

Interconnection Regulations

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1. Introduction

- (1) The Communications and Information Technology Commission (CITC, hereinafter the “Commission”) Statutes set out rules, regulations, rights, and obligations with regard to the interconnection of telecommunications networks.
- (2) The concept of interconnection carries significant importance for the growth and progress of the telecommunication market. It is a key component to enable and foster competition in the market. Telecommunications users would not be able to connect to each other without interconnection arrangements between service providers. Moreover, interconnection allows service providers to offer services in areas in which they are not present, maximising the number of offers each user can access, increasing competition to the benefit of users, without the need of duplicating networks.
- (3) Promoting and facilitating interconnection between Service Providers will contribute to the objectives stated in the Telecoms Act regarding in particular:
 - a. the provision of advanced and adequate telecommunications services at affordable prices;
 - b. the provision of access to the public telecommunications networks, equipment and services at affordable prices; and
 - c. the creation of a favorable atmosphere to promote and encourage fair competition in all fields of telecommunications.

2. Definitions, Purpose and Scope of the Regulations

2.1. Definitions

- (1) The terms and expressions defined the Telecommunications Act and its Bylaws shall have the same meaning in these Interconnection Regulations, unless specified otherwise.
- (2) The following terms and expressions shall have the meaning assigned to them hereunder:
 - a. “Service Provider” means any person licensed by the Commission to: (1) provide telecommunications services to the public, and (2) operate a network used by that person or another person to provide telecommunications services to the public, or both.
 - b. “Reference Offer” means a document prepared by the Dominant Service Provider which defines and provides details of a set of standard terms and conditions for interconnection and access to physical facilities services with other Service Providers.
 - c. “Interconnection Services” shall include active services provided between Service Providers for the interconnection of their telecommunications networks and/or other forms of access allowing their Users to access particular Users or services.
 - d. “Interconnection Agreement” means an agreement for the provision of Interconnection Services between Service Providers.
 - e. “International Cable Landing Station” means the facilities at which a submarine cable landed in the Kingdom is or can be connected to a Telecommunications Network in the Kingdom, directly or through a backhaul circuit, including, but not limited to, the buildings, equipment and land necessary to establish and maintain such connection.
 - f. “Days” means calendar days, unless stated otherwise.

2.2. Purpose and Scope of the Regulations

- (1) The purpose of these Regulations is to align the provision of Interconnection Services in the Kingdom with the objectives of the Telecommunications Act, in particular by ensuring:
 - a. the fair and non-discriminatory treatment of all Service Providers with respect to the provision of Interconnection Services;
 - b. the promotion and encouragement of fair competition on all telecommunications markets in the Kingdom;
 - c. the prevention of abuses by dominant Service Providers; and
 - d. the provision of detailed reference provisions for the interpretation and implementation of any remedies on interconnection and access imposed by the Commission on dominant Service Providers.
- (2) These Regulations govern Interconnection Services between all Service Providers. Certain specific requirements apply only to Service Providers that have been designated as dominant in a relevant market according to the Market Definition, Designation and Dominance (MDDD) Report.
- (3) The Regulations shall provide a basis for any Commission decision in respect of any complaints or disputes that may arise in connection with matters covered by these Regulations and are subject to the Commission's enforcement or dispute resolution powers under any Commission Statute.
- (4) These Regulations shall apply to Interconnection Services, unless specified otherwise in any Commission Statute.

3. Regulations Applicable to All Service Providers

- (1) Interconnection Services must be provided in a technologically neutral manner. Accordingly, the provisions of these Regulations shall apply to all relevant and current technologies, telecommunications networks and next generation networks (NGN) with no discrimination between fixed and wireless technologies.
- (2) Interconnection Services must ensure, at any time and without limitation, any-to-any communication to the benefit of the end-user. Interconnection Services as wholesale products relate to telecommunication services (voice, data, fixed, mobile, value added services, etc.) provided over communications networks, irrespective of their origin or their routing.
- (3) Any reference to a written request in these Regulations means a request by letter, fax, or electronic means (such as e-mail, Internet communication, or similar technical means).
- (4) Every Service Provider, if so requested in writing by another Service Provider or an international service provider operating an international public telecommunications network under its home jurisdiction's Regulations, must enter into good faith negotiations to conclude an Interconnection Agreement. Service Providers must meet all reasonable requests for Interconnection Services and adhere to non-discrimination between Interconnection Services they provide to their own units and affiliates, and those they provide to others.
- (5) Every Service Provider must offer, and has the right to receive, Interconnection Services under transparent, fair and non-discriminatory terms and conditions, and in a timely fashion.
- (6) Interconnection or other connections for the provision of Interconnection Services shall be permitted at any technically feasible point.
- (7) Interconnection at International Cable Landing Stations (or at the closest location in which it is technically feasible) shall be offered by Service Providers owning, operating

and/or exercising effective control over International Cable Landing Stations upon request and on commercial and fair terms, unless otherwise required under any applicable Commission Statute.

- (8) Any Service Provider owning, operating or exercising effective control over an International Cable Landing Station shall publish a price list for applicable Interconnection Services on the company's website, and sending an updated copy to the Commission annually.
- (9) To the extent technically feasible, Interconnection Services shall be provided without elements that have not been requested by the Service Provider concerned, unless the Service Provider offering the Interconnection Services provides objective and justifiable reasons for the inclusion of any such additional elements.
- (10) Service Providers must negotiate in good faith to resolve any disputes between them relating to Interconnection Services, and within a maximum period of 60 days, and in a fair manner. Where resolution cannot be reached, disputes shall be referred to the Commission for resolution in accordance with its Statutes and the provisions of these Regulation including, in particular, those concerning the burden of proof by each Service Provider.
- (11) Interconnection interfaces and interconnection standards shall be based on national and international standards acceptable to the Commission.
- (12) All information provided between Service Providers shall be subject to the terms of confidentiality defined in the RO or an Interconnection Agreement. Where the Service Providers concerned have no obligation to publish a RO, they shall not unreasonably refuse or delay the conclusion of a non-disclosure agreement for the exchange of confidential information prior to the conclusion of an Interconnection Agreement.
- (13) Without prejudice to the parties' rights and obligations under other Commission Statutes, the terms and conditions of Interconnection Services between Service

Providers must be set out in an Interconnection Agreement between the Service Providers concerned. Its negotiation and content shall be subject to the Service Providers' commercial freedom as regards any terms and conditions that are not subject to mandatory provisions under these Regulations or another Commission Statute.

- (14) Service Providers may not request the inclusion of any terms or conditions in their Interconnection Agreement that are in violation of these Regulations.
- (15) Service Providers must transmit to the Commission a copy of any Interconnection Agreement not later than 10 days from its conclusion.
- (16) The receipt by the Commission of any Interconnection Agreement transmitted to it pursuant to this provision shall not imply approval of its terms and conditions by the Commission and shall be without prejudice to the possible exercise, at any point in the future, of the Commission's powers under the Bylaw.
- (17) In case the Commission decides, pursuant to the Bylaw, that an Interconnection Agreement is not compliant with a Commission Statute, the Commission will notify the Service Providers concerned. These must amend their agreement within 30 days after receiving such notification.

4. Regulations Applicable to Dominant Service Providers

4.1. Scope of Obligations

- (1) Dominant Service Providers' obligations under these Regulations' section 4 shall apply with regard to any non-discrimination (see subsection 4.2), transparency (see subsection 4.3), pricing (see subsection 4.4) and/or unbundling (see subsection 4.5) remedies imposed on such Service Providers concerning interconnection in any markets in which they have been designated as Dominant according to the Market Definition, Designation and Dominance (MDDD) Report.
- (2) The provisions of these Regulations' sections 3 and 4 shall be without prejudice to any other obligations of Dominant Service Providers set out in any other Commission Statute or any exceptions to such obligations provided under the Telecoms Act or its Bylaws.

4.2. Non-discrimination

- (1) Dominant Service Providers with a non-discrimination obligation for Interconnection must:
 - a. provide equivalent Interconnection Services in equivalent circumstances to other Service Providers, also including their own Affiliates or commercial partners, on the same terms and conditions regarding, in particular, information, timescales, price, quality and service level.
 - b. provide Interconnection Services to other Service Providers by means of the same systems and processes, in order to ensure equivalence of access.

4.3. Transparency

4.3.1. Publication of a Reference Offer (RO)

- (1) Dominant Service Providers with an obligation to publish standard terms and procedures for Interconnection Services to other Service Providers must do so in a Reference Offer ("RO").
- (2) The RO must include and provide details of a set of standard terms and conditions for Interconnection Services to other Service Providers. The RO must be used by a Dominant Service Provider as a reference to conclude Interconnection Agreements with other Service Providers.
- (3) A Dominant Service Provider may not use terms and conditions, that are different from those set out in the RO with regard to the same Interconnection Services, until and unless these terms and conditions are included in the RO and offered to all other Service Providers receiving Interconnection Services.
- (4) The prices specified in the reference offer should be considered as price ceilings. A Dominant Service Provider can offer prices below the specified ceiling, provided that they are offered to other Service Providers without discrimination, taking into account the quality and quantity of the services provided.
- (5) A Dominant Service Provider shall prepare a RO within 60 days of being so directed by the Commission and submit it to the Commission for approval. The Commission may request changes to the draft RO, which the Dominant Service Provider must incorporate within 15 days, and re-submit it to the Commission for its approval. If the Dominant Service Provider fails to incorporate in time, the Commission may adopt and publish a decision ordering the Dominant Service Provider to provide Interconnection Services on the terms and conditions requested by the Commission and published in its decision.
- (6) A Dominant Service Provider shall periodically update its RO, upon request by the Commission or, in any event, at least once every two years, to take account of any

changes to these Regulations or other Commission Statutes; new or modified services offered by the Dominant Service Provider; changes to the associated networks, processes and systems; or any other regulatory requirements that may directly impact the terms and conditions of a RO. The Service Provider must obtain the Commission's approval on the updated RO.

- (7) A Dominant Service Provider must publish its RO on its website within 15 days after approval by the Commission.
- (8) A Dominant Service Provider shall include in its RO an amendment procedure that describes how changes will be made to its terms and conditions, to include this amendment procedure and the following:
 - a. Specify how other Service Providers will be informed about proposed changes and the timeframe for such changes; and
 - b. Provide for submission to, and prior approval by, the Commission of the details of the proposed amendments.
- (9) The Commission may, at any time, require changes to a RO pursuant to Commission Statutes.
- (10) Upon a Dominant Service Provider's reasoned request, the Commission may accept the exclusion of certain confidential information from the RO's published version.
- (11) If so requested by the Commission, a Dominant Service Provider must combine Reference Offers required under this subsection 4.3.1 or any other Commission Statute in a single document. Any decision taken by the Commission under articles 4.3.1 (5), (6) or (9) above may be applicable to the whole or part of such single document, as further determined in that decision.

