**Suruhanjaya Komunikasi dan Multimedia Malaysia**

Malaysian Communications and Multimedia Commission

# COMMUNICATIONS AND MULTIMEDIA ACT 1998

# COMMISSION DETERMINATION ON ACCESS LIST

# DETERMINATION NO. 6 OF 2021

In exercise of the powers conferred by sections 55 and 146 of the Communications and Multimedia Act 1998 *[Act 588]* ("Act"), the Commission hereby determines as follows:

## Citation and commencement

1. This determination may be cited as the **Commission Determination on Access List, Determination No. 6 of 2021.**

2. This determination shall come into operation on 15 December 2021.

## Interpretation

3. For the purpose of this Determination, unless the context otherwise requires,

   (i) any term used in this Determination shall have the same meaning as in the Act or the regulations made under it;

   (ii) words in the singular include plural and vice versa; and

   (iii) the following terms used in this Determination shall have the stated meaning:

"5G Network Slice" means, in respect of a 5G New Radio core, a virtualised network or network partition used by the Access Provider to support a particular type of service, use case, application, customer or other purpose, and includes the following:

(a) mobile broadband;

(b) massive Internet of Things ("IoT"); and

(c) mission-critical;

"Access Provider" means a network facilities provider who owns or provides Facilities and/or a network service provider who provides Services, listed in this Determination, and who is a licensee as defined in the Act;

"Access Seeker" means a network facilities provider, a network service provider, an applications service provider, or a content applications service provider who is a licensee as defined in the Act and who makes a written request for access to Facilities or Services, listed in this Determination;

"Any-to-Any Connectivity" means a connection which is achieved when an End User is able to communicate with another End User, whether or not the End Users are connected to the same network;

"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;

" 'A' party" means, in the context of communications between End Users, the End User from whom the communication originates;

" 'B' party" means, in the context of communications between End Users, the End User to whom the communication terminates;

"Border Gateway Protocol" means a standardised gateway protocol that enables the internet to exchange routing information between autonomous systems;

"Call Communications" means communications in whole or in part involving a number or IP address used in the operation of each Operator's network including Message Communications;

"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;

"Contention Ratio" means the notional bit rate expressed as a proportion of the per user bit rate;

"Customer" means, in relation to an Operator, a person having a contractual relationship with that Operator for the provision of communications by means of that Operator's Facilities and/or Services;

"Customer Access Module" means a device that provides a connection including ring tone and ring current to customer equipment. Examples include a customer line module of a local switch, remote terminals of a digital line carrier system, a digital subscriber line access multiplexer, a node in a fibre to the node network and an optical line terminating equipment in a fibre to the premises network;

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

"Facilities" means network facilities and/or other facilities which facilitate the provision of network services or applications services, including content applications services;

"Fixed Network" means network facilities and/or network services comprising the Public Switched Telephone Network and/or networks based on Internet Protocols for the provision of communications by guided electromagnetic energy or by point-to-point unguided electromagnetic energy;

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

(a) the High-Speed Broadband Network, Phase 1;

(b) the High-Speed Broadband Network, Phase 2; and

(c) the Suburban Broadband Network;

"Interconnecting Networks" means interconnection of the network of an Access Provider and the network of an Access Seeker;

"Interconnection Service" means Facilities or Services including the physical connection between separate networks, to facilitate Any-to-Any Connectivity provided by an Access Provider to an Access Seeker which involves or facilitates the carriage of communications between an End User connected to the network of the Access Provider and:

(a) a Point of Interconnection; or

(b) where specified in the description of the relevant Facility or Service, an Access Seeker Point of Presence;

"Inter-exchange Duct" means each duct or series of ducts that connects (whether directly or indirectly) between two Access Provider locations, including exchange buildings;

"IP" or "Internet Protocols" means network-layer which is Layer 2 protocol, as defined by the Internet Engineering Task Force, that contains addressing information and some control information that enables packets to be routed;

"Jitter" means the difference between the actual Latency of a packet and a reference Latency for a packet population of interest. The reference Latency of a population of packets is the minimum Latency for the packets within the population of interest. Jitter is a statistical sample, measured over a packet population of interest;

"Latency" means the one-way time interval between the moment the first bit of a IP packet crosses an entry point of a network and the moment the last bit of the same packet crosses an exit point of the network dimensioned in time;

