f) the MCMC is not proposing that access providers must wait for a full Access List review to propose the removal of transmission routes from the scope of the Transmission Service. The MCMC will consider whether to hold a Public Inquiry in response to operators' proposals to deregulate transmission routes between Access List reviews (subject to operators submitting appropriate evidence to justify a Public Inquiry). While such a process will comply with the requirements of the CMA for Public Inquiries, the MCMC expects that such Public Inquiries to be more streamlined than major reviews such as the present Public Inquiry; and
- (g) the MCMC confirms that related companies will not be considered Independent Operators and will essentially be jointly assessed for the purpose of gauging competition in a market, as was the case in the MCMC's recent Assessment of Dominance.

9.44 The MCMC notes Altel's submission that the MCMC should consider a process to include facilities or services in the Access List that is similar to the proposed responsive removal mechanism. The responsive removal mechanism is intended to be a process that allows the MCMC to ensure that access regulation can be highly targeted and to maximise competition and investment incentives. The MCMC does not consider that there is a particular need to introduce a counterpart mechanism to add new facilities and services to the Access List.

- 9.45 The MCMC acknowledges submissions from TM and Fiberrail regarding routes that can be immediately considered for removal from the scope of the Transmission Service. The MCMC notes that no evidence of competitive supply has been provided to the MCMC that would satisfy either the originally proposed or revised responsive removal test. Therefore the MCMC does not intend to remove any routes from the scope of the Transmission Service at this time. However, the MCMC invites further information to allow it to address this issue in the future.
- 9.46 In response to Fibrecomm's submission that particular geographic areas have placed restriction on access provider or are otherwise lacking in competition, the MCMC confirms that the removal of access regulation in these areas would depend on a change in policy that would allow competition to occur.
- 9.47 On operator submissions regarding specific technologies, interfaces and bandwidths, the MCMC notes that:
- (a) the service description for the Transmission Service is technologically neutral. Consequently, all existing and new technologies that are used by access providers to supply transmission (including those technologies such as Ethernet that access providers use for transmission themselves) are within the scope of the Transmission Service; and
 - (b) prices and service implementation details such as latency, including for particular bandwidths or technologies, may be considered as part of future MSAP and MSA reviews, respectively.
- 9.48 In response to Fibrecomm's submission on particular issues it has faced with civil works for physical network deployment, the MCMC notes that such matters are outside the scope of this Public Inquiry but welcomes Fibrecomm's continued engagement with the MCMC on such matters.
- 9.49 In response to TM's submission that it is required to significantly invest in new network infrastructure even where demand may not allow for cost recovery, the MCMC notes that access providers are not required to build new facilities or services under the SAOs. Rather, the Access List requires access providers to supply access to *existing* facilities and services. The MCMC also notes that access seekers may place fewer orders for the Transmission Service from access providers if access seekers are granted access to the Network Co-Location Service in accordance with the SAOs and are able to deploy their own infrastructure for transmission.
- 9.50 In response to YTL's submission that it is facing issues in interfacing with particular technologies, the MCMC notes that the service is a technologically neutral one, and access providers are required to support all interfaces that they supply to themselves, on request from access seekers. As noted in the PI Paper, if an access seeker considers that an access provider is not supplying the same service to the access provider's retail arm and the access seeker, the access seeker is encouraged to submit a complaint under section 69 of the CMA.

MCMC Views

- 9.51 The MCMC confirms its preliminary views that:
- (a) the service description for the Transmission Service should be renamed the Trunk Transmission Service;
 - (b) amendments should be made to the service description for the Transmission Service to clarify the MCMC's existing intention that the service description only includes transmission over trunk segments;
 - (c) the Access List should include a responsive removal mechanism to allow the MCMC to remove specific routes from the scope of the Transmission Service between Access List reviews; and
 - (d) that the responsive removal mechanism should be based on a Public Inquiry for each removal.
- 9.52 The amendments that the MCMC proposes to the service description for the Transmission Service are as set out in the PI Paper with minor amendments to the examples of interfaces which may be used in the supply of the service:

Trunk Transmission Service

- (a) *The Trunk Transmission Service is a Facility and/or Service for the carriage of communications between any two technically feasible network transmission points (not being ~~Customer transmission points~~ End User locations or Access Seeker Points of Presence) on the Access Provider's network via such network interfaces at such transmission rates as may be agreed between the Access Provider and the Access Seeker on a permanent or virtual basis.*
- (b) *Network interfaces may use any technology as may be agreed between the Access Provider and the Access Seeker including, for example, Ethernet interfaces.*
- (c) *The functionalities of the Trunk Transmission Service include:*
 - (i) *transmission and switching (whether packet or circuit);*
 - (ii) *the signalling required to support the technology or to provide a service;*
 - (iii) *termination at either end by a port, router, network termination unit, switch, submarine cable landing centre or earth station; and*
 - (iv) *a digital protocol (including Internet Protocols).*
- (d) *A technically feasible network transmission point in paragraph (a) ~~includes~~ may include a submarine cable ~~and~~ or satellite link between Sabah and Sarawak and Peninsular Malaysia, submarine cable landing centre ~~and~~ or an earth station.*
- (e) *The Trunk Transmission Service may be for the carriage of communications which comprise a content applications service.*
- (f) *An Access Seeker for the Trunk Transmission Service includes (but is not limited to) a network facilities provider or network service provider which is only authorised to provide limited (e.g. in the last mile) network facilities or network*

services, but wishes to acquire the *Trunk* Transmission Service in order to connect its limited network facilities or network services.

~~(g) For the avoidance of doubt, the Transmission Service comprises but is not limited to the Facilities and/or Services specified in paragraphs 6(8), 6(13)(i) and/or paragraph 6(22).~~

9.53 Following operator submissions, the MCMC's revised view is that the following mechanism should be adopted for removal of regulated access to Trunk Transmission Service on a route-by-route basis:

- (1) *An Access Provider may submit to the MCMC:*
 - (a) *a written proposal to remove one or more routes from the scope of the Trunk Transmission Service;*
 - (b) *commercial terms of supply, including prices, that the Access Provider proposes to offer for transmission over the identified route(s) should the identified route(s) be removed from the scope of the Trunk Transmission Service; and*
 - (c) *detailed evidence of competition in the supply of the Trunk Transmission Service over the identified route(s) that support the Access Provider's proposal.*
- (2) *If the MCMC receives a proposal and supporting information under paragraph (1), the MCMC will conduct a preliminary review of the proposal and supporting information.*
- (3) *The MCMC may request further information from the Access Provider and from any other party, which the MCMC considers is relevant to its preliminary review under paragraph (2).*
- (4) *The MCMC may consider the following factors as part of its preliminary review under paragraph (2):*
 - (a) *whether there are three or more Independent Operators supplying the Trunk Transmission Service over the identified route(s);*
 - (b) *whether the Trunk Transmission Service supplied by each of the Independent Operators over the identified route(s) terminate at or near the same locations;*
 - (c) *the volume of the Trunk Transmission Service which each of the Independent Operators has supplied and is capable of supplying over the identified route(s);*
 - (d) *evidence of barriers to entry, including whether or not the Independent Operators facilitate co-location for the Trunk Transmission Service;*
 - (e) *the prices at which the Independent Operators are supplying and have previously supplied the Trunk Transmission Service over the identified route(s);*
 - (f) *countervailing buying power of Access Seekers of the Trunk Transmission Service over the identified route(s); and*

- (g) *potential effects of removal of identified route(s) from the scope of the Trunk Transmission Service on supply and acquisition of the Trunk Transmission Service over other routes and the supply and acquisition of other facilities and services.*
- (5) *If the MCMC's preliminary view is that there may be sufficient competition in the supply of the Trunk Transmission Service over the identified route(s), the MCMC will conduct a Public Inquiry on whether to remove the identified route(s) from the scope of the Trunk Transmission Service.*
- (6) *Any Operator may object to the potential removal of the identified route(s) from the scope of the Trunk Transmission Service by providing detailed evidence of the lack of competition in the supply of the Trunk Transmission Service on the identified route(s), including evidence about any of the matters listed in paragraphs (4)(a)-(g), during the Public Inquiry.*
- (7) *If the MCMC receives an objection under paragraph (6) within the deadline set out in the Public Inquiry, it may extend the Public Inquiry to conduct such further inquiries as it considers necessary, including by gathering information from any party.*
- (8) *Following the completion of the Public Inquiry, including any extended Public Inquiry, where applicable, the MCMC shall publish a Public Inquiry Report setting out its findings.*

9.54 The MCMC proposes to define the term "Independent Operators" as follows:

"Independent Operators" means, in relation to any two or more Operators, that the Operators are not under common control and the operators have not been determined by the MCMC to be collectively dominant in a relevant market.

Wholesale Local Leased Circuit Service

Introduction

- 9.55 In the PI Paper, the MCMC noted that the rationale for regulating the Wholesale Local Leased Circuit Service remains, as this service is an essential input into a wide range of downstream services provided by access seekers.
- 9.56 The MCMC confirmed that it is open to deregulating the Wholesale Local Leased Circuit Service on an area-by-area basis subject to sufficient evidence of competition to deregulate a given area. It proposed a two-step test for deregulation and requested operator comments on that proposal.
- 9.57 The MCMC noted that the current service description in the Access List envisages the Wholesale Local Leased Circuit Service being connected to the access seekers' network by means of an Interconnect Link Service. Some operators had submitted that they acquire the Wholesale Local Leased Circuit Service with a trunk transmission segment.
- 9.58 The MCMC proposed amending the service description of the Wholesale Local Leased Circuit Service to address situations where the service is acquired with a trunk transmission segment, but clarifying that in that circumstance, the access seeker is effectively acquiring the Wholesale Local

Leased Circuit Service from an End User location to a POI, and then also acquiring the Trunk Transmission Service from the same POI to another POI.

Submissions Received

- 9.59 Celcom does not acquire nor supply the Wholesale Local Leased Circuit Service even though it could potentially acquire this service as an access seeker. Celcom is agreeable with the MCMC's proposal to remove the service if there are three or more independent providers on a particular route, considering the other proposed factors.
- 9.60 Celcom is unable to provide any particular areas or locations that should be removed from the scope of the Wholesale Local Leased Circuit Service. Celcom identified two scenarios where this service could be used. The first is when the access seeker does not have a local POP in all areas in Malaysia, and this service could be acquired to connect the access seeker's customer premises with the access seeker's switching location or aggregation point in a distant location. The second scenario is where the access seekers has already deployed infrastructure to the access provider's POP that serves the end user's premises, and the access seeker has co-located its own equipment within this facility. In this situation, the access seeker would only be acquiring the tail segment of what was previously the Private Circuit Completion Service. Celcom proposed that the service description should reflect both the scenarios.
- 9.61 Celcom also agreed with the MCMC's proposed approach to removing routes from the scope of the Wholesale Local Leased Circuit Service where warranted, through a Public Inquiry process. In addition, Celcom proposed that the MCMC adopts a more detailed process, similar to the process adopted by ACCC in Australia for removal of Domestic Transmission Capacity Service.
- 9.62 Digi has not acquired this service previously and submitted that it does not understand the benefits of redefining the scope of the service. Therefore, Digi proposed that MCMC retain the definition in the current Access List. However, Digi believes that the service should continue to be regulated on a national basis, without any exclusions. Digi submitted that the two step test proposed in the PI Paper could include a broader quantitative and qualitative assessment, similar to the revised methodology adopted by ACCC in its Final Report on the review of the declaration for the Domestic Transmission Capacity Service in March 2014. Digi believes that the proposed two-step may entail several setbacks as the existence of three or more independent operators may not necessarily indicate that there is sufficient competition. Digi identified information asymmetry as another issue that could prohibit accurate quantitative and qualitative assessments.
- 9.63 Fiberail provides the Wholesale Local Leased Circuit Service as an access provider and it has not faced any major difficulties with the service. Fiberail agreed with the proposal to remove areas from the scope of the Wholesale Local Leased Circuit Service where there are three or more independent

providers and to consider location by location for removal instead of broad geographic areas. Fiberail also agreed with the proposed changes to the description of the Wholesale Local Leased Circuit Service.

- 9.64 Maxis submitted that it has neither acquired nor supplied the Wholesale Local Leased Circuit Service. Maxis claimed that the main reason for not acquiring the Wholesale Local Leased Circuit Service is because it is not allowed to co-locate in TM's exchanges. Instead, TM requested that Maxis meet via fibre splicing outside the exchange area where the Wholesale Local Leased Circuit Service is requested. Without network co-location, Maxis submitted that the Wholesale Local Leased Circuit Service is not cost effective.
- 9.65 Maxis does not see the rationale for the MCMC to consider removal of certain locations from the scope of the Wholesale Local Leased Circuit Service. Based on its experience, Maxis believes that TM is capable of providing the Wholesale Local Leased Circuit Service. Other access providers are unable to do so due to limitations with last mile connections.
- 9.66 Maxis is agreeable to the MCMC's proposal to retain the Wholesale Local Leased Circuit Service in the Access List and it proposed to include Metro-E as an example of the technology used.
- 9.67 Maxis submitted several changes to the proposed removal mechanism by the MCMC in certain locations. One of the suggestions is that the MCMC request the access provider to submit a letter of undertaking to the MCMC on terms and conditions on which it will supply the service if it is deregulated. In terms of evidence that there are three or more independent access providers, Maxis proposed that the MCMC considers various aspects such as whether the operators have been declared jointly dominant, market share of the largest operator, presence of at least two other access providers in close proximity, whether the Wholesale Local Leased Circuit Service is being provided in the identified location(s) by at least three operators, whether there is direct connectivity from the other access providers' exchanges, whether there is sufficient demand, and the level of price competition in the identified locations.
- 9.68 In carrying out the two-step test, Maxis urged the MCMC to form a preliminary view after the criteria in the removal mechanism are met and after a comprehensive assessment including price trends, rollout of other access providers, market share of access providers, locations etc. to ascertain that there is effective competition. Maxis also expressed reservation that the mere presence of three operators can result in a preliminary view of competition and believe that a deeper investigation is warranted.
- 9.69 Packet One does not acquire or provide the Wholesale Local Leased Circuit Service and it is of the view that the service should be regulated nationwide, without any exemption. However, it is agreeable to the MCMC's proposed approach to remove locations by way of Public Inquiry.

- 9.70 Sacofa submits that it acquires and supplies the Wholesale Local Leased Circuit Service and it has not faced any difficulty. Sacofa did not agree with the MCMC's proposed removal mechanism.
- 9.71 TM supplies the Wholesale Local Leased Circuit Service as an access provider and it has not encountered any problems in supplying the service. As for the locations to be removed from the scope of the Wholesale Local Leased Circuit Service, TM believes that the number of independent providers should be two or more in the locations. TM is of the view that there are a range of areas, including the majority of the Klang Valley, which can and ought to be excluded from the Access List. Importantly there is no demand for the Wholesale Local Leased Circuit Service, given there are other viable alternatives open to licensees including self-provisioning of infrastructure. Therefore, TM submitted that there is a strong rationale for removing this service from the Access List.
- 9.72 TM also agrees with the modifications to the service description proposed by MCMC except for the changes proposed to (7A)(b)(ii) under paragraph 13.79 of the PI Paper, relating to the signalling service for the following reasons:
- (a) the full span Interconnect Link Service has been always been provided based on the Transmission Service with additional Signalling System Number Seven (**SS7**) signalling and it does not require the Wholesale Local Leased Circuit Service to complete the service;
 - (b) the Wholesale Local Leased Circuit Service is a half circuit provided by access provider from the POI to end users premises to complete the access seeker's circuit offering to the access seeker's end users; and
 - (c) not every desired location is connected to the nearest POI exchange; therefore depending on the locations requested, the access provider will have to provide the Wholesale Local Leased Circuit Service via trunk and tail segments. Such approach is consistent with the MSAP as well.
- 9.73 TM opined that the Public Inquiry process would be the most suitable approach to removing routes from the scope of the Wholesale Local Leased Circuit Service. However, it is concerned about the considerable length of time between Access List reviews (e.g. 7+ years between 2008 and 2015) which are not consistent with global best practice. As such, TM submitted that alternative means in the interim are needed. TM recommended that the removal of certain areas and routes from the scope of access regulation should be done initially in the Public Inquiry process including data gathering and then afterwards by notification.
- 9.74 TIME does not acquire or supply the Wholesale Local Leased Circuit Service and highlighted their inability to co-locate equipment in the incumbent's local exchanges as a reason which adds to the technical limitation to acquiring the service. TIME agrees with the proposal to remove areas from

the scope of the Wholesale Local Leased Circuit Service if there are three or more independent providers, subject to Fiberail, Fibrecomm and TM being considered as one group. TIME does not believe that removing the locations would have additional positive impact since the offerings would have been competitive enough. TIME is agreeable to the changes to the service description and is impartial to the proposed approach to removing locations.

- 9.75 YTL acquires the Wholesale Local Leased Circuit Service and it submitted that it does not face any impediments in acquiring this service. In terms of removing areas from the scope of the service when there are three or more providers, YTL suggested that other factors such as prices and capacity supplied must be taken into account.

Discussion

- 9.76 The MCMC thanks all operators for their detailed and considered submissions on this key service.
- 9.77 The MCMC acknowledges operator submissions that the Wholesale Local Leased Circuit Service can already be acquired either on a tail-only or trunk-plus-tail segment basis and that the MCMC should not redefine the service. Notwithstanding reservations from operators, the MCMC confirms that:
- (a) the current Wholesale Local Leased Circuit Service is only intended to cover transmission over the tail segment and associated signalling required for interconnection; and
 - (b) the MCMC's proposed changes to the service description are intended to clarify this point, and the MCMC does not consider them to change the MCMC's original intention in listing the Wholesale Local Leased Circuit Service.
- 9.78 This approach to regulating the Wholesale Local Leased Circuit Service is important for the same reasons which are discussed above in relation to the Trunk Transmission Service. A key feature of access regulation is the concept that access seekers will invest in infrastructure over time as part of the ladder of investment. This requires modular access to bottleneck facilities so that, over time, access seekers can move from acquisition to self-supply of specific inputs to a downstream service, increasing their efficiency in supply, creating service differentiation opportunities and promoting competition at both the wholesale and retail levels.
- 9.79 Given that the Trunk Transmission Service is available to access seekers to acquire transmission over the trunk segment, it is not necessary or appropriate for the Wholesale Local Leased Circuit Service to subsume such transmission. However, the MCMC does propose to change the description of the Wholesale Local Leased Circuit Service to make clear that the service may be acquired together with the Trunk Transmission Service to facilitate transmission from an access seeker location or customer location to a POI

that is reached by both trunk and tail segments (whether the POI is at remote access provider exchange or an access seeker POP).

- 9.80 The concerns that operators have in relation to the unbundling of trunk and tail transmission were already discussed in relation to Trunk Transmission Service, above. Specifically for Wholesale Local Leased Circuit Service, access seekers will need to co-locate equipment in access providers' exchanges, which will be difficult, particularly due to access providers' failure to supply the Network Co-Location Service. The MCMC has commented on its concerns regarding failure to supply the full scope of the Network Co-Location Service in section 7. However, these concerns regarding Network Co-Location Service are also addressed by the MCMC's proposals to amend the Wholesale Local Leased Circuit Service to allow an access seeker to acquire "onward transmission via a Wholesale Local Leased Circuit Service provided by the same Access Provider" as part of that service instead of terminating it on an Interconnect Link Service. This allows the access seeker to optionally bundle the Wholesale Local Leased Circuit Service and the Trunk Transmission Service, but move to unbundled acquisition over time.
- 9.81 On the proposed two-step test for removal of the Wholesale Local Leased Circuit Service regulation on particular areas, the MCMC again expresses its appreciation of operators' detailed and well-reasoned submissions. The MCMC proposes to address operators' submissions by adopting a broader test to determine whether there is competitive supply of the Wholesale Local Leased Circuit Service on a given area which is similar to the revised approach proposed for the Trunk Transmission Service.
- 9.82 The MCMC has not discussed each of the submissions by operators in relation to the Wholesale Local Leased Circuit Service, as most are common to the Trunk Transmission Service which has already been addressed comprehensively above. However, the MCMC addresses concerns raised with the Wholesale Local Leased Circuit Service in particular as follows.
- 9.83 The MCMC notes Maxis' submission that the service description for the Wholesale Local Leased Circuit Service should include Metro-E as an example of the technology used. While the MCMC understands that transmission is currently supplied overwhelmingly using Metro-E, the MCMC does not have sufficient information to determine whether the use of Metro-E is directly linked to the supply of End-to-End Transmission Services, or whether Metro-E would be used to supply disaggregated trunk or tail transmission, if acquired separately. The MCMC confirms that if an access provider is self-supplying trunk and tail transmission using Metro-E, it must also supply transmission to access seekers using Metro-E, on request.
- 9.84 The MCMC has not received any evidence that the Wholesale Local Leased Circuit Service has been competitively supplied in any area in a manner that would satisfy either the originally proposed or revised responsive removal test. Therefore the MCMC does not intend to remove any areas from the scope of the Wholesale Local Leased Circuit Service at this time.

9.85 In response to TM's submission that there is no demand for the Wholesale Local Leased Circuit Service given there are other viable alternatives open to licensees including self-provisioning of infrastructure, the MCMC reiterates the views it expressed in relation to the Trunk Transmission Service:

- (a) as highlighted in multiple access seeker submissions, the failure to supply the full scope of the Network Co-Location Service may affect demand for other services including the Wholesale Local Leased Circuit Service; and
- (b) lack of demand cannot be inferred where required inputs are not offered for supply.

MCMC Views

9.86 The MCMC confirms its preliminary views that:

- (a) amendments should be made to the service description for the Wholesale Local Leased Circuit Service to clarify the MCMC's existing intention that the service description only includes transmission over tail segments;
- (b) the Access List should include a responsive removal mechanism to allow the MCMC to remove specific areas from the scope of the Wholesale Local Leased Circuit Service between Access List reviews; and
- (c) that the responsive removal mechanism should be based on a Public Inquiry for each removal.