4.3.2. Content of the RO

- (1) Annex A includes an illustrative outline of an RO, and a description of its minimum content.

- (2) The RO must include a full list of Interconnection Services the Dominant Service Provider is required to offer, as well as the associated terms and conditions, including tariffs and charges, for each service and component of such service. A description of those services is provided in Annex B.
- (3) The Commission may require Dominant Service Providers to include certain services in their RO other than the ones described in the aforementioned Annex B.

4.4. Pricing Principles and Cost Orientation

- (1) Where Dominant Service Providers are subject to a cost-orientation obligation under any Commission Statute, their charges for Interconnection Services must be subject to the provisions of this subsection 4.4.
- (2) Dominant Service Providers may not pass any cost inefficiencies to other Service Providers through the tariffs or charges for Interconnection Services.
- (3) Charges for Interconnection Services must be free of any costs related to any universal service obligations of the Dominant Service Provider and should take into account any subsidy or other aid granted to that Dominant Service Provider by any governmental or other public authority in the Kingdom.
- (4) A Dominant Service Provider may provide volume discounts, subject to compliance with its non-discrimination and transparency obligations under these Regulations and any Commission Statute.
- (5) Any new or amended tariffs, charges or other pricing conditions proposed by Dominant Service Providers for the RO must be approved by the Commission. If so requested by the Commission, Dominant Service Providers must provide the Commission with adequately detailed and documented cost studies supporting the proposed tariffs or charges, or their amendment. Those studies shall be based on causal cost allocation, including proper consideration of joint and common costs and

a reasonable cost of capital, according to international best practice and the Commission's determinations.

- (6) In order to assess and approve any tariffs and charges proposed by a Dominant Service Provider, the Commission may adopt and apply a long run incremental cost (LRIC) approach, including proper consideration of joint and common costs, and a reasonable cost of capital, according to international best practice and the Commission's determinations. The Commission may apply or combine alternative approaches, such as relying on the costs that result from accounting separation systems or benchmarking of charges in other countries. The Commission may determine by decision, based on the above criteria, a Dominant Service Provider's applicable charges for access and Interconnection Services.
- (7) The Commission may order a Dominant Service Provider to adjust its charges for Interconnection Services in order to ensure compliance with these Regulations. In the event of any such adjustment requested by the Commission or approved under article 4.4(5) above, the Commission may also decide that charges for similar Interconnection Services provided by other Service Providers to the Dominant Service Provider should not be higher than the adjusted charges charged by the Dominant Service Provider, unless the other Service Provider can demonstrate, to the Commission's satisfaction, that its associated costs are higher than those of the Dominant Service Provider. In imposing any such reciprocity obligations, the Commission will take into consideration, in particular, the objectives pursued by these Regulations under subsection 2.2.

4.5. Unbundling of Services

- (1) Dominant Service Providers may not render the provision of individual Interconnection Services conditional on their bundling with separate interconnection, access or other services that are not requested by the other Service Provider.

4.6. Amendments to Existing Services

- (1) Any material changes in the setup of existing Services of Dominant Service Providers must be agreed with the interconnected Service Provider or within a multilateral working group (see section 5 below).
- (2) The Dominant Service Provider must allow sufficient time to any Service Providers to make any necessary modifications or adjustments to their systems and networks in response to any planned amendments to Interconnection Services planned by the Dominant Service Provider. Unless otherwise agreed between the parties or allowed under the applicable RO approved by the Commission, this notice period shall be at least 60 days prior to the commencement of the implementation of the relevant amendments by Dominant Service Provider.
- (3) In case of upgrading of interconnection to more efficient technologies, the Dominant Service Provider must coordinate such major changes with all Service Providers affected and give them a notice period of at least two (2) years prior to the start of these changes. Coordination shall take place in accordance with section 7 of these Regulations and shall encompass at least the following aspects:
 - a. Network architecture, number and location of Points of Interconnection (Pols);
 - b. Technical Interfaces for transport and signaling with unified national implementation based on international standards;
 - c. Billing and accounting;
 - d. Transport, signaling, routing and numbering aspects;
 - e. Quality of service (end-to-end) and Service Level agreements;
 - f. Migration strategy and timelines for changes;
 - g. Termination or obsolescence of existing services.
- (4) Each Service Provider shall bear its own costs incurred through any migration Interconnection Services to new technologies.

5. Joint Technical and Operational Committee and Multilateral Working Group

5.1. Joint Technical and Operational Committee

- (1) Service Providers shall establish a joint technical and operational committee. The joint technical and operational committee shall facilitate discussion to reach mutually acceptable agreements on technical, operational, planning, billing and other service aspects of Interconnection Services.
- (2) The composition of the joint technical and operational committee shall be agreed upon by the Service Providers and can be reconstituted as and when required. The Commission may join one or more of the meetings of this Committee, as an observer, if the Commission deems that appropriate.
- (3) The joint technical and operational committee shall meet at regular intervals with an agenda agreed in advance and may cover one or more of the following areas:
 - a. New Points of Interconnection or provision of access;
 - b. Analysis of traffic levels;
 - c. Service quality;
 - d. Capacity requirements;
 - e. Fault analysis;
 - f. Billing processes;
 - g. Network and/or service changes;
 - h. Change of technical standards;

- i. Any other technical and operational issues associated with Interconnection Services.
- (4) In the event of the Commission's participation, the Commission may take decisions based on the majority rule or in the public interest, in which case service providers shall be obligated to implement such a decision.

5.2. Multilateral Working Group

- (1) A multilateral working group for the purpose of facilitating Interconnection Services may be established. All concerned Service Providers shall participate in such a multilateral working group. The working group shall establish terms and procedures. The multilateral working group, if initiated, shall hold periodic meetings at least quarterly. The Commission may participate in and chair such meetings.
- (2) The multilateral working group may establish several sub-groups which may consist of regulatory, operational or technical staff as required to address specific issues as they arise. Such working groups shall aim at establishing industry solutions, standards and procedures, including on issues such as:
 - a. Operations and maintenance processes;
 - b. Management of services;
 - c. Technical standards and interfaces;
 - d. Spare capacity;
 - e. Migration issues;
 - f. Introduction of new services.
- (3) Consensus and results achieved in the working group shall be compiled in written form. Service Providers are to implement the agreed results and where appropriate to include them in their Reference Offers and/or Interconnection Agreements and

submit the revised documents to the Commission in accordance with the Statutes. Results, outcomes and meeting minutes must be made available to all members, other Service Providers and the Commission.

- (4) In the event of the Commission's participation, the Commission may take decisions based on the majority rule or in the public interest, in which case service providers shall be obligated to implement such a decision.

6. Dispute Resolution

- (1) Any disputes between Service Providers on entering into an Interconnection Agreement, a failure to reach such an agreement or its interpretation, or the rights and obligations of one of the parties, may be referred to the Commission by either of the parties according to Chapter 6 of the Bylaw.
- (2) If the Parties cannot agree on a consensual resolution by the Commission, either party to the dispute may file an application with the Commission for a mandated resolution. When dealing with such disputes the Commission shall apply, in particular, the relevant provisions of the Telecommunications Bylaw on the procedure to be followed and those of these Regulations as regards the substance of the dispute.
- (3) A Dominant Service Provider shall include in its RO a clear procedure for escalating and resolving disputes including notification, meeting and response times, and the time limit for resolution before the dispute is escalated to the next level.
- (4) The dispute resolution procedure of a Dominant Service Provider shall include an escalation process through various levels:
 - a. Level 1: Resolution at the Operational Committee level.
 - b. Level 2: Referral of dispute to senior management level of the concerned Service Providers for resolution.
 - c. Level 3: Referral to the Commission in line with Chapter 6 of the Telecom Bylaw.
- (5) A Dominant Service Provider's RO may set out a faster timetable for the resolution of disputes or their referral to the Commission.

7. Procedure and Principles for the Provision of Interconnection Services

7.1. Procedures

- (1) Annex C lays down the procedure Service Providers must follow for the request for and provision of services under these Regulations.

7.2. Technical Aspects

7.2.1. Physical Form of Interconnection

- (1) The physical form of interconnection is the linking and interworking of the telecommunications networks/systems of Service Providers which permit users to communicate with one another.
- (2) The Point of Interconnection (POI) is the physical or virtual point at which Service Providers connect their systems through interconnection links.
- (3) There are three main forms of physical interconnection where the Point of Interconnection may be located:
 - a. Site of the Service Provider offering interconnection – Collocated Interconnection;
 - b. Site of the requesting Service Provider – Customer Sited Interconnection; and
 - c. A point in between the sites of the Service Providers – In-span Interconnection.
- (4) The RO of a Dominant Service Provider shall include:
 - a. Offers for the three main forms of physical interconnection, unless otherwise approved by the Commission.
 - b. A list of locations offered for interconnection including maps to enable other Service Providers to make efficient choices on the selection of Poles for

Interconnection Services. The details of these points offered for interconnection are to be maintained as an annex to a RO. The list and the related information must be updated on a regular basis.

- c. All relevant technical specifications and standards for each POI including services and numbering provisions. The details must provide all necessary information to allow for technical network planning.
- d. Procedures for establishing, relocating or removing a POI in a Dominant Service Provider's network. A Dominant Service Provider is obligated to provide other Service Providers with advance notice of at least 60 days of any expected changes and to seek to minimize any adverse effect of any expected changes on Interconnection Services provided.

7.2.2. Switching Network Interconnection

- (1) Efficient interconnection at the switching level is one of the most significant aspects of network interconnection. Switching in this context is meant to be technologically neutral and includes circuit and packet switched technologies.
- (2) The RO shall:
 - a. Address the approach for meeting the switching capacity requirements for interconnection traffic;
 - b. Identify the Regulations governing the level at which switching point the interconnection will take place, e.g. at International Gateway, Service Node or Local Exchange or, in the case of IP interconnection, at which transport level interconnection will take place;
 - c. Identify interconnection Regulations for switch diversity.

7.2.3. Network Interconnection Links and Routing

- (1) The Network Interconnection Links connect the networks of Service Providers and facilitate the conveyance of traffic between them. These links are between Points of Interconnection.
- (2) For initial interconnection, a configuration with two separate Poles in separate buildings and over physically diverse routes shall be regarded as sufficient.
- (3) Routing considerations for Network Interconnection Links shall include:
 - a. Route capacity; and
 - b. Route dimensioning;
 - c. Route diversity.

Route Capacity

- (4) A RO shall identify the Regulations for minimum and maximum capacities and increments in which capacity may be provisioned.
- (5) For expansion of the route capacity, the number of Poles must be based on reasonable engineering principles including a justified need to provide network resilience.
- (6) A Dominant Service Provider may require other Service Providers to interconnect at more than one location or to a particular location taking into account the requirements of section 4 of these Regulations. Any such requirements must be based on reasonable engineering principles and a justified need to provide network resilience.

Route Dimensioning

- (7) Network Interconnection Links shall be provisioned according to international standards (e.g. maximum Erlang level). A performance metric (e.g. utilization factor, packet loss) shall be established in order to determine when to upgrade links. For a

“fully-provisioned” link a maximum performance metric of 80% shall be used. Should the measured utilization of such a link regularly exceed the maximum performance metric, then either traffic should be re-routed away from that link or the capacity of the link increased.

Route Diversity

- (8) Route diversity is defined as the communications routing between two points over more than one geographic or physical path with no common points. For interconnection between networks, route diversity is required in order to enhance reliability.
- (9) Interconnection Service resilience shall be supported.

Signaling Network Interconnection

- (10) Service Providers must provide signaling interconnection and ensure control information is delivered for processing of session management.
- (11) Service Providers shall use ITU Signaling System Number 7 (SS7) for circuit switched technologies. For IP interconnection, a signaling standard that conforms to international standards may be agreed upon between the Service Providers in accordance with subsection 7.3 and section 5 of these Regulations or may be determined by the Commission.
- (12) Dominant Service Providers shall specify signaling interconnection options and the associated configurations.

7.2.4. Synchronization

- (1) Synchronization is necessary for interconnected networks. Service Providers shall agree on the technical standards and operational procedures for synchronization.

7.2.5. Interface Standards

- (1) The interface used by Service Providers must be based on internationally accepted technical standards

7.2.6. Network Interoperability

- (1) Interoperability means the technical features of a group of interconnected systems that ensure end-to-end provision of a given service in a consistent and predictable way.
- (2) Service Providers must agree on the interoperability testing procedures that verify network integrity and interoperability of functionalities and features of Interconnection Services.

7.2.7. Supplementary Services

- (1) Dominant Service Providers providing supplementary services (such as those defined in Annex B.2.1.12) to their end-users are required to make the necessary technical and operational arrangements with interconnecting Service Providers to support the availability of these supplementary services to the end-users of the interconnecting Service Provider.

7.2.8. Numbers and Addressing Elements

- (1) Dominant Service Providers shall provide details of numbers and addressing elements on their networks. This shall include number ranges allocated by the Commission but not yet activated.

7.2.9. KPIs, SLAs and Penalties

- (1) A RO must include Key Performance Indicators (KPIs) and Service Level Agreements (SLAs) which describes the characteristics of Interconnection Services, the service level obligations and compensation details for failure to meet these obligations.

- (2) The KPIs for all operational processes must be clearly stated in the RO without prejudice to the effects of potential stop-clock events that may happen during the process. The RO must also clearly state stop-clock events and the effect on the computation of time of operational processes. Stop-clock events must refer exclusively to events or delays that are not due to the responsibility of the Dominant Service Provider.
- (3) The Service Level Agreement shall include:
 - a. Service configuration and technical characteristics such as points of interconnection, routing and signaling;
 - b. Operational and maintenance conditions and associated performance measures such as order lead time, network availability and service restoration time;
 - c. Quality of Service indicators and grade of service measures. Such indicators shall include, but are not limited to, those specified in the regulations of the Commission on quality of service.
- (4) The RO shall not specify caps to penalties. Penalties shall be either directly paid to requesting Service Providers or considered as a service credit in future wholesale invoices by deducting the penalty from the total amount charged for interconnection or access services.
- (5) A Dominant Service Provider shall be responsible for measuring and monitoring the quality of service for Interconnection Services it provides.
- (6) Dominant Service Providers shall provide to the Commission traffic, quality of service measurement, SLAs and any other required KPIs data. For the purpose of monitoring the effectiveness of RO and the achieved degree of interconnection, Dominant Service Providers are required to report to the Commission quarterly on an individual basis for each Service Provider and on average for all Service Providers at least the following KPIs (disaggregated by service):

- a. Average time from order received and accepted until a service is installed and ready to use
- b. Fault rate
- c. Fault repair time
- d. Service availability measured the percentage of time the service is available
- e. Percentage of peak bandwidth utilization of leased lines services and bandwidth capacity services
- f. Percentage of unsuccessful call termination rate in the busy hour

7.3. Management of Interconnection

7.3.1. Services Management

- (1) Dominant Service Providers offering or providing The Services shall designate a Services Manager to deal with other Service Providers requiring Interconnection Services. The role of Interconnection Services Manager shall be to facilitate communication between Service Providers on commercial and technical aspects and the provision of other services to Service Providers.
- (2) Dominant Service Providers shall agree to meeting with other Service Providers within 5 working days of the meeting being formally requested.

7.3.2. Provision of Information between Service Providers

Network and Facilities Information

- (1) A Dominant Service Provider offering Interconnection Services shall provide relevant information about its network and services to other Service Providers in order to assist these Service Providers in network planning, financial planning and operation of

their networks. Such information has to be provided within 15 days after the request has been received.

Planned Network and Facilities Changes

- (2) All Service Providers shall provide reasonable notice to all other Service Providers about any planned network change or upgrade which may be expected to affect the operation of interconnection or access arrangements between the Service Providers. Sufficient time shall be allowed for Service Providers to make necessary changes or adjustments to their systems and networks to ensure continuity of service. The minimum period of advance notification shall be 60 days unless agreed otherwise.

Interconnection Links and Facilities Database

- (3) All Service Providers shall maintain a database of the interconnection links between their networks and those of other Service Providers. This database shall contain all related information such as:
 - a. A unique identifier (common to Service Providers) of each interconnection link;
 - b. The details of the terminating equipment and facilities;
 - c. Information on the transmission path including capacity;
 - d. Traffic routing plan;
 - e. The signaling plan.
- (4) A Dominant Service Provider deploying telecommunications facilities shall maintain detailed and accurate records of such facilities and of available spare capacity to support access by other Service Providers.
- (5) The information contained in this database shall be provided in electronic form to the Commission upon request.

Annex A. Illustrative Outline for a Reference Offer (RO)

The outline for a RO given below is for illustrative purposes only. As long as the present Regulations are followed, the structure, format and arrangement of contents may vary.

A.1. Framework Agreement

- a. Preamble, definitions and interpretation
- b. Commencement and duration
- c. Confidentiality and non-disclosure
- d. Intellectual property rights
- e. Legal rights, protections and extent of liabilities
- f. Review, renewal rights and obligations
- g. Terms associated with breach, suspension and termination of the agreement
- h. Provisions for staff safety and systems protection
- i. Disputes and arbitration
- j. Force majeure, waiver and assignment
- k. Authorized representatives and notices
- l. Governing law and jurisdiction

A.2. Service Definition

- a. Service definition and description
- b. Service configuration

- c. Service provisioning
- d. Technical characteristics
- e. Operational conditions

A.3. Technical Aspects

- a. Physical form of interconnection
- b. Switching network interconnection
- c. Network interconnection links and routing
- d. Synchronization
- e. Interface standards and interoperability
- f. Numbering and addressing elements
- g. Technical information for the access to physical facilities

A.4. Service Level Agreement

- a. Quality and service level objectives
- b. Penalties for non-compliance with service level objectives

A.5. Operational and Provisioning Processes

- a. Provisioning processes
 - o Network planning
 - o Forecasts

- Ordering procedures
- Lead times
- Implementation
- b. Operations and maintenance processes
 - Network operation
 - Traffic management
 - Routing management
 - Fault management
 - Escalation procedure
 - 24x7 emergency channels
 - Safety and system protection
 - Billing process
 - Payment process
 - Billing dispute resolution process

A.6. Management of Interconnection

- a. Services management
- b. Joint technical and operational committee
- c. Provision of information between Service Providers
 - Network and facilities information
 - Planned network and facilities changes

- Interconnection links and facilities database

A.7. Dispute resolution

A.8. Pricing

- a. Rates
- b. Billing procedures
- c. Terms & conditions

Annex B. Interconnection Services

B.1. Overview

The below list of services is not intended to be exhaustive. Further Services may be defined by the Commission at any time as deemed necessary.

- a. Traffic conveyance services
- b. Leased lines services and bandwidth capacity services
- c. Wholesale broadband access services at a fixed location
- d. Pure Resale of Telecommunications Services
- e. Wholesale mobile access services
- f. Collocation
- g. Local Loop Unbundling (LLU)
- h. Sub Loop Unbundling (SLU)
- i. Line Sharing Access Service

B.2. Description

In the following descriptions, Service Provider A is requesting an Interconnection Service (requesting Service Provider A) and Service Provider B is offering the Interconnection Service. Any other Service Provider is referred to as Service Provider C.

B.2.1. Traffic conveyance services

B.2.1.1. Wholesale Fixed Call Termination Service

Wholesale fixed call termination service to geographic numbers is a call conveyance service provided by Service Provider B through its network where a voice call handed over by requesting Service Provider A is carried from the Point of Interconnection to a called party's network termination point, the called party being a subscriber of Service Provider B.

Service Provider B is obliged to terminate such calls irrespective of the point of origination.

Fixed call termination services can be of three types depending on the location of the called party relative to the calling party:

- a. Local call termination: Where the calls are delivered through an interconnection link to the local node serving the end-user;
- b. Single tandem call termination: Where the calls are delivered through an interconnection link to a tandem (or transit) node that has a direct link to the local node serving the end-user;
- c. Double tandem call termination: Where the calls are delivered through an interconnect link to a tandem (or transit) node which does not have a direct link to the local node serving the end-user. In this case the call must be routed over one or more additional tandem nodes before being sent to the local node serving the end-user.

In case the network architecture changes, the above classification of service types may be revised according to the new architecture.

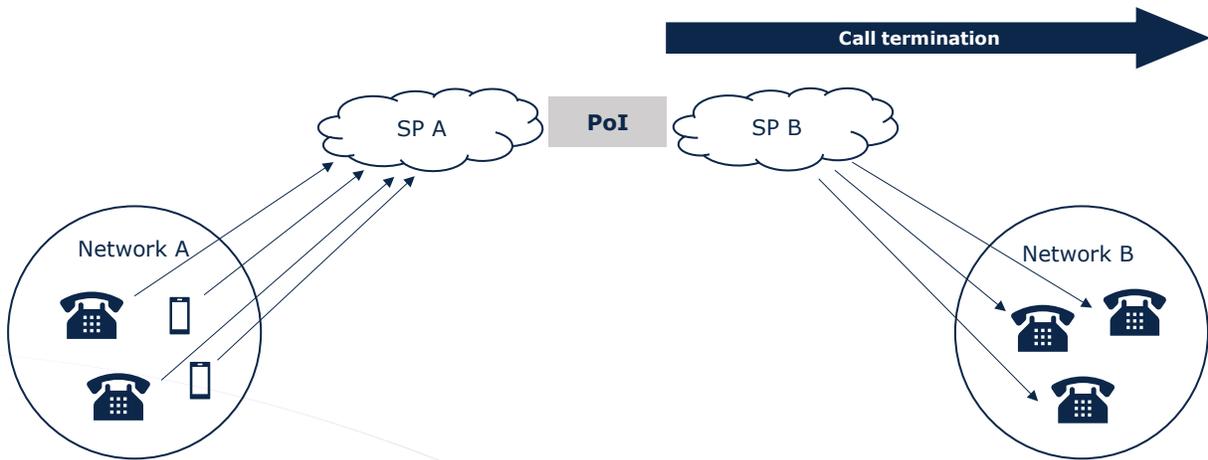


Figure 1: Diagram of 'Wholesale Fixed Call Termination Service'

B.2.1.2. Wholesale Mobile Call Termination Service

Wholesale mobile call termination service is a call conveyance service provided by mobile Service Provider B through its network where the voice call handed over by requesting Service Provider A is carried from the Point of Interconnection to a called party's network termination point, the called party being a subscriber of Service Provider B.

Mobile Service Provider B is obliged to terminate such calls irrespective of the point of origination.

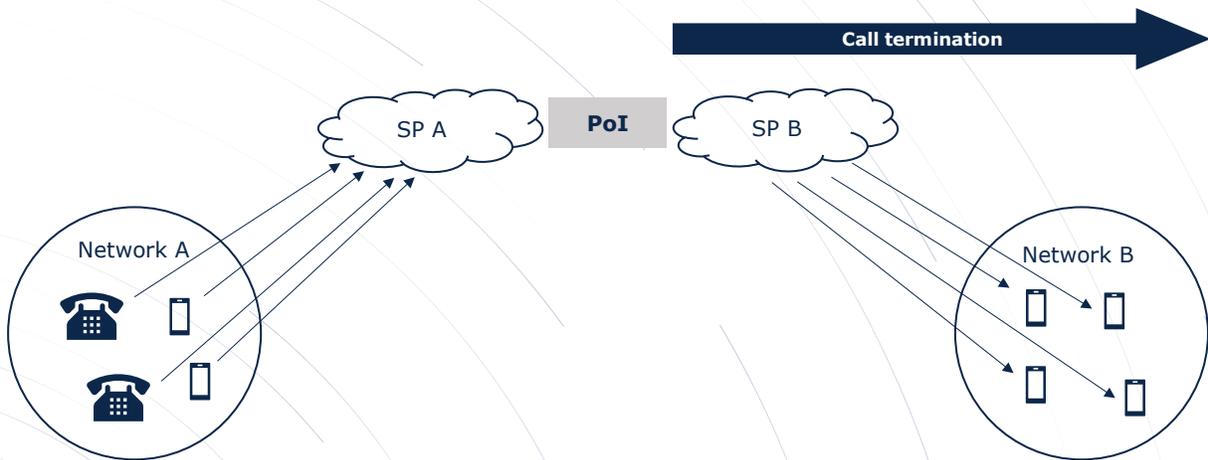


Figure 2: Diagram of 'Wholesale Mobile Call Termination Service'

B.2.1.3. Wholesale Fixed Voice Call Origination Service

Wholesale fixed voice call origination service comprises the conveyance of a call from a calling party's network termination point through the infrastructure of Service Provider B to a Point of Interconnection where the call is handed over to requesting Service Provider A for transit and/or termination. These services are used for carrier selection solutions.

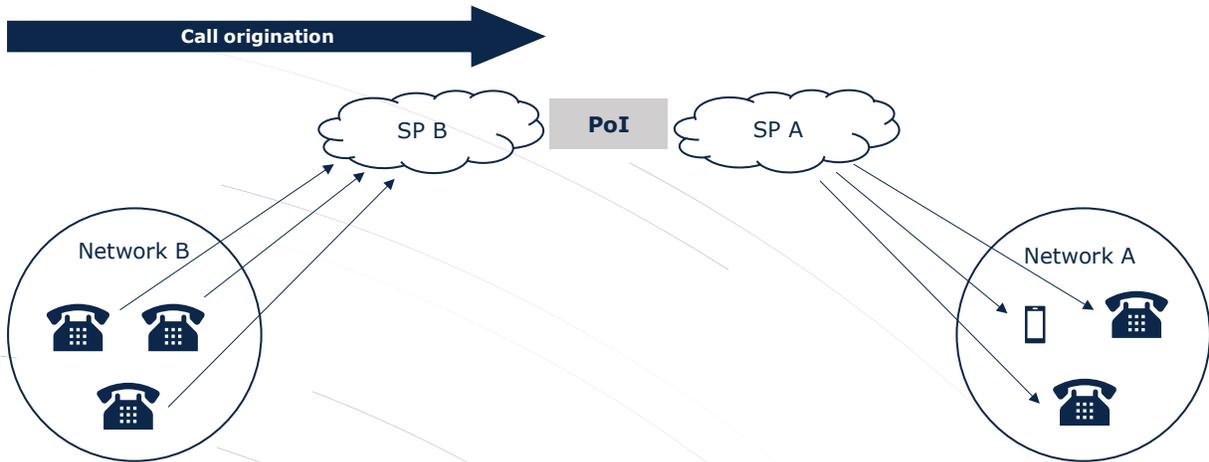


Figure 3: Diagram of 'Wholesale Fixed Voice Call Origination Service'

B.2.1.4. Wholesale Fixed Intelligent Call Origination Service

Fixed intelligent call origination comprises the conveyance of a call to an intelligent network service from a calling party's fixed network termination point through the infrastructure of offering Service Provider B to a Point of Interconnection where the call is handed over to requesting Service Provider A for connection to the intelligent network service and termination. These are, for example, calls to freephone (800) or premium rate services (both national and international).

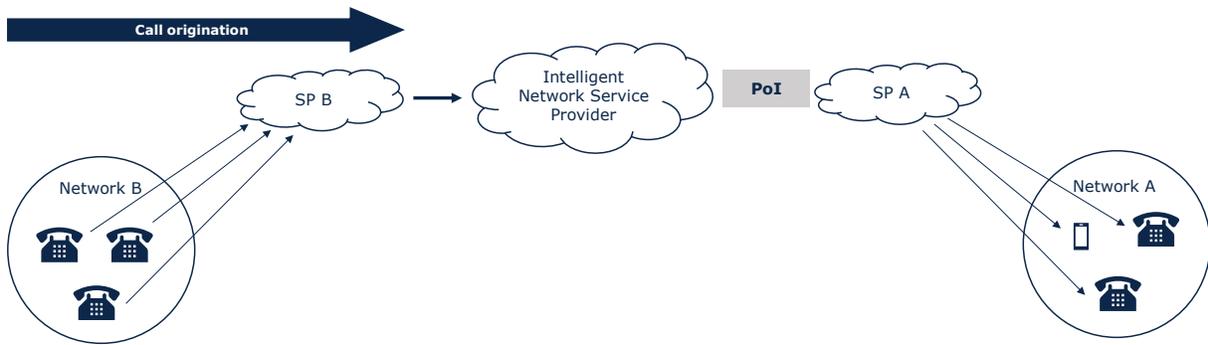


Figure 4: Diagram of 'Wholesale Fixed Intelligent Call Origination Service'

B.2.1.5. Wholesale Mobile Intelligent Call Origination Service

Mobile intelligent call origination comprises the conveyance of a call to an intelligent network service from a calling party's mobile network termination point through the infrastructure of offering Service Provider B to a Point of Interconnection where the call is handed over to requesting Service Provider A for connection to the intelligent network service and termination. These are, for example, calls to freephone or premium rate services (both national and international).

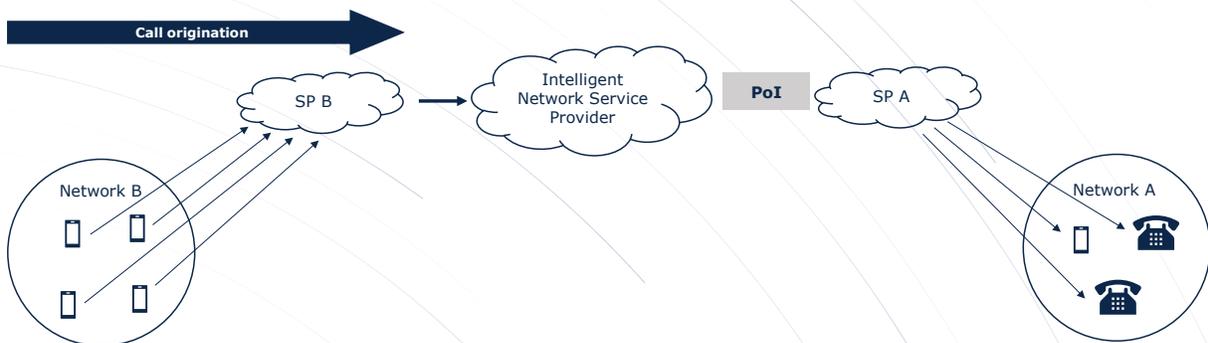


Figure 5: Diagram of 'Wholesale Mobile Intelligent Call Origination Service'

B.2.1.6. Wholesale Transit Interconnection Service

Wholesale transit Interconnection Service comprises the conveyance of a call originating with requesting Service Provider A through the Point of Interconnection to the network of Service Provider B and then through another Point of Interconnection to the network of Service Provider C. Service Provider B is providing call transit service. For example, Service

Provider B may route traffic from one local Service Provider A to another local Service Provider C, or from a local requesting Service Provider A to a long distance or a mobile Service Provider C.

Service Provider B providing the wholesale transit Interconnection Service is responsible neither for origination nor termination of the call.

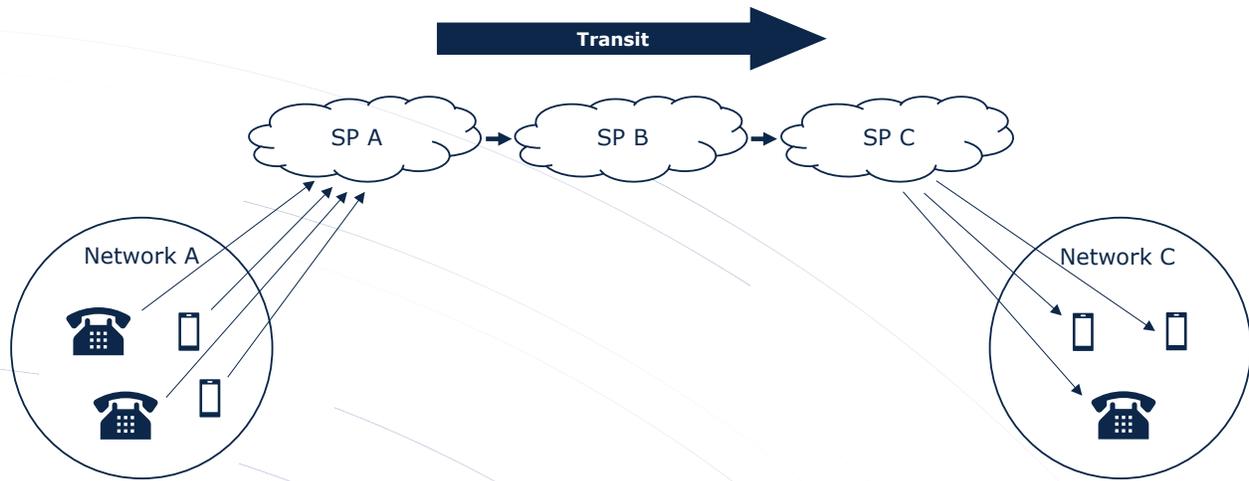


Figure 6: Diagram of 'Wholesale Transit Interconnection Service'

B.2.1.7. Wholesale International Voice Call Services

Wholesale international voice call services (international transit service) is the conveyance of outgoing and incoming international calls from/to the network of Service Provider A through the Point of Interconnection with the network of Service Provider B (including International Free Number related calls). Any Service Provider licensed to provide international access services can provide such services to any Service Provider's end-users in combination with voice call transit service, a fixed/mobile voice call termination service and/or international free number service.

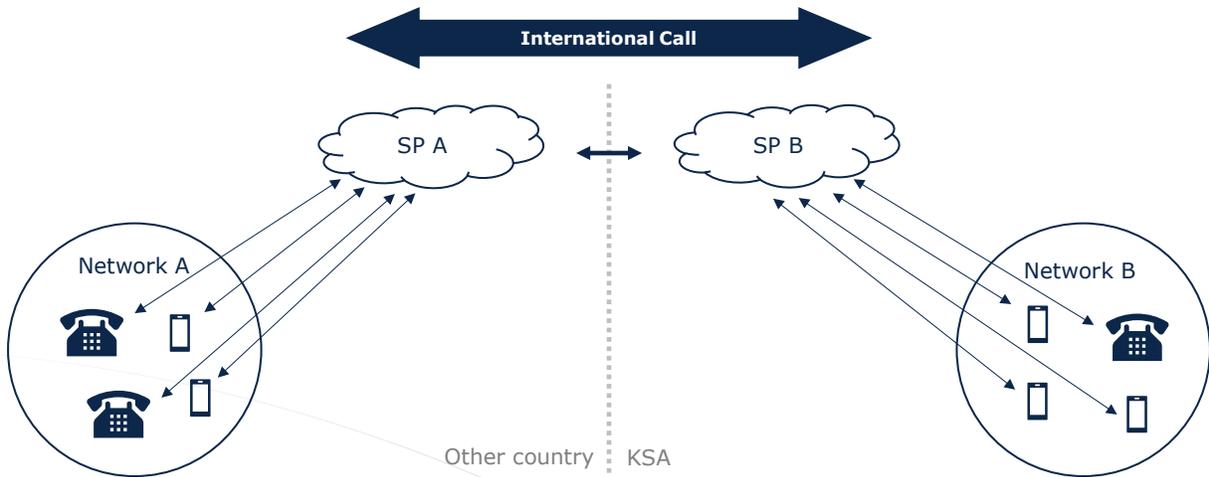


Figure 7: Diagram of 'Wholesale International Voice Call Services'

B.2.1.8. Short Message Service (SMS) Termination Service

Short message service (SMS) termination service is the conveyance of short messages provided by mobile Service Provider B through its network where an SMS handed over by requesting Service Provider A is carried from the Point of Interconnection to the receiving party's network termination point, the SMS receiving party being a subscriber of Service Provider B.

SMS messages may also originate via web-based browser applications.

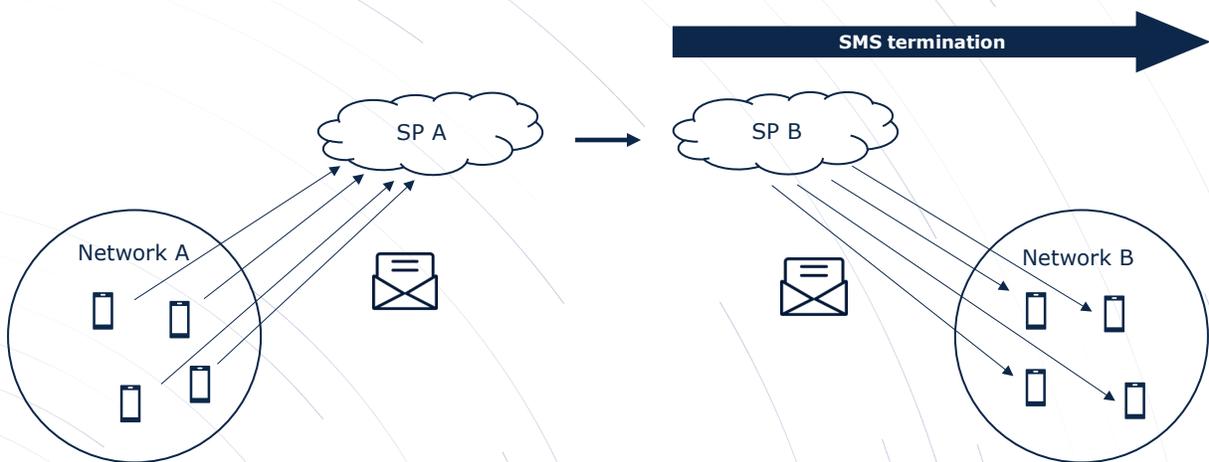


Figure 8: Diagram of 'Short Message Service (SMS) Termination Service'

B.2.1.9. Multimedia Messaging Service (MMS) Termination Service

Multimedia messaging service (MMS) termination service is the conveyance of multimedia messages provided by mobile Service Provider B through its network where an MMS handed over by requesting Service Provider A is carried from the Point of Interconnection to the sent party's network termination point, the MMS receiving party being a subscriber of Service Provider B.

MMS may also originate via web-based browser applications.

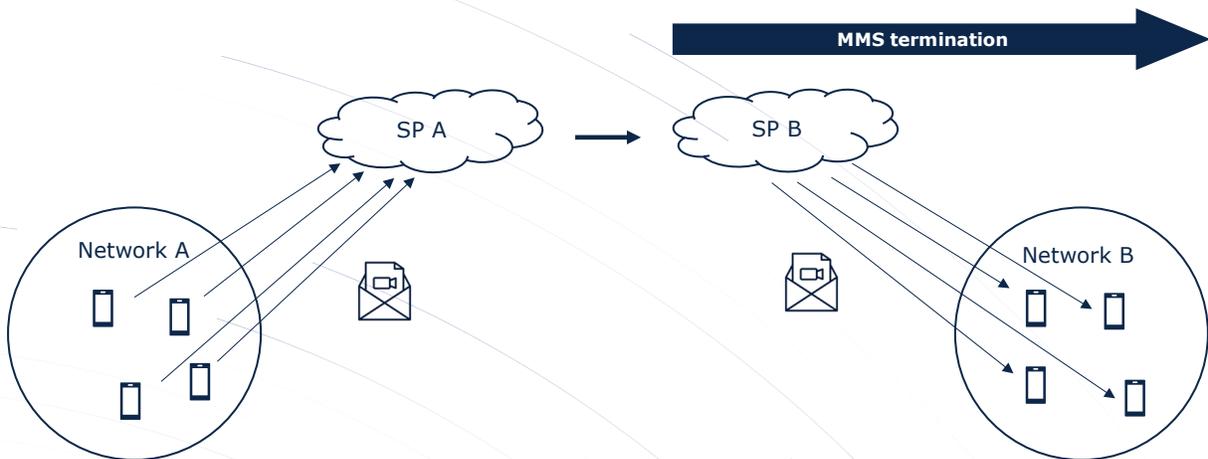


Figure 9: Diagram of 'Multimedia Message Service (MMS) Termination Service'

B.2.1.10. Video Call Termination Service

Video call termination service is the conveyance of a video call provided by mobile Service Provider B through its network where a video call handed over by requesting Service Provider A is carried from the Point of Interconnection to the called party's network termination point, the called party being a subscriber of Service Provider A.

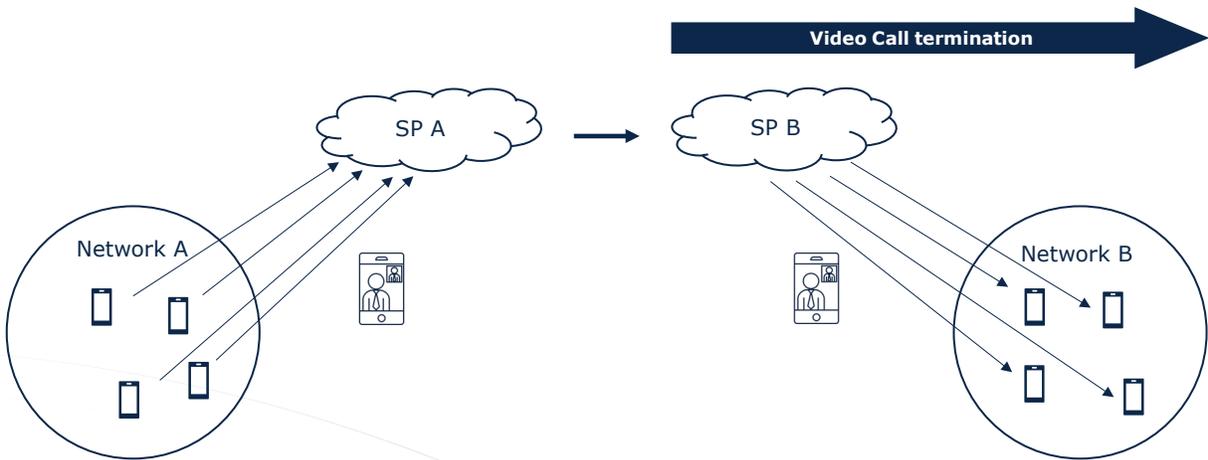


Figure 10: Diagram of 'Video Call Termination Service'

B.2.1.11. Interconnection Link Service

Interconnection link service is a transmission link connecting one licensed requesting Service Provider A's interconnection node and another licensed Service Provider B's interconnection node passing through a Point of Interconnection. The interconnection link service serves to support the provision of the different Interconnection Services. Service Provider A may use transmission links provided by itself, and/or Service Provider B and/or Service Provider C to interconnect with Service Provider B.



Figure 11: Diagram of 'Interconnection Link Service'

B.2.1.12. Ancillary Services

Calls to Emergency Services

Calls to Emergency Services comprises the conveyance of telephone calls from a Point of Interconnection with the Service Provider A's network, across the Service Provider B's network and delivered to an emergency call handling center.

Calls to Directory Enquiry Services

Calls to Directory Enquiry Services comprises the conveyance of telephone calls from a Point of Interconnection with the Service Provider A's network, across the Service Provider B's network and delivered to a directory enquiry center.

Cost Sharing Call Services

Cost Sharing Call Services comprises the conveyance of telephone calls from a Point of Interconnection with the Service Provider A's network, across the Service Provider B's network and delivered to a phone number associated to cost-sharing schemes, such as 9200 numbers for mobile and fixed.

Short Access Code Call Services

Short Access Code Call Services comprises the conveyance of telephone calls from a Point of Interconnection with the Service Provider A's network, across the Service Provider B's network and delivered to a phone number associated short access code number (three, four, five, and six numbers schemes).

Call Center Call Services

Call Center Call Services comprises the conveyance of telephone calls from a Point of Interconnection with the Service Provider A's network, across the Service Provider B's network and delivered to Service Provider B's call center.

Supplementary Services

Supplementary Services are network-based services that may be offered by Service Providers and shall be supported by interconnecting Service Providers. Examples of such features for which interoperability between Service Providers may be required are:

- a. Call Waiting
- b. Call Transfer
- c. Connected Line Identification Presentation
- d. Connected Line Identification Restriction
- e. Calling Line Identification Presentation
- f. Calling Line Identification Restriction
- g. Closed User Group
- h. Conference Calling
- i. Direct-Dialing-In (DDI)
- j. Call Diversion Services
- k. Line Hunting
- l. Three-Party Service
- m. User-to-User Signaling
- n. Multiple Subscriber Number
- o. Call Hold
- p. Advice of Charge

- q. Multi-level Precedence and Preemption
- r. Priority
- s. Malicious Call Identification
- t. Malicious Call Tracing
- u. Outgoing Call Barring
- v. Reverse Charging
- w. Ring-back when free
- x. E-164 Number Portability
- y. In-band Audio Tones and Announcements to the user
- z. Dual-tone Multi-frequency Signaling (DTMF)
- aa. Sub-addressing

B.2.2. Leased lines services and bandwidth capacity services

B.2.2.1. Wholesale National Terminating Segments of Leased Lines Service

Wholesale Terminating Segments of Leased Lines Service comprises the provision by the Service Provider B of a fixed capacity transmission (e.g. by the means of technologies such as Ethernet, MPLS, DWDM) facility joining a customer site to a trunk node, for onward connection to the Service Provider A's point of access, either directly or via a Wholesale Trunk Segment of a Leased Line. A Trunk Node is a location on the Service Provider B's network designated for the purpose of connecting a leased line access segment with Wholesale Trunk Segments of Leased Lines.

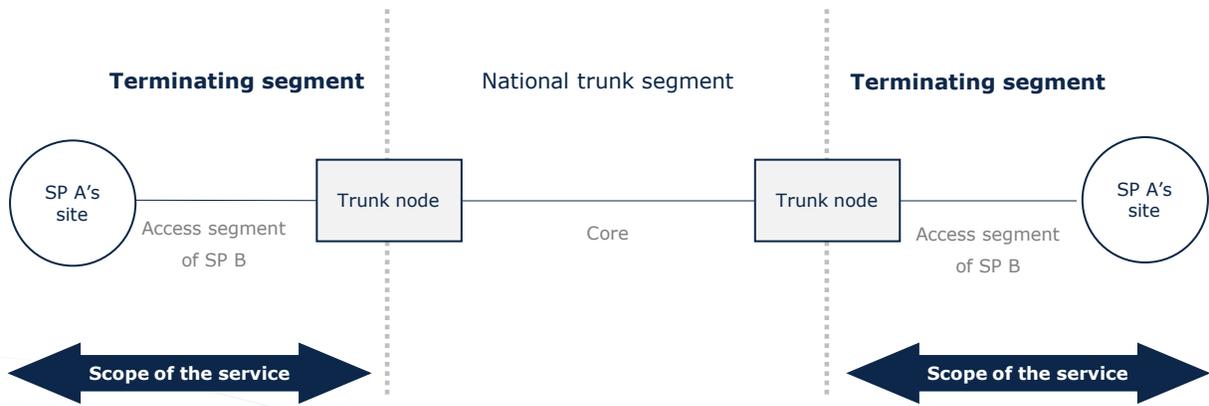


Figure 12: Diagram of 'Wholesale National Terminating Segments of Leased Lines Service'

B.2.2.2. Wholesale National Trunk Segments of Leased Lines Service

Wholesale Trunk Segments of Leased Lines Service comprises the provision by the Service Provider B of a fixed capacity transmission (e.g. by the means of technologies such as Ethernet, MPLS, DWDM) facility between a point of access with the Service Provider A at a designated Trunk Node and another Trunk Node, for onward connection to a leased line access segment.

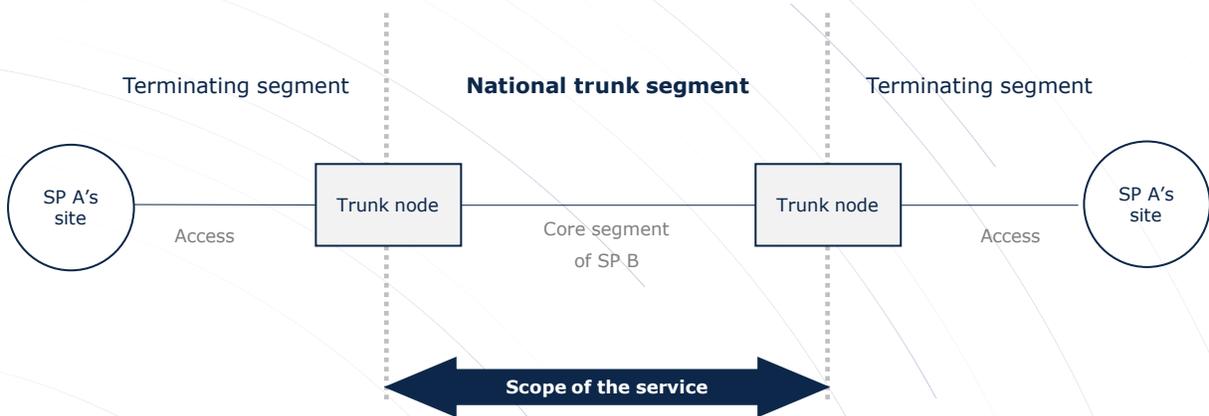


Figure 13: Diagram of 'Wholesale National Trunk Segments of Leased Lines Service'

B.2.2.3. Wholesale International Transmission Capacity Service

Wholesale International Transmission Capacity Service is a service where the Service Provider B provides international transmission capacity by means of submarine cables, terrestrial, or satellite links to the requesting Service Provider A.

This service also comprises the access to the facilities of the Service Provider B (e.g. International Cable Landing Stations, satellite terrestrial stations) to co-locate the Service Provider A's equipment.

B.2.2.4. IP Transit Service

IP transit is a metered data service where Service Provider B provides national and/or international bandwidth for IP traffic to all destinations in its routing table or identifies a default route with the intention to provide global internet connectivity (e.g. Internet traffic) to requesting Service Provider A.

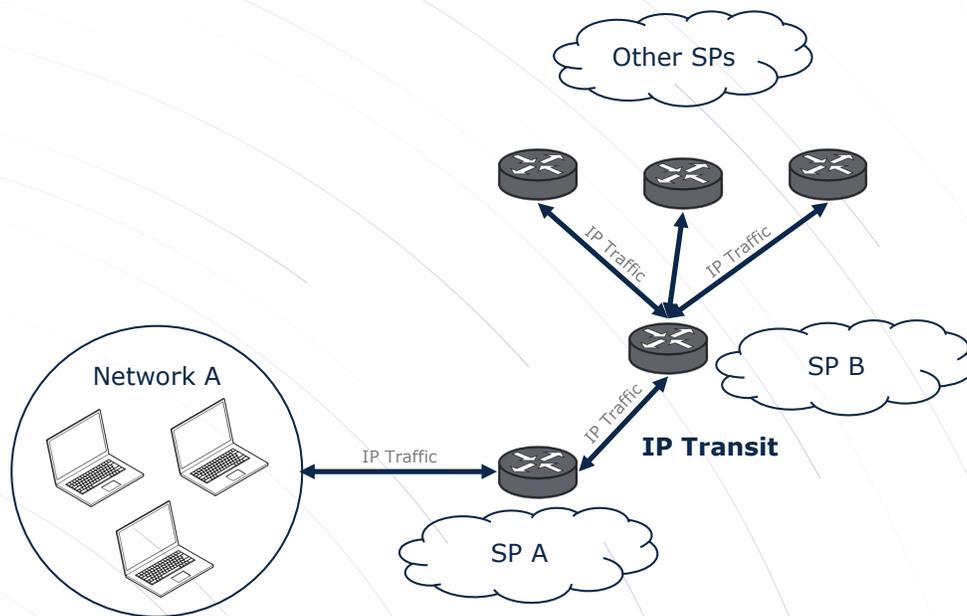


Figure 14: Diagram of 'IP Transit Service'

B.2.2.5. Private Peering Service

Private peering is a service where two separate autonomous systems interconnect for the purpose of exchanging traffic between the users of each network. Private peering is implemented by a physical interconnection of the networks, using an interconnection link service including an exchange of routing information through the Border Gateway Protocol (BGP).

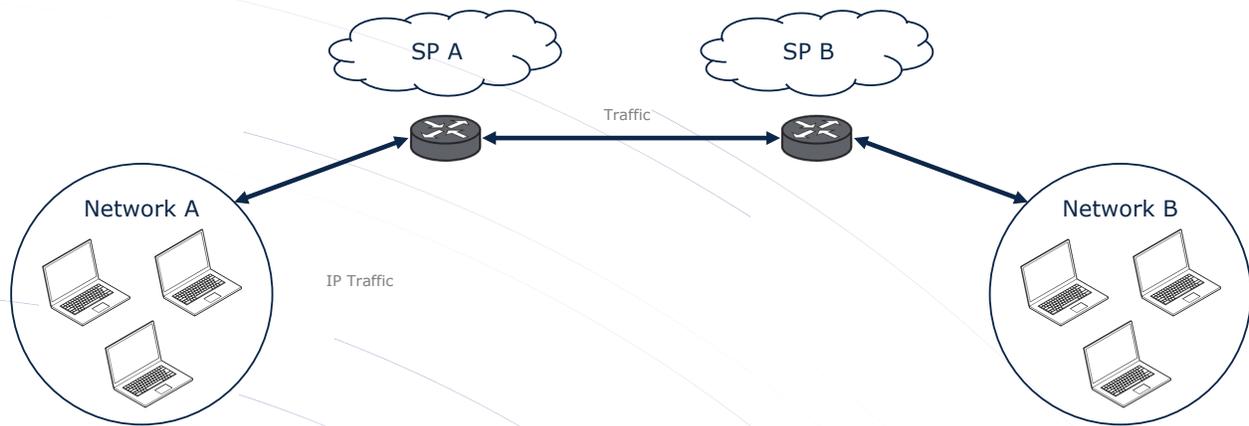


Figure 15: Diagram of 'Private Peering Service'

B.2.2.6. Capacity Services in the International Cable Landing Station

By the means of Capacity Services in the International Cable Landing Station, Service Provider A should be able to access international capacity collocating its active equipment in Service Provider B's International Cable Landing Station. The capacity services may be provided using any suitable technology (for example, but not limited to, Ethernet, MPLS, DWDM).

In the case that, due to justified technical reasons accepted by this Commission, it is not possible to provide the collocation of Service Provider A's active equipment at the International Cable Landing Station, the Service Provider B should provide an alternative collocation mechanism, including at least:

- a. Collocation at Service Provider B's closest technically feasible location (e.g. data center, exchange and point of hand over, etc.). In this case, Service Provider B's

should provide cross-connection services to allow Service Provider A to access to the requested capacity service, without charging Service Provider A any additional cost.

- b. Cross-connection from Service Provider B's International Cable Landing Station to a Service Provider A's facility.

B.2.3. Wholesale broadband access services at a fixed location

B.2.3.1. Wholesale Bitstream Access Service

Wholesale bitstream access service comprises the conveyance of IP messages (packets) from a customer's broadband line (including xDSL and fiber-based infrastructures), across the Service Provider B's network to a point of interconnection with the requesting Service Provider A.

The interface at the point of interconnection can use a Layer 2 technology and Layer 3 IP.

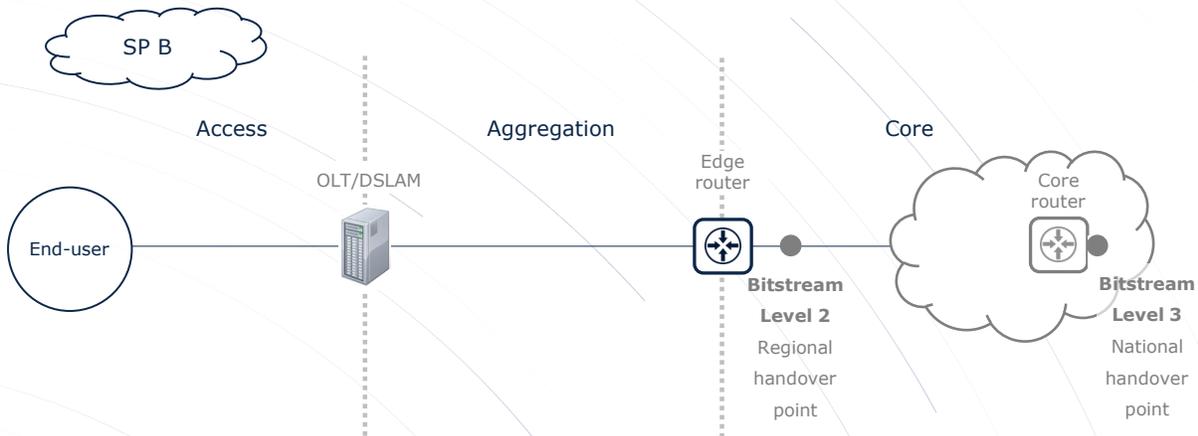


Figure 16: Diagram of 'Wholesale Bitstream Access Service'

B.2.3.2. Virtual Unbundled Local Access (VULA) Service

Virtual Unbundled Local Access (VULA) is a service by which requesting Service Provider A uses a virtual connection provided by Service Provider B, to provide services to subscribers

connected to Service Provider B's next generation access network. VULA service is a form of wholesale bitstream access service in which the interconnection occurs locally at the Optical Line Termination (OLT) location. Thus, virtual unbundling should allow a similar level of flexibility in retail product design as physical unbundling.

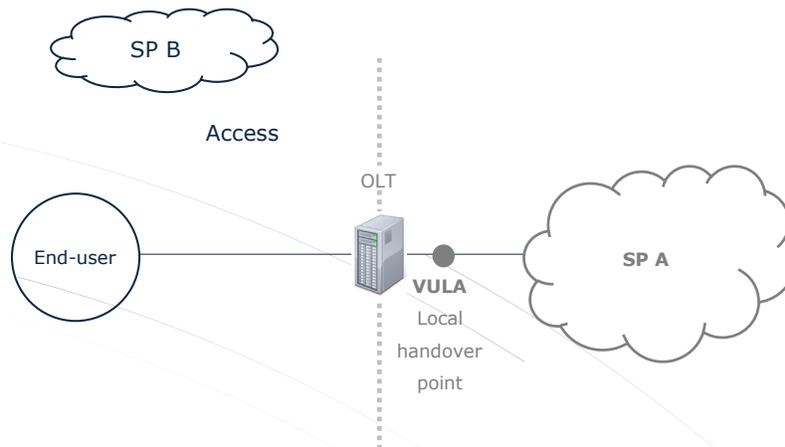


Figure 17: Diagram of 'Virtual Unbundled Local Access (VULA) Service'

B.2.4. Pure Resale of Telecommunications Services

Pure resale is a service where Service Provider A purchases a product from Service Provider B, and, without adding its own network elements, sells it to the client or the beneficiary under its own brand and with its own price plan (e.g. Bulk SMS service).

B.2.5. Wholesale mobile access services

B.2.5.1. MVNO Hosting Service

A mobile virtual network operator (MVNO) hosting service is a service that allows the Service Provider A, without spectrum assignment or a radio access network, to lease mobile network capacity from the Service Provider B and use this capacity to provide MVNO services to its own retail customers. Such MVNO services include, but are not limited to, mobile voice, internet services, SMS, voicemail, multi-media services, (VoLTE),(WiFi calling),(5G) among

others¹. The provision of these MVNO services should follow the relevant regulations issued by the Commission and any other Commission Statutes.

The specific MVNO Hosting Services may vary depending on the type of MVNO and the agreement reached. Some of the services that may be provided by Service Provider B through its network to a Service Provider A provided are:

- a. Voice origination: A voice call that is originated by a Service Provider A's subscriber connected to Service Provider B's radio access network² is conveyed by Service Provider B to Service Provider A in an Interconnection Point. In some cases and types of MVNO, Service Provider B may terminate the call to the receiver (through its own network or based on Wholesale Mobile Termination Services) instead of conveying the call to Service Provider A.
- b. Video-call origination: Equivalent to Voice origination but in the case of video-calls.
- c. SMS origination: Equivalent to Voice origination but in the case of SMS services.
- d. MMS origination: Equivalent to Voice origination but in the case of MMS services.
- e. Termination of services: The termination of a voice call, video-call, SMS or MMS addressed to a Service A's subscriber connected Service Provider B's radio access network².
- f. Bulk SMSs: It may contain services such as the mass sending of SMSs to groups of subscribers, who may be on any service provider, by a Bulk SMS Service licensee utilizing commercial agreements with a Service Provider B or with a Service Provider A which utilizes Service Provider B's radio access network².
- g. Data traffic: Under this service, a Service Provider A's customer connected to Service Provider B's radio access network² is able to use data traffic services. The data traffic may be conveyed to Service Provider A in an Interconnection Point or it can be directly routed to the Internet by Service Provider B, depending on the particular agreement and type of MVNO.

¹ Interconnection Services provided in a technologically neutral manner

² Or to the radio access network of a third party in the area in which Service Provider B is using National Roaming services from such third party for its own users.

B.2.5.2. Wholesale National Roaming Service

Wholesale national roaming service is a service where the Service Provider A's subscribers may be hosted using the facilities and/or services of a second mobile Service Provider B's mobile telecommunications network where these subscribers are out of range of their own mobile telecommunications network coverage.

B.2.5.3. In-Building Solutions (IBS) wholesale services

In-Building Solutions (IBS) wholesale services where the Service Provider A's subscribers may be hosted using dedicated facilities and/or services of a second mobile Service Provider B's mobile telecommunications network in location such as stadiums, stations, airports, buildings, etc.

B.2.6. Collocation

Collocation is a service where a Service Provider B makes available space, electric power and air conditioning in one of its physical facilities (such as its nodes, satellite terrestrial stations or International Cable Landing Stations, data center, exchange and point of hand over, etc.) to Service Provider A for the installation of telecommunications equipment. Service Provider A has 24-hour by 7-day access to the collocation space or room, operate and maintain its own telecommunications equipment. This service also encompasses the cross-connection between the equipment of the same premises.

B.2.7. Local Loop Unbundling (LLU)

Local Loop Unbundling is a service where a Service Provider B leases to a Service Provider A copper pairs. Service Provider A takes full control of the copper pairs from the main distribution frame (MDF) to the subscriber and can provide both voice and data services over all frequencies supported by the copper pairs.

B.2.8. Sub Loop Unbundling (SLU)

Sub Loop Unbundling is the partial unbundling of the local loop by a Service Provider A at a physical point between the MDF and the termination point at the subscriber's premises. Service Provider A can connect at various physical access points in the sub-loop (e.g. street cabinet).

B.2.9. Line Sharing Access Service

Line sharing access is a service where a Service Provider A uses only the non-voice frequency spectrum of the copper pairs provided by a Service Provider B to provide data services. Service Provider B offering the wholesale service continues to provide circuit switched voice telephony service, while requesting Service Provider A delivers services over the same local loop, using the higher part of the frequency spectrum. No aggregation of data streams is provided by Service Provider B.

Annex C. Procedure for the provision of services

C.1. Provisioning Processes

- (1) The RO of a Dominant Service Provider shall fully specify the provisioning processes for Interconnection Services to be provided to the other Service Providers including but not limited to:
- a. Network planning;
 - b. Traffic forecasts;
 - c. Ordering of Interconnection Services and lead times;
 - d. Implementation.

Network Planning

- (2) A Dominant Service Provider shall specify the network planning process in a RO including but not limited to:
- a. Planning of new interconnection links;
 - b. Removal of interconnection links;
 - c. Interconnection capacity forecasts;
 - d. Transport network interconnection.
- (3) Service Providers are required to exchange forecast information to ensure sufficient capacity is available when needed.
- (4) Service Providers shall agree on the approach for the management of capacity.

Forecasts

- (5) Service Providers requesting or using Interconnection Services shall provide a rolling two-year forecast to the Interconnection Services provider. The rolling forecast shall be updated every six months.
- (6) The RO of a Dominant Service Provider shall identify the detailed requirements for the provision of traffic forecasts.

Collocation

- (7) Service Providers with existing telecommunications facilities shall allow other Service Providers to collocate their telecommunications transmission systems at their telecommunications facilities as required for the provision of Interconnection Services under these Regulations, where such collocation is economically feasible and no major additional construction work is required.
- (8) The accommodation of equipment required for Interconnection Services at sites at which collocation is already established shall be permitted where technically feasible.

Ordering Procedures

- (9) A RO shall provide detailed procedures for the ordering of Interconnection Services.
- (10) Orders may be completed and transmitted only in a specific template, available electronically. The template attached to these Regulations as Annex D shall be considered as the minimum content to be included.
- (11) A Dominant Service Provider shall respond within 10 working days at the latest to a request for Interconnection Services indicating acceptance or rejection.
- (12) Where the request is not accepted, a written response, indicating the reasons as well as an appropriate alternative proposal, shall be provided to the Service Provider making the request and a copy of the response provided to the Commission.

- (13) CITC has the right to define the mechanism and the procedures of the services requests \ orders and follow up process.

Lead Times

- (14) A Dominant Service Provider shall identify in its RO or, as the case may be, the expected lead times associated with the ordering of Interconnection Services.

Implementation

- (15) The Implementation process defined in the RO shall cover installation, including construction and any civil works which may be required, testing and commissioning, and shall ensure that the quality of service standards are met.
- (16) Dominant Service Providers shall provide terms and conditions for Service Providers to request access to the facilities required for Interconnection Services in order to install new, or maintain or operate existing, equipment in the Dominant Service Provider's shared facilities. Works on reserved facilities must be requested at least 2 days before the target date and confirmed by the Dominant Service Provider within 1 day after the reception of such request. Qualified personnel from the Service Providers must be allowed to perform such works autonomously unless there are specific and exceptional security concerns that deem this supervised work necessary.
- (17) Dominant Service Providers shall provide the conditions under which authorized staff working on behalf of the Service Providers is permitted to facilities of the Dominant Service Provider unsupervised to conduct a survey, install or repair cables or equipment and conduct decongestion, enhancement or perform bypass works on existing infrastructures in the context of Interconnection Services under these Regulations. The Dominant Service Provider shall report all details about the works carried out in its reserved facilities within 5 days after their completion and will be responsible for any damage or security breach caused during the installation works.

- (18) For the commissioning and handover of an interconnection or access service, there shall be a formal sign-off by both Service Providers to indicate that the service has been provided to the agreed standards.

C.2. Operations and Maintenance Processes

- (1) The RO of a Dominant Service Provider shall specify all the operations and maintenance processes associated with interconnection including but not limited to:
- a. Network management;
 - b. Traffic management;
 - c. Routing management;
 - d. Fault management;
 - e. Operational testing;
 - f. Safety and system protection.

Network Management

- (2) A Dominant Service Provider shall ensure that one or more Network Operation Centers (NOCs) are operational 24/7 for management of the networks used for Interconnection Services.

Traffic Management

- (3) All interconnected Service Providers must have Network Traffic Management (NTM) capabilities for real-time surveillance and control of traffic flow in order to maximize the use of available capacity and maintain quality of service standards.
- (4) The RO of a Dominant Service Provider shall specify procedures for dealing with NTM queries and problems.

- (5) Service Providers shall be responsible for measuring and monitoring both the traffic and the quality of service on all interconnection links in their network. A Service Provider may implement appropriate traffic controls within its own networks to safeguard against problems detected in the interconnected network of another Service Provider. In such case, fault management procedures shall apply.

Routing Management

- (6) Service Providers must manage and jointly plan the routing of outgoing and incoming calls and data traffic in their networks up to the Point of Interconnection.
- (7) The RO of a Dominant Service Provider shall provide the detailed framework for routing management.

Fault Management

- (8) A Dominant Service Provider shall describe in its RO the procedures for fault management and related timeframes including:
- a. Contact details and escalation process for fault reporting;
 - b. Detection of faults;
 - c. Processing of faults.
- (9) All Service Providers are required to provide 24/7 contact points for reporting of faults.
- (10) A Service Provider detecting a possible fault that may affect Interconnection Services shall inform the other interconnected Service Provider immediately. This shall be done irrespective of whether or not the fault is within the detecting Service Provider's network.
- (11) Following a reported fault, Service Providers shall determine who is responsible for the fault and proceed to clear the fault and restore service.

- (12) In the event of a fault, all concerned Service Providers shall share as much information as may be required to resolve the problem and restore service to normal operation.
- (13) Service Providers should develop and operate a fault reporting and tracking system.

Operational Testing

- (14) Operational and maintenance testing shall be undertaken with minimal impact on traffic flow. The scheduling shall be mutually agreed and testing shall preferably take place at the lowest traffic period of the day.

Safety and System Protection

- (15) Service Providers are responsible for the safety and operation of their own systems.
- (16) Service Providers have an obligation to protect the integrity and ensure the safe operation of their interconnected networks and shall adopt measures for providing safety protection to all personnel and users.
- (17) A Dominant Service Provider's RO shall include safety standards and procedures to ensure the safety of the staff of another Service Provider that works at a Dominant Service Provider's site. The range of safety standards shall cover physical safety, electrical safety, electromagnetic radiation and any other aspects required by national law, industry standards or Commission Statutes.

Billing Processes

- (18) The RO of a Dominant Service Provider shall fully describe the billing processes including but not limited to:
 - a. Charging Data Records;
 - b. Charging principles for Interconnection Services;
 - c. Payment process;

d. Billing reconciliation.

- (19) Service Providers offering Interconnection Services shall have the capability to measure, record and bill the charges for these services.
- (20) In case the billing of a Service depends on the traffic exchanged, billing shall be based on charging data records (CDR) as inputs to the billing system.
- (21) The billing party shall store billing data for a period of at least one year. The data shall be in easily retrievable format if required for recalculation of any due amounts.
- (22) A Dominant Service Provider's RO shall document a formal payment process including the billing and payment periods, invoice format, invoice queries, transmittal of invoice and other payment details such as settlements.
- (23) A Dominant Service Provider's RO shall describe the reconciliation process for billing.
- (24) The reconciliation process shall be undertaken in good faith and interconnecting Service Providers shall work together to reach a satisfactory resolution of billing issues.
- (25) A Dominant Service Provider's RO shall also define procedures for handling unresolved billing issues.

Annex D. Template for Interconnection Orders

TEMPLATE FOR INTERCONNECTION ORDERS	
CONTACT INFORMATION OF THE REQUESTING SERVICE PROVIDER	
Entity name:	
Address:	
CONTACT PERSON OF THE REQUESTING SERVICE PROVIDER	
Name:	
Position:	
Telephone:	
E-mail:	
OVERVIEW OF REQUESTED SERVICES (select as many services as needed):	
<input type="checkbox"/> Traffic conveyance services (additionally, please specify the type of service, e.g. Interconnection Link Service)	
<input type="checkbox"/> Leased lines services and bandwidth capacity (additionally, please specify the type of service, e.g. Wholesale National Terminating Segments of Leased Lines Service)	
<input type="checkbox"/> Wholesale broadband access services at a fixed location	
<input type="checkbox"/> Pure Resale of Telecommunications Services	
<input type="checkbox"/> Wholesale mobile access services	
<input type="checkbox"/> Collocation	
<input type="checkbox"/> Local Loop Unbundling (LLU)	
<input type="checkbox"/> Sub Loop Unbundling (SLU)	
<input type="checkbox"/> Line Sharing Access Service	
<input type="checkbox"/> Others (please specify)	
DESCRIPTION OF THE REQUESTED SERVICES (provide individual descriptions for each of the selected services)	
<u>Detailed description and capacity requirements for the requested services (provide diagrams as needed):</u>	
ADDITIONAL INFORMATION (IF ANY):	
SIGNATURE:	
DATE:	



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