"Lead-In Duct" means a duct which extends from an End User or Access Provider 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);

"Message Communications" means communications that provide only text with or without associated images, audio clips and video clips. Examples of Message Communications include 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;

"Mobile Network" means network facilities and/or network services comprising the public cellular mobile network and/or the public mobile radio network, for the provision of communications;

"MyIX" means the Malaysia Internet Exchange;

"MVNO" or "Mobile Virtual Network Operator" means an Operator that is not a holder of a relevant spectrum assignment or an apparatus assignment under Chapter 1 of Part VII of the Act, but is capable of providing public cellular services to End Users;

"Network Boundary" has the meaning given to it in section 128 of the Act;

"Operator" means:

(a) a network facilities provider;

(b) a network service provider;

(c) an applications service provider; or

(d) a content applications service provider,

who is, an Access Provider or an Access Seeker;

"Packet Loss" means the ratio of total lost IP packets to total transmitted packets in a population of interest. Total lost packets include any delivered with errors or Latency greater than 3 seconds;

"POI" or "Point of Interconnection" means any technically feasible point which demarcates the Interconnecting Networks, and is the point at which communication is transferred between the Interconnecting Networks, such as MyIX;

"POP" or "Point of Presence" means a point at which an Access Seeker has established itself for the purpose of obtaining access to Facilities and/or Services;

"PSTN" or "Public Switched Telephone Network" means a telephone network accessible by the public providing circuit switching and transmission facilities utilising analogue and/or digital technologies;

"QoS Class" or "Quality of Service Class" means a set of quality of service parameters as defined above as Latency, Jitter and Packet Loss, that are associated with Layer 2 connectivity;

"Services" means network services and/or other services which facilitate the provision of network services or applications services, including content applications services; and

"Transport Stream" means a packet based method of multiplexing one or more digital audio-visual or audio streams having one or more independent time bases into a single stream.

**Implementation of service under paragraph 5(13)**

4. Paragraph 5(13) will come into force upon the commencement of the Mandatory Standard on Access which contains security measures referred to in subparagraph 5(13)(b)(iii).

**Access List**

5. (1) 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 (excluding Short Message Service and Multimedia Message Service Message 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.

Examples of technologies used in the provision of the Fixed Network Origination Service include PSTN, Integrated Services Digital Network ("ISDN"), 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 (excluding Short Message Service and Multimedia Message Service Message Communications).

(2) 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.

Examples of technologies used in the provision of the Fixed Network Termination Service include PSTN, ISDN, 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.

(3) Mobile Network Origination Service

(a) A Mobile Network Origination Service is an Interconnection Service for the carriage of Call Communications (excluding Short Message Service and Multimedia Message Service Message Communications) from an '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) Worldwide Interoperability for Microwave Access ("WiMAX");

(iii) Long-Term Evolution ("LTE");

(iv) International Mobile Telecommunications – Advanced ("IMT-Advanced" or "LTE-Advanced");

(v) 5G New Radio ("5G"); and

(vi) any other mobile technology which is currently available or which may be developed in future that involves the carriage of Call Communications (excluding Short Message Service and Multimedia Message Service Message Communications).

(4) 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.

(b) 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.

(c) 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.

(d) Examples of technologies used in the Mobile Network Termination Service would be:

(i) GSM;

(ii) WiMAX;

(iii) LTE;

(iv) IMT-Advanced or LTE-Advanced;

(v) 5G; 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) Interconnect Link Service

(a) An Interconnect Link Service is a Facility and/or Service which enables the connection between the network of an Access Provider and the network of an Access Seeker for the purpose of providing an Interconnection Service, including but not limited to:

(i) the interconnection of the IP-based network of an Access Provider to the IP-based network of an Access Seeker; and

(ii) 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.

(b) Interconnection of the kind described in subparagraph (5)(a)(i) above includes the provision of bandwidth at the following increments:

(i) 1 Gbps;

(ii) 10 Gbps; and

(iii) any other amount or increment of bandwidth agreed between the Access Provider and the Access Seeker.

(6) Wholesale Local Leased Circuit Service

(a) A Wholesale Local Leased Circuit Service is a Facility and/or Service for the carriage of communications by way of a private circuit between a POI at an Access Provider's premises and an End User location or an Access Seeker's premises, available only at one end of a private 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 any type of routing or switching, whether packet, circuit, multi-layer or otherwise;

(ii) the signalling required to support the 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.

Examples of technologies used in the Wholesale Local Leased Circuit Service would be ISDN, Metro Ethernet ("Metro-E"), IP based networks and Ethernet interfaces.

(c) Without limiting subparagraph 6(a) above, the Wholesale Local Leased Circuit Service includes the provision of any Trunk Transmission Service by the same Access Provider to the extent required to enable connectivity between the relevant End User location or Access Seeker's premises and a POI at the Access Provider's premises.

(d) The Wholesale Local Leased Circuit Service includes any Wholesale Local Leased Circuit Service supplied to the Access Seeker with:

(i) any network availability between 99.90% and 99.992%, whether per month or otherwise;

(ii) any latency of between <1 ms and <40 ms;

(iii) zero or more routes of redundancy; and

(iv) any other technical parameters specified or utilised by the Access Provider from time to time, including parameters of a type referred to in subparagraphs (i) to (iii) above.

(7) 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 (including rooftop 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:

(i) towers and Associated Tower Sites; and

(ii) any other facility that supports, or has the capability to support, the installation of mobile or fixed network equipment in, along, or in close proximity to:

(A) a street;

(B) a road;

(C) a path;

(D) a railway corridor;

(E) a park; or

(F) such other outdoor area that may be accessed by members of the public,

including but not limited to billboards, public transit shelters, poles, traffic light poles, bridges, and road gantries.

(c) Physical access includes power (including right-of-way for power installation by the Access Seeker), 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.

(8) 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, 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.

(9) 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, any location where a main distribution frame is housed and such other network facilities locations associated with the provision of a Facility or Service in the Access List.

(10) 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 and regardless of the system used to deliver that Transport Stream to receivers.

(11) Layer 2 HSBB Network Service with Quality of Service ("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 or the Access Provider'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;

(iii) the Access Seeker selects the QoS Class; 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) 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, either in a single location or at multiple locations (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** | |
| Unconstrained | Unconstrained | Access Provider does not constrain the speed of the service itself but would provide an unconstrained network service which the Access Seeker rate shapes, i.e. determines the speed. This option is only available with QoS Class 5. |
| 30 Mbps | 5 Mbps | Low-speed broadband services |
| 30 Mbps | 10 Mbps | |
| 30 Mbps | 30 Mbps | |
| 50 Mbps | 10 Mbps | High-speed residential, business broadband services, or |
| 50 Mbps | 20 Mbps | |
| 50 Mbps | 50 Mbps | |

| Bit rate | | Note and example applications |
|---|---|---|
| Downstream | Upstream | |
| 100 Mbps | 40 Mbps | enterprise grade business broadband services |
| 100 Mbps | 50 Mbps | |
| 100 Mbps | 100 Mbps | |
| 250 Mbps | 100 Mbps | |
| 500 Mbps | 100 Mbps | |
| 600 Mbps | 100 Mbps | |
| 700 Mbps | 100 Mbps | |
| 800 Mbps | 200 Mbps | |
| 1000 Mbps | 500 Mbps | |
| Any other higher, lower or different bit rates specified or utilised by the Access Provider from time to time | | |

(ii) in accordance with the following 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 – Voice over IP ("VoIP") |
| 1 | ≤ 200 ms | ≤ 50 ms | ≤ $10^{-3}$ | Real-time, jitter sensitive, interactive – IP television ("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) any other technical parameters or standards specified, utilised or agreed by the Access Provider from time to time.

(12) 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 End User locations or Access Seeker's premises, 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 and Metro-E.

(c) The functionalities of the Trunk Transmission Service include:

(i) transmission and any type of routing or switching, whether packet, circuit, multi-layer or otherwise;

(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 subparagraph (a) may include a submarine cable or satellite link between Sabah and Sarawak and Peninsular Malaysia, submarine cable landing centre or an earth station.

(e) The Trunk Transmission Service may be for the carriage of communications which comprise of content applications service.

(f) An Access Seeker for the Trunk Transmission Service which includes but is not limited to a network facilities provider or network service provider which is only authorised to provide limited network facilities or network services such as in the last mile, but wishes to acquire the Trunk Transmission Service in order to connect its limited network facilities or network services.

(13) Duct and Manhole Access

(a) Duct and Manhole Access is a Facility and/or Service which comprises provision of physical access to, at the Access Seeker's discretion, one or more of the following elements:

(i) Lead-in Ducts;

(ii) Mainline Ducts;

(iii) Inter-exchange Ducts;

(iv) manholes, including any manholes associated with Lead-in Ducts, Mainline Ducts or Inter-exchange Ducts; and

(v) 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, or procurement of 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;

(ii) access for the personnel of the Access Seeker, including to the land upon which any Lead-in Ducts, Mainline Ducts, Inter-exchange Ducts, sub-ducts and manholes are situated; and

(iii) provision of physical access in subparagraphs (i) to (ii) above will be subject to the security measures to be included in the Mandatory Standard on Access to mitigate security risk of Access Provider.

(14) 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, either in a single location or at multiple locations (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** |
| 30 Mbps | 5 Mbps |
| 30 Mbps | 10 Mbps |
| 50 Mbps | 10 Mbps |
| 50 Mbps | 20 Mbps |
| 100 Mbps | 40 Mbps |
| 100 Mbps | 50 Mbps |
| 250 Mbps | 100 Mbps |
| 500 Mbps | 100 Mbps |

| Additional Bit Rates the Access Seeker may request | |
|---|---|
| Downstream | Upstream |
| 600 Mbps | 100 Mbps |
| 700 Mbps | 100 Mbps |
| 800 Mbps | 200 Mbps |
| 1000 Mbps | 500 Mbps |
| Any other higher, lower or different bit rates specified or utilised by the Access Provider from time to time | |

(ii) in accordance with the following 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 |

(iii) any other technical parameters or standards specified, utilised or agreed by the Access Provider from time to time.

(15) 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 Seekers' premises; or

(iii) between one End User location and one Access Seeker's premises,

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 any type of routing or switching, whether packet, circuit, multi-layer or otherwise;

(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's premises in subparagraph (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 Service, such as Metro-E, or any other applicable technology which is currently available or which may be developed in future, 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 which includes but is not limited to a network facilities provider or network service provider which is only authorised to provide limited network facilities or network services such as in the last mile, 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.

(i) The End-to-End Transmission Service includes any End-to-End Transmission Service supplied to the Access Seeker with:

(i) any network availability between 99.90% and 99.992%, whether per month or otherwise;

(ii) any latency of between <1 ms and <40 ms;

(iii) zero or more routes of redundancy; and

(iv) any other technical parameters specified or utilised by the Access Provider from time to time, including parameters of a type referred to in subparagraphs (i) to (iii) above.

(16) 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 GSM, WiMAX, LTE, IMT-Advanced or LTE-Advanced, 5G New Radio or 5G 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 includes but is not limited to the Access Provider's:

(i) radio network;

(ii) Serving GPRS Support Node (SGSN) and Gateway GPRS Support Node (GGSN);

(iii) Home Location Register (HLR);

(iv) value-added service platforms (such as its Short Message Service Centre (SMSC), Multimedia Service Centre (MSC) and voicemail server);

(v) Subscriber Identity Module (SIM) provisioning and configuration;

(vi) customer billing; and

(vii) customer relationship management.

(17) Domestic Inter-Operator Roaming Service

(a) The Domestic Inter-Operator Roaming Service is a Service that enables an End User of an Operator or an MVNO to initiate, receive or otherwise utilise applications on the Mobile Network of another Operator, where:

(i) the Access Seeker is the first Operator or the Mobile Virtual Network Operator; and

(ii) the Access Provider is the second Operator.

(b) The functionalities of the Domestic Inter-Operator Roaming Service include but are not limited to the ability of the Customer to initiate and receive voice calls and transmit data, but are otherwise limited to the applications that the Access Provider provides to its own Customers on its Mobile Network which supports Any-to-Any Connectivity.

(18) 5G Standalone Access

(a) 5G Standalone Access is a Facility and/or Service for access to a 5G New Radio radio network, whether or not as part of a Mobile Network, for the purpose of the Access Seeker providing:

(i) MVNO Access;

(ii) services to enterprise or government Customers;

(iii) public cellular services to the public; or

(iv) wireless or mobile broadband services to the public.

(b) 5G Standalone Access may include access to the Facilities and Services used by the Access Seeker to provide one or more of voice, data and application services, as selected by the Access Seeker, provided that where the Access Seeker has integrated its 5G core with the Access Provider's gNodeB, the Access Seeker is solely responsible for any voice service capability (and for the avoidance of doubt any such voice services may be delivered using the Access Provider's radio network).

(c) Examples of Facilities and Services to which the Access Seeker may request access includes but is not limited to:

(i) radio network, including gNodeB;

(ii) integration between the Access Provider's gNodeB and the Access Seeker's 5G core (5GC);

(iii) Network Slice Selection Function (NSSF and 5G Network Slices as selected by the Access Seeker;

(iv) Unified Data Management (UDM);

(v) Unified Data Repository (UDR);

(vi) Network Exposure Function or (NEF);

(vii) Mobile Edge Computing (MEC);

(viii) Network Function Virtualisation (NFV);

(ix) security-related functions, such as Security Anchor Function (SEAF) and Authentication Server Function (AUSF);

(x) value-added service platforms (such as its IP-Multimedia Subsystem, Short Message Service Centre, Multimedia Service Centre and Voicemail Server);

(xi) customer billing; and

(xii) customer relationship management.

(d) The 5G Standalone Service shall be supplied to the Access Seeker in compliance with 3rd Generation Partnership Project ("3GPP") Release 15 and any updates to that standard from time to time, and with all technical capabilities, as may be required to enable the Access Seeker to provide the following types of services (or similar services), as selected by the Access Seeker:

(i) mobile broadband services;

(ii) massive IoT services; and

(iii) mission-critical services.

(19) 4G Evolved Packet Core ("EPC") with 5G Radio Access Network ("RAN") Access

(a) 4G EPC with 5G RAN Access is a Facility and/or Service for access to a 5G New Radio radio network, for the purpose of the Access Seeker providing:

(i) MVNO Access;

(ii) services to enterprise or government Customers;

(iii) public cellular services to the public; or

(iv) wireless or mobile broadband services to the public.

(b) 4G EPC with 5G RAN Access may include access to the Facilities and Services used by the Access Seeker to provide one or more of voice, data and application services, as selected by the Access Seeker, provided that the Access Seeker is solely responsible for any voice service capability (and for the avoidance of doubt any such voice services may be delivered using the Access Provider's radio network).

(c) The functionalities of 4G EPC with 5G RAN Access include:

(i) integration between the Access Provider's gNodeB and the Access Seeker's EPC, whether using anchor technology or otherwise; and

(ii) support for 3GPP Release 15 Options 3, 3a and 3x, including E-UTRA New Radio Dual Connectivity (EN-DC) and any updates to that standard from time to time.

(d) 4G EPC with 5G RAN Access shall be supplied to the Access Seeker in compliance with 3GPP Release 15 and any updates to that standard from time to time, and with all technical capabilities as may be required to enable the Access Seeker to provide mobile broadband and similar services.

(20) IP Transit Service

The IP Transit Service is a Facility and/or Service for the carriage of data in digital form, based on Border Gateway Protocols, between an Access Seeker Point of Presence at which peering is not available and a POI at which peering is available.

**Revocation**

5. The Commission Determination on Access List, Determination No. 2 of 2015 shall be revoked with effect from 15 December 2021.

**Transitional and Savings**

6. Access agreements that have been registered with the Commission under the Commission Determination on Access List, Determination No. 1 of 2005, the Variation to Commission Determination on Access List (Determination No. 1 of 2005), Determination 1 of 2009 and the Commission Determination on Access List, Determination No. 2 of 2015, shall continue to be in full force and effect as if the same are registered under this Determination.

7. In so far as the Commission Determination on Access List, Determination No. 2 of 2015 is being referred to in the following Commission Determinations, on or after 15 December 2021, this Determination shall be applicable as if this Determination was referred to in the following Commission Determinations:

(a) the Commission Determination on the Mandatory Standard on Access Pricing, Determination No. 1 of 2017; and

(b) the Commission Determination on the Mandatory Standard on Access, Determination No. 3 of 2016.

Made: 2 December 2021

DR. FADHLULLAH SUHAIMI ABDUL MALEK
*Chairman*
*Malaysian Communications and Multimedia Commission*