



**SMS SERVICE SCHEDULE to AA.80
1.0
July 2008**

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Security Classification Category (see next page)	
Unrestricted to	X

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Feedback

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Table of Contents

1	Definitions	5
2	Service Definition	9
3	Obligations.....	10
4	Termination of Service	11
5	Suspension	11
6	Data Privacy, Telecommunications Laws & Regulations and Lawful Interception.....	12
7	Participating Election Process	12
8	Mobile Number Portability	14
9	Transparency.....	14
10	Testing Requirements	15
11	Service Contact Details.....	15
	ANNEX 1 – BILLING.....	17
	ANNEX 2 – TECHNICAL.....	21
	ANNEX 3 - SLA.....	25

Between

<<Service Provider>>

having its registered address:

.....
(Hereinafter referred to as "Party A")

And

<<IPX Provider>>

having its registered address:

.....
(Hereinafter referred to as "Party B")

WHEREAS

The Parties have executed an IP Packet eXchange (IPX) Agreement on <<DATE>>.

The Parties have expressed their wish to enter into an SMS Interworking agreement.

The Parties agree to establish this Addendum on the terms and conditions as stated below.

IP Packet eXchange (IPX) Service Schedule for SMS IW

1 DEFINITIONS

For the purpose of this Agreement the following terms shall have the meanings set forth in their respective definitions, unless a different meaning is called for in the context of another provision in the Agreement:

- 1.1 **"3GPP Standard"** means 3GPP TS 23.040, as amended from time to time;
- 1.2 **"Agreement"** shall mean this Agreement for SMS Hubbing Service;
- 1.3 **"Bulk SMS Data"** shall mean billing data transferred by Service Provider to an Elected Participating Operator which relates to a SMS covered by this Agreement.
- 1.4 **"Charges"** means the Participating Operator Termination Charges, the Service Provider Termination Charges and the SMS Transit Charges;
- 1.5 **"Chargeable Event"** Each Party should charge the SMS received from the other Party upon Successful SMS Delivery. Concatenated SMS are billed as separate standard SMS of 160 characters. SMS sent to multiple recipients shall be billed separately for each recipient;
- 1.6 **"Commencement Date"** After the effective date, as soon as SMS traffic is exchanged and recorded in the billing system the service will be deemed to have started. This Commencement Date is applicable per Elected Participant Operator.
- 1.7 **"Service Provider"** means a Network Operator that has a commercial relationship with the SMS IPX Provider in order to have SMS Interworking with Elected Participating Operators;
- 1.8 **"Service Provider Service Parameters"** means the service parameters and service restrictions relating to the SMS Termination Service provided by the Service Provider as set out in Annex 7;
- 1.9 **"Service Provider System"** means the communications systems operated by the Service Provider;
- 1.10 **"Service Provider Termination Charges"** or **"Participating Operator Termination Charges"** means the Service Provider's charges or Participating Operator's charges for the provision of the SMS Termination Services
- 1.11 **"Confidential Information"** means all financial, business and technical or other data and all other information (whether written, oral or in electronic form or on magnetic or other media) concerning the business and affairs of a Party that the other Party obtains, receives or has access to as a result of the discussions leading up to or the entering into or the performance of this Agreement and shall include the content of this Agreement;
- 1.12 **"Customers"** shall mean a subscriber or any entity of the retail communications services offered by the Service Provider or any Participating Operator, capable of originating an SMS MO and/or receiving an SMS MT.;

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- 1.13 “Destination”** means any Elected Participating Operator on whose network the recipient Customer is registered and thus the SMS traffic has to be terminated;
- 1.14 “Effective Date”** means the date (dd/mm/yy) of signature of this Schedule and when this Schedule enters into force;
- 1.15 “Elected”** in respect of a Participating Operator means elected as SMS Interworking Partner by the Service Provider in accordance with the procedures set out in Article 7;
- 1.16 “Group”** in respect of either the Service Provider or the IPX PROVIDER means such company together with its subsidiaries and its holding company and all other subsidiaries of such holding company and for these purposes a company is a ‘subsidiary’ of another company (it’s holding company’) if that other company:
- Holds a majority of the voting rights in it;
 - Is a member of it and has the right to appoint or remove a majority of its board of directors;
 - Is a member of it and controls alone or pursuant to an agreement with other shareholders or members, a majority of voting rights in it;
 - Or if it is a subsidiary of a company which is itself a subsidiary (directly or indirectly) of that other company;
- 1.17 “GSM Association Permanent Reference Documents”** or **“GSMA PRD”** means a document noted as such by the EMC to the General Assembly and listed as such by Headquarters on the list of Permanent Reference Documents;
- 1.18 “Invoicing Currency”** means the currency in which Participating Operator Termination Charges are to be invoiced and paid as set out in Annex 1?;
- 1.19 “Invoice Period”** means 00:00:00 AM (GMT) on the first day of a calendar month until 23:59:59 PM (GMT) on the last day of a calendar month;
- 1.20 “Key Performance Indicator (KPI)”** means any parameter out of those indicated in the Annex 13, to be used to measure the level of performance of the SMS Transit Service offered by the IPX PROVIDER.
- 1.21 “Operational Procedures”** means the operational procedures set out in Annex 2
- 1.22 “Originating Device”** in respect of an SMS means a handset or terminal device registered on the Service Provider System or on a Participating Operator System from which that SMS originates;
- 1.23 “Originating Operator”** in respect of an SMS means either the Service Provider or a Participating Operator (as the context requires) upon whose System the Originating Device in respect of that SMS is registered;
- 1.24 “Participating Operator”** means an Operator which has entered into a Participating Operator Agreement with the IPX PROVIDER or with a Third Party IPX PROVIDER and listed in Annex 11 as amended or replaced from time to time;
- 1.25 “Participating Operator Agreement”** means an agreement between the IPX PROVIDER and a Participating Service Provider for the provision of interworking services in respect of SMSs;