9.87 The amendments that the MCMC proposes to the service description for the Wholesale Local Leased Circuit Service are as set out in the PI Paper with minor changes to clarify that the service is only for tail transmission and to provide the examples of technologies which may form part of the supply of the Wholesale Local Leased Circuit Service:

Wholesale Local Leased Circuit Service

- (a) *A Wholesale Local Leased Circuit Service is ~~an Interconnection Service~~ a Facility and/or Service for the carriage of communications by way of a private circuit between a POI at the Access Provider's premises and an end user location or an Access Seeker Point of Presence, available only at one end of a private circuit. The Wholesale Local Leased Circuit Service comprises transmission and switching (whether packet or circuit) at such transmission rates as may be agreed between the Access Provider and the Access Seeker on a permanent or virtual basis.*
- (b) *The functionalities of the Wholesale Local Leased Circuit Service include:*
 - (i) *Transmission and switching (whether packet or circuit);*
 - (ii) *The signalling required to support the ~~Interconnection Service~~ Interconnect Link Service or onward transmission via a Trunk Transmission Service provided by the same Access Provider; and*

- (iii) *A digital protocol (including Internet Protocols).*
- (c) *An example of a technology Examples of technologies used in the Wholesale Local Leased Circuit Service would be Integrated Services Digital Network (ISDN) and IP based networks and Ethernet interfaces.*
- ~~(d) *An end user includes a wholesale or retail customer and includes an Operator and the final recipient of the service.*~~
- ~~(e) *For the avoidance of doubt, the Wholesale Local Leased Circuit Service comprises but is not limited to the Facilities and/or Services specified in paragraph 6(7).*~~

9.88 Following operator submissions, the MCMC's revised view is that the following mechanism should be adopted for removal of regulated access to wholesale local leased circuit services on an area-by-area basis (noting that the definition of "Independent Operators" described at paragraph 9.54, above, is also used in the following mechanism):

- (1) *An Access Provider may submit to the MCMC:*
 - (a) *a written proposal to remove one or more areas from the scope of the Wholesale Local Leased Circuit Service;*
 - (b) *commercial terms of supply, including prices, that the Access Provider proposes to offer for transmission in the identified area(s) should the identified area(s) be removed from the scope of the Wholesale Local Leased Circuit Service; and*
 - (c) *detailed evidence of competition in the supply of the Wholesale Local Leased Circuit Service in the identified area(s) that support the Access Provider's proposal.*
- (2) *If the MCMC receives a proposal and supporting information under paragraph (1), the MCMC will conduct a preliminary review of the proposal and supporting information.*
- (3) *The MCMC may request further information from the Access Provider and from any other party, which the MCMC considers is relevant to its preliminary review under paragraph (2).*
- (4) *The MCMC may consider the following factors as part of its preliminary review under paragraph (2):*
 - (a) *whether there are three or more Independent Operators supplying the Wholesale Local Leased Circuit Service in the identified area(s);*
 - (b) *whether the Wholesale Local Leased Circuit Service supplied by each of the Independent Operators in the identified area(s) terminate at or near the same locations;*
 - (c) *the volume of the Wholesale Local Leased Circuit Service which each of the Independent Operators has supplied and is capable of supplying in the identified area(s);*
 - (d) *evidence of barriers to entry, including whether or not the Independent Operators facilitate co-location for the Wholesale Local Leased Circuit Service;*

- (e) *the prices at which the Independent Operators are supplying and have previously supplied the Wholesale Local Leased Circuit Service in the identified area(s);*
 - (f) *countervailing buying power of Access Seekers of the Wholesale Local Leased Circuit Service in the identified area(s); and*
 - (g) *potential effects of removal of identified area(s) from the scope of the Wholesale Local Leased Circuit Service on supply and acquisition of the Wholesale Local Leased Circuit Service in other areas and the supply and acquisition of other facilities and services.*
- (5) *If the MCMC's preliminary view is that there may be sufficient competition in the supply of the Wholesale Local Leased Circuit Service in the identified area(s), the MCMC will conduct a Public Inquiry on whether to remove the identified area(s) from the scope of the Wholesale Local Leased Circuit Service.*
 - (6) *Any Operator may object to the potential removal of the identified area(s) from the scope of the Wholesale Local Leased Circuit Service by providing detailed evidence of the lack of competition in the supply of the Wholesale Local Leased Circuit Service in the identified area(s), including evidence about any of the matters listed in paragraphs (4)(a)-(g), during the Public Inquiry.*
 - (7) *If the MCMC receives an objection under paragraph (6) within the deadline set out in the Public Inquiry, it may extend the Public Inquiry to conduct such further inquiries as it considers necessary, including by gathering information from any party.*
 - (8) *Following the completion of the Public Inquiry, including any extended Public Inquiry, where applicable, the MCMC shall publish a Public Inquiry Report setting out its findings.*

10 Interconnect link markets

Interconnect Link Service

Introduction

- 10.1 In the PI Paper, the MCMC noted that its preliminary view was that the Interconnect Link Service should remain in the Access List because:
 - (a) interconnect links are essential for allowing end-to-end connectivity for end users;
 - (b) interconnect links typically do not have any viable substitutes and are considered to be a natural monopoly; and
 - (c) each operator with a network is dominant in the interconnect link market for each POP along that operator's network.
- 10.2 During the Public Inquiry, several stakeholders submitted that the service description for the Interconnect Link Service should include IP interconnection. In the PI Paper the MCMC requested further submissions from stakeholders on this matter, and indicated that it is considering amending the service description.

Submissions Received

- 10.3 Altel submitted that it is both an access seeker and provider for the Interconnect Link Service, but in practice, the role of an access seeker closely relates to it. Altel does not have major difficulties in negotiating the service and finds that the current implementation of the service is being undertaken with full cooperation by the other licensees.
- 10.4 Altel is poised to implement the LTE services, thus, it submitted that IP-based interconnection will likely be used to offer origination and termination services and other related services. Altel noted that it is a new licensee that is involved in discussions with the other licensees in respect to the establishment of IP-based interconnection. Altel suggests that IP-based interconnection be included in the Access List to facilitate discussions to implement IP-based interconnection because licensees' networks are moving towards an IP-based network environment. It also proposed some amendments in its submission.
- 10.5 Celcom submitted that it is both an access seeker and access provider for the Interconnect Link Service. It does not experience any difficulty in acquiring or supplying the service. Currently, it is not involved in the provisioning of any specific downstream services which require IP-based interconnection. Celcom supplies IP-based interconnection on a commercial basis upon request by an operator and suggests that the description of the Interconnect Link Service include bandwidth allocation instead of distance. It has further specified equipment types such as DWDM, Next-Generation Synchronous Digital Hierarchy and Packet-Based Transport Networks as examples used to supply the Interconnect Link Service.
- 10.6 Digi submitted that it acquires the Interconnect Link Service as an access seeker. It currently uses the SS7 interface, which suffices for interconnection and does not face any impediments to access. Digi does not acquire any alternative IP-based interconnection; hence it views that it is unnecessary to amend the definition of Interconnect Link Service to be technology neutral or to include IP-based interconnection alongside SS7.
- 10.7 Maxis submitted that it is both an access seeker and access provider for the Interconnect Link Service and has no difficulty in acquiring or supplying the service since the existing scope of the service is sufficient. Currently, Maxis is not exploring IP-based interconnection because the existing SS7 interconnection method is working effectively and the Interconnect Link Service description has adequate functionality with no impediment to access or supply. Maxis does not acquire or supply IP-based interconnection on a commercial basis and does not acquire alternative forms of interconnection at this stage. Overall, Maxis finds the current service description sufficient. With regard to the establishment of IP-based interconnection, Maxis stated that the implementation of IP-based interconnection would require significant investment by operators, namely, in terms of new equipment to be purchased, network design and resources, and submitted that it is not being prioritised right now.

- 10.8 Packet One submitted that it acquires the Interconnect Link Service as an access seeker and proposes extending the service to include IP-based interconnection. It submitted that its current arrangements with its access provider are satisfactory. It requires IP-based interconnection for high definition voice. Packet One proposes that the description of the Interconnect Link Service be amended to include pure IP-based connection using the Session Initiation Protocol (**SIP**).
- 10.9 Sacofa submitted that it does not acquire or supply the Interconnect Link Service. However, it has proposed that the service should include future proof technology and not solely focus on IP-based interconnection. Sacofa did not elaborate further on the proposed technology.
- 10.10 TM submitted that it is both an access seeker and access provider of the Interconnect Link Service. TM noted that the great majority of the services are established by means of in-span interconnection. It believes that mid-span is the preferred form of interconnection by all market participants. It does not experience any difficulty in acquiring or supplying the service since the service is already mature in the market.
- 10.11 TM stated that it requires IP-based interconnection for voice and video services and does not acquire or supply IP-based interconnection on a commercial basis at this stage. TM proposes that the Interconnect Link Service for IP-based interconnection should be provided over IP trunking and support SIP and that the link should be separated from the circuit based Interconnect Link Service to ensure workability.
- 10.12 TIME submitted that it is both an access seeker and access provider for the Interconnect Link Service. It does not experience any serious impediment in acquiring or supplying the service when entering into interconnection arrangements with other mobile and fixed providers. TIME is of the view that IP-based interconnection is required for downstream services such as VoIP services, SIP services and teleconference services. Currently, TIME does not acquire or supply IP-based interconnection on a commercial basis. TIME proposes that MCMC considers reviewing the draft document entitled "Guideline on IP Interconnection" that was developed by the working group under Malaysian Technical Standard Forum Bhd in 2009. TIME would like MCMC to consider utilising the service description and processes proposed in the said document.
- 10.13 YTL submitted that it acquires the Interconnect Link Service as an access seeker and finds it to be a usable input into services offered to customers without impediments. YTL proposes that the MCMC include aspects like IP-based interconnection and costs involved in the description of the service as it submitted that IP-based interconnection is preferable for cost control in operations, management efficiency and differentiated services strategies. At present, YTL does not require IP-based interconnection to provide any related or downstream services and does not acquire or supply IP-based interconnection on a commercial basis. It however, does not rule out the possibility of requiring IP-based interconnection to provide the related or downstream services in the future.

Discussion

- 10.14 The MCMC confirms its preliminary view that the Interconnect Link Service should remain in the Access List and notes that all operators are supportive of this approach.
- 10.15 The MCMC notes the varying views of operators on whether IP-based interconnection should be regulated as part of the Interconnect Link Service. First the MCMC notes that the Interconnect Link Service is for interconnection of voice traffic only, and does not include interconnection for the exchange of data.
- 10.16 Any amendments to the service description for the Interconnect Link Service to incorporate IP-based interconnection would need to specify whether the access provider would need to provide any or all of the following:
- (a) IP-to-IP voice traffic interconnection only;
 - (b) IP-to-PSTN voice traffic interconnection; and
 - (c) PSTN-to-IP voice traffic interconnection.
- 10.17 Only TM appears to have commented on this issue, recommending that any expansion of the Interconnect Link Service be limited to IP-to-IP voice traffic interconnection.
- 10.18 Only Celcom has submitted that it currently supplies or acquires IP-based interconnection on a commercial basis (though a number of operators are in negotiations to acquire or supply IP-based interconnection and others did not expressly comment on their current practices in this regard).
- 10.19 The MCMC notes that despite the rapid growth of IP-based data networks and IP-based data interconnection for peering and transit, the transition to IP-based voice traffic and IP-based voice traffic interconnection has progressed much more slowly globally, with few precedents of regulators mandating IP-based interconnection. Moreover, while operator-supplied VoIP is being adopted by operators on-net for fixed lines, VoLTE is only now beginning to roll out commercially.
- 10.20 Given the relative immaturity of IP-based interconnection and the continued prevalence of TDM interconnection based on SS7 globally and in Malaysia, the MCMC declines to amend the service description for the Interconnect Link Service to include IP-based interconnection at the present time.

MCMC Views

- 10.21 The MCMC considers that the Interconnect Link Service should be retained in the Access List without any amendments to its service description, as follows:

Interconnect Link Service

An Interconnect Link Service is a Facility and/or Service which enables:

- (a) *the physical connection between the network of an Access Provider and the network of an Access Seeker for the purpose of providing an Interconnection Service; and*
- (b) *the interconnection of the Signalling System Number Seven (SS7) network of an Access Provider to the SS7 network of an Access Seeker at the signal transfer points.*

Domestic Connectivity to International Services (Connectivity Only)

Introduction

- 10.22 In the PI Paper, the MCMC expressed the preliminary view that the Domestic Connectivity to International Services (Connectivity Only) should remain in the Access List without any modifications. The MCMC noted that the rationale for maintaining the Domestic Connectivity to International Services (Connectivity Only) in the Access List remains strong.
- 10.23 This service remains a bottleneck facility essential for operators seeking to access international private leased circuits or transmission links from submarine cable landing stations to a network transmission point in Malaysia, as well as more distant services such as international Internet exchange services.
- 10.24 The MCMC noted operators' concerns that they were experiencing difficulties in acquiring or supplying the Domestic Connectivity to International Services (Connectivity Only) due to access providers' failure to supply the Network Co-Location Service at submarine cable landing stations and access providers' requirement to acquire backhaul routes to its submarine cable landing stations instead, breaching the prohibition against forced bundling, also known as "conditional access", under section 5.13.22 of the MSA.

Submissions Received

- 10.25 Celcom does not acquire the Domestic Connectivity to International Services (Connectivity Only). Its existing service is based on connection at a Point of Access (**POA**) on a commercially agreed basis. It has stated that the access provider does not allow co-location at its submarine cable landing station.
- 10.26 Digi submitted that the Domestic Connectivity to International Services (Connectivity Only) is essential to ensure effective and practical connectivity to international linkages. Digi stated that it was denied access to co-locate its infrastructure at the incumbent's submarine cable landing stations; hence, it is unable to acquire the Domestic Connectivity to International Services (Connectivity Only). Digi is however compelled to use the incumbent's transmission service in order to gain access to its

submarine cable landing station which in turn results in additional unnecessary costs to Digi.

- 10.27 Maxis submitted that it is an access provider for the Domestic Connectivity to International Services (Connectivity Only) but has not supplied the service because it has not received any requests from access seekers and it does not have any submarine cable landing station. Maxis stated that it has not been able to acquire the Domestic Connectivity to International Services (Connectivity Only) because the incumbent does not allow Maxis to co-locate its equipment in the incumbent's submarine cable landing station.
- 10.28 Maxis strongly agrees with the MCMC's view that the Domestic Connectivity to International Services (Connectivity Only) should be retained in the Access List because it is experiencing difficulty acquiring the service provided by TM. Maxis submitted that it is being forced to subscribe to the commercially offered POA service by TM instead of being allowed to co-locate its equipment in TM's submarine cable landing station in order for it to connect to its international submarine cable capacity. Maxis described the commercially supplied solution as summarised below:
- (a) The current POA service provided by TM requires the access seeker and TM to meet via fibre splicing, in a manhole outside the incumbent's submarine cable landing station.
 - (b) The spliced fibre is connected to the access seeker's transmission equipment (e.g. STM-1, STM-4, STM-16, etc.) at one end and to TM's transmission equipment (e.g. STM-1, STM-4, STM-16, etc.) at the other end in the cable landing station before it is cross-connected to the access seeker's capacity on the submarine cable system.
 - (c) From costing and technical perspectives, the service becomes expensive because access seeker has only limited capacity access but has to pay to TM for connection to each piece of transmission equipment at a high commercial price.
- 10.29 Maxis submitted that the service will only be only effective and efficient if it is allowed to co-locate in the incumbent's submarine cable landing station and the access route to the co-located space i.e. fibre ducts and manholes are regulated by the MCMC (for situations where fibre connectivity is allowed). Thus, capacity restrictions will not exist and the cost would be much lower to the access seeker, eventually benefitting end users.
- 10.30 Maxis also stated that the strict enforcement of the Domestic Connectivity to International Services (Connectivity Only) will result in cheaper IP transit as multiple providers can access the critical element of submarine cables in a landing station.
- 10.31 Packet One submitted that it has not acquired the service to date and is also not a provider of this service.

- 10.32 Sacofa submitted that it supplies the Domestic Connectivity to International Services (Connectivity Only) and may acquire it in the future. It currently does not face any issues in supplying the Domestic Connectivity to International Services (Connectivity Only).
- 10.33 TIME submitted that it acquires the Domestic Connectivity to International Services (Connectivity Only) from TM on a very limited basis. It would be able to supply the service once both its submarine cable landing stations and the international submarine cables which land into the respective submarine cable landing stations are operational. Its cable landing stations will be operational at Kuala Muda in Kedah, Penang and Cherating in Pahang. TIME has found it difficult to co-locate its equipment at TM's cable landing stations because TM has categorized all of its cable landing stations as CNII.
- 10.34 TM submitted that it supplies the Domestic Connectivity to International Services (Connectivity Only) as an access provider. It stated that it has not faced any difficulty in supplying the service as it is providing POA which includes active elements to provide specific bandwidth capacity. It is not purely a connection service but comprises of in-span co-location, virtual co-location, connection and bandwidth services. It does not agree with the complaints made by some operators in relation to its provisions of the Domestic Connectivity to International Services (Connectivity Only) and considers that its offerings and conduct to be consistent with the Access List, the MSA and the MSAP.
- 10.35 YTL submitted that it is an access seeker but did not provide further input on this service.

Discussion

- 10.36 The MCMC acknowledges the serious issues faced by access seekers in acquiring the Domestic Connectivity to International Services (Connectivity Only) from TM. The MCMC thanks access seekers of this service for providing clear and detailed descriptions of the issues they have faced.
- 10.37 The MCMC does not agree with TM's submission as the commercial supply it is offering access seekers does not comply with the service description for the Domestic Connectivity to International Services (Connectivity Only). The MCMC reminds access providers that:
- (a) they are required by the SAOs to supply facilities and services included in the Access List; and
 - (b) they are prohibited from forced bundling, also known as "conditional access", under section 5.13.22 of the MSA.
- 10.38 For example, an access provider that only supplies the Domestic Connectivity to International Services (Connectivity Only) bundled with:
- (a) active elements to provide specific bandwidth capacity;
 - (b) in-span co-location or virtual co-location; and/or

(c) connection and bandwidth services,

will be breaching both section 149 of the CMA and section 5.13.22 of the MSA.

10.39 The MCMC notes that the issues raised by operators relate to implementation of the Domestic Connectivity to International Services (Connectivity Only), and no operators have suggested any changes to, or removal of, the service from the Access List.

MCMC Views

10.40 The MCMC considers that the Domestic Connectivity to International Services (Connectivity Only) should remain in the Access List with modifications to put the scope of the service (and its limitations) beyond doubt, as follows:

Domestic Connectivity to International Services

Domestic Connectivity to International Services is a Facility and/or Service which comprises physical connection services at the Access Provider's submarine cable landing station to the between the Access Seeker's equipment and any submarine cable system to which the Access Seeker has informed the Access Provider that it has a right to connect.

11 Wholesale digital broadcasting transmission market

Digital Terrestrial Broadcasting Multiplexing Service

Introduction

11.1 In the PI Paper, the MCMC noted that there is currently one single national operator, Puncak Semangat Sendirian Berhad (**PSSB**), managing DTTB infrastructure. PSSB has been designated by the MCMC as the Common Integrated Infrastructure Provider (**CIIP**) for DTTB nationwide. PSSB consequently has a monopoly over digital transmission.

11.2 In the PI Paper the MCMC noted that it does not consider analogue transmission or online delivery as viable substitutes for digital transmission. The MCMC also noted that multiplexing is an essential element in this process because digital broadcasts cannot be transmitted to end users unless they have been multiplexed.

Submissions Received

11.3 Maxis submitted that it is not involved in the provisioning of the Digital Terrestrial Broadcasting Multiplexing Service but it supports the service being included in the Access List because there is only one access point involved and it is therefore a bottleneck service. Maxis submitted that the service has potential to extract greater monopolistic rent compared to analogue services in the past; hence the need to regulate the service remains critical.

- 11.4 Maxis considers that a SSNIP in the wholesale costs can result in market departure of service providers for content that is delivered free-to-air with sponsored advertising. Maxis did not suggest any refinements to the description of the service.
- 11.5 TM submitted that it is not involved in the provisioning of the Digital Terrestrial Broadcasting Multiplexing Service, but submitted that the monopoly services, i.e. DTTB and satellite TV services should be regulated through the Access List.

Discussion

- 11.6 The MCMC confirms its view that Digital Terrestrial Broadcasting Multiplexing Service is definitely a bottleneck facility as PSSB has been designated as the sole CIIP to provide DTTB services nationwide, and multiplexing is an essential step for any DTTB broadcaster which wishes to reach its end users.
- 11.7 In relation to TM's submission that satellite TV services should be regulated through the Access List, the MCMC notes that it has not received any information in support of TM's submission and the MCMC is therefore not in a position to consider this submission further.

MCMC Views

- 11.8 The Digital Terrestrial Broadcasting Multiplexing Service should remain in the Access List with no modifications to its service description, as follows:

Digital Terrestrial Broadcasting Multiplexing Service

The Digital Terrestrial Broadcasting Multiplexing Service is a Facility and/or Service for the combining of multiple content applications service Transport Streams into a single Transport Stream with or without the addition of conditional access information.

Part C Proposed New Access List Facilities and Services

12 Access to Carrier Pre-selection and Equal Access

Introduction

- 12.1 Carrier pre-selection and equal access services are not currently regulated under the Access List.
- 12.2 Maxis requested that the MCMC consider listing these facilities or services. It submitted that the Wholesale Line Rental Service (which is listed in the Access List) requires equal access and/or carrier pre-selection to allow access seekers to provide a complete alternative fixed voice services to end users.
- 12.3 As noted in the PI Paper, following its 2008 Access List Review the MCMC:

- (a) decided to remove the Equal Access (PSTN) Service from the Access List because the level of end user reliance on it was negligible and the increased use of VoIP allowed for greater end user choice of operator without disproportionate regulatory intervention;³ and
- (b) decided not to mandate access to carrier pre-selection and specifically found that regulated carrier pre-selection was not necessary for the Wholesale Line Rental Service to operate effectively and to the long-term benefit of end users as the Wholesale Line Rental Service could be used for the supply of retail Naked DSL services, which do not require mandated carrier pre-selection and which can be used to implement voice over broadband.⁴

12.4 Maxis also raised a number of international examples that it submitted to support its view that carrier pre-selection and equal access ought to be added in the Access List. In the PI Paper, the MCMC noted that there were significant differences between the markets which Maxis had cited in its submissions and the Malaysian market, and that therefore those examples did not support the argument that carrier pre-selection and equal access ought to be added in the Access List.

12.5 In the PI Paper, the MCMC expressed the preliminary view that its reasoning at the time of the 2008 Access List Review remains relevant at this time.

Submissions Received

12.6 Celcom has submitted that while there is substitution at the margins between VoIP and traditional fixed line telephony services, there remain barriers to substitution including:

- (a) VoIP's continued reliance on fixed line infrastructure and services; and
- (b) technical limitations of VoIP (including dependence on bandwidth, network delay and latency, packet loss and echo).

12.7 Celcom did not expressly state whether or not it supported the addition of carrier pre-selection and/or equal access in the Access List.

12.8 Maxis has submitted further evidence supporting its initial informal submissions to the MCMC, that carrier pre-selection and equal access should be added to the Access List. Maxis has pointed to further international markets in which carrier selection and pre-selection are regulated for various types of calls. Maxis has also noted that there are some differences between VoIP and carrier pre-selection or equal access. Most relevantly:

³ 2008 Access List Review PI Report, p. 42

⁴ 2008 Access List Review PI Report, p. 55.

- (a) like Celcom, Maxis submitted that VoIP generally has a lower QoS than traditional fixed line voice services;
 - (b) Maxis also considers that a customer's ability to access less expensive calls while maintaining their existing phone number is a benefit of carrier pre-selection and equal access, which cannot be replicated by VoIP (which it submitted was particularly important for business customers).
- 12.9 TM's submission agrees with the MCMC's preliminary views that:
- (a) historical regulation of carrier pre-selection did not result in a material take-up of services; and
 - (b) VoIP is increasingly a viable substitute for carrier pre-selection and equal access.
- 12.10 On the second point, TM pointed to international benchmarks that indicate carrier pre-selection and equal access are of decreasing importance in a number of developed economies.
- 12.11 TM also submitted that fixed-to-mobile substitution in voice services also decreases the importance of carrier pre-selection and equal access.
- 12.12 TIME has also submitted that VoIP is an acceptable substitute to carrier pre-selection and equal access. It also submitted that VOIP could be offered via PRI ISDN or 1800 freephone services and that customers could enjoy good quality voice over VoIP services. TIME noted that it is supplying VoIP services through SIP trunking services to enterprise and retail customers without difficulty (apart from unrelated physical access issues with deploying fixed line infrastructure).
- 12.13 Packet One has also submitted that VoIP offers substitutable quality to traditional voice services, and submitted that lingering concerns about quality represented consumer misperception rather than technological limitations.
- 12.14 YTL submitted that it acquires carrier pre-selection on a commercial basis and that it is a suitable input to YTL's downstream services. However, it noted that using carrier pre-selection to offer competitive rates can require routing which results in lower quality voice services. YTL also submitted that there is a difference between the quality of VoIP and carrier pre-selection. It is not clear whether this means that VoIP and carrier pre-selection can both suffer in quality depending on the routing and other technical specifics selected by the operator.

Discussion

- 12.15 The MCMC thanks operators for their considered and detailed submissions on the issue of whether the carrier pre-selection should be re-listed in the Access List and whether equal access should be included in the Access List. The MCMC acknowledges the variety of views on this topic and the

perceived benefits of regulating access to carrier pre-selection and/or equal access.

- 12.16 On balance, the MCMC continues to believe that VoIP is a viable substitute to carrier pre-selection and equal access, which is of decreasing importance worldwide even where they were deployed prior to VoIP gaining prominence and which never achieved significant penetration in Malaysia.
- 12.17 Some operators have submitted that VoIP faces technical and quality limitations which make it unsuitable as a substitute to carrier pre-selection and equal access. However, others consider that VoIP can achieve parity with traditional call quality if deployed in a manner that supports high quality voice. And some have noted that even carrier pre-selection and equal access services can suffer from poor quality depending on implementation details such as alternative routing.
- 12.18 The MCMC acknowledges Maxis' concern that VoIP does not allow a customer to maintain their existing phone number which may be particularly important for business customers. However, considering the potentially significant burden on access providers supplying the services, and the lack of any evidence to suggest that take-up of the services would be materially different from the poor take-up of the equal access service when previously included in the Access List, the MCMC does not consider this limitation of VoIP is sufficient to justify regulation.

MCMC Views

- 12.19 Having carefully considered operators' submissions, the MCMC confirms its preliminary view that carrier pre-selection and equal access should not be included in the Access List at this time.

13 Poles, Ducts and Manholes (PDM)

Introduction

- 13.1 The MCMC expressed a preliminary view in the PI Paper that access to "Uncompetitive Duct Infrastructure" should be regulated through the Access List. The MCMC described Uncompetitive Duct Infrastructure as including lead-in ducts and manholes nationally and mainline ducts and associated manholes in areas where operators have been granted exclusive rights to install telecommunications infrastructure.
- 13.2 The MCMC's preliminary view was that access to Uncompetitive Duct Infrastructure should be regulated by amending Infrastructure Sharing as currently included in the Access List.
- 13.3 In reaching this preliminary view the MCMC took into account submissions from a number of operators that they had been experiencing issues obtaining PDM access despite the Malaysian Access Forum Berhad (**MAFB**) framework, which was designed to facilitate access. The MCMC noted the MAFB's own submission that there had been differing views among its members as to the correct scope of the framework.

- 13.4 The MCMC also considered the costs of regulation and determined that regulation should be limited to Uncompetitive Duct Infrastructure so that costs and risks incurred are proportionate to the long-term benefit to end users.
- 13.5 Noting the submissions of some stakeholders that regulating Uncompetitive Duct Infrastructure could discourage investment, the MCMC concluded that this was unlikely because:
- (a) in areas where it is economic for the access provider to build lead-in ducts, mainline ducts and associated manholes, the benefit of having an ubiquitous network is likely to continue to incentivise investment; and
 - (b) in less economically beneficial areas, universal service funding is likely to continue to incentivise investment.

Submissions Received

- 13.6 Altel submitted that it supports the MCMC's preliminary views on PDM access in all regards. Altel submitted that the MCMC should modify an element of the definition of the Infrastructure Sharing service description in the Access List, however this element was not specific to PDM access and Altel's submission, in this regard, is discussed in section 7 above.
- 13.7 Astro submitted that it supports the MCMC's preliminary views on PDM access in all regards except that the service description should clarify that access to lead-in ducts and mainline ducts includes sub-ducts associated with the provision of these ducts. Astro also submitted that the MCMC should consider taking further actions such as studying the issue of separating the operations of TM's physical facility operations from its retail business.
- 13.8 Celcom submitted that it agrees with the MCMC's proposal to regulate access to PDM. However, it submitted that access to all Brownfields duct and manhole infrastructure should be regulated, not only the infrastructure to which a single operator has been granted exclusive rights. Celcom submitted that an access provider may refuse to provide access by claiming that it does not have exclusive rights. Celcom also submitted that ducts to which access is granted should include sub-ducts.
- 13.9 Digi submitted that it generally agrees with the MCMC's proposal to regulate access to PDM. However, it submitted that the MCMC should clarify the definition of mainline PDM which are considered to be exclusively operated by an operator. Digi submitted that it would be impractical and exceptionally difficult to validate when exclusivity has been granted contractually in any written form. Instead, Digi submitted that the MCMC should consider an exclusivity test including the following criteria:
- (a) whether there is any independent alternative access provider;

- (b) whether there is alternative direct connectivity on a route of a comparable distance;
 - (c) the level of price competition for a given route; and
 - (d) whether there is evidence for refusal of service for a particular route.
- 13.10 Digi also recommended defining an exclusive Greenfields area as comprising any area within 2km of an exclusive operator's PDM unless other operators are providing PDM access within that 2km zone.
- 13.11 Finally, Digi submitted that defining PDM access as part of the Infrastructure Sharing service description may lead to confusion regarding whether PDM access is a subset of access to towers, access to associated tower sites and in-building infrastructure. Consequently, Digi recommended defining PDM through a separate service description in the Access List.
- 13.12 edotco submitted that it agrees with the MCMC's proposal to regulate access to PDM and further submitted that the scope of the service should include Greenfields and Brownfields developments, urban and suburban areas.
- 13.13 Fiberail submitted that it supports the MCMC's preliminary views on PDM access in all regards.
- 13.14 Fibrecomm submitted that it did not agree with the MCMC's proposal to regulate PDM access, and raised a number of issues as follows:
- (a) section 228 of the CMA addresses the issue of PDM and any new access requirement through the Access List would cause confusion; and
 - (b) the MAFB PDM framework should serve as the vehicle for any further development of PDM access processes.
- 13.15 Fibrecomm submitted that while it agrees with the MCMC that a comprehensive approach is required for access to PDM, Fibrecomm is of the view this should be limited to infrastructure which is exclusively operated by a single operator and even in this context, access should be regulated by a framework under section 228 of the CMA.
- 13.16 Maxis submitted that it agrees with the MCMC's proposal to regulate access to PDM. However, Maxis submitted that regulation should not be limited to Uncompetitive Duct Infrastructure as described in the PI Paper. Maxis drew a comparison with general infrastructure sharing mandated in respect of tower assets in the mobile sector. Maxis also submitted that even in Brownfields, it was not possible for duct and manhole infrastructure to be duplicated by multiple operators.
- 13.17 Maxis also submitted that defining PDM access as part of the Infrastructure Sharing service description may lead to a perception that PDM access is limited to PDM required for mobile service deployment, whereas Maxis

noted it has had issues with building owners claiming that ducts have been reserved or are operated by TM. Maxis also noted that the MSA terms on Infrastructure Sharing have specific provisions for tower sharing, whereas PDM can be used for both fixed and mobile networks and deserves to be a separate service on its own, similar to the Network Co-Location Service.

- 13.18 Maxis submitted an alternative service definition including a number of details, including the supply of sub-ducts and environmental services including heat, light and ventilation; security; site maintenance and access for access seeker personnel.
- 13.19 NeuTrans submitted that it agrees with the MCMC's proposal to regulate access to PDM. However, it foresees a number of potential issues with operators wishing to access PDM even if regulated, including capacity issues.
- 13.20 Packet One submitted that it agreed with the MCMC's proposal to regulate PDM access but noted that it foresees operational issues such as security management and proper tagging of equipment which will require careful management for successful implementation of PDM access.
- 13.21 Sacofa submitted that it did not agree with the MCMC's proposal to regulate PDM access. Sacofa submitted that access to PDM is already competitive, especially for mainline ducts, that arrangements are reached commercially, that developers in Greenfields provide common ducts to avoid duplication of infrastructure and that the MAFB PDM framework provides sufficient guidance on PDM access and sharing. Sacofa also submitted that in-span connectivity might be an alternative to PDM access.
- 13.22 TM submitted that it did not agree with the MCMC's proposal to regulate PDM access, and raised a number of issues as follows:
 - (a) section 228 of the CMA addresses the issue of PDM and any new access requirement through the Access List would cause confusion;
 - (b) the MAFB PDM framework should serve as the vehicle for any further development of PDM access processes; and
 - (c) international models do not account for Malaysian legal, administrative and constitutional complexities.
- 13.23 TM submitted that if, despite its submissions to the contrary, PDM is added to the Access List, its scope should be restricted to very limited Greenfields areas due to operational, technical, capacity, planning, security, safety and other difficulties of implementing PDM access in Brownfields areas. TM also noted that there are often difficulties with, or obligations owed by an Access Provider to property developers, owners and occupiers which differ on a case-by-case basis. TM sought to compare this with access to mobile infrastructure where it submitted the Access Provider has absolute control of the elements to which it must grant access.

- 13.24 TM submitted a number of proposed refinements to the definitions proposed by the MCMC which would have the effect of limiting PDM access to Greenfields developments in which a single operator is given exclusive rights to operate and maintain facilities belonging to a developer.
- 13.25 TIME submitted that PDM should not be regulated on a nationwide basis, since only mobile operators would benefit from such access, that mobile operators would avoid the costs that fixed line operators have borne to develop PDM infrastructure and that fixed line operators would be marginalised to providing passive infrastructure and be unable to compete with mobile operators. TIME also submitted that to the extent that access to mainline ducts is regulated, the MCMC should allow Access Providers to recoup their investments.
- 13.26 TIME submitted that it agrees with the MCMC's proposal that regulation of PDM access should be limited to Uncompetitive Duct Infrastructure as described in the PI Paper. In that context, TIME submitted that it foresees barriers to effective access in the form of excessive fees being charged by incumbent operators managing and operating Greenfields PDM infrastructure and claiming that space is reserved for future capacity under section 228(2) of the CMA. TIME submitted that regulation of PDM would need to be detailed to avoid such outcomes.
- 13.27 TIME submitted that access to telecommunications rooms including MDFs and poles should be added to duct and manhole access as part of PDM access.
- 13.28 YTL submitted that while it supports the MCMC's preliminary views on PDM access, it considers that access regulation should extend to all mainline ducts and manholes. YTL also submitted that it foresees state and local level measures will be required to ensure effective access to certain infrastructure.
- 13.29 A mobile operator submitted that it supports the MCMC's preliminary views on PDM access in all regards.

Discussion

- 13.30 The MCMC thanks operators for their detailed and considered submissions on this potentially significant change to the Access List. The MCMC notes that the majority of operators expressed strong support for the inclusion of PDM access, but that many operators recommended changes to the details of the PDM access proposed by the MCMC.
- 13.31 The MCMC considers operators' specific submissions in more detail below.
- 13.32 A number of operators expressed concern that including PDM access in the service description for Infrastructure Sharing is likely to lead to confusion and a misapprehension that PDM access need only be supplied in connection with mobile infrastructure sites which the balance of Infrastructure Sharing regulates. The MCMC agrees that these concerns are

well-founded and proposes a dedicated service description for PDM access below.

- 13.33 A number of operators recommended that the service description for PDM access should include express access to the access provider's sub-ducts. The MCMC notes that international practice is for an access seeker to install sub-ducts within an access provider's duct infrastructure (though sub-ducts are not used universally in lead-in ducts). Consequently, the MCMC proposes to clarify that the access seeker's right to acquire PDM access includes access for the purpose of installing sub-ducts, but the access provider need only supply access to sub-ducts if there is no room for the access seeker to install its own sub-ducts.
- 13.34 A number of operators recommended expanding the scope of PDM access to cover all Brownfields infrastructure. The MCMC has considered this possibility in the PI Paper and continues to hold the view that only Uncompetitive Duct Infrastructure should be regulated, for the reasons that is set out in the PI Paper.
- 13.35 Regarding operators' concerns that some access providers may refuse access to infrastructure on the basis that they do not have exclusive access, the MCMC notes that exclusivity is a factual question. The MCMC has sought to address this concern in the wording of the proposed service description, below.
- 13.36 Other operators recommended limiting the scope of PDM access to cover only Greenfields infrastructure or a subset thereof. The MCMC has also considered this possibility in the PI Paper and continues to hold the view that Uncompetitive Duct Infrastructure should be regulated regardless of whether that infrastructure is in a Greenfields or Brownfields area, for the reasons it set out in the PI Paper.
- 13.37 The MCMC also acknowledges operator submissions that PDM access is already regulated under section 228 of the CMA and any issues with access can be addressed through the MAFB PDM framework. The MCMC notes that it has supported this approach for some time. Despite concerted efforts from industry and the MCMC's support, the MAFB's attempt to build on section 228 has not resulted in a broad consensus amongst industry about the proper scope of, or approach to, PDM access. The MCMC therefore finds it appropriate and necessary to list the PDM access in the Access List so that it may further consider PDM access as part of future MSA and MSAP reviews.
- 13.38 In response to NeuTrans', Packet One's and TM's submissions, the MCMC notes that future MSA terms might address any:
- (a) issues with how capacity limitations are calculated and addressed; and
 - (b) any operational, technical, capacity, planning, security, safety issues,

and this is one of the potential benefits of including PDM access in the Access List.

- 13.39 The MCMC notes Astro's submission that the MCMC should consider studying the issue of separating the operations of TM's physical facility operations from its retail business, however this issue is beyond the scope of the present Public Inquiry.
- 13.40 The MCMC notes Maxis' proposal that PDM access should include reference to environmental services including heat, light and ventilation; security; site maintenance and access for access seeker personnel. PDM access does not generally include environmental services, as it is only supplied for the purpose of the access seeker co-locating its cables in ducts (either within sub-ducts or not) and for locating limited cable-related equipment in breakout pits. However, the MCMC agrees that access for access seeker's personnel is a practical necessity for access seekers to install and maintain cable and equipment and should be included in the PDM access service description as it is for other facilities and services, like the Network Co-Location Service and Infrastructure Sharing, which include such physical access.
- 13.41 In response to Sacofa's submission that in-span connectivity might be an alternative to PDM access, the MCMC notes that such connectivity would occur in a market several layers higher in the OSI model than PDM access and would have significantly different competition characteristics.
- 13.42 In response to TM's submission that international models do not account for Malaysian legal, administrative and constitutional complexities, the MCMC notes that the PDM access regulation through the Access List will only require licensees under the CMA to supply PDM access. Consequently, the MCMC does not foresee legal, administrative or constitutional issues with its proposed regulation.
- 13.43 In response to TM's submission that there are often difficulties with, or obligations owed by an access provider to, property developers, owners and occupiers which differ on a case-by-case basis, the MCMC notes that all licensees under the CMA must enter into agreements that are compatible with their obligations under the CMA, including obligations to comply with the SAOs when an access seeker seeks access to the access provider's facilities and services. These obligations will apply to the access provider's duct and manhole infrastructure as they do to any other facilities and services of the access provider.
- 13.44 In response to TIME's submissions on the cost of rolling out PDM infrastructure and access providers' needs to recoup such costs, the MCMC notes that:
- (a) only Uncompetitive Duct Infrastructure will be regulated, meaning that access to major duct infrastructure which is capable of economic duplication will not be subject to Access List regulation; and

- (b) cost recovering and pricing matters will be subject to a future MSAP review.

13.45 The MCMC acknowledges TIME's submission that access to telecommunications rooms including MDFs and poles should be added to the scope of PDM access under the Access List. In the PI Paper, the MCMC noted that MDFs and in-building wiring are conventionally located on the customer side of the network boundary and facilities located on the customer side of the network boundary cannot be subject to access regulation under the CMA. The MCMC also invited stakeholders feedback relating to whether there are a significant number of buildings in Malaysia (or buildings of commercial significance) where:

- (a) the MDF and/or in-building wiring falls on the operator side of the network boundary; and
- (b) there is a rationale for regulating access to the MDF and/or in-building wiring.

13.46 Not having received any evidence or information that would allow the MCMC to consider this issue further, the MCMC concludes that PDM access should not include access to telecommunications rooms, MDFs or in-building wiring at this time.

13.47 In its Market Definition Analysis in 2014, the MCMC concluded that there is a national market for the wholesale supply of lead-in duct and manhole infrastructure which does not include aerial or sewer access to end user locations where available. Consequently, it is not appropriate to consider pole access as part of the PDM access which the MCMC proposes to include in the Access List.

MCMC Views

13.48 The MCMC confirms its preliminary view that access to duct and manhole should be regulated through the Access List, but reflecting submissions from operators, proposes to do so through a new service description, as follows:

New definitions

"Lead-In Duct" means a duct which extends from an End User location to the first manhole associated with such a duct.

"Mainline Duct" means each duct (or series of ducts) which extend(s) from one or more Lead-In Duct(s) to the closest exchange building associated with the duct(s).

Duct and Manhole Access

- (a) *Duct and Manhole Access is a Facility and/or Service which comprises provision of physical access to:*
 - (i) *Lead-In Ducts and associated manholes;*

- (ii) *Mainline Ducts and associated manholes in areas in which a single operator has exclusive rights to develop or maintain duct and manhole infrastructure (whether or not in combination with other facilities and services); and*
 - (iii) *sub-ducts where there is no room for the Access Seeker to install its own sub-ducts.*
- (b) *Provision of physical access includes the provision of:*
 - (i) *space at specified network facilities to enable an Access Seeker to install and maintain its own lines, equipment and sub-ducts; and*
 - (ii) *access for the personnel of the Access Seeker.*
- (c) *Exclusive rights to develop or maintain duct and manhole infrastructure includes exclusive rights in contracts, arrangements or understandings between the Access Provider and any person, whether formal or not, whether written or not, and whether reflected in practice or not.*

14 Access to Dark Fibre in the Core Network

Introduction

- 14.1 In the PI Paper, the MCMC considered whether to regulate wholesale access to dark fibre within transmission links in the core network. The MCMC noted that, provided that the transmission link uses optical fibres that can be physically unbundled across the whole length of the link (i.e. a dedicated fibre strand can be allocated to the access seeker, who is then able to install its active equipment at each end), such access could be regulated through the Access List.
- 14.2 The MCMC acknowledged that several stakeholders have requested that dark fibre access in the core network be listed in the Access List as a new service. Nevertheless, the MCMC expressed a preliminary view that it does not consider that there is, at present, a sufficient economic basis for regulating dark fibre access in the core network in Malaysia.
- 14.3 The MCMC noted that, for the reasons discussed in detail in the PI Paper, it does not consider dark fibre within the core network to be a bottleneck facility.

Submissions Received

- 14.4 Altel submitted that it has sought access to dark fibre as an access seeker, but that its requests to access providers for access have yet to receive a response. Altel reiterated its informal submissions to the MCMC that there is an abundance of supply of dark fibre in Malaysia that access providers are refusing to supply to access seekers. Altel agreed with the MCMC's preliminary view that dark fibre is not a bottleneck facility on the basis that there are sufficient operators able to provide dark fibre. However, Altel submitted that dark fibre should be included in the Access List to allow access seekers to gain access to this facility. Altel suggested that the MCMC might consider including the dark fibre service under the responsive removal process (which the MCMC has proposed for other services) when it

has been implemented successfully. Altel's submission referred to examples of dark fibre regulation in several countries in Europe.

- 14.5 Astro submitted that it would acquire dark fibre as an access seeker but that it is understood that dark fibre is not available on a commercial basis presently. Astro sees dark fibre as a wholesale passive access product that it can use to fulfil its internal transmission requirements and manage its needs more effectively. Astro requested that the dark fibre access be added to the Access List with pricing to be determined between the Parties.
- 14.6 Celcom submitted that it currently acquires dark fibre access as an access seeker and does not experience any difficulty agreeing to commercial terms of access. Celcom noted that it is not aware of any similarities between jurisdictions that regulate dark fibre and Malaysia.
- 14.7 Digi submitted that dark fibre should be regulated in a similar manner to its proposal for regulation of PDM - in that it should be regulated in Greenfields areas in which exclusive operator access has been granted (and Digi set out a detailed description of how such areas should be defined). Digi submitted that such regulation in exclusive areas is critical.
- 14.8 edotco submitted that it requires access to dark fibre as an access seeker and experiences difficulties because the major dark fibre owner-operators (e.g. TM, TIME, Fibrecomm, Fiberail and V-Tel) typically do not permit access to dark fibre and prefer to lease lit fibre on a bandwidth basis. edotco noted that at present, the state of Melaka and the municipality of Putrajaya limit access to their own respective fibre partners. edotco submitted that dark fibre access should be added to the Access List.
- 14.9 Fiberail submitted that it is both an access seeker and access provider of dark fibre services, and that this is their core product. Fiberail agreed with the MCMC's comments in the PI Paper that regulation of dark fibre from other jurisdictions may not work in the Malaysian context, and added that the MCMC needs to study similarities between those jurisdictions and Malaysia, and how other jurisdictions' methodologies could be applied in Malaysia, if similarities in the markets do exist.
- 14.10 Maxis submitted that it presently does not acquire dark fibre as an access seeker as TM does not offer the service to other access seekers, including Maxis. Maxis expressed concern that the MCMC's Dominance Report reversed the MCMC's earlier findings that there is a national market for the wholesale provision of access to dark fibre and that TM is dominant in this market, and sought clarifications on this matter. Maxis submitted that the fact that a product is not available in its pure form indicates an absence of competition and that the dominant player in the market (TM) is withholding access to its dark fibre. Maxis further noted that the fact that there is currently no dark fibre product in the Malaysian communications market does not necessarily mean there is no market for such a product.
- 14.11 Maxis further queried the MCMC's focus in the PI Paper on access to dark fibre in the core network. Maxis is of the view that the scope of review of dark fibre should focus on local access or last mile dark fibre, which is a

bottleneck service largely dominated by TM. Maxis submitted that access regulation must be concerned with removing bottlenecks which prevent access seekers from competing at every layer of the network to permit maximum competition for the long-term benefit of end users. Maxis therefore strongly proposed that the MCMC consider including the last mile dark fibre in the Access List. Maxis referred to Ofcom's Business Connectivity Market Review Consultation of May 2015, which proposed dark fibre remedies in respect of Openreach.

- 14.12 Maxis submitted that it has not received any requests for access from access seekers and added that it does not supply access to its own dark fibre due to its limited coverage in the last mile. Maxis noted that it is aware of dark fibre being offered on a selected basis and gave the example of Malaysia Internet Exchange's (**MyIX**) ring in the Klang Valley which connects nodes using dark fibre provided by Fiberail, asserting that this debunks the view that dark fibre is only for operators' internal uses.
- 14.13 NeuTrans submitted that although it supports an effort to open access to ducts and manholes, the better approach would be to share dark fibre operated by a neutral operator who does not provide services to end users. NeuTrans noted that the MCMC had not considered this approach in the PI Paper. NeuTrans submitted that it plans to become a dark fibre access provider since it cannot be an access seeker due to unavailability of other access providers.
- 14.14 NeuTrans disagreed with the MCMC's view in the PI Paper, that there is insufficient economic basis for regulating dark fibre access in the core network in Malaysia. In particular, NeuTrans noted none of the operators mentioned by the MCMC as having fibre assets offer dark fibre to other operators. NeuTrans further submitted that there is no alternative to dark fibre access, especially for long distance routes. It submitted that it disagrees with the MCMC's view that entry barriers to an operator deploying its own dark fibre are not prohibitive, given the cost of duct build and the prohibition against the use of poles to lay fibre in some localities and limited access to sewerage ducts. NeuTrans also disagreed with a number of other statements by the MCMC in the PI Paper regarding dark fibre and the state of competition in the national market for supply of dark fibre facilities or services.
- 14.15 Packet One submitted that it is not an access seeker or access provider of dark fibre access. In general, Packet One's opinion is that all infrastructure should be optimised, especially where a lot of challenges and investment are involved. Packet One suggested studying existing dark fibre in Malaysia to determine whether the country already has sufficient services to meet current and future demand. Packet One added that if the results of this study indicate a lack of supply, service providers should be pushed to invest to ensure sufficient supply and it may be necessary to offer incentives to investors, but if supply is already adequate or abundant, access should be opened for sharing.

- 14.16 TM supports the MCMC's preliminary view not to regulate dark fibre access in the core network and stated that this is consistent with the Dominance Report. TM submitted that it does not supply dark fibre as an access provider or acquire it as an access seeker, and that dark fibre has never formed part of TM's wholesale service offering.
- 14.17 TM noted that its fibre infrastructure is precisely laid to cater for its planned purposes and the need to service the markets that consist of end-to-end products and services. It is also deployed to address the current and future demand based on TM's network coverage plan. TM submitted that there has never been any case of excess capacity that would support a business case for the resale of dark fibre, particularly in the context of TM's HSBB and SUBB Network rollouts.
- 14.18 TM submitted that there are a number of competing fibre providers including TIME, Maxis, Celcom Timur and Cyberjaya Metro Fibre Network. TM also submitted that there are considerable operational, administrative and logistical issues if dark fibre were to be offered which make it difficult and costly to manage whilst ensuring a high QoS to access seekers, particularly in the context of TM's HSBB Network rollouts.
- 14.19 TM also submitted that its core network is for the purpose of providing transmission services, which are already regulated in the Access List, and noted that regulating transmission services is a more efficient allocation of resources operationally and technically than regulating dark fibre.
- 14.20 TM submitted that the MCMC should incentivise operators who invest in laying fibre given many areas including housing areas in big cities are not being served currently by any operators. TM submitted that mandating dark fibre access will discourage investment as operators will become more prudent and invest to meet their short-term needs only.
- 14.21 In response to the MCMC's questions about similarities between Malaysia and other jurisdictions that regulate the dark fibre core network, TM submitted that there are few similarities between Malaysia and the few jurisdictions that mandate access to dark fibre and highlighted a series of markets that have declined to regulate dark fibre services. It submitted that there are no examples of emerging markets that have mandated dark fibre access.
- 14.22 TIME submitted that it has previously acquired access to dark fibre as an access seeker to cater for its requirement to build point-to-point networks, however recently TIME has been unable to acquire access due to a policy imposed by incumbent operators to not offer this service commercially. TIME submitted that, in the UK, Ofcom has proposed opening the BT fibre network to access, and noted that BT's business model is similar to TM's HSBB network services model, in that it is partly funded by the government and concentrates on wholesale backhaul services. TIME also submitted that in Singapore, the IDA is considering opening access and increasing competition for dark fibre, and noted that Singaporean business models are quite similar to TM's HSBB network services in that the common duct and

dark fibre operator (NetCo) would lease dark fibre to multiple operators and light these with equipment from OpCos to offer wholesale bandwidth to retail service operators.

- 14.23 YTL submitted that it acquires dark fibre as an access seeker but that cost is a factor and not all access providers are willing to provide dark fibre access. YTL noted that dark fibre is not being offered for new contracts at the moment, and that access providers prefer to supply bandwidth, which is costly and distance independent.
- 14.24 A mobile operator submitted that it has sought access to dark fibre as an access seeker for the purpose of carriage of voice and data communications. However, the mobile operator stated that the current access provider does not offer the service for access seekers, and gives no reason for this. The mobile operator submitted that the FCC in the United States has determined that dark fibre is subject to its jurisdiction. However, the mobile operator acknowledged that whether a service is a common carriage or private carriage is a question of fact and depends on the facts of the offering which will determine whether the service is subjected to regulation or not. The mobile operator is of the view that the dark fibre service should be regulated if it is offered as common carriage and access providers should be legally compelled to supply access to such services.

Discussion

- 14.25 The MCMC thanks operators for their detailed and extensive submissions on the important topic of dark fibre access.
- 14.26 The MCMC acknowledges the desire of access seekers to access dark fibre as an alternative to higher layer services such as the Transmission Service. However, the MCMC confirms its preliminary view that the benefit that access seekers perceive in acquiring access to a particular facility or service that an access provider could provide does not justify regulation of that access in the absence of a clear economic basis for regulation, such as a finding that a bottleneck facility exists that requires regulation.
- 14.27 In response to operators' comments that access providers are not supplying dark fibre, the MCMC acknowledges that this may be the common experience of access seekers. However, there are multiple potential suppliers of dark fibre in the core network. Further, there is no bottleneck to operators building their own dark fibre links (noting that in the Dominance Report the MCMC found that access to mainline and inter-exchange ducts and manholes is generally competitive). These facts suggest that lack of supply by potential access providers does not foreclose the possibility of dark fibre supply or self-supply on a commercial basis. A lack of such supply currently does not, in and of itself, justify regulation.
- 14.28 In response to operator submissions that the MCMC should consider regulating access to dark fibre in Greenfields areas or in the access network more generally, the MCMC refers to its consideration of such access in the PI Paper. As noted there, the point-to-multipoint nature of PON networks

used for next generation access networks in Malaysia effectively prevent such dark fibre access on a technological basis, at least for the time being.

- 14.29 In response to Maxis' request for clarification on the MCMC's findings on dark fibre in the MCMC's revised Dominance Report, the MCMC notes that the original version of the report which was released did not include the MCMC's final analysis of the market, and further analysis required the MCMC to revise its views.
- 14.30 In response to NeuTrans' submission that shared dark fibre should be operated by a neutral operator who does not provide services to end users, the MCMC notes that any such regulation is beyond the scope of the present Public Inquiry. However, it would be open to operators to create a joint venture to operate such a neutral network on a commercial basis.
- 14.31 While the MCMC acknowledges NeuTrans' disagreement with a number of the MCMC's preliminary views in the PI Paper, the MCMC confirms that it continues to hold those views.
- 14.32 Having considered the varying submissions on international precedents in this area, the MCMC considers that given its finding on the state of competition in Malaysia, direct comparisons with jurisdictions that regulate dark fibre access are not useful to determining whether dark fibre access should also be regulated in Malaysia.

MCMC Views

- 14.33 The MCMC confirms its preliminary view that access to dark fibre in the core network should not be regulated through inclusion in the Access List at this time.

15 Access to Layer 3 HSBB Network Services

Introduction

- 15.1 In the PI Paper, the MCMC stated that it considers that there is a rationale for regulating access to Layer 3 HSBB Network Service in order to encourage infrastructure investment and to facilitate competition in the supply of downstream HSBB Network-based retail services.
- 15.2 The MCMC noted that TM, as the monopoly provider of wholesale access to services on the HSBB Network, has no economic incentive to provide wholesale access on equitable and non-discriminatory terms. The fact that TM may provide wholesale access to access seekers on a commercial basis is not enough to ensure that such access is priced reasonably and contains the features necessary for effective competition to be fostered.
- 15.3 The MCMC also noted that regulating a Layer 3 HSBB Network Service in the Access List will allow access seekers to gain a customer base which will in turn encourage the access seeker to move to the acquisition of a Layer 2 service in order to reduce costs and maximise profit, thus leading to infrastructure investment.

- 15.4 Consequently, the MCMC expressed the preliminary view that a new Layer 3 HSBB Network Service should be added to the Access List.
- 15.5 To encourage infrastructure investment at the Layer 2 level, the MCMC also proposed to include a mechanism for the eventual removal of the Layer 3 HSBB Network Service from the Access List on an area-by-area basis where there is sufficient evidence of the supply of the Layer 2 HSBB Network Service in that area and it is likely that based on that input, there will be competition for the supply of Layer 3 services if regulation of the higher level service is removed.

Submissions Received

- 15.6 Astro submitted that it would acquire HSBB Network Service at Layer 3, and supported the inclusion of a new Layer 3 HSBB Network Service in the Access List. It submitted that this is because the commercial offer is prohibitively expensive and a Layer 3 HSBB Network Service would offer more choices to access seekers, particularly for smaller access seekers.
- 15.7 Astro reiterated its view that Layer 3 HSBB Network Service should be introduced in conjunction with continuing regulation of the Layer 2 HSBB Network Service. Astro noted that access seekers are not a generic group, and the emphasis on the Layer 3 HSBB Network Service should not be at the expense of enforcing access to the Layer 2 HSBB Network Service. There is no take up of Layer 2 access arrangements due to a lack of access rather than a lack of interest. Likewise, Astro submitted that there should be parallel effort to incentivise access seekers that have made significant infrastructure investment to gain access to a Layer 2 service. It also reiterated its view that heavy regulatory involvement is required in respect of reference offer, setting standards and price control mechanisms to alleviate hardships incurred in acquiring access.
- 15.8 Astro commented that to the extent possible, the Layer 3 HSBB Network Service should provide as many opportunities for differentiation as possible. Astro provided further feedback as follows:
- (a) Bit rates: Astro welcomed the categorisation of multiple bit rates up to 100 Mbps, and generally, submitted that it is better to have more pre-defined speed options. Astro also considered that asymmetric bit rates should be included as they allow for more efficient allocation of bandwidth and differentiation of offerings, and recommended asymmetric bit rates identical to its proposal for Layer 2 HSBB Network Service with QoS (discussed above). However, Astro submitted that the MCMC's proposed symmetric bit rates are also important as they enable the creation of products to meet the needs of businesses;
 - (b) Class of Service: Astro proposed that the Class of Service for a Layer 3 service be determined by reference to QoS (latency, jitter and loss) characteristics. It made reference to the Class of Service description used by NBN in Australia which defines four traffic

classes. In terms of traffic prioritisation, Astro proposed that voice applications should take priority, as is the industry standard;

- (c) Contention ratio: Astro submitted that the contention ratio of 1:10 is significantly over-provisioned, and this removes the ability of the retail service provider to offer and price a product flexibly to adjust to customer demand, especially in the early stages of deployment, and to differentiate their offering based on service quality. Hence, Astro proposed to add other contention ratios ranging from 1:20 to 1:50. In the case of video on demand or IPTV which use local core networks rather than internet bandwidth, contention ratios would not be required;
- (d) Bandwidth required for IPTV/Video on demand: Astro suggested including minimum bandwidth that is sufficient to support two High Definition Video at 12 Mbps each and one Video on Demand program at 6 Mbps; and
- (e) Other conditions: As proposed for Layer 2 HSBB Network Service with QoS, Astro also proposed additional conditions to allow the classes of service and QoS to evolve in line with new technologies and applications, and submitted that access providers should not bundle ancillary broadband amenity services with the regulated product.

15.9 Astro submitted that a mechanism for responsive removal is not necessary, as competition and emergence of other resale options would 'crowd out' the need for the regulated resale product, rendering a formal removal mechanism unnecessary. Astro agreed with the MCMC's preliminary view that if Layer 2 HSBB Network Service is enforced concurrently, then there is a possibility that more than one access seeker of the Layer 2 HSBB Network Service with QoS or equivalent commercial services will begin competing to supply Layer 3 HSBB Network Service over time.

15.10 Celcom acquires HSBB Network Service at Layer 3 from TM on a commercial basis. Celcom strongly agreed that a new Layer 3 HSBB Network Service should be listed in the Access List. It added that the regulatory intervention should be applied specifically on HSBB projects carried out by TM which are funded by as PPPs, such as the High-Speed Broadband Network, Phase 1 (**HSBB1**), HSBB2 and SUBB projects. Celcom noted that Argentina, Latvia, Singapore and the Slovak Republic have implemented PPP projects that ensure open access principles or that ensure wholesale services are made available on a non-discriminatory basis, however, in Malaysia, access to the PPP HSBB project is on a commercially negotiated wholesale basis. Celcom submitted that the HSBB projects funded through PPP arrangements require regulation to ensure that TM complies with the SAOs that apply under section 149 of the CMA. This is also required based on TM's dominance in HSBB market. However, Celcom opined that the regulatory holiday approach applied to TM's HSBB network should also be applied to new HSBB networks to encourage infrastructure investment. Further, as proposed for Layer 2 HSBB Network Service with

QoS, Celcom recommended that the incumbent and dominant operator should be specifically mentioned in relevant guidelines or instruments.

15.11 Celcom provided the following feedback on the Layer 3 HSBB Network Service:

- (a) POI: Celcom proposed that it should include provisions for access seeker to access the incumbent's nationwide POIs;
- (b) Bit rates: Celcom recommended the inclusion of asymmetric bit rates, and reiterated its view that the upstream bit rate should not be less than 50% of the downstream bit rate, based on ITU-T Recommendation G.984.1 and the fact that there is an increase of end users providing web hosting and data sharing services;
- (c) Class of Service: Celcom recommended that the class of service for voice service is top priority, as based on ITU-T Recommendation Y.1541 Network Performance Objectives for IP-based services; and
- (d) Contention ratio: Celcom recommended that the access seeker should be given the flexibility in choosing contention ratio so that they can manage the cost of bandwidth. Specifically, Celcom proposed the contention ratios for the following services:
 - (i) VoIP service: 1:1, 1:10, 1:20, 1:25 and 1:50;
 - (ii) Broadband service: 1:1, 1:10, 1:20, 1:25 and 1:50; and
 - (iii) Video unicast and multicast: 1:1.

15.12 Celcom did not agree that there should be any mechanism for removal of Layer 3 HSBB Network Service, which is provided by TM under a PPP agreement. It submitted that both Layer 2 and Layer 3 HSBB Network Service should be regulated, as there is evidence of discriminatory conduct affecting access seekers. Celcom expressed concern that if the Layer 3 HSBB Network Service is deregulated by any mechanism, the access provider will continue to impose unreasonable terms and conditions which would result in anti-competitive conduct. Further, the Celcom noted that while mechanism proposed by the MCMC considers the number of competitors, in Celcom's view, the most important aspect to consider is the anti-competitive conduct of the incumbent.

15.13 Maxis reiterated that it has no option but to acquire a Layer 3 HSBA on a commercial basis which, it noted elsewhere, is hard bundled with transmission. Maxis faces significant on-going competition issues and limitations that could lead to technical discrimination against access seekers. Firstly, the contention ratio creates an artificial demand for bandwidth, and the access provider stands to make significant gains through contention ratio. Secondly, Maxis submitted further evidence supporting its initial informal submissions to the MCMC on the access provider's failure to meet the MCMC's Mandatory Standard on QoS. Despite HSBA being offered for 3 years and despite Maxis' repeated efforts to

request changes in the HSBA agreement on the fault restoration service level agreement to be consistent with the abovementioned Mandatory Standard, TM has not been able to assist Maxis to comply with those QoS requirements. In addition, the benchmark parameter set by TM on the speed test on browsing performance is too low, making it a challenge for Maxis to meet the applicable QoS requirements.

15.14 Maxis firmly agreed with the inclusion of a new Layer 3 HSBB Network Service in the Access List because, it noted, TM is a monopoly provider of wholesale access to services on the HSBB network and without competition or the prospect of likely competition, TM has little commercial incentive to provide wholesale access on equitable and non-discriminatory access to access seekers who would compete with TM at the retail level. Maxis is also concerned that the commercial HSBA service is only limited to HSBB1, and would not include additional capacity on HSBB2 or the SUBB, and urged the MCMC to clearly indicate in the Access List that the regulated HSBB services are applicable to all phases of HSBB network to avoid refusal of access.

15.15 Maxis provided feedback in respect of the proposed service description of Layer 3 HSBB Network Service, and the main areas are as follows:

- (a) Contention ratio: Consistent with its proposal for Layer 2 HSBB Network Service with QoS, Maxis also recommended the removal of contention ratio for the Layer 3 HSBB Network Service in favour of alternative measures to manage network performance and dimensioning;
- (b) Bit rates: Maxis stated that it preferred symmetric bit rates, rather than asymmetric bit rates, as it is not uncommon for applications and social media to require high bit rates for uploads. Hence, Maxis proposed that symmetric bit rates from 32 kbps, and bit rate increments between 32 kbps and up to 1 Gbps should be selected by the access seeker; and
- (c) Class of Service: Maxis generally agreed with the proposed Classes of Service, but has proposed a different traffic priority, as follows:
 - (i) VoIP : traffic priority 1;
 - (ii) Video on Demand, IPTV : traffic priority 2;
 - (iii) Management, Business Internet : traffic priority 3; and
 - (iv) Customer Internet: traffic priority 4.

15.16 Maxis submitted that, as TM has been found dominant in the retail and wholesale, business and residential segments of the fixed broadband and data market, Maxis does not see the rationale for the MCMC considering including a responsive removal mechanism for Layer 3 HSBB Network Service. In addition, it also did not agree that if the access provider offers the Layer 2 HSBB Network Service, the Layer 3 HSBB Network Service can be removed from the Access List. It reiterated its view that it is important

to ensure that access seekers have appropriate access to new networks at multiple layers of the network stack to allow them to grow their customer base, invest in network elements and move up the ladder of investment, resulting in greater service innovation and competition in the market over time.

- 15.17 Maxis proposed several changes to the removal mechanism proposed by the MCMC. One of the suggestions is to request the access provider to submit a letter of undertaking to the MCMC on terms and conditions if the service is deregulated. In terms of evidence that there are three or more independent access providers, Maxis proposed that the MCMC considers various aspects such as whether the operators have been declared jointly dominant, market share of the largest operator, presence of at least two other access providers in close proximity, whether the Layer 3 HSBB Network Service is being provided in the identified premise(s) by at least three operators, whether there is sufficient demand and the level of price competition in the identified premise(s). In carrying out the two-step test, Maxis urged the MCMC to form a preliminary view after the criteria in the removal mechanism are met and after a comprehensive assessment including, price trends, rollout of other access providers, market share of access providers, premises etc. to ascertain that there is effective competition. Maxis also expressed reservation that the mere presence of three operators can result in a preliminary view of competition and believes that a deeper investigation is warranted. Further, Maxis submitted that even if there is a responsive removal mechanism included in the Access List, it is unlikely that more than one access seeker of the Layer 2 HSBB Network Service with QoS or equivalent commercial services will begin to compete to supply Layer 3 HSBB Network Service over time.
- 15.18 Packet One is an access seeker for HSBB Network Service at Layer 3. It agreed with the inclusion of a new Layer 3 HSBB Network Service in the Access List, and is agreeable to the proposed description. Packet One submitted that the Business Internet class of service should be given the highest priority and that the categorisation of classes of service should be based on service type. It agreed with the inclusion of a responsive removal mechanism, and submitted that the proposed process should take into account licensees' points of view before the decision is made on whether to maintain or remove the service. Packet One also agreed that it is likely that more than one access seeker of the Layer 2 HSBB Network Service with QoS or equivalent commercial services will begin competing to supply Layer 3 HSBB Network Service over time. Finally, Packet One agreed that the MCMC should continue to regulate the Layer 2 HSBB Network Service, if a Layer 3 HSBB Network Service is included in the Access List.
- 15.19 TM submitted that as the HSBB Network Services at Layer 3 is yet to be included in the Access List, the MCMC's questions on the topic are premature. Whilst the other operators own HSBB networks and are providing HSBB services to the end users, they are not providing the wholesale service to other licensees, as the service is not listed in the Access List.

15.20 TM does not agree with the inclusion of a new Layer 3 HSBB Network Service in the Access List and reiterated its views in its initial informal submissions to the MCMC. TM considers that access to HSBB services is covered comprehensively under its PPP agreement with government. It noted that it has 5 agreements signed for HSBA and there has been growth year-on-year for HSBA on port activation and bandwidth subscription from 1,940 ports in 2011 to 104,581 ports in 2015 which TM submitted has resulted in competition in the retail market. Hence, there is no evidence of market failure and the need for additional mandated access obligations. TM also highlighted that if a new Layer 3 HSBB Network Service is listed in the Access List, then the existing wholesale customers may migrate to the new service and this could cause confusion in the market and create uncertainty for TM when providing services based on the PPP agreement as well as impacting existing agreements with contract periods ranging from 5 to 10 years. Further, a mandated Layer 3 HSBB Network Service could limit the development of creative offerings, create a challenge for TM technically as strict QoS and service level arrangements as proposed are not possible to be implemented with the current network setup and level of quality. TM noted that these measures come with a price, and finally, that regulated access could reduce the incentive for investments in HSBB infrastructure. In addition, TM views that the reason that the MCMC is considering regulating the service is due to complaints made by other operators prior to the Public Inquiry. It appears that these complaints which are due to operational matters should be investigated, if there is a basis, and be addressed between parties. If there are still concerns thereafter, a dispute can be lodged with the MCMC for resolution. Hence, a simplistic approach of regulating the service may not be needed.

15.21 TM is not in favour of regulating any of the services covered under the PPP agreement, unless the MCMC also regulates other operators' HSBB networks. While it does not support the inclusion of Layer 3 HSBB Network Service, TM provides the following as feedback for the service, should the MCMC list it:

- (a) Differentiation of elements: TM submits that the MCMC did not specify the differentiation of elements between Layer 2 HSBB Network Service with QoS and Layer 3 HSBB Network Service with QoS. TM provided its view that the MCMC's proposal for the Layer 3 service appears to include a POI at the access seeker's POP rather than the access provider's POP;
- (b) Fully managed by access provider: TM proposed that the active elements be fully managed by the access provider;
- (c) Asymmetric bit rates: TM recommended that these be mutually agreed by the parties;
- (d) Class of Service: TM is not in favour of overly prescriptive parameters, and instead, recommends flexibility to offer in accordance with access seekers' requirements and access provider's network features and capabilities. Further, parameters should be

generic enough to be implemented by multiple access providers and not be applicable to one operator; and

- (e) Contention ratio: TM proposed that this should be based on the offer by the access provider; however, any other contention ratio is to be mutually agreed as it would affect the access provider's network performance and the cost of implementation.

15.22 TM appreciated the introduction of a removal mechanism for Layer 3 HSBB Network Service. However, it submitted that a mechanism should be established for all facilities and services in the Access List. TM submitted that the criteria of having three or more independent operators is not realistic, as almost all access seekers seek fixed services for their own use, rather than to deploy fixed infrastructure. Hence, where there is competition, in most cases there would be only two independent operators, and hence, TM suggested the MCMC consider only two or more independent operators. Other criteria for removal suggested by TM is to include no take up for 3 years after the facilities and services are listed in the Access List, a certain percentage of market loss by the incumbent service provider due to competition, technology substitution and infrastructure that could be easily replicated.

15.23 TIME does not acquire HSBB Network Service at Layer 3 but supplies HSBB Network Service at Layer 3 based on a commercial arrangement with Astro. It highlighted that in its arrangement with Astro, it faces barriers in offering services in high-rise buildings or condominiums where the building's MDF rooms are handed over to TM, and it has been difficult for TIME to install its GPON equipment.

15.24 TIME agreed with the inclusion of a Layer 3 HSBB Network Service in the Access List and submitted that the service description, classes of service and 1:10 contention ratio are sufficient. However, it viewed that asymmetric bit rates should not be specified. TIME proposed asymmetric regulation, as mentioned earlier, to allow other operators to recuperate its investment. If the proposal for asymmetric regulation is not appropriate, then TIME submitted the mechanism for responsive removal should be adopted. However, TIME commented that there will never be more than two access providers providing Layer 2 HSBB services in an area, as it is uneconomical even for a second access provider to lay fibre into a home. Finally, it supported the continual regulation of Layer 2 HSBB Network Service even if Layer 3 HSBB Network Service is included in the Access List.

15.25 YTL does not acquire HSBB Network Service at Layer 3, however, it does not rule out the possibility of acquiring them in the future. YTL agreed with the inclusion of a new Layer 3 HSBB Network Service in the Access List, as it provides more flexibility and features to end consumers. YTL submitted that the test for competition for the responsive removal mechanism should be robust. It noted that major providers may be related companies, and though there are many providers, it would not denote competition. Hence, it provided that in addition to the factors mentioned, prices and capacity supplied by each provider should also be taken into account in any

responsive removal mechanism. The prices should be below MSAP regulated prices whilst each access provider should be providing less than 1/3 of the total capacity along the route.

- 15.26 A mobile operator acquires HSBB Network Service at Layer 3 as an access seeker. It agreed with the inclusion of the new Layer 3 HSBB Network Service in the Access List as it will promote competitiveness and growth and over time spur investment and encourage innovation in the market. The mobile operator agreed with the classes of service and service description of the Layer 3 HSBB Network Service. Finally, it agreed that the MCMC's proposed removal mechanism should be included to provide fair competition and to avoid any one operator as a monopoly.

Discussion

- 15.27 The MCMC thanks operators for their detailed and extensive submissions on the continuing refinement of HSBB Network access regulation. The MCMC notes that this is a critical topic for the continued development of Malaysia and that incentives for both access providers and access seekers of HSBB Network Service must be carefully balanced.
- 15.28 The MCMC confirms its preliminary view that a Layer 3 HSBB Network Service should be included in the Access List. The MCMC also confirms its preliminary view that a responsive removal mechanism should be included to incentivise both access providers and access seekers to move to the supply and acquisition of services at Layer 2 over time, which the MCMC finds is likely to result in a commercial market for the supply of Layer 3 services which would allow the removal of access regulation. However, in response to operator submissions, the MCMC proposes to amend the details of both the listed service and the removal mechanism from the details included in the PI Paper.
- 15.29 First, the MCMC considers that the service description should include elements that reflect the HSBA service actually being offered and supplied by TM. This approach:
- (a) addresses TM's concerns that there are trade-offs in service design which need to be reflected in any regulated access service;
 - (b) addresses the MCMC's concern that access providers may fail to supply the regulated access service on the basis of technical differences between their facilities and the service description; and
 - (c) will allow the MCMC to consider whether further regulation is required in relation to the Layer 3 service actually supplied by TM as part of future MSA and MSAP reviews, subject to Public Inquiry processes that can assess all operator views through an open and transparent process.
- 15.30 Second, the MCMC considers that the responsive removal mechanism should be based on a more holistic approach, for the reasons discussed at

paragraph 9.43 above for revising the responsive removal mechanism that will apply in relation to the Trunk Transmission Service.

- 15.31 The MCMC provides responses to specific operator submissions not addressed in these general comments as follows.
- 15.32 The MCMC acknowledges operator submissions that some operators seek regulation of the Layer 3 service, not because they do not wish to acquire the existing Layer 2 services in the Access List, but because the Layer 2 services are not being supplied. The MCMC confirms that, as discussed above, the Layer 2 HSBB Network Service with QoS will continue to be listed, offering operators a migration path to lower layer supply and access over time.
- 15.33 The MCMC acknowledges that, in general, potential access seekers have submitted requests for:
- (a) the greatest number of bit rate increments practical, to allow for service differentiation;
 - (b) asymmetric as well as symmetric bit rates to match the demand from significant numbers of end users and avoid acquisition of unused capacity;
 - (c) significantly higher contention ratios than proposed should be defined, including 20:1, 25:1 and 50:1 or that contention ratios should be removed altogether.
- 15.34 The MCMC confirms that it has taken these requests into account and the service description for the Layer 3 HSBB Network Service will include bit rates and other features both reflecting TM's current HSBA offer that is being supplied, and also adding new options.
- 15.35 In response to operator submissions that the classes of service for a Layer 3 service should be defined by reference to QoS (latency, jitter and loss) characteristics and ITU-T Recommendation Y.1541, the MCMC notes that such measures are not usually provided for in the wholesale supply of Layer 3 services. International regulatory models that define QoS requirements are usually for Layer 2 access, similar to the Layer 2 HSBB Network Service with QoS.
- 15.36 In response to Astro's and Maxis' submissions about access providers bundling transmission or other ancillary services with the regulated HSBB service, the MCMC reiterates that as stated in the PI Paper, forced bundling, also known as "conditional access", is prohibited under section 5.13.22 of the MSA. Access seekers facing such issues should raise a complaint with the MCMC under section 69 of the CMA.
- 15.37 The MCMC notes that the Access List is not based on an asymmetric ex-ante regulatory model. However, given that TM is the dominant access provider of HSBB Network Service by a significant margin, there should be

no doubt that all HSBB Network Service obligations in the Access List apply to it.

15.38 With regard to Celcom's submission that access seekers should have an option to connect to the incumbent's HSBB Network nationwide through a single POI or POP, the MCMC notes that access seekers must also invest in infrastructure. The Access List is only intended to regulate access to bottleneck facilities which would be uneconomic to duplicate, such as the 'last mile' access network. Where it is economically feasible to duplicate infrastructure, such as in aggregated backhaul links between major POIs, access seekers are expected roll out their own infrastructure or acquire access to infrastructure on a commercial basis. However, the MCMC notes that to roll out competitive infrastructure, access seekers are required to have access to regulated inputs such as:

- (a) the ability to co-locate equipment at multiple POIs, which is the reason MCMC is particularly concerned that TM must supply access to the full scope of Network Co-Location Services (as discussed above); and
- (b) transmission over trunk routes, which is the reason MCMC proposes to continue regulating trunk transmission separately from tail transmission (as discussed above).

15.39 In response to Celcom's concern that the responsive removal mechanism proposed by the MCMC considers the number of competitors, while in Celcom's view, the most important aspect to consider is the anti-competitive conduct of the incumbent, the MCMC notes that:

- (a) it is now proposing a more holistic approach to decide where access regulation should be removed; and
- (b) in any case, if there is competition to supply Layer 3 services by multiple access providers, TM will no longer have a monopoly at Layer 3 (even if all Layer 3 access providers are acquiring a Layer 2 service from TM). Layer 2 regulation would remain to ensure that any remaining bottleneck at Layer 2 does not adversely affect competition in the supply of Layer 3 services.

15.40 Regarding access seeker submissions that access providers have failed to meet the Mandatory Standard on QoS or other regulations, the MCMC reiterates its guidance that access seekers should raise a complaint with the MCMC under section 69 of the CMA to allow the MCMC to consider verifiable evidence and take any required enforcement action.

15.41 In response to Maxis' concern that the commercial HSBA service is only limited to HSBB1, and would not include supply over HSBB2 or the SUBB, the MCMC reiterates that regulation of HSBB Network Service apply to all HSBB Networks and all operators capable of supplying the services. However, the MCMC also proposes amendments to the definition of "High-Speed Broadband Network" in the Access List to further clarify this point.

- 15.42 The MCMC agrees with Maxis' submission that, at Layer 3, Classes of Service define the service characteristics which support the provision of specified applications. Consequently, it is not necessary to specify contention ratios at Layer 3. Rather, the access provider must ensure that network resources are sufficiently managed to supply the required service characteristics for an access seeker's selected Classes of Service.
- 15.43 In response to Packet One's submission that any decision to remove regulation of the Layer 3 service should take into account licensees' points of view before the decision is made, the MCMC confirms that it will hold a Public Inquiry on any such decision.
- 15.44 In response to TM's submission that other operators own HSBB networks and are providing HSBB services to the end users, but are not providing wholesale services to other licensees, the MCMC invites TM and other operators to provide the MCMC details of any such failure to comply with the SAOs and to raise a complaint with the MCMC under section 69 of the CMA to allow the MCMC to consider verifiable evidence and take any required enforcement action.
- 15.45 The MCMC does not consider the PPP Agreement between the Malaysian Government and TM to pose any barrier to the MCMC listing a Layer 3 HSBB Network Service in the Access List nor on TM complying with the SAOs that apply to such a listed service.
- 15.46 The MCMC acknowledges the statistics provided by TM on growth of HSBA services. However, HSBB Network Service at Layer 2 and Layer 3 remain bottlenecks as discussed by the MCMC in some detail in the PI Paper. Combined with continuing access seeker concerns about the terms and practicality of TM's supply, the MCMC considers that access regulation is both necessary and justified.
- 15.47 The MCMC is confident that operators will co-operate to manage any issues regarding migration of commercial services to regulated services to minimise confusion and contractual management issues.
- 15.48 The MCMC is not concerned by TM's submission that access regulation could reduce the incentive for investment in HSBB infrastructure. It notes that there are significant benefits to HSBB Network rollout with or without regulated access, particularly in TM's case as it is receiving significant public funds for its rollout.
- 15.49 While the MCMC acknowledges TM's submission that access seeker complaints relate to operational matters, which could be investigated and addressed between parties and if required, subject to the MCMC's dispute resolution (or complaint) mechanisms. However, not all issues raised are operational. For example, if TM is bundling HSBA with transmission, that issue is not an operational one.
- 15.50 Regarding TM's submission that a responsive removal mechanism should be established for all facilities and services in the Access List, the MCMC notes that it has proposed mechanisms for a number of transmission and HSBB

services. However, it is not necessary or appropriate to include such mechanisms for services that have little prospect of being competitively supplied between Access List reviews. For example, by its nature it is unlikely that the Network Co-Location Service will ever be competitively supplied.

15.51 With regard to TM's other submissions on the MCMC's proposed responsive removal mechanism, the MCMC notes that:

- (a) it may be true that the current state of competition in Malaysia would make it difficult to identify three independent access providers of the Layer 3 HSBB Network Service in an area. However, if that is the case, that is not an argument for the MCMC to lower the competition test to require only two independent access providers. Instead it is an incentive for access providers to supply associated services, such as the Network Co-Location Service, which would allow competing operators to deploy HSBB Network Service in a location;
- (b) a lack of service take-up does not necessarily indicate a lack of interest in service acquisition, particularly if access providers are failing to supply the regulated service or other required services (like Network Co-Location) and therefore, the MCMC does not consider lack of take-up to be a relevant data point in its analysis of whether to remove access regulation of a particular service or part thereof; and
- (c) the MCMC will consider changes of market share and any other relevant factors as part of its revised holistic approach to responsive removal of access regulation.

15.52 The issues raised by TIME regarding PDM and other physical access to end user locations are discussed in chapter 13, above.

15.53 In response to TIME's comment that it is uneconomic even for a second access provider to lay fibre into a home, the MCMC clarifies that its proposal is that:

- (a) even if there is only one physical fibre into a home, and one operator controls access to the physical fibre, it may supply services over that fibre to multiple access seekers, who in turn compete to supply services to the end user in the retail market;
- (b) ideally, the access providers should supply access to access seekers at Layer 2, maximising the access seekers' ability to differentiate their services and innovate in service provision; and
- (c) such Layer 2 access would allow access seekers to become access providers at Layer 3, removing the need for regulation at Layer 3.

MCMC Views

15.54 The MCMC confirms its preliminary view that access to a Layer 3 HSBB Network Service should be regulated through the Access List, but having reflected on submissions from operators, proposes to do so through a revised service description and associated definitions, as follows:

New Definition

"End User" means a Consumer and final recipient of the service, and includes an ultimate retail Customer of an Operator.

Changed Definition

"High-Speed Broadband Network" or "HSBB Network" means an IP-based network capable of providing services of at least 10 Mbps. For the avoidance of doubt, "High-Speed Broadband Network" or "HSBB Network" includes (but is not limited to):

- (a) the High-Speed Broadband Network, Phase 1;*
- (b) the High-Speed Broadband Network, Phase 2; and*
- (c) the Sub Urban Broadband Network,*

co-funded by the Government of Malaysia.

Layer 3 HSBB Network Service

(a) The Layer 3 HSBB Network Service is an access and transmission Facility and/or Service for the provision of Layer 3 connectivity for the carriage of certain communications (being data in digital form and conforming to Internet Protocols) between customer equipment at an End User's premises and a POI at the Access Provider's premises or the Access Seeker's premises, as selected by the Access Seeker, where in respect of the service:

- (i) the customer equipment is directly connected to an Access Provider's High Speed Broadband Network;*
- (ii) the Access Seeker selects the bit rate; and*
- (iii) the Access Seeker selects the Classes of Service ("COS").*

(b) The Layer 3 HSBB Network Service includes:

- (i) any hybrid Layer 2 and/or Layer 3 functionality required for the provision of the service;*
- (ii) shared splitting services;*
- (iii) interfaces to operational support systems; and*
- (iv) network information.*

(c) Nothing in this service description is intended to limit:

- (i) the number of concurrent Layer 3 HSBB Network Services acquired by an Access Seeker from an Access Provider associated with a single Customer;*

- (ii) concurrent acquisition of the Layer 3 HSBB Network Service and other HSBB Network Services by an Access Seeker from an Access Provider associated with a single Customer; or
 - (iii) the number of HSBB Network Services that may be acquired by a single Access Seeker (or permit an Access Provider to require an Access Seeker to acquire any minimum or maximum number of HSBB Network Services, either in a single location or at multiple locations, as a condition of an Access Provider supplying the Layer 3 HSBB Network Service).
- (d) The Layer 3 HSBB Network Service shall be supplied to the Access Seeker as follows:
- (i) at pre-defined speeds which are capable of providing the bit rates specified below, as selected by the Access Seeker (subject to the maximum bit rate supported by the access technology used at particular End User premises):

Symmetric base bit rates
4 to 30 (inclusive) in 1 Mbps increments
32
50
60
100

Additional Bit Rates the Access Seeker may request	
Downstream	Upstream
32 kbps	32 kbps
64 kbps	64 kbps
128 kbps	128 kbps
256 kbps	256 kbps
512 kbps	512 kbps
1 Mbps	256 kbps
6 Mbps	1 Mbps
10 Mbps	5 Mbps
20 Mbps	5 Mbps
20 Mbps	10 Mbps
25 Mbps	5 Mbps
25 Mbps	10 Mbps
30 Mbps	5 Mbps
30 Mbps	10 Mbps
50 Mbps	10 Mbps
50 Mbps	20 Mbps
100 Mbps	40 Mbps
100 Mbps	50 Mbps

- (ii) in accordance with the following classes (each a "CoS"), as selected by the Access Seeker, with traffic in each CoS prioritised as set out below in the case of congestion:

Class of Service	Traffic Priority
VoIP	1
IPTV, Video-On-Demand	2
Management, Business Internet	3
Residential Internet, Best Efforts Connection	4

15.55 Following operator submissions, the MCMC's revised view is that the following mechanism should be adopted for removal of regulated access to the Layer 3 HSBB Network Service on an area-by-area basis:

- (1) *An Access Provider may submit to the MCMC:*
 - (a) *a written proposal to remove one or more areas from the scope of the Layer 3 HSBB Network Service;*
 - (b) *commercial terms of supply, including prices, that the Access Provider proposes to offer for Layer 3 HSBB Network Service to all End user locations in the identified area(s) should the identified area(s) be removed from the scope of the Layer 3 HSBB Network Service; and*
 - (c) *detailed evidence of competition in the supply of the Layer 3 HSBB Network Service to all End user locations in the identified area(s), that support the Access Provider's proposal.*
- (2) *If the MCMC receives a proposal and supporting information under paragraph (1), the MCMC will conduct a preliminary review of the proposal and supporting information.*
- (3) *The MCMC may request further information from the Access Provider and from any other party, which the MCMC considers is relevant to its preliminary review under paragraph (2).*
- (4) *The MCMC may consider the following factors as part of its preliminary review under paragraph (2):*
 - (a) *whether there are three or more Independent Operators supplying the Layer 3 HSBB Network Service to all End user locations in the identified areas area(s);*
 - (b) *the volume of the Layer 3 HSBB Network Service which each of the Independent Operators has supplied and is capable of supplying in the identified area(s);*
 - (c) *evidence of barriers to entry, including whether a single operator controls transmission to and from the Points of Interconnection for the Layer 3 HSBB Network Service;*
 - (d) *the prices at which the Independent Operators are supplying and have previously supplied the Layer 3 HSBB Network Service in the identified area(s);*
 - (e) *countervailing buying power of Access Seekers of the Layer 3 HSBB Network Service in the identified area(s); and*

- (f) *potential effects of removal of identified area(s) from the scope of the Layer 3 HSBB Network Service on supply and acquisition of the Layer 3 HSBB Network Service in other areas and the supply and acquisition of other facilities and services.*
- (5) *If the MCMC's preliminary view is that there may be sufficient competition in the supply of the Layer 3 HSBB Network Service to all End user locations in the identified area(s), the MCMC will conduct a Public Inquiry on whether to remove the identified area(s) from the scope of the Layer 3 HSBB Network Service.*
- (6) *Any Operator may object to the potential removal of the identified area(s) from the scope of the Layer 3 HSBB Network Service by providing detailed evidence of the lack of competition in the supply of the Layer 3 HSBB Network Service to End user locations in the identified area(s), including evidence about any of the matters listed in paragraphs (4)(a)-(f), during the Public Inquiry.*
- (7) *If the MCMC receives an objection under paragraph (6) within the deadline set out in the Public Inquiry, it may extend the Public Inquiry to conduct such further inquiries as it considers necessary, including by gathering information from any party.*
- (8) *Following the completion of the Public Inquiry, including any extended Public Inquiry, where applicable, the MCMC shall publish a Public Inquiry Report setting out its findings.*

16 Access to End-to-End Transmission Services

Introduction

- 16.1 In the PI Paper, the MCMC considered whether access to End-to-End Transmission Services should be regulated in addition to the Trunk Transmission Service and the Wholesale Local Leased Circuit Service.
- 16.2 The MCMC noted that regulation of an End-to-End Transmission Service must be carefully considered from a policy perspective and only imposed in a manner which facilitates access providers and access seekers moving to the supply and acquisition of the Trunk Transmission Service and Wholesale Local Leased Circuit Service over time.
- 16.3 The MCMC noted that its preliminary view is that a new End-to-End Transmission Service should be added to the Access List together with a mechanism to remove regulation of that service on a route-by-route basis when there is sufficient evidence of supply of separate trunk and tail transmission on that route. The MCMC proposed a two-step test for determining whether there is sufficient evidence of such supply.

Submissions Received

- 16.4 Altel acquires the End-to-End Transmission Service as an access seeker and since this service is proposed to be included in the Access List to promote competition, together with a removal mechanism, it is deemed good practice. Altel believes that since the proposed description of End-to-End Transmission Service comprises the (Trunk) Transmission Service and the

Wholesale Local Leased Circuit Service, it does not change the definition and meaning of each of the disaggregated services.

- 16.5 On the proposed two-step test, Altel does not believe that the number of independent operators alone is sufficient to determine the degree or level of competition. Altel suggested that the MCMC adopt the term "independent" operators diligently and further strengthen removal mechanism by including broader evidence extracted from factors such as barriers to entry, pricing and countervailing buyer power. Altel is of the view that the word "can" in the second step of the two-step test implies that it is not compulsory but an option to include the other factors. In addition, it also considers that the factors mentioned in the second step of the test are not extensive to build a broader evidence of competition or lack thereof and suggested other factors such as degree of rivalry between the competing firms, the nature of change and innovation in the market, growth and the presence of strong facilities-based entrants. It added that that the technique and analytical tools employed should be constantly updated and refined to ensure continued relevance and usefulness and the MCMC should be transparent to the stakeholders in deliberating the test undertaken. Altel agreed to the responsive removal process but raised concerns with the absence of a process to include facilities or services in the Access List.
- 16.6 Altel submitted that End-to-End Transmission, Trunk Transmission and Wholesale Local Leased Circuit each have different market and the competition analysis and determination of market power would vary from one to another. The Trunk Transmission Service and Wholesale Local Leased Circuit Service refer to different parts of network and they are not substitutes, instead they are complementary. In addition, the Trunk Transmission Service and Wholesale Local Leased Circuit Service are national in scope and barriers to entry apply nationally rather than a route-to-route basis. Thus, Altel believes it is inappropriate to remove the Wholesale Local Leased Circuit Service and Trunk Transmission Service from the scope of End-to-End Transmission Service when there are three or more independent operators. Similarly, Altel submitted that the analysis for removal of regulation of the Wholesale Local Leased Circuit Service and End-to-End Transmission Service should be carried out separately.
- 16.7 Celcom acquires the End-to-End Transmission Service and is also a provider of the service. Celcom does not view the End-to-End Transmission as a new service and suggested renaming the existing Transmission Service as the End-to-End Transmission Service. Celcom is agreeable to the proposed description of the service, the mechanism to remove the service on a route-by-route basis and the proposal to remove regulation when there are three or more independent providers.
- 16.8 In addition, Celcom proposed that the MCMC adopt a more detailed process, similar to the process adopted by the ACCC in relation to the Domestic Transmission Capacity Service. Celcom believes that considerations regarding removal should be done independently by applying the mechanism to the service itself. If there is a relationship

between removal of the Wholesale Local Leased Circuit Service and the End-to-End Transmission Service, the rationale must be made clear.

- 16.9 Digi submitted that the Transmission Service is essentially a bottleneck and regulatory intervention in the form of ex-ante regulation is critical. Digi submitted that the scope of the Transmission Service should remain as stipulated in the Access List Determination in 2009 and it is not necessary to include a new End-to-End Transmission Service. Consequently, Digi is of the view that the removal mechanism is unnecessary and the Transmission Service should continue to be regulated on a national basis with no exclusion of routes for the following reasons:
- (a) there are limited number of access providers aside the collectively dominant TM that are able to serve widespread routes;
 - (b) the Transmission Service is usually procured to connect clusters of sites rather than on a link-by-link basis; and
 - (c) to maximise the cost benefits, necessary economies of scale would be needed and excluding some routes from the scope of regulation would reduce the economies of scale benefits.
- 16.10 Digi submitted that the two-step test proposed in the PI Paper could include a broader quantitative and qualitative assessment, similar to the revised methodology adopted by the ACCC in its Final Report on the review of the declaration for the Domestic Transmission Capacity Service in March 2014. Digi believes that the proposed two-step may entail several setbacks as the existence of three or more independent operators may not necessarily indicate that there is sufficient competition. In addition, information asymmetry is another issue that could prohibit accurate quantitative and qualitative assessments. Digi also requested the MCMC to consider mandating prices for the higher bandwidth capacities and guaranteed latency.
- 16.11 Fiberail supplies the End-to-End Transmission Service as an access provider. Fiberail agreed with the inclusion of this service in the Access List and the proposed service description. Fiberail also agreed with the proposed removal mechanism.
- 16.12 Maxis is an access seeker of the End-to-End Transmission Service but has not supplied the End-to-End Transmission Service due to its limited last mile coverage. Maxis strongly supports the inclusion of the End-to-End Transmission Service in the Access List as it provides complete end-to-end connectivity under one service definition. Maxis believes that the present Transmission Service acquired from TM is an End-to-End Transmission Service.
- 16.13 Maxis submitted that it is extremely important to include Metro-E as an example of the technology used to provide the Transmission Service since about ninety percent (90%) of the Transmission Service provided by the access provider is on Ethernet technologies. It does not agree with the responsive removal mechanism for the End-to-End Transmission Service,

since TM has been found dominant in both the national (collectively with Fiberrail and Fibrecomm) and Peninsular Malaysia to East Malaysia markets. Maxis also pointed out that TM has not allowed other access seekers to co-locate in their exchange buildings and there are no other access seeker exchanges that are located side-by-side or close (e.g. within 100m) to TM exchanges. Maxis believes that only TM is capable of providing the Wholesale Local Leased Circuit Service as other access providers have limitations with the last mile connection.

- 16.14 Although Maxis did not agree to a responsive removal mechanism for the End-to-End Transmission Service, it has nevertheless provided views on the removal mechanism. One of the suggestions is to request the access provider to submit a letter of undertaking to the MCMC on terms and conditions if the service is deregulated. In terms of evidence that there are three or more independent access providers, Maxis proposed that the MCMC considers various aspects, such as whether the operators have been declared jointly dominant, the market share of the largest operator, presence of at least two other access providers in close proximity, whether the Transmission Service is being provided in the identified location(s) by at least three operators, whether there is direct connectivity from the other access providers' exchanges, whether there is sufficient demand and the level of price competition in the identified locations. In carrying out the two-step test, Maxis urged the MCMC to form a preliminary view after the criteria in the removal mechanism are met and after a comprehensive assessment including, price trends, rollout of other access providers, market share of access providers, locations etc. to ascertain that there is effective competition. Maxis also expressed reservations that the mere presence of 3 operators can result in a preliminary view of competition and believes that a deeper investigation is warranted. Maxis also believes that the Wholesale Local Leased Circuit Service and Trunk Transmission Service should be handled separately from the End-to-End Transmission Service. Therefore, it does not agree that if regulated access to the Wholesale Local Leased Circuit Service is removed in a particular location, the End-to-End Transmission Service should also be removed.
- 16.15 Sacofa is a supplier of the End-to-End Transmission Service and may acquire this service in the future. Sacofa agreed that End-to-End Transmission Service should be included in the Access List and believes that the service description is acceptable. Sacofa also supported the inclusion of a responsive removal mechanism, however, it does not agree that if there are three or more independent parties in a route, it should be removed from the scope of End-to-End Transmission Service. Sacofa also disagreed with the MCMC's proposal that if the Wholesale Local Leased Circuit Service is removed in a particular location, the End-to-End Transmission Service in that location should also be removed.
- 16.16 TM supplies the transmission service as currently defined in Access List which is exactly the same as the End-to-End Transmission Service. TM does not support the inclusion of the proposed End-to-End Transmission Services for the following reasons:

- (a) the current description of the Transmission Service in the Access List is sufficient to fulfil the End-to-End Transmission service;
- (b) issues arose with regards to the Transmission Service when the MSAP 2012 regulated only the trunk price and not the tail portion, which is from the access provider exchange to the access seeker node. TM adopted the regulated Wholesale Local Leased Circuit Service tail pricing so as to have a complete end-to-end pricing to reflect the transmission service offering;
- (c) the definition of the existing Transmission Service should be retained because it is already an end-to-end service to the access seeker which includes a trunk connecting to two segments of tail. The purpose of the Transmission Service is for upstream markets and not for downstream markets as this defeats the original intention of the Transmission Service;
- (d) as per Celcom's claim in paragraph 20.12(a) in the PI Paper, TM has offered an End-to-End Transmission Service under the Transmission Service definition prior to 1st March 2013 and has been continuously providing the same after 1st March 2013. TM has not increased the installation charge since the implementation of the MSAP 2012 as claimed by Celcom;
- (e) in response to Maxis' and TIME's claims in paragraph 20.12 (b) and (e) in the PI Paper, TM submitted that it has actually provisioned the Transmission Service with ports and tails segments since the establishment of the Access List in 2001; and
- (f) TM believes that there will be some uncertainty and confusion if the new service is introduced.

16.17 TM did not agree with the service description proposed by the MCMC for the End-to-End Transmission Service. TM is of the view that current description of the Transmission Service is sufficient. TM agrees that Access List should include a mechanism for responsive removal of the End-to-End Transmission Service. However, TM is of the opinion that in the current industry environment the proposed approach would be unworkable, as it may be difficult to identify three or more independent providers on the same competitive routes. TM believes that access seekers are seeking transmission capacity from a small number of access providers in order to maximize returns by investing in the more lucrative mobile business. This is more likely to be the case when regulated prices are set too low and it does not make commercial sense for licensees to invest. Hence, TM suggested that the MCMC consider removing regulation of the service if there are only 2 or more independent operators for the same service. Other criteria below may also be considered:

- (a) no take up for three years after the facilities and or services are listed in the Access List;

- (b) a certain percentage of market loss by the incumbent service provider due to competition;
 - (c) technology substitution; and
 - (d) whether infrastructure could be easily replicated (e.g. through the collaboration of two or more operators building transmission capacity).
- 16.18 TM was agreeable to the MCMC's suggestion that if the Wholesale Local Leased Circuit Service is removed in a particular location, End-to-End Transmission Service in that location should also be removed.
- 16.19 TIME acquires and supplies the End-to-End Transmission Service. It strongly supports the inclusion of this service in the Access List and the service description. TIME is of the opinion that if there is sufficient competition in any geographical area, market forces will ensure that the End-to-End Transmission Service is offered more attractively than the regulated service. Therefore, they believe that the removal mechanism is redundant. However, TIME will support the MCMC's decision provided that Fiberail, Fibrecomm and TM is considered as a group. On the removal of regulation if there are three or more End-to-End Transmission Service providers, TIME is impartial but will support the MCMC's decision. TIME is of the opinion that the removal of regulated access would not have significant impact if the routes are already competitive.
- 16.20 YTL acquires End-to-End Transmission Service as an access seeker and it supports the MCMC's proposal to include the service in the Access List. In terms of the service description, YTL proposed that physical and virtual connections are taken into account. On the removal mechanism, they suggested that other factors such as capacity supplied and prices are also taken into account.
- 16.21 A mobile operator who acquires the End-to-End Transmission Service submitted that it supports the inclusion of this service in the Access List to avoid doubt and confusion. The mobile operator believes that the proposed service description provides sufficient details of the elements involved in the service. The mobile operator supports the inclusion of the responsive removal mechanism, including removal of regulation if there are three or more independent providers and removing regulation of the End-to-End Transmission Service in a particular location if the Wholesale Local Leased Circuit Service is removed.

Discussion

- 16.22 The MCMC thanks all operators for their responses on the key question of whether or not to add a new End-to-End Transmission Service to the Access List.
- 16.23 The MCMC acknowledges submissions from a number of operators that the Transmission Service which is currently included in the Access List (which the MCMC proposes to rename the "Trunk Transmission Service") already

provides End-to-End Transmission. However, for the reasons discussed above at paragraphs 9.37 to 9.42, the MCMC considers that it is necessary to clarify that the Trunk Transmission Service and Wholesale Local Leased Circuit Service allow access seekers to acquire transmission over the trunk and tail segments independently of each other.

- 16.24 As discussed above, allowing access seekers to acquire each bottleneck facility or service separately means that access seekers can gradually replace each of those bottlenecks with alternatives, one at a time, as it becomes feasible. It is this separate acquisition and gradual replacement of bottlenecks which makes the ladder of investment possible and opens the door to competition.
- 16.25 However, recognising that operators need to move to this model from the current acquisition of end-to-end services, the MCMC considers it necessary and appropriate to:
- (a) list the End-to-End Transmission Service; and
 - (b) include a responsive removal mechanism to incentivise independent supply and acquisition of transmission services on different segments and remove regulation of the consolidated service when that independent supply and acquisition is achieved.
- 16.26 The MCMC thanks operators for their considered submissions on the operation of this market in practice and, for the same reasons set out in paragraph (in relation to the Trunk Transmission Service), the MCMC proposes to give effect to the general consensus that the responsive removal process must use a holistic test to assess when access regulation should be removed.
- 16.27 The MCMC also thanks operators for their submissions on whether the removal of a particular route from the scope of the End-to-End Transmission Service can be tied to removal of the end-point of the route from the scope of the Wholesale Local Leased Circuit Service. The MCMC notes that with some exceptions, there was widespread concern that these services played different roles and the removal of one should not be linked to the removal of the other. Notwithstanding these concerns, the MCMC confirms its preliminary views that:
- (a) if a location is removed from the scope of the Wholesale Local Leased Circuit Service following a Public Inquiry process in which all operators may make submissions, that means that the MCMC has concluded tail transmission to that location is competitive;
 - (b) if tail transmission to a location is competitive, then an access seeker may acquire that tail transmission plus trunk transmission either on a regulated basis or (particularly if the particular trunk route of interest to the access seeker has been removed from the scope of the Trunk Transmission Service) commercially, plus the tail transmission at the other end of the route (again, on a regulated or commercial basis);

- (c) therefore, the access seeker may construct an End-to-End Transmission Service from a mixture of competitive and regulated transmission segments depending on the maturity of competition along each of those segments;
- (d) this is precisely the type of competition that access regulation is intended to foster; and
- (e) in this circumstance it is appropriate to remove the End-to-End Transmission Service.

16.28 In response to operator concerns that TM is dominant for a vast majority of locations to which End-to-End Transmission (or tail transmission alone) is acquired, the MCMC acknowledges that it may be that in the short-term, very few locations will have competitive supply of tail transmission and therefore very few will be removed from the scope of either the Wholesale Local Leased Circuit Service or the End-to-End Transmission Service. Nevertheless, there may be some small number of locations where regulation can be removed in the short-term. Additionally, it is appropriate to include a mechanism that can cater for increased competition that the MCMC hopes will develop over time.

16.29 The MCMC acknowledges Digi's submission that transmission is usually acquired on a clustered basis rather than on a link-by-link basis. First, the MCMC notes that the revised holistic test for responsive removal will allow the MCMC to consider such practical marketplace behaviour. Second, the MCMC suggests that changes to clustered acquisition and supply practices may promote Long-Term Benefit of the End User by introducing competition on routes where there is the most economic promise and route-by-route supply and acquisition may even develop as a result of the MCMC's proposed responsive removal mechanism, by giving access providers an incentive to increase competition and thereby remove regulation.

16.30 The MCMC notes that it has considered and responded to Altel's concern regarding the absence of a process to include facilities or services in the Access List at paragraph 9.44, above.

16.31 In response to Maxis' submission that the service description for transmission services should include Metro-E as an example of the technology used to provide the transmission services, the MCMC notes its discussion of Metro-E in paragraph 9.47, and that Metro-E is particularly relevant to the supply of End-to-End Transmission Service. The MCMC therefore agrees with Maxis' submission in respect of the service description for the End-to-End Transmission Service specifically.

16.32 In response to TM's concern that introduction of a new End-to-End Transmission Service may cause confusion, the MCMC notes that:

- (a) this concern is not in itself a reason not to regulate a service which needs regulation for the Long-Term Benefit of the End User, but rather a reason for clear communication between the parties and from the MCMC; and

- (b) there is already significant confusion about the services (albeit primarily on pricing matters).

16.33 The MCMC has previously addressed the balance of TM's concerns on transmission services regulation, and particularly factors to be considered as part of the responsive removal mechanism, in section 9, above.

MCMC Views

16.34 The MCMC confirms its preliminary view that the End-to-End Transmission should be regulated through the Access List, and proposes the following service description:

End-to-End Transmission Service

- (a) *The End-to-End Transmission Service is a Facility and/or Service for the carriage of communications between:*
 - (i) *two End User locations;*
 - (ii) *between two Access Seeker Points of Presence; or*
 - (iii) *between one End User location and one Access Seeker Point of Presence,*
via such network interfaces at such transmission rates as may be agreed between the Access Provider and the Access Seeker on a permanent or virtual basis.
- (b) *Network interfaces may use any technology as may be agreed between the Access Provider and the Access Seeker including, for example, Ethernet interfaces.*
- (c) *The functionalities of the End-to-End Transmission Service include:*
 - (i) *transmission and switching (whether packet or circuit);*
 - (ii) *the signalling required to support the technology or to provide a service;*
 - (iii) *termination at either end by a port, router, network termination unit, switch, submarine cable landing centre or earth station; and*
 - (iv) *a digital protocol (including Internet Protocols).*
- (d) *An End User location or Access Seeker Point of Presence in paragraph (a) may include submarine cable or satellite link between Sabah and Sarawak and Peninsular Malaysia, submarine cable landing centre or an earth station.*
- (e) *The End-to-End Transmission Service may be for the carriage of communications which comprise a content applications service.*
- (f) *Technologies used to supply End-to-End Transmission, such as Metro-E may be requested by Access Seekers and the Access Provider must supply End-to-End Transmission Service using these technologies on request.*
- (g) *An Access Seeker for the End-to-End Transmission Service includes (but is not limited to) a network facilities provider or network service provider which is only authorised to provide limited (e.g. in the last mile) network facilities or network services, but wishes to acquire the End-to-End Transmission Service in order to connect its limited network facilities or network services.*

- (h) *For the avoidance of doubt, the End-to-End Transmission Service comprises but is not limited to the Facilities and/or Services specified in the Trunk Transmission Service and the Wholesale Local Leased Circuit Service.*

16.35 Following operator submissions, the MCMC's revised view is that the following mechanism should be adopted for removal of regulated access to End-to-End Transmission Service on an route-by-route basis (noting that the definition of "Independent Operators" described at paragraph 9.54, above, is also used in the following mechanism):

- (1) *An Access Provider may submit to the MCMC:*
 - (a) *a written proposal to remove one or more routes from the scope of the End-to-End Transmission Service;*
 - (b) *commercial terms of supply, including prices, that the Access Provider proposes to offer for transmission services over the identified route(s) should the identified route(s) be removed from the scope of the End-to-End Transmission Service; and*
 - (c) *detailed evidence of competition in the supply of transmission services over either of the tail segments of the End-to-End Transmission Service on the identified route(s), that support the Access Provider's proposal.*
- (2) *The Access Provider may submit a proposal and supporting information under paragraph (1) together with a proposal to remove one or more areas from the scope of the Wholesale Local Leased Circuit Service, in which case the MCMC will consider both proposals together (including by holding a combined Public Inquiry, should the MCMC consider it desirable to do so).*
- (3) *If the MCMC receives a proposal and supporting information under paragraph (1), the MCMC will conduct a preliminary review of the proposal and supporting information.*
- (4) *The MCMC may request further information from the Access Provider and from any other party, which the MCMC considers is relevant to its preliminary review under paragraph (3).*
- (5) *The MCMC may consider the following factors as part of its preliminary review under paragraph (3):*
 - (a) *whether there are three or more Independent Operators supplying the transmission over the tail segment(s) identified by the Access Provider in paragraph 1(c);*
 - (b) *whether the transmission services supplied by each of the Independent Operators over the identified tail segment(s) terminate at or near the same locations;*
 - (c) *the volume of the transmission services which each of the Independent Operators has supplied and is capable of supplying over the identified tail segment(s);*
 - (d) *evidence of barriers to entry, including whether or not the Independent Operators facilitate co-location for the identified tail segment(s);*

- (e) *the prices at which the Independent Operators are supplying and have previously supplied transmission over the identified tail segment(s);*
 - (f) *countervailing buying power of Access Seekers of transmission services over the identified tail segment(s); and*
 - (g) *potential effects of removal of identified route(s) from the scope of the End-to-End Transmission Service on supply and acquisition of the End-to-End Transmission Service over other routes and the supply and acquisition of other facilities and services.*
- (6) *If the MCMC's preliminary view is that there may be sufficient competition in the supply of transmission services over the identified tail segment(s), the MCMC will conduct a Public Inquiry on whether to remove the identified route(s) from the scope of the End-to-End Transmission Service.*
 - (7) *Any Operator may object to the potential removal of the identified route(s) from the scope of the End-to-End Transmission Service by providing detailed evidence of the lack of competition in the supply of transmission services on the identified tail segment(s), including evidence about any of the matters listed in paragraphs (5)(a)-(g), during the Public Inquiry.*
 - (8) *If the MCMC receives an objection under paragraph (7) within the deadline set out in the Public Inquiry, it may extend the Public Inquiry to conduct such further inquiries as it considers necessary, including by gathering information from any party.*
 - (9) *Following the completion of the Public Inquiry, including any extended Public Inquiry, where applicable, the MCMC shall publish a Public Inquiry Report setting out its findings.*

17 Access to Radio Access Network (RAN) Sharing

Introduction

- 17.1 In the PI Paper, the MCMC considered whether to regulate RAN Sharing through the Access List. The MCMC noted that RAN Sharing can promote efficiency, increase network coverage and lower capital costs for MNOs as well as costs for end users.
- 17.2 The MCMC acknowledged that several stakeholders have requested that RAN Sharing be listed in the Access List as a new service. Nevertheless, the MCMC expressed a preliminary view that it does not consider that RAN Sharing should be regulated through the Access List. This is because RAN Sharing requires a high degree of joint coordination, planning and investment by MNOs, usually implemented via a joint venture model which makes RAN Sharing inappropriate for regulation under an "access provider – access seeker" model.

Submissions Received

- 17.3 Altel noted that while it did not currently engage in RAN sharing, Altel considered it likely that it would have RAN sharing arrangements in the future. Altel urged the MCMC to consider multiple operator core network sharing as it had all the elements of RAN sharing but also additional

benefits in terms of lower active equipment costs. Altel acknowledged that the cost of such arrangements was a lack of control of traffic quality and capacity. Altel provided summaries of where such core network sharing was implemented globally and noted it was considering core network sharing benefits for its own business model.

- 17.4 Celcom noted that it was currently negotiating a RAN sharing arrangement with another operator and had experienced no difficulty in doing so. Celcom urged that RAN sharing not be regulated on the basis that it could be achieved through commercial negotiation, noting the RAN sharing agreement between Maxis and U Mobile.
- 17.5 Digi agreed with the MCMC's preliminary view not to regulate RAN sharing as it could be achieved via commercial agreements and provided a list of jurisdictions (including Malaysia) where RAN sharing was conducted via commercial agreements. Digi noted that mandating RAN sharing could reduce investment incentives for network rollout.
- 17.6 Maxis noted it had 2 separate RAN sharing arrangements, one with U Mobile for 3G network sharing and the other with Redtone for spectrum pooling for LTE. Maxis supported the MCMC's preliminary views to not regulate RAN sharing. Maxis noted that mandated RAN sharing may discourage investment in and development of, alternative networks and infrastructure, which were key drivers of retail mobile competition and noted a number of RAN sharing arrangements concluded on a commercial basis from around the world. Maxis suggested that no RAN sharing services be included in the Access List.
- 17.7 TM noted that it did not engage in RAN sharing, but supported the regulation of RAN sharing to resolve service coverage in lowly populated areas of Malaysia and to break up mobile monopolies. TM noted that any regulation should follow the best practice recommendations for Mobile Network Sharing, as presented at the ITU Global Symposium of Regulators in Thailand in 2008.
- 17.8 YTL submitted that while it did not currently engage in RAN sharing, it considered that regulation would encourage such sharing, subject to technical constraints. YTL considered that RAN sharing should be regulated to mandate sharing in the lower spectrum bands to enhance consumer experiences.
- 17.9 A mobile operator submitted that it currently engages in RAN sharing with Maxis and noted that while it had experienced some difficulties in terms of joint coordination and planning issues, these could be managed commercially via agreements, although other operators were still able to exclude RAN sharing for strategic areas of their access networks, such as for rural or highly populated areas.

Discussion

- 17.10 The MCMC notes that the potential access seekers of a regulated RAN Sharing Service must each have their own spectrum allocations, as RAN

sharing only involves sharing active equipment to access allocated spectrum. Consequently, the potential access seekers of a regulated RAN Sharing Service are effectively limited to existing MNOs and WiMAX providers. As is evident from the summary above, the general consensus amongst MNOs is that they do not require regulated access to RAN Sharing.

- 17.11 The MCMC acknowledges that YTL, which has been allocated spectrum, does not agree with this consensus. However, the MCMC reiterates its comments in the PI Paper that access to other operators' spectrum would not be facilitated by a RAN Sharing Service, though a RAN Sharing Service may theoretically assist an access seeker to obtain more favourable terms and conditions for access to the active components required to benefit from separately arranged spectrum pooling.
- 17.12 Ultimately though, as the MCMC observed in the PI Paper, the asymmetric relationship between the access provider and access seeker is not suited to the high degree joint control and planning that is required in order to effectively implement RAN sharing, and the MCMC is not aware of any other jurisdiction globally that imposes ex-ante access obligations in respect of RAN sharing.
- 17.13 The MCMC notes however, that some of the aims that TM and YTL seek to achieve may be facilitated by MVNO access, which is discussed below.

MCMC Views

- 17.14 The MCMC confirms its preliminary view that it is not appropriate or necessary to regulate access to a RAN Sharing Service through the Access List at this time.

18 Access to MVNO Services

Introduction

- 18.1 In the PI Paper, the MCMC considered whether it is appropriate to regulate MVNO services through the Access List, and if so, the precise scope of such services. The MCMC noted several operators had expressed their support for regulated access to such services. But the MCMC sought further views about what the scope of such services might be, given the many potential MVNO models.
- 18.2 The MCMC observed that the mobile telephony market was found to be competitive in the Dominance Report. However, the MCMC noted that while there was a level of competition between MNOs to partner with MVNOs to target certain customer bases, the small market share of MVNOs and a number of other factors may limit MVNOs ability to effectively compete with MNOs for end users and may indicate that there is an insufficient level of competition in the wholesale market for the supply of mobile telephony services by MNOs to MVNOs.
- 18.3 The MCMC refrained from expressing a preliminary view about whether or not an MVNO Service ought to be regulated through the Access List. The

MCMC came to a preliminary view that the arguments for and against regulating access to a MVNO service are finely balanced and it invited further submissions from operators on how regulated access to a particular MVNO service would contribute to the long-term benefit of end users.

Submissions Received

- 18.4 Celcom, as a provider of MVNO services noted that it had not experienced difficulties in providing MVNO services and currently provided access to six MVNOs, including the recipient of the Frost and Sullivan MVNO of the Year award 2014, RedONE. Celcom observed that only MVNOs with niche target markets and with other telecommunications and non-telecommunications business interests were able to survive or grow. Celcom did not consider that access regulation was necessary for MVNO services, citing previous MCMC public inquiries into MVNO arrangements that left MVNO services to be regulated by market forces, as still inherently accurate. Celcom submitted that barriers to entry were low in the market and a number of new MVNO market entrants had emerged.
- 18.5 Digi also cited previous MCMC public inquiries into MVNO arrangements as being inherently correct in their conclusion that the mobile services market was competitive and noted that an estimated 22 MVNOs exist in Malaysia, suggesting that there is no need for access regulation. Digi noted that both the FCC in the USA and Ofcom in the UK did not intervene in the form of access regulation for MVNO entrants. Finally, Digi concluded that there were inherent incentives for MNOs to provide access to their networks to MVNOs as they obtained wholesale revenue from the MVNOs and that successful MVNOs usually targeted niche or underserved segments of the consumer market, i.e. consumers unserved by MNOs.
- 18.6 Maxis noted that it currently supports 2 MVNOs, both of which target Indonesian immigrants. Maxis considers the mobile services market in Malaysia to be extremely competitive and noted that internationally, access regulation in favour of MVNOs was only undertaken if there was a lack of competition in the mobile services market as was the case in Spain, Qatar, Brazil and China. Maxis considers the main difficulties in supplying MVNO access services is that MVNOs may want the MNO to share and co-invest in a dedicated platform which may not be a cost-effective avenue for the MNO if their wholesale operations are still small.
- 18.7 Maxis considers that Malaysia's current competition framework and Guidelines on Dominance and Substantial Lessening of Competition are the best methods of ensuring MVNO access, whereas mandated access regulation may encourage unviable MVNOs to enter the market. Maxis observed that the MCMC had not yet considered the role of independent third party MVNO platform enablers, such as Enabling Asia and Barakath that provide platform services such as Home Location Registers to either the MNO or the MVNO. Maxis submitted that the presence of such players adds a layer of complexity to any proposed access regulation such as who is subjected to the obligation to provide access. In light of these

considerations, Maxis does not support the inclusion of MVNO services in the Access List.

- 18.8 TM expressed interest in acquiring MVNO services but noted that it has not been able to come to an agreement with an MNO. TM submitted that the difficulties it has faced in acquiring MVNO services include uncompetitive pricing, the current market only supporting the thin MVNO models, the bundling of voice and data services, access to 3G-only services (not 4G or LTE) and the requirements of MNOs for TM to have a business case aimed at targeting complementary segments of the MNOs customer base. TM considers that the mobile services market is oligopolistic and that mandated MVNO services are necessary. It cited a number of international examples where MVNO access has been mandated and further examples of where MNOs had offered MVNO access to their 4G and LTE networks. TM supported the inclusion of MVNO services in the Access List and submitted that regulation should require MVNO services to be unbundled i.e. to prohibit requirements to purchase voice services and data services. It also submitted that regulation should require MNOs to support “thick” MVNOs.
- 18.9 Packet One explained that it had tried to acquire MVNO services once but did not do so due to unattractive pricing and other unattractive conditions of the arrangement. Packet One acknowledged that it may be difficult to determine what MVNO services should be regulated as there are a variety of MVNO business models but opined that access regulation in this sector may encourage MNOs to open up their networks where they do not already have sufficient incentives to do so.
- 18.10 YTL does not acquire MVNO services but had experienced difficulties with MNOs requiring MVNO partners to provide a business case with target customers and specifying minimum service packages. YTL considers that applications services should be mandated as MVNO services in the Access List but that these should not be overly defined as the applications services each MVNO will need will differ based on its business model and its pre-existing infrastructure and communications arrangements.
- 18.11 A mobile operator stated that it provides MVNO access and had experienced no difficulties in supplying such services via commercial agreements. The mobile operator does not consider that MVNO services should be included in the Access List as there is no evidence to suggest that market failure is occurring in the highly competitive mobile market.

Discussion

- 18.12 The MCMC thanks operators for the market information they have supplied in response to the MCMC’s questions about the MVNO market in Malaysia. Each of the MNOs have submitted that it is unnecessary to regulate MVNO access. There are a number of MVNOs already in the market, and the MCMC acknowledges that each of the MNOs does host MVNOs. These MVNO arrangements have been commercially agreed.
- 18.13 However, the MCMC notes that potential access seekers have consistently requested MVNO access to be regulated through the Access List and cited

past failed commercial negotiations. Further these potential access seekers are existing CMA licensees with fixed or wireless communications businesses and have expressed an interest in establishing “thick” MVNOs. This cannot be compared with the current MVNOs in the market, which are “thin” MVNOs. The IDA has recently considered the differences between thin and thick MVNOs. It noted that thick MVNOs, having more control over their operations, customer databases and services to be offered, can bring about innovative or niche services to benefit consumers on a larger scale and can compete in a more sustainable manner compared to thin MNOs. The IDA proceeded to impose new negotiating principles which MNOs must comply with when negotiating with MVNOs, and stated that it would mediate in negotiations, if required.

- 18.14 The MCMC considers that the IDA’s comments on thick MVNOs are particularly relevant to the Malaysian market given the lack of any thick MVNOs, and the relatively limited service differentiation and market shares of existing MVNOs.
- 18.15 The IDA joins an international regulatory trend. As spectrum is becoming increasingly scarce, and there is a need to keep spectrum consolidated for new mobile technologies which require ever-greater bandwidth, countries are limited in the number of MNOs that can be supported. Mobile penetration is also reaching or has passed the saturation point, including in Malaysia. Regulators are increasingly turning to MVNOs to continue service innovation and competition in mobile markets. The international examples cited by TM include China, the European Union, France, Hong Kong, Japan, Korea, Saudi Arabia, Spain and Thailand. There are several other examples that could be cited including Singapore, as discussed above.
- 18.16 Given these factors, the MCMC considers that, while there may not be a bottleneck to accessing MNO host facilities and services generally, regulating access to an MVNO Access facility or service would contribute to National Policy Objectives in the CMA, including:
- (a) to establish Malaysia as a major global centre and hub for communications and multimedia information and content services; and
 - (b) to ensure an equitable provision of affordable services over ubiquitous national infrastructure.
- 18.17 Further, the MCMC considers that adding an MVNO Access facility or service to the Access List can:
- (a) promote competition in relevant markets;
 - (b) achieve any-to-any connectivity in relation to communications services; and
 - (c) encourage the economically efficient use of and investment in communications infrastructure, including scarce spectrum,

which are relevant to achieving the National Policy Objective of regulating for the Long-Term Benefit of the End User.

MCMC Views

18.18 Considering the matters discussed above, the MCMC considers that it is appropriate to add the following service description for MVNO Access to the Access List as follows:

MVNO Access

- (a) *MVNO Access is a Facility and/or Service for access to the Mobile Network used by the Access Provider to provide public cellular services to the public, for the purpose of the Access Seeker providing public cellular services to the public.*
- (b) *MVNO Access may include access to the Facilities and Services used by the Access Seeker to provide:*
 - (i) *one or more of voice, data and application services, as selected by the Access Seeker; and*
 - (ii) *services over networks including Global System for Mobile Communications (GSM), International Mobile Telecommunications 2000 (IMT-2000 or 3G), Worldwide Interoperability for Microwave Access (WiMAX), Long-Term Evolution (LTE), International Mobile Telecommunications – Advanced (IMT-Advanced, or LTE-Advanced) and any other mobile networks which are currently available or which may be developed in future.*
- (c) *Examples of Facilities and Services to which the Access Seeker may request access to include (but are not limited to) the Access Provider's:*
 - (i) *radio network;*
 - (ii) *Serving GPRS Support Node and Gateway GPRS Support Node;*
 - (iii) *Home Location Register;*
 - (iv) *value-added service platforms (such as its Short Message Service Centre, Multimedia Service Centre and Voicemail Server);*
 - (v) *SIM provisioning and configuration;*
 - (vi) *customer billing; and*
 - (vii) *customer relationship management.*

19 Access to Domestic Roaming

Introduction

19.1 In the PI Paper, the MCMC stated that it considers that there is no rationale for the reintroduction of the 3G-2G Domestic Inter-Operator Roaming Service to the Access List or for the listing of any broader domestic roaming services in the Access List.

19.2 The MCMC noted that the competitive benefits of a domestic roaming service are unclear given that MNOs are already required to rollout national

networks by virtue of their licence conditions or spectrum assignments. There was a sunset clause in the previously listed Access List service to ensure that 3G spectrum holders retained an incentive to invest in their own infrastructure rather than relying on 2G roaming. At the time of the previous Public Inquiry in the Access List, the most recent MNO entrant, U Mobile, had completed roaming arrangements, so the listed domestic roaming service would not have played an on-going role in promoting the long-term benefit of end users.

- 19.3 Consequently the MCMC came to the preliminary view in the PI Paper that access to domestic roaming should not be regulated under the Access List.

Submissions Received

- 19.4 Altel submitted that it acquired domestic roaming services as an access seeker and was currently in difficult negotiations with its domestic roaming provider concerning high domestic roaming rates which was impeding Altel's ability to offer any-to-any connectivity to its users in 2G and 3G areas. Altel does not consider that the 3G-2G Inter-Operator Roaming Service should be reintroduced to the Access List but rather, similar domestic roaming services for 4G-4G, 4G-3G and 4G-2G should be included in the Access List as many operators have been awarded 4G spectrum without any 2G or 3G spectrum and this impacts their ability to offer 'any-to-any' connectivity if there is no domestic roaming service to support such connectivity between 4G, 3G and 2G networks. Altel noted there was Canadian regulatory precedent to support such inclusions.
- 19.5 Altel considers that mandated access to domestic roaming for specified time periods could encourage infrastructure investment by new entrants offering 4G LTE who could use the service to obtain revenue by offering 'any-to-any' connectivity to customers and using this revenue to support the rollout of their own mobile network into areas covered by 2G and 3G networks.
- 19.6 Altel noted there were a number of reasons why operators would not enter into domestic roaming arrangements even where it was efficient to do so, including commercial issues such as the high degree of cooperation between domestic roaming partners, concerns about breaching anti-competitive practice laws, technical issues such as transfer of billing records, network failure due to sudden influxes of traffic and call handover procedures.
- 19.7 Celcom submitted that it both acquired and supplied domestic roaming services and had not experienced any difficulty in either the acquisition or supply of such services. Celcom does not support the inclusion of any domestic roaming service in the Access List as there was evidence of commercial negotiations for such services being successful, as there were a number of MNOs with 2G and 3G networks competing against each other and no sign of market failure to justify regulation. Celcom further submitted that mandating domestic roaming services would discourage network

rollout as service providers had no incentive to rollout their networks if they could rely on roaming on to other networks.

- 19.8 Celcom submitted that according to ACCC's definition, 'any-to-any' connectivity involved connecting a customer to a network rather than focusing on communications between 2 customers and therefore considers that any-to-any connectivity was not relevant for domestic roaming. Celcom considers that roaming on 3G or 2G networks would not increase end users' access to LTE data services and roaming on 2G networks would not increase access to 3G data services, as 2G networks supported voice and SMS services only. Finally, Celcom is not aware of any situation in Malaysia where a commercial roaming arrangement was not concluded where it would be efficient for operators to do so.
- 19.9 Digi submitted that it supported the sunset clause for the 3G-2G Domestic Inter-Operator Service and noted that commercial agreements for domestic roaming services had been concluded since then. Digi considers that mandated access to domestic roaming services could discourage infrastructure investment and could lead to wasted spectrum in areas where 4G LTE and 3G spectrum holders chose to rely on domestic roaming services rather than extending their networks.
- 19.10 Maxis submitted that it provided domestic roaming services on a national basis for U Mobile and also has smaller scale domestic roaming arrangements in selected areas of Malaysia. Maxis does not support the reintroduction of 3G to 2G Domestic Roaming Services to the Access List as the mobile services market in Malaysia is competitive and that in any case, domestic roaming should not be a permanently mandated privilege but, as international examples prove, is better used to temporarily support new market entrants. Maxis considers that mandating access to domestic roaming services discourages expedited network rollout by operators who have been granted spectrum rights. Maxis considers that any-to-any connectivity is a concern in termination markets where operators refuse to interconnect, not in domestic roaming markets where operators seeking the service are typically required to rollout their own mobile networks anyway. Maxis considers that mandated Infrastructure Sharing is the most appropriate way to deal with lack of network coverage. Maxis does not consider that mandated access to domestic roaming would enable greater uptake of LTE.
- 19.11 TM supports the inclusion of LTE, 3G and 2G roaming services in the Access List, as this avoids unnecessary network duplication in remote areas of Malaysia where it may not be economically feasible to roll out competing networks. Telekom Malaysia noted that mandated domestic roaming was a key feature of the successful 3G rollout in Europe and a number of other markets including New Zealand, Indonesia, Thailand and the USA and would facilitate commercial roaming arrangements which involve lengthy negotiations. TM considers that mandated domestic roaming would encourage investment in infrastructure as roaming would mean that network duplication in sparsely populated areas would no longer be required, freeing up funds to invest in infrastructure in completely unserved

areas or address congestion in high demand areas. Telekom Malaysia considers that domestic roaming services are necessary for 4G/LTE operators to provide nationwide services. TM noted that circuit-switched fall-back to 3G and 2G networks for LTE voice services would make LTE data-voice bundles more attractive to consumers. TM noted that even where it is efficient for domestic roaming arrangements to be entered into as opposed to investment in competing network rollouts, unfair contractual conditions imposed on the access seeker will usually prevent such arrangements from coming to fruition.

- 19.12 Packet One acquires domestic roaming services and considers that the main difficulty in acquiring such services is that negotiations are lengthy and access providers usually attempt to bundle other service offerings with domestic roaming. Packet One supported the inclusion of a domestic roaming service in the Access List but for spectrum holders only.
- 19.13 Packet One submitted that domestic roaming services being mandated in the Access List will not adversely affect investment in infrastructure as it is usually only used as a short-term measure. They also submitted that this service is necessary for new mobile operators, as the operators would need adequate service coverage to launch their services. In addition, this service is also necessary for operators to offer complete service offerings.
- 19.14 Packet One considers that since end users require bundled voice and data packages, domestic roaming service will support the voice component of the LTE bundle. Packet One highlighted that the biggest factor that is hindering roaming is the fact that the mobile operators refuse to allow roaming to protect their market share.
- 19.15 TIME, while noting that it didn't acquire or supply domestic roaming services, supported the inclusion of such services in the Access List if it would promote the long-term benefit of end users. TIME considers that domestic roaming services would allow new entrants to better compete with existing players by offering appropriate coverage to consumers. TIME believes that since new entrants are required to comply with the network rollout plans agreed with the MCMC as a condition of their spectrum assignment, investment in infrastructure would be safeguarded as the MCMC could revoke the spectrum assignment for any failure to rollout the appropriate network infrastructure.
- 19.16 YTL considered that domestic roaming was a good policy for the long-term benefit of end users and that allowing such roaming on 2G and 3G networks would give LTE services wider coverage and thus provide wider LTE data service access to end users.
- 19.17 A mobile operator submitted that it obtains domestic roaming services from Maxis and supported the reintroduction of the 3G-2G Domestic Inter-Operator Roaming to the Access List as even when such services were mandated in the Access List, the mobile operator experienced difficulty in negotiating fair prices and other terms with access providers. The mobile operator considers that if the MCMC chose to mandate such services in the

Access List without specifying the pricing principles to be adhered to, then the MCMC should use its information gathering powers to scrutinise whether each and every domestic roaming service agreement is objectively fair and reasonable, without the parties having to raise a dispute with the MCMC. The mobile operator noted that the effect of mandated access to domestic roaming depended on the access seeker's business strategy and cited ACCC research on domestic roaming access pricing that also found that any-to-any connectivity was relevant in domestic roaming markets to allow end users to communicate with each other.

- 19.18 The mobile operator acknowledged that mandated access to domestic roaming will not necessarily guarantee user access to LTE data services. The mobile operator considered that where it was efficient to enter into a domestic roaming agreement rather than rollout infrastructure, access seekers would be prevented from entering into such arrangements by concerns about the quality of service. The mobile operator cited Hong Kong as an example where issues such as non seamless call handover has affected the QoS.

Discussion

- 19.19 The MCMC thanks operators for their descriptions of the practicalities of negotiating domestic roaming arrangements, and acknowledges the differences of operators' views on this matter based on whether the operator is an access seeker or access provider of domestic roaming services.
- 19.20 While the MCMC considers that there would be little benefit in 4G-4G, 4G-3G, 3G-3G or 3G-2G roaming for reasons discussed in the PI Paper, there are more finely balanced arguments for regulating or not regulating 4G-2G domestic roaming considering the context that:
- (a) LTE operators have submitted that they require regulated access to domestic roaming to ensure that they have a full service offering (including an offering that supports any-to-any connectivity) to its customer base which will allow them to generate sufficient revenue to support their rollout obligations;
 - (b) potential access providers have submitted that domestic roaming regulated on the basis of the above arguments would support permanent regulation of domestic roaming, which does not reflect the traditional purpose of domestic roaming (which was conceived as a short-term remedy while new networks are being rolled out) and would be a disincentive to LTE operators rolling out their networks as quickly as they would in the absence of regulated domestic roaming; and
 - (c) the reasons submitted by some operators for domestic roaming not being offered could actually be seen as reflecting economically rational behaviour which encourages efficiencies (such as protecting networks against excessive network activity or protecting market

share in lucrative areas where there will be competition amongst roaming providers to supply roaming to access seekers).

- 19.21 Ultimately, the MCMC notes that LTE-only operators do have an obligation to build their own network and LTE-only operators have been granted relatively more spectrum than the other operators. These factors provide significant incentives for LTE-only operators to implement LTE services including VoLTE as early as possible, achieving the purpose of their spectrum allocation.

MCMC Views

- 19.22 The MCMC confirms its preliminary view that access to domestic roaming should not be regulated by way of the Access List.

20 Access to Internet Interconnection (including MyIX)

Introduction

- 20.1 As noted in the PI Paper, an Internet Interconnection Service was first included in the Access List in 2005. In its 2009 variation to the Access List, the MCMC maintained the Internet Interconnection Service in the Access List but with a sunset date of 1 January 2011. Since 1 January 2011, Internet Interconnection Service has not been subjected to access regulation.
- 20.2 Since early 2000, Internet Interconnection in Malaysia is facilitated by MyIX as a central location for domestic peering.
- 20.3 The majority of submissions received in relation to the PI Paper expressed views that the market for wholesale internet interconnection is functioning well and that MyIX services are not difficult to obtain.
- 20.4 In the PI Paper, the MCMC expressed the preliminary view that wholesale Internet interconnection should not be regulated through the Access List.

Submissions Received

- 20.5 Altel has noted that it acquires wholesale Internet Interconnection Services and that the current arrangements for Internet Interconnection facilitated by MyIX are working well and therefore there is no need to reintroduce such services to the Access List.
- 20.6 Celcom neither acquires nor provides wholesale Internet Interconnection Services, but it noted that it did not support the reintroduction of such services to the Access List as it considers MyIX to be fully operational and robust.
- 20.7 Digi confirmed that it acquires wholesale Internet Interconnection Services with no difficulty.
- 20.8 MyIX submitted that it was created to manage and encourage domestic internet peering by offering membership on an open basis and that there

are 37 ordinary and 30 associate members of MyIX. MyIX submitted that it had significantly reduced the cost of Internet peering since its inception, including by the elimination of bandwidth charges in favour of simplified port charges. Accordingly, MyIX supports the MCMC's preliminary view that Internet Interconnection should not be reintroduced to the Access List.

- 20.9 Maxis acquires and provides wholesale Internet Interconnection and is a founding member of MyIX. Maxis has not experienced difficulties in either acquiring or providing such services and noted that MyIX port prices were scheduled to reduce for Quarter 3 2015 and that generally there is a competitive market for peering and transit services. Maxis noted that further upstream, there are issues with access to submarine cable landing stations due to enforcement of certain Access List services such as Network Co-Location Service and Domestic Connectivity to International Services. Maxis concluded that there is no reason to mandate access to Internet Interconnection in the Access List.
- 20.10 Packet One submitted that it acquires wholesale Internet Interconnection Services with no difficulty and agreed with the MCMC's preliminary views that this service does not need to be reintroduced to the Access List.
- 20.11 Sacofa noted that it acquires Internet peering services and had experienced no difficulty in acquiring these services.
- 20.12 TM acquires and provides wholesale Internet Interconnection Services including acquiring from content service providers such as Google and Facebook. TM noted that MyIX is operated on a one-vote-per-member basis which prevents larger providers from wielding undue amounts of influence. TM supported the MCMC's preliminary view that Internet Interconnection does not need to be regulated through the Access List for a number of reasons including the fact that few operators have experienced difficulties in acquiring such services, that TM's competing Domestic Transit Access Service had experienced low levels of uptake, that there are a number of other transit or internet access products in the Malaysian market, and because the MCMC has found no operator to be dominant in the market for Internet Interconnection services.
- 20.13 TIME subscribes to MyIX to acquire its Internet Interconnection Services and has experienced no difficulties in acquiring such services. Accordingly TIME supports the MCMC's preliminary view that such services do not require regulation through the Access List. TIME disagreed with Packet One's suggestion that MyIX Internet Interconnection Services be used as a POI for inter-operator interconnection as to do so would jeopardise quality of voice traffic and thus potentially breach the Mandatory Standard on QoS.
- 20.14 YTL acquires wholesale Internet Interconnection Services with no difficulties and considers it technically unfeasible to regulate such services as Internet Interconnection in Malaysia now involves many foreign entities outside the jurisdiction of the MCMC.
- 20.15 A mobile operator acquires Internet Interconnection Services for its peering arrangements and has not encountered any difficulty in acquiring such

services. The mobile operator concluded that there is no need to re-list Internet Interconnection Service in the Access List.

Discussion

- 20.16 The MCMC notes the uniform view of operators that the arrangements for Internet Interconnection are operating well in Malaysia. This reflects the MCMC's findings in the Dominance Report.

MCMC Views

- 20.17 The MCMC confirms its preliminary view that there is no need to include an Internet Interconnection service in the Access List.

21 Access to Content Delivery Networks (CDN)

Introduction

- 21.1 Access to CDNs is currently not regulated through the Access List, but in the PI Paper the MCMC noted that it has received a submission that access to CDNs should be added to the Access List.
- 21.2 The MCMC noted that CDNs are supplied globally and that such supply is competitive. The MCMC had not received any specific rationale for including access to CDNs in the Access List. The MCMC further noted that it is not aware of any other jurisdictions which regulate access to CDNs.
- 21.3 In the PI Paper, the MCMC expressed the preliminary view that access to CDNs should not be regulated through the Access List.

Submissions Received

- 21.4 Astro submitted that it acquires access to CDNs as an access seeker and has encountered difficulties in relation to the high costs of acquiring such services. Astro supported the MCMC's preliminary view that CDNs were not bottleneck facilities and therefore should not be included in the Access List. Furthermore, Astro submitted that it understands that new players are considering entering the Malaysian market to host CDN services.
- 21.5 Celcom, while acknowledging that it does not acquire or supply CDN services, considers that CDNs should not be regulated until the market is better defined and there is evidence of anti-competitive conduct. Celcom noted that while it is not aware of any overseas jurisdiction regulating access to CDN services, it is aware of other jurisdictions where telecommunications operators have collaborated by forming an 'Operator Carrier Exchange' to develop CDN standards and allow access to their CDNs, in competition with traditional CDN providers.
- 21.6 Maxis acquires CDN services as an access seeker, although it also has a direct peering relationship with larger CDN providers. Maxis noted that many CDN providers are not Malaysian licensees and have no presence in Malaysia, and consequently Maxis is unsure how such providers could be subject to local Malaysian access regulation. Maxis also clarified that access

regulation of CDN services are not as pressing a concern as the high price of upstream connectivity at submarine cable landing stations which is a fundamental component in accessing CDNs.

21.7 TM neither acquires nor supplies CDNs and is not aware of any jurisdiction that has regulated access to CDN services. TM considers that CDNs are groups of servers hosted at different physical locations around the world and that there are multiple providers of such technologies. As such, it was unlikely that CDNs constitute a bottleneck service and therefore should not be subjected to access regulation.

21.8 TIME and YTL neither acquire nor supply CDN services and do not consider that CDNs should be included in the Access List.

Discussion

21.9 The MCMC thanks operators for their submissions and notes that operator submissions uniformly support the MCMC's observations in the PI Paper.

MCMC Views

21.10 The MCMC confirms its preliminary view that access to CDNs should not be regulated through the Access List.

22 Access to Digital Multimedia Terminals (DMT)

Introduction

22.1 Access to Digital Multimedia Terminals (**DMTs**) is not currently regulated under the Access List, but the MCMC had received a submission that access to DMTs should be added to the Access List to consolidate in-home equipment in Malaysia and avoid unrestricted access to DMTs that might result in their use to access illegal or subversive content.

22.2 In the PI Paper, the MCMC noted that it does not have the power to regulate network facilities solely on the customer side of the network boundary. Additionally, the MCMC noted that there are no significant barriers to distributing DMTs, some of which currently have open access terminals not tied to particular content channels. The MCMC also noted that access to illegal or subversive content is better dealt with via content standards than the current Access List Public Inquiry.

22.3 In the PI Paper, the MCMC expressed the preliminary view that access to DMTs should not be regulated through the Access List.

Submissions Received

22.4 Altel considers that regulating or forcing access to DMTs is not appropriate because by their very nature, DMTs are designed in contemplation of particular types of networks and designing DMTs compatible with all networks via a series of network interfaces would increase the cost of DMTs and also interfere with the research and development programs of DMT designers.

- 22.5 Astro agrees with the MCMC's preliminary views that it is not appropriate to regulate DMTs via the Access List.
- 22.6 Celcom supports the MCMC's preliminary views that DMTs are customer premise equipment and therefore, are not within the scope of access regulation. Celcom acknowledged Media Prima's comments in the PI Paper concerning unrestricted or open access to DMTs possibly leading to increased access to illegal or subversive content but considered that these concerns are more appropriate for media content standards than access regulation.
- 22.7 TM supports the MCMC's preliminary view that DMTs do not fall within the MCMC's jurisdiction under section 145 of the CMA and thus could not be included in the Access List. TM noted that customer premises equipment should be regulated under technical standards or competition provisions of the CMA, if applicable.
- 22.8 TIME stressed the importance of not burdening consumers with the task of managing multiple subscriptions from different content providers and broadcasters. Hence, TIME supported the idea of broadcasters selling content through the DMT provider.
- 22.9 YTL considered that access to DMTs could be better dealt with through the issuance of standards.

Discussion

- 22.10 The MCMC thanks operators for their submissions and notes that operator submissions uniformly support the MCMC's observations in the PI Paper.

MCMC Views

- 22.11 The MCMC confirms its preliminary view that access to DMTs should not be regulated through the Access List.

23 Access to Content Channel Sharing

Introduction

- 23.1 In the PI Paper, the MCMC considered whether to include a Content Channel Sharing Service in the Access List. In its Market Definition Analysis, the MCMC found separate national wholesale markets for the acquisition of premium content and the acquisition of ordinary content. The MCMC acknowledged that the acquisition of the premium content on an exclusive basis is a matter of growing concern internationally, but the MCMC is not aware of any regulatory regime which imposes regulated access to content acquired exclusively by Free to Air (**FTA**) broadcasters in order to remedy this competition concern.
- 23.2 Furthermore, the MCMC noted that adding a Content Channel Sharing Service to the Access List may be beyond the jurisdiction of the MCMC at present, as neither content providers nor broadcasters are regulated under the CMA as access providers. The MCMC sought the views of stakeholders

on whether it is appropriate to add a Content Channel Sharing service to the Access List.

Submissions Received

- 23.3 Astro considers that it is beyond the MCMC's powers under section 145 of the CMA to regulate Content Channel Sharing and it could also be a breach of the Copyright Act 1987 and possibly the Federal Constitution. Astro also considers that the regulation of the content acquisition markets requires more precise definitions of exclusive and ordinary content. It should be determined by conducting robust investigations instead of considering the loose definition as a basis for remedy.
- 23.4 Astro considers that the effect of mandating Content Channel Sharing would be to discourage investment in content and lead to increased costs as content deals would have to be renegotiated. Astro considers that access regulation would be inappropriate because content acquisition in Malaysia involves a competitive bidding process. It submitted that the bidding process indicates no bottleneck facility and furthermore, current international content exclusivity remedies have not delivered lower prices to consumers.
- 23.5 Celcom noted that if a Content Channel Sharing Service were included in the Access List, subscription television service providers would have the obligation to supply facilities or services. These providers have the financial resources to lock out access to premium content. Celcom also submitted that only exclusively licensed content which is extremely popular, such as the English Premier League, should be covered by the access regulation. Celcom considered that the regulation of this nature would lead to FTA and subscription TV providers competing on technology neutral platforms. This would lead to the wholesale market for premium and ordinary content acquisition becoming competitive.
- 23.6 TM noted that its HyppTV provides subscribers access to FTA channels in Malaysia. However, TM is under pressure to block certain FTA content as the content licensors pressure the rights holders to block the content from TM's HyppTV, which has created a competitive disadvantage for the HyppTV service. TM considers that the FTA channels should be the subject of the Content Channel Sharing Service. TM highlighted the existence of "must carry" regimes across a number of jurisdictions which require cable television providers to carry FTA channels. TM considered that if a Content Channel Sharing Service is mandated in the Access List, there should not be any limitation on the content being carried by operators.
- 23.7 TM considers that if the MCMC were to include Content Channel Sharing Service in the Access List, the effects on the markets for FTA, pay-TV and OTT are as follows: For FTA broadcasters, it would create increase awareness and demand for content shown on FTA channels, and would potentially lead to greater advertising revenues although there could be pressure from content providers to increase content fees. For pay-TV and OTT operators, they would have the ability to attract customers who wish

to consume FTA content. However, the QoS will be determined by the FTA broadcasters.

- 23.8 TM does not consider that there would be adverse impacts on wholesale content acquisition markets if the Content Channel Sharing Service is mandated in the Access List. However, TM noted that content providers may seek additional fees for their content if such content were carried on multiple channels. Additionally, premium content providers may also limit the amount of their premium content on FTA channels if there is greater revenue to be gained from pay-TV operators.
- 23.9 TIME submitted that the broadcasters must pay a premium price for premium content and that they lack the power to negotiate with content licensors. TIME considers that if the MCMC were to include a Content Channel Sharing Service in the Access List, this would lead to OTT operators gaining traction over time and hence, ensures no exclusivity in the marketplace.
- 23.10 YTL submitted that the issue is not whether Content Channel Sharing Service should be limited to exclusive content or extended to ordinary content, but rather whether service providers should be allowed to enter into exclusive arrangements. YTL highlighted that sometimes exclusive arrangements can lead to beneficial outcomes such as more locally tailored content.

Discussion

- 23.11 The MCMC thanks operators for their views on the potential regulation of a Content Channel Sharing Service. The MCMC acknowledges that a number of operators could see benefits from the regulation of such a service. However, the MCMC is concerned that:
- (a) neither the MCMC nor any operator has identified any bottlenecks in the wholesale content acquisition market to justify such regulation;
 - (b) the MCMC remains unconvinced that there is a jurisdictional basis for such regulation; and
 - (c) the MCMC does not consider that there is any international precedent for such regulation despite many jurisdictions having similar broadcasting and content distribution environments as in Malaysia (in particular, the MCMC notes that must-carry obligations are imposed on dominant operators of content distribution to carry content which they might otherwise inhibit dissemination of – the equivalent in the Malaysian context would be if the MCMC were to require TM and other operators to carry a particular content, which is not the intention of operators seeking the regulation of a Content Channel Sharing Service).
- 23.12 Taking these issues into account, the MCMC does not consider it appropriate to list a Content Channel Sharing Service in the Access List at this time.

MCMC Views

23.13 The MCMC confirms its preliminary view that a Content Channel Sharing Service is not regulated through the Access List at this time.

24 Access to Metro-E and other Local Managed Data Facilities and Services

Introduction

24.1 Local managed data services such as Metro-E are not currently regulated in the Access List, but the MCMC had received a submission to consider the inclusion of Metro-E in the Access List.

24.2 The MCMC noted that TM was found to be dominant in the market for local managed data services. However, as there was little or no price differential between wholesale and retail levels for the supply of local managed data services, this suggested that there was a single national retail market for such services, which would indicate that regulation of a wholesale product in the Access List would have little practical impact on the market.

24.3 In the PI Paper, the MCMC refrained from expressing a preliminary view about whether such services should be regulated through the Access List, but sought views from operators on the value of regulating wholesale access to facilities and services in the national market for local managed data services.

Submissions Received

24.4 Celcom noted it has experienced no difficulty in obtaining local managed data services such as Metro-E and knew of no price differentials for such services at retail and wholesale levels.

24.5 Digi noted that as mobile networks become increasingly focused on IP-based technologies, it is important to have access to IP-based transmission services such as Metro-E, which are cheaper, more scalable and more easily connectable to customer premises than their Synchronous Digital Hierarchy counterpart technologies.

24.6 Maxis requested that the term "Metro-E" be removed from the service descriptions included in this section to avoid confusion with certain TM products of the same name. Maxis submitted that to strengthen competition in relation to local managed data services, the MCMC should better regulate the key components of such services, namely the Transmission Service and the Wholesale Local Leased Circuit Service.

24.7 TM considers that the local managed data services are a complete end-to-end retail service. Telekom Malaysia noted that the main components for managed data services were already regulated under the Access List i.e. the Transmission Service and Wholesale Local Leased Circuit Service and therefore there would be little (if any) price differentials that would result from regulating the full end-to-end retail service.

- 24.8 TIME considered that Metro-E services should be regulated under the Access List as these are commonly offered to retail customers as an evolution from traditional leased lines. TIME also noted the limited price differential between wholesale and retail levels of Metro-E services could be the result of a price squeeze by the incumbent and that in any case, regulating Metro-E services could make Malaysia more attractive to companies wishing to set up local businesses. TIME claimed that if local managed data facilities and services were regulated in the Access List, TIME could potentially serve a larger geographical customer base.
- 24.9 YTL noted that Metro-E was increasingly being used and offered in lieu of dark fibre for backhaul purposes and that Metro-E was preferred beyond other regulated services such as local leased circuits for such purposes. YTL supported the current service offerings on Access List in lieu of adding Metro-E to the Access List.

Discussion

- 24.10 The MCMC thanks operators for their submissions on the regulation of local managed data services, including Metro-E. The MCMC considers that the differences of opinion amongst submissions may be the result of certain services being supplied in multiple markets. In particular, the MCMC observes that Metro-E can be used to supply:
- (a) transmission services, particularly those supplied over multiple links or segments, where the routing component of the service is enabled by Metro-E services; and
 - (b) local managed data services, particularly at the retail level where multiple customer end-points can be effectively connected using the Metro-E services.
- 24.11 The MCMC notes that where Metro-E is supplied in the transmission services market, such supply is already regulated, as the Trunk Transmission Service, Wholesale Local Leased Circuit Service and End-to-End Transmission Service all comprise technologically neutral service descriptions. The MCMC has also proposed some minor clarifications to these service descriptions to avoid doubt about their scope.
- 24.12 The MCMC does not consider that there is evidence for regulating access to local managed data services in the national wholesale market because such services would necessarily remove a bottleneck in the supply of downstream retail services given that there is very little difference between the service supplied in the wholesale and retail markets. The MCMC considers that its proposed measures to disaggregate supply of transmission services over trunk and tail segments is more likely to provide access seekers with the ability to construct differentiated local managed data services. Hence, access seekers can compete effectively and sustainably with the incumbent provider of transmission services. The MCMC's access regulation should therefore be limited to the Trunk Transmission Service, Wholesale Local Leased Circuit Service and End-to-

End Transmission Service and the incentive-based regulatory approach that the MCMC has proposed in respect of those services.

MCMC Views

24.13 For the reasons discussed above, the MCMC does not consider it appropriate or necessary to regulate access to local managed data services at this time.

25 Miscellaneous Services

Introduction

25.1 In the PI Paper, the MCMC noted that U Mobile had requested the MCMC to consider regulating services such as Calling Cards, Directory Assistance, MERS999/Emergency Services, Information Services, Operator Assistance, Reverse Charging and One Number Services. The MCMC noted that the examples that U Mobile had provided are mostly retail services and that the access to retail services are beyond the scope of Access List.

25.2 The MCMC did not propose to regulate services identified by U Mobile, but sought views from operators as to whether there were any facilities or services which were not currently regulated under the Access List which should be regulated.

Submissions Received

25.3 Celcom noted that the services identified by U Mobile for further regulation e.g. Calling Card, Operator Assistance Reverse Charging etc., are not inputs or facilities. These are retail services which are not appropriate for inclusion in an access regulation framework.

25.4 TM also rejected the inclusion of the services identified by U Mobile for further access regulation.

25.5 TIME considered that access to telecommunications rooms in high-rise buildings should be included in the Access List. TIME also requested the MCMC to rationalise the retail charges to directory services and the wholesale charges offered by TM. Though the financial impact is not significant, TIME subsidises the calls made by its retail customers to TM's directory services. TIME noted that if wholesale directory services were mandated in the Access List, the wholesale price could be regulated.

Discussion

25.6 The MCMC thanks Celcom and TM for confirming their support for the MCMC's preliminary views.

25.7 In response to TIME's submission, the MCMC notes that:

- (a) it has responded to TIME's request that access to telecommunications rooms in high-rise buildings be included in the

Access List, at paragraphs 13.45 to 13.46 and does not propose to regulate such access at this time; and

- (b) the issue raised on access to directory services is being considered under Public Consultation on Rates Rules. TIME did not raise any particular issue in relation to the wholesale supply of access of directory services and consequently it is not appropriate or necessary to regulate access to such services through the Access List.

MCMC Views

- 25.8 The MCMC considers that the facilities and services considered above constitute a comprehensive list of facilities and services that merit regulation through the Access List at this time, and does not propose to list additional facilities or services as a result of submissions from TIME or U Mobile at this time.

Part D Removal of Access List Facilities and Services

26 Access List Facilities and Services to be removed

- 26.1 The MCMC has considered each facility and service currently included in the Access List in Part B of this PI Report, including submissions from operators that some of these facilities and services should be removed from the Access List. Pursuant to the discussion of each facility and service in Part B, the MCMC only proposes to remove one service which is currently included in the Access List, which is the HSBB Network Service without QoS.
- 26.2 The MCMC has also proposed some modifications to other facilities and services. The MCMC has also proposed mechanisms to be included within the Access List for the responsive removal of access regulation for the Transmission and HSBB Network Services as discussed in sections 9, 15 and 16.
- 26.3 The MCMC refers to its discussion of international trends in the gradual removal of access regulation in a number of jurisdictions on a case-by-case basis. In that discussion, the MCMC noted that access regulation has only been removed internationally in response to evidence of competition in the supply of particular facilities and services, often as a direct result of earlier access regulation. For that reason, removal of access regulation has not been uniform or consistent. As noted in paragraph 1.6(d), the MCMC considers the level of access regulation in Malaysia reflects the level of competition in Malaysia and continued dominance of several key bottleneck facilities by a single incumbent.
- 26.4 Ultimately, as noted by the MCMC in the PI Paper, access regulation is required in connection with a facility or service supplied by an operator (to other operators or to itself) where it is in the long-term benefit of end users for the facility or service to be made available to other operators at a wholesale level on an equitable and non-discriminatory basis, and otherwise in accordance with the SAOs. As discussed in Part A of this PI Report and in the PI Paper, it will usually be to the long-term benefit of end users to regulate wholesale access to a facility or service which is a bottleneck to competition in downstream markets.
- 26.5 The MCMC has applied these criteria to each facility and service currently included in the Access List and has determined that:
- (a) the HSBB Network Service without QoS should be removed from the Access List; and
 - (b) responsive removal mechanisms should be introduced to allow targeted removal of regulation on an on-going basis for facilities and services that have a good prospect of becoming subject to competition in the foreseeable future.