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- 1.26 “Participating Operator Service Parameters”** means the service parameters and service restrictions relating to the SMS Termination Service provided by a Participating Operator as set out in Annex 2
- 1.27 “Participating Operator System”** means the public telecommunications system operated by a Participating Operator;
- 1.28 “Performance Reporting or QoS report”** meaning the IPX PROVIDER report to the Service Provider on the actual performance of its SMS Hub Service, based on the KPIs defined in the Annex 13 Service Level Agreement in order to follow the fulfilment of such SLA;
- 1.29 “Quality” or “QoS”** means the level of performance of the Service as per the provisions of Annex 3.
- 1.30 “Recipient Device”** in respect of an SMS means a handset or terminal device registered on the Service Provider System or on an Elected Participating Operator System to which that SMS is addressed;
- 1.31 “Recipient Service Provider”** in respect of an SMS means either the Service Provider or the Elected Participating Operator (as the context admits or requires) upon whose System the Recipient Device has a subscription;
- 1.32 “Scheduled Maintenance Window”** in accordance with the provisions of Annex 3, it is a maximum half-hour-per-day maintenance window for which the IPX PROVIDER notifies the Service Provider in advance with a minimum 15 days prior written notice to the customer. Service availability and performance may be affected during this window however the IPX PROVIDER shall agree with the Service Provider on a timeframe minimizing Service impact. Cumulated Maintenance time shall not exceed a maximum amount of 14 hours per year. The Service Provider reserves its right to refuse a scheduled event given an important reason. A scheduled event is only approved and may be carried out if both partners agree on it, in accordance with the provisions of Annex 3;
- 1.33 “Service Credit”** means a compensation or remedy provided by the IPX PROVIDER to the Service Provider, following a case of no compliance with a certain level of performance (KPI), as set out in Annex 3.
- 1.34 “Service Level Agreement”** means the service level agreement set out in the Annex 3.
- 1.35 “Short Message” or “SMS”** shall mean a short message service conforming to GSM 03.40 enabling text message of up to 160 characters to be transferred and/or originated, on compatible communications devices and fixed devices connected to the systems of the Parties;
- 1.36 “SMS-C”** means the function responsible for the relaying and store-and-forwarding of an SMS between a Service Provider and an Elected Participating Operator.
- 1.37 “SMS-G”** means the gateway operated by the IPX PROVIDER to offer the Service to a Service Provider and the Participating Operators.
- 1.38 “IPX PROVIDER System”** means the communications systems operated by the IPX PROVIDER in connection with the provision of the SMS HUB Service and associated services;

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- 1.39 "IPX PROVIDER Transit Charges"** means the IPX PROVIDER's charges for the provision of the SMS HUB Service as set out in Annex 1 as amended from time to time;
- 1.40 "SMS MO"** shall mean the transfer of an SMS from the Originating Operator's Customer through any of the SMS-Cs set out in this Schedule.
- 1.41 "SMS MT"** shall mean the transfer of an SMS from the SMS-G from the IPX Provider to the Recipient Operator's Customer.
- 1.42 "SMS Hubbing Service"** means the SMS Transit Service and the SMS Termination Service;
- 1.43 "SMS Interworking"** is the relationship between the Service Provider and the Elected Participating Operator(s) for the exchange of SMS, established through the Service offered by the IPX PROVIDER;
- 1.44 "SMS Termination Service"** means:
- The termination of SMS onto a Recipient Device, provided by the Service Provider pursuant to this Agreement;
 - and/or
 - The termination of SMS onto a Recipient Device, provided by an Elected Participating Operator to be obtained by the IPX PROVIDER and offered to the Service Provider pursuant to this Agreement;
- 1.45 "SMS Transit Service"** means: The transit of SMS between the Service Provider and the Elected Participating Operators, provided by the IPX PROVIDER to the Service Provider pursuant to this Agreement, or provided by the IPX PROVIDER to a Participating Operator pursuant to a Participating Operator Agreement
- 1.46 "Successful Routing"** shall be interpreted as follows, in line with ETSI TS 102 250-5 V.1.1.1:
- In respect of SMS routed from the Originating Operator to the Recipient Operator via the IPX PROVIDER only (and for the avoidance of doubt, not via a Third Party IPX PROVIDER in addition), "Successful Routing" shall be deemed to have occurred upon receipt of delivery report by the IPX PROVIDER within 175 seconds of the transmission of the SMS in question; or
- In respect of SMS routed from the Originating Operator to the Recipient Operator via Third Party/ies IPX PROVIDER and the IPX PROVIDER, "Successful Routing" shall be deemed to have occurred in respect of an SMS if delivery report issued by the Second IPX PROVIDER is received by the First IPX PROVIDER within 175 seconds of the transmission of the SMS in question confirming receipt by the Second IPX PROVIDER of a delivery report from the Recipient Operator (and for these purposes "First IPX PROVIDER" shall mean whichever of the IPX PROVIDER and the Third Party IPX PROVIDER receives the SMS in question directly from the Originating Operator and "Second IPX PROVIDER" shall mean whichever of the IPX PROVIDER and the Third Party IPX PROVIDER receives the SMS in question from the First IPX PROVIDER for delivery to the Recipient Operator); same will apply in the case of a third IPX PROVIDER involved in the traffic delivery.
- 1.47 "Successfully Routed"** shall be interpreted accordingly;

- 1.48 “Successful SMS Delivery”** If the SMS is delivered via SIGTRAN, Successful delivery is confirmed by a Successful MT Forward SM Acknowledgement sent by the Terminating Operator (or by the Third Party’s IPX PROVIDER involved in the traffic termination) to the Service Provider’s IPX PROVIDER; This confirms that the SM has been successfully delivered onto the Recipient Device. If the SMS is delivered via SMPP, Successful Delivery is confirmed by a Submit_SM_RESP sent by the Terminating Operator (or by the Third Party’s IPX PROVIDER involved in the traffic termination) to the Service Provider’s IPX PROVIDER. This confirms that the SM has been successfully delivered on the Terminating Operator’s SMSC not on the Recipient Device;
- 1.49 “System”** means the IPX PROVIDER System, the Service Provider System and/or a Participating Operator System as the context may require and “Systems” shall be construed accordingly;
- 1.50 “Technical Specifications”** shall mean the technical specifications defined and adopted by 3GPP (Third Generation Partnership Project), including the ETSI technical specifications defined and adopted by 3GPP;
- 1.51 “Test Plan”** means the test plan set out in ??as described as such;
- 1.52 “Third Party IPX PROVIDER”** means a provider of an SMS transit service (other than the IPX PROVIDER);
- 1.53 “Third Party IPX PROVIDER System”** means the communications system operated by a Third Party IPX PROVIDER in connection with the provision of the SMS transit service provided by the IPX PROVIDER to the Service Provider;
- 1.54 “Unsolicited Messages”** shall mean:
- A situation where Commercial SMS or other SMS are sent to the Service Provider’s Customers or to the Participating Operator’s Customers without their prior consent, as required by national law and/or
 - A situation where Commercial SMS or other SMS are sent to the Service Provider’s Customers or to the Participating Operator’s Customers encouraging them directly or indirectly to call or send a SMS or other electronic communication to a premium rate number and/or
 - A situation where any unlawful or fraudulent SMS are sent to the Service Provider’s Customers or to the Participating Operator’s Customers.
- For the purpose of this Schedule “commercial SMS” means SMS designed to promote, directly or indirectly, the goods, services or image of any person pursuing a commercial activity or exercising a regulated profession.

2 SERVICE DEFINITION

The IPX PROVIDER operates the SMS Hubbing Service (the Service) as defined in Article 1 (Definitions) which enables the international transit of SMS sent between telecommunications networks.

Upon the terms and subject to the conditions set out in this Schedule for International SMS Hubbing Services (the Agreement’), the Parties wish to establish terms and conditions for:

The supply of the Service and other associated services by the IPX PROVIDER to the Service Provider whereby the IPX PROVIDER agrees to convey SMS received from the Service Provider System to the Participating Operator's Systems run by each Participating Operator either directly or via Third Party/ies IPX PROVIDER System for delivery to a Recipient Device; and

The provision of SMS Termination Services and other associated services by the Service Provider to the IPX PROVIDER whereby the Service Provider agrees to convey SMS received from the IPX PROVIDER System to a Recipient Device and whereas (for the avoidance of doubt) SMS sent from the IPX PROVIDER System to the Service Provider System may be:

Data received by the IPX PROVIDER from the Participating Operator System of a Participating Operator Elected by the Service Provider; or

Data received by the IPX PROVIDER System from a Participating Operator Elected by the Service Provider via a Third Party IPX PROVIDER System.

The IPX PROVIDER shall, in its own name and on its own account and behalf:

- Provide to the Service Provider the Service in accordance with the provisions set out in this Schedule (including the Annexes hereto);
- Procure the necessary additional SMS Hubbing services from Third Party IPX PROVIDERS;

In order to facilitate the Successful Routing of SMS (i) from the Service Provider System to the Participating Operator System of a Participating Operator which elects to receive SMS traffic from the Service Provider by means of the Service provided by the IPX PROVIDER; and (ii) from the Participating Operator System of a Participating Operator Elected by the Service Provider to the Service Provider System, with a level of performance in line with the Service Level Agreement attached hereto.

The Service Provider shall use the Service in accordance with the applicable Operational Procedures and Technical Description

The Service Provider shall provide to the IPX PROVIDER the Service Provider's SMS Termination Service, e.g. the Interconnection and Operational Procedures in relation to SMS received from the IPX PROVIDER in respect of which an Elected Participating Operator is the Originating Operator.

The list of Participating Operators Elected by the Service Provider shall be updated on a monthly basis in accordance with the procedures described in Annex 2 hereto.

The IPX PROVIDER has responsibility in the end-to-end service delivery. Therefore the IPX PROVIDER chooses the routing to be used for the delivery of the Service Provider's traffic up to the Elected Participating Operator's network, provided that the QoS levels remain unchanged.

3 OBLIGATIONS

The Parties shall connect and keep connected the IPX PROVIDER System and the Service Provider System in accordance with the provisions of this Schedule.

The IPX PROVIDER may provide the Service based on both kind of connectivity/technology: SMPP or SIGTRAN connectivity technology.

The Parties shall mutually determine and agree upon the appropriate method of interconnection, i.e. SIGTRAN or SMPP.

The responsibility over the connection between the IPX PROVIDER and the Service Provider will be dependent upon the way such connection has been agreed by the Parties and consequently established.

The level of performance of the connectivity between the Service Provider and the IPX PROVIDER is covered by the SLA included in annex 3

Parties shall comply with the SMS Test Plan as described in Annex 2

Neither Party shall send any SMS to the other Party's System which originates from a third party's Service Provider other than:

- (In the case of the IPX Provider) SMS originating from a End user of a Participating Service Provider who is Elected by the Service Provider; and
- (In the case of the Service Provider) a mobile virtual network operator with whom the Service Provider has entered into an agreement to provide mobile virtual network services by means of the Service Provider.

Nothing in this Schedule shall be construed as imposing any requirement or obligation upon the Service Provider to convey SMS to the IPX Provider.

4 TERMINATION OF SERVICE

All matters relating to the termination of the Agreement refer to Section 21 in the Main Body of this agreement.

The termination of the SMS Interworking Service shall be subject to a notice period of no less than ninety (90) days. Other notification shall be agreed between the IPX Provider, Service Provider and Participating Service Provider based in accordance to the requirements based on the Service specific requirements.

5 SUSPENSION

All matters relating to the suspension of the Agreement refer to Section 5 in the Main Body of this agreement.

6 DATA PRIVACY, TELECOMMUNICATIONS LAWS & REGULATIONS AND LAWFUL INTERCEPTION

[Please list National Data Privacy, Telecommunications Laws & Regulations and Lawful Interception requirements which have impact on the provision of SMS Service under this Agreement]

Each Party shall comply with any applicable data protection laws and laws and regulations of telecommunications services (including telecom secrecy and lawful interception) governing the provision of the Service and shall, irrespective of any Article hereto, indemnify and hold harmless the other Party from and against all costs or expenses of any kind arising out of any claim or demand brought by any person as a result of any breach or alleged breach of such data protection laws and telecommunications laws or regulations.

The Parties shall comply with the provisions of sections 14 &15 from the main body in respect of data privacy and telecommunications laws and regulations.

Notwithstanding this Article, the Service Provider will give access to the IPX PROVIDER to the information stored in the Service Provider's HLR, whenever such access is necessary for a proper functionality of the Service e.g. the IPX PROVIDER asking for SRI needed to route the Service Provider's traffic. Access by the IPX PROVIDER to the Service Provider's HLR shall be limited to the purpose of getting the sole information necessary to deliver the Service to the Service Provider.

7 PARTICIPATING ELECTION PROCESS

This Agreement is intended to include the relationship required between the IPX PROVIDER and any Third Party IPX PROVIDER needed to convey the Service Provider's traffic to/from all Elected Participating Operators' networks, in order to ensure the proper functioning of the SMS Interworking between Service Provider and its Elected Participating Operators.

All Participating Operators, Elected or not by the Service Provider, and relevant information such as the termination charges and the service parameters are listed in the Annexes to this Agreement.

No less than seven (7) days before the beginning of each Invoice Period, the IPX PROVIDER shall provide the Service Provider with a list setting out the following information:

- Any Participating Operators accessible through the IPX PROVIDER directly or indirectly (i.e. through Third Party/ies IPX PROVIDER) where the new Participating Operators are specifically highlighted;
- All the Participating Operator Termination Charges (including any new Participating Operators):

- In the currency of the Participating Operator; and
- In the Invoicing Currency;
- together with the exchange rate used for any necessary conversions from the currency of the Participating Operator to the Invoicing Currency.

The IPX PROVIDER shall include with the list referred to above in this section, all available details of any existing and new Participating Operator including Termination Charges and Service Parameters with any relevant proposed changes.

With respect to each Invoice Period, the currency exchange rate to be used by the IPX PROVIDER to make any necessary currency conversions with respect to any Participating Operator Termination Charges shall be the closing IMF exchange rate on the eighth (8th) day prior to the beginning of that Invoice Period as published on the following IMF website http://www.imf.org/external/np/fin/rates/param_rms_mth.cfm.

In the event that any list issued by the IPX PROVIDER contains details of any new Participating Operator, Annexes 2 or the list referred to in this Article hereto shall be deemed to have been amended following the update sent by the IPX PROVIDER to the Service Provider, in order to include the details of that new Participating Operator together with the Service Parameters and the Participating Operator Termination Charges quoted in the currency of the Participating Operator;

In response to the receipt by the IPX PROVIDER of the list mentioned above in this section, the Service Provider may :

- A) X days prior to the commencement of the Invoice Period to which the list relates, notify the IPX PROVIDER of any Participating Operator contained in the list in respect of which the Service Provider does wish to have SMS Interworking activated via the IPX PROVIDER. Participating Operators shall be deemed to be Elected for the purposes of this Agreement provided that such a notice is given in respect of them by the Service Provider to the IPX PROVIDER prior to the commencement of the Invoice Period to which the list relates,
- or
- B) X days prior to the commencement of the Invoice Period to which the list relates, notify the IPX PROVIDER of any Participating Operator contained in the list in respect of which the Service Provider does not wish to have SMS Interworking activated via the IPX PROVIDER. Participating Operators shall be deemed to be Elected for the purposes of this Agreement provided that such a notice is not given in respect of them by the Service Provider to the IPX PROVIDER prior to the commencement of the Invoice Period to which the list relates.

The choice between A (OPT-IN Mechanism) or B. (OPT-OUT Mechanism) is agreed between the Service Provider and the IPX PROVIDER at the signature of this Agreement and can be changed at any time upon a new written agreement between the Parties.

In respect of the establishment of SMS Interworking between the Service Provider and a new Participating Operator Elected by the Service Provider:

- the IPX PROVIDER shall commence the provision of the Service on and from beginning of the Invoice Period following the election of the Participating Operator

notified by the Service Provider to the IPX PROVIDER (Service Commencement Date) and may commence charging for such services on and from the same date;

- the Service Provider shall (without prejudice to any other obligations it may have under this Agreement) be under no obligation to provide the Service Provider's SMS Termination Service in respect of that Elected Participating Operator unless and until the Service Commencement Date has passed.

The Service Provider may at any time notify the IPX PROVIDER that it wishes to have SMS Interworking with a Participating Operator which is not already (at the time of such notice) an Elected Participating Operator. In such a case, the provisions of this Article shall apply, provided that the Parties will agree on a specific Service Commencement Date and provided always that the Parties shall each be able to commence charging in respect of traffic exchanged between the Service Provider and the Elected Participating Operator in question, as soon as they commence the SMS Interworking.

In any circumstances where a Participating Operator is added to the list of Participating Operators Elected by the Service Provider, Annex 2 or the list referred to in this Article shall be deemed to have been amended accordingly.

In respect of any Participating Operator Elected by the Service Provider, the Service Provider may cease the provision of the Service Provider's SMS Termination Service at any time upon at least eighty (80) days' prior written notice to the IPX PROVIDER. With effect from the expiry of such notice, the Service Provider shall have no further obligation to provide the Service Provider's SMS Termination Service in respect of that Elected Participating Operator (unless and until the Service Provider shall Elect that Participating Operator again in accordance with the provisions of this Article) and the Parties shall be deemed to have amended the list of Participating Operators Elected by the Service Provider accordingly.

The IPX PROVIDER may remove Participating Operators from the list of Participating Operators set out in Annex 2 or the list referred to in this Article upon at least sixty (60) days' prior notice in writing to the Service Provider. Upon the expiry of such a notice:

- Neither Party shall have any further obligation to provide the Service in respect of the Participating Operator specified in the notice; and
- The Parties shall be deemed to have amended this Agreement by deleting references to that Participating Operator from the list.

8 MOBILE NUMBER PORTABILITY

(For further study)

9 TRANSPARENCY

The IPX PROVIDER will transport and handle the Service Provider's traffic end-to-end in a transparent way, i.e. with full transparency on the routing and on the charging.

9.1 Transparency on the routing:

The routing used by the IPX PROVIDER to deliver the Service Provider's traffic must be made transparent to the Service Provider (either online or offline). All parties involved in the delivery of the Service Provider's traffic shall be fully visible to the Service Provider.

9.2 Transparency on the charging:

The pricing applied by the IPX PROVIDER to the Service Provider will transparently show all price components. This means that the Elected Participating Operators' Termination fees and the SMS Transit Charge shall be fully visible to the Service Provider.

This means that the IPX PROVIDER shall not combine the Elected Participating Operator's Termination fees and the SMS Transit charges related to the supply of the Service to the Service Provider on a per country or regional basis, e.g. blended rates.

10 TESTING REQUIREMENTS

The IPX shall perform all end-to-end tests described in the Annex 2 and will ensure that the Service implemented via the IPX between the Service Provider and the Elected Participating Service Providers is functioning correctly.

The Service Provider and an Elected Participating Service Provider shall provide all necessary tools in order to support end-to-end testing.

11 SERVICE CONTACT DETAILS

Notices and notifications relevant to the implementation and operation of this Service and listed in this Service Schedule will be considered as duly executed when exchanged between the Service Provider and the IPX Provider at the respective contact points defined here below.

Service Provider Contact Points:

<Operator>
<Additional info.>
<Postal address>
<Postcode>
<COUNTRY>
Contact person:
<Name>
Telephone: <+xx xx xx xx xx> (Operator: <+xx xx xx xx xx>)
Fax: <+xx xx xx xx xx>
Internet Address: xxx.xxxx@xxx.xxx.xx
Service hours: <.....>

IPX Provider Contact Points:

<Operator>
<Additional info.>
<Postal address>
<Postcode>
<COUNTRY>
Contact person:
<Name>
Telephone: <+xx xx xx xx xx> (Operator: <+xx xx xx xx xx>)
Fax: <+xx xx xx xx xx>
Internet Address: xxx.xxxx@xxx.xxx.xx
Service hours: <.....>

12 SERVICE SCHEDULE SIGNATURE

IN WITNESS WHEREOF the Parties have caused this Agreement to be executed by their duly authorised representatives on the date(s) shown below.

IPX Provider

Service Provider

Signature

Signature

Printed

Printed

Title

Title

Date

Date

ANNEX 1 – BILLING

SMS Interworking scenarios, Charges and Payment

1. SMS Interworking (SMS MT) Scenarios:

- A) SMS MT sent by IPX PROVIDER to Service Provider network
 - Scenario 1: SMS MT sent by IPX PROVIDER's SMS-G to Service Provider's Customers on Service Provider's network.
 - Scenario 2: SMS sent by IPX PROVIDER's SMS-G to Service Provider's Customers, roaming in another Operator.
- B) SMS MT sent by Service Provider to IPX PROVIDER:
 - Scenario 3: SMS MT are sent by Service Provider to IPX PROVIDER and delivered by IPX PROVIDER to the Elected Participating Operator in case the recipient Customer on the Elected Participating Operator's network.
 - Scenario 4: SMS MT are sent by Service Provider to IPX PROVIDER and delivered by IPX PROVIDER or a Third Party IPX PROVIDER to the Operator (actual destination network) where the recipient Customer of the Elected Participating Operator is roaming.

The following charges shall apply:

- Scenario 1: The Service Provider Termination Charge as set out within this Annex.
- Scenario 2: The Service Provider Termination Charge set out in this Annex should not be applied as this scenario involves international roaming SMS traffic which is governed by the existing Permanent Reference Documents ("PRDs") of the Billing, Accounting and Roaming Group ("BARG") and the relevant charging principles of the International GSM Roaming Agreement between the mobile networks involved. If the Service Provider decides to charge IPX PROVIDER for this scenario of international roaming, because the Operator actually terminating the SMS traffic is charging the Service Provider for termination of this scenario, the IPX PROVIDER will revert such cost to the Elected Participating Operator from whose network the traffic has been originated.
- Scenario 3: The SMS IPX PROVIDER Transit Charges as set out in this Annex and the Termination Charges set out in this Annex or in the list referred to in Article 7 of the Elected Participating Operators terminating the traffic.
- Scenario 4: The SMS IPX PROVIDER Transit Charges as set out in this Annex and the Elected Participating Operator Termination Charge set out in this Annex or in the list referred to in Article 7 should not be

applied as this scenario involves international roaming SMS traffic which is governed by the existing Permanent Reference Documents ("PRDs") of the Billing, Accounting and Roaming Group ("BARG") and the relevant charging principles of the International GSM Roaming Agreement between the mobile networks involved. If the Elected Participating Operator decides to charge IPX PROVIDER (directly or via a Third Party IPX PROVIDER) for this scenario of international roaming, because the Operator actually terminating the SMS traffic is charging the Elected Participating Operator for termination of this scenario, the IPX PROVIDER will revert such cost to the Service Provider from whose network the traffic has been originated.

The IPX PROVIDER should not charge any extra fee to the Service Provider in the case where the traffic to/from the Elected Participating Operators is routed via Third Party(ies) IPX PROVIDER. All necessary interconnections with any Third Party IPX PROVIDER involved in the traffic transmission to/from the Elected Participating Operators will be implemented by the IPX PROVIDER without any additional cost imposed on the Service Provider.

All Charges shall be invoiced and paid effectively in [state currency]. Such Charges shall be payable on and from the Service Commencement Date and shall be payable only in respect of Chargeable Events.

The IPX PROVIDER shall provide the Service Provider with an invoice in respect of each Invoice Period within one calendar month from the end of the relevant Invoice Period. Such invoice shall set out the following information in respect of the relevant Invoice Period:

- The applicable invoice period to which the Charges applies;
- The number of Successful SMS Delivery routed via the Service to each Elected Participating Operator together with the Participating Operator Termination Charges for each;
- The SMS Transit Charges for the number of Successful SMS Delivery routed via the Service.

Within fourteen (14) calendar days from the end of each Invoice Period, the Service Provider shall endeavour to provide the IPX PROVIDER with an invoice setting out the total number of Successful SMS Delivery received in its network from the IPX PROVIDER for all Participating Operator Elected by the Service Provider together with the Service Provider Termination Charges accrued in respect of the relevant Invoice Period.

In the event that:

- an invoice issued by the IPX PROVIDER includes Charges for the previous six (6) months, the IPX PROVIDER shall ensure that the invoice clearly indicates which Invoice Periods such amounts relate to;
- an invoice issued by the Service Provider includes Service Provider Termination Charges for the previous six (6) months, the Service Provider shall ensure that the invoice clearly indicates which Invoice Periods such amounts relate to.

The IPX PROVIDER shall within one calendar month of the end of each Invoice Period make available on a reporting website (the address of which will be notified by the IPX PROVIDER to the Service Provider) or through adequate reports, the details of the number of Successful SMS Delivery routed by the IPX PROVIDER in the Invoice Period to each Elected Participating Operator. Additional reporting details shall be provided from time to time by the IPX PROVIDER.

Invoices issued by a Party (the "Billing Party") pursuant to this Agreement shall be payable by the other Party (the "Paying Party") within thirty (30) days from the date on which the invoice is dispatched by the Billing Party (the "due date").

Where both parties have sent each other invoices, then the debtor will make payment by netting off the difference between the two Parties' invoices. This netting off applies exclusively to the billing of the Service.

For any disputes issue please refer to Article 5 of the Main Body.

2. Service provider termination charges

3. IPX Transit Charges

The IPX Provider will charge the Service Provider amount/currency X per SMS exchanged upon successful transmitting of the SMS to the destination.

4. Participating Service Providers Termination Rates

The IPX Provider should provide the Service Provider, on a monthly basis, with the termination charges of all participating Service Providers (list referred to in Article 7)

5. Data exchange and Invoice procedure

Minimum Content of the invoice

The minimum content of an invoice issued either by the IPX Provider or the Service Provider has to be the following:

General details:

- name of the receiving operator
- name of the sending operator
- invoicing date and number
- invoicing due date

- the bank details

Specific details for each elected participating Service Provider destination:

- name and country of the elected Service Provider
- number of SMS and applied tariff
- transit fee per message
- total transit fee amount
- other recurrent or non recurrent charges if applicable
- total invoice amount

Additionally Bulk SMS Data shall be exchanged monthly in form of a text format (e.g., *.csv, *.xls) sent by e-mail

Check of received SMS Bulk Data

The Parties check the received bulk data against own information. In case of discrepancies the relevant clauses in the main body are applicable.

ANNEX 2 – TECHNICAL

1. Test Plan and Operational Procedures

In order for the Service Provider to control and prepare statistics of the Service interworking traffic terminating in its network, the IPX Provider as transparently as possible transmits to the Service Provider all details of the Service content, on the originating number and originating Service Provider.

The operational process can be divided into 5 main areas.

These are:

- Planned notification and information exchange
- Service performance and statistical monitoring
- Changes to the Service
- Unplanned events notification
- Planned Notifications and Information Exchange

Each Service Provider will receive a monthly report including all the message exchange detail per destination. The report will be in a format agreed between the Service Provider and the IPX Provider.

This process for setting up and operating the service is divided into 2 main phases as follows:

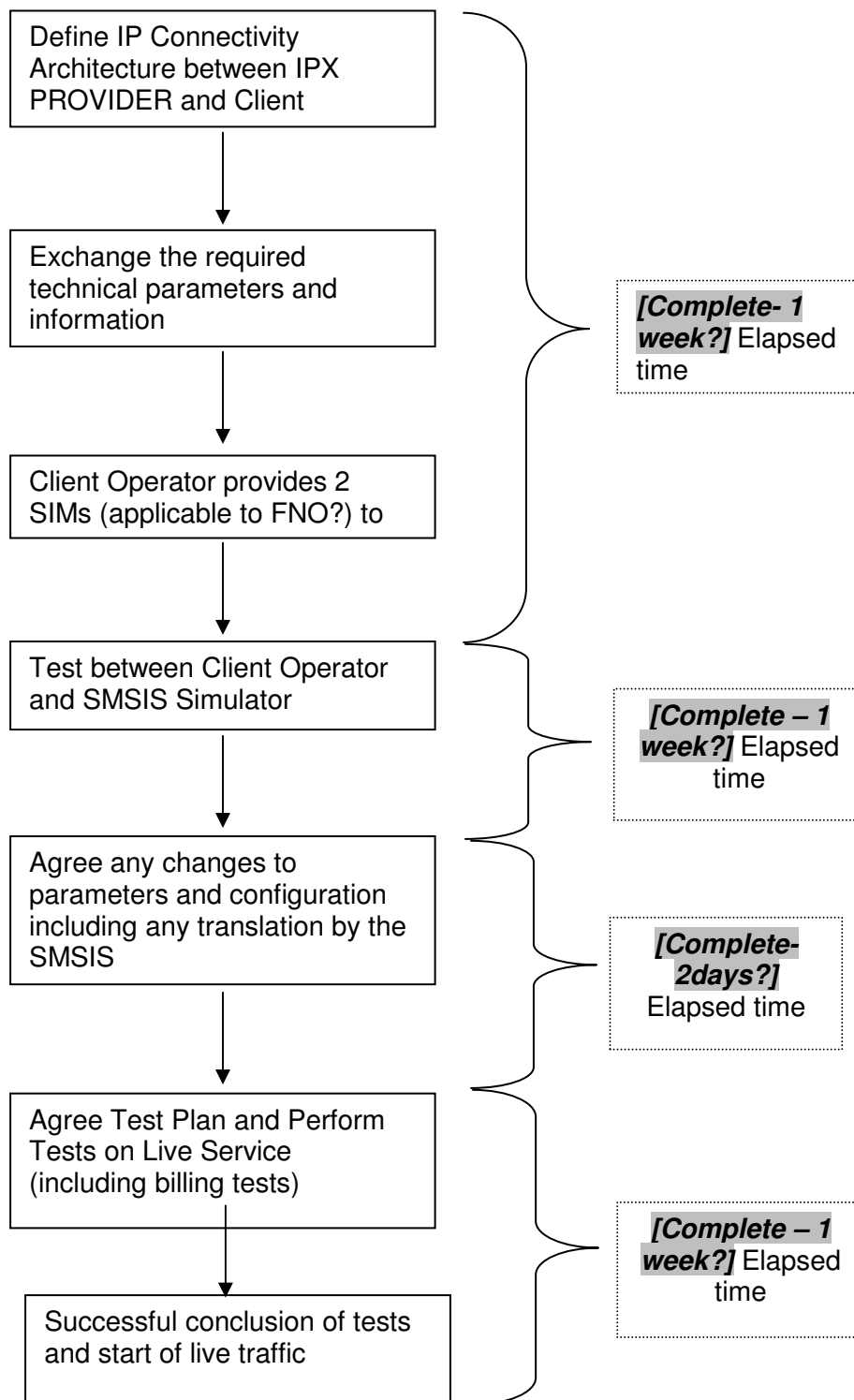
- Phase 1 – Technical Process of setting up and testing of the service prior to the commencement of the live service
- Phase 2 – Operational Process is the on-going commercial and technical aspects of operating the service

Note: The rest of this document contains estimates of how long various steps in the process will take. These are estimates only, for the purpose of guidance only, and may vary in practice.

These phases are summarised below:

Phase 1 - Technical Process of Set-up and Testing

Overview



Description

- a) Client Operator and IPX PROVIDER to define Connectivity

The Client Operator and the IPX PROVIDER agree the technical architecture for the connectivity between the IPX PROVIDER System and the Client Operator System.

- b) Client Operator and IPX PROVIDER exchange technical parameters and billing information

This relevant technical information may be gathered using a standard template document agreed between the Parties which will contain at least the following:

Client Operator IR.21 which contains

- Contact information
- IP connectivity details
- SMTP-DNS information
- SM4 parameters
- Routing method
- Trace
- Test numbers and SIM cards information (applicable to FNO?)
- SMS handset configuration
- Billing information

The Client Operator will provide two SIMs to the IPX PROVIDER for the purpose of testing. With these SIMs from the Client Operator, the IPX PROVIDER shall perform the activation tests with each new Participating Operator connected via the hub with the Client Operator. (check applicability of this step for FNO)

The test plan will be agreed based on a sub-set of the tests outlined in Appendix A of this document. Tests shall be performed by the IPX PROVIDER using the test SIM cards provided by the Client Operator. .

In the case where the Client Operator would prefer to perform the tests on its own, he will promptly inform the IPX PROVIDER.

As a minimum, tests will include the following: To be completed

The IPX PROVIDER will provide a test report to the Client Operator covering the test cases run and the results. This will include the CDRs and a test bill if required.

In the case where the Client Operator is performing the tests on its own, the test report will be delivered by the Client Operator to the IPX PROVIDER.

Timeline: To be completed

Upon positive completion of the activation tests by the IPX PROVIDER (or to the Client Operator as the case may be) , testified by the sending to the Client Operator (or to the IPX PROVIDER as the case may be) of a positive test report, the Parties will agree on a Service Commencement Date for SMS Interworking between the Client Operator and the Elected Participating Operator in respect of which the Service has been tested in accordance to the procedure mentioned above.

Upon activation of the Service between the Client Operator and the tested Elected Participating Operators, the procedures detailed in Article 7 "Participating Operators' Charges/ Election of Participating Operators" and Annex 1 fully apply as well as the rest of the provisions included in this Agreement.

2. Participating Service Parameter Change Notification

IPX Provider to Service Provider: The Service Provider will be notified once monthly of any parameter changes for Participating Service Providers. The Service Provider will be notified at the time of how many days the Service Provider has to respond to the change request.

Service Provider to IPX Provider: The Service Provider will need to notify the IPX Provider as soon as possible of any parameter changes which will impact either the IPX Provider or the Participating Service Providers.

Emergency notifications should be carried out in accordance with the terms of the Service Level Agreement.

3. Participating Service Provider's Parameters

Service Provider's Parameters to be completed

4. Monthly Report

The IPX PROVIDER will send a monthly report during the first 5 working days of the following month to the Service Provider, including all the participating Service Providers information described on the tables below.

Country	Operator	Directly Connected to the IPX PROVIDER System? (Y/N)	Rate per SMS

ANNEX 3 - SLA

SERVICE LEVEL AGREEMENT FOR SMS Interworking HUB SERVICE

Purpose

The architecture of the IPX domain is clearly split in two layers: Service and Transport. The Service layer is in charge of Service Hub and Service Transit capabilities, and the Transport layer is in charge of maintaining along the whole path the technical characteristics of the communication depending on the Traffic Class of Service used.

This appendix is intended to provide the requirements to ensure the end-to-end Quality of the SMS Interworking IPX Service described in this Service Schedule for the Service Layer.

According to these principles, this Appendix includes the following areas:

- Service Definitions
- Definition of Terms
- Service Quality commitments
- Qualifying faults
- Service credits
- Service Credits claim procedures
- IPX Provider and Service Provider commitment to end-to-end quality
- Troubleshooting
- Customer Care
- Fast response times
- Monthly reporting on QoS indicators
- SLA Review

1 Scope and Assumption

The parties agree that this Appendix to the Agreement:

- provides a detailed description of end to end Quality of Service (QoS), including related terms definition, initial requirements, provisioning and measurement methods.
- does not cover the IPX end-to-end QoS at the Transport layer and it is independent of the IP network transport layer used. To avoid any misunderstanding, only 2 possibilities can be applied for the transport layer: GRX transport or IPX transport.
- covers IPX end-to-end QoS at the Service layer only for the communications where Service Provider is the originating network. That is, it is intended as a one

way SLA, that is, traffic that starts from the Service Provider, goes via the IPX Provider only or also via Third party IPX Provider(s) and ends at a Terminating Service Provider(i.e. the Participating Service Provider on whose network the traffic has to be terminated). The IPX Provider commits to send to the Service Provider all the traffic it receives from other Elected Participating Service Providers or Third Party IPX Provider(s) at the same QoS by which the IPX Provider receives the traffic.

- applies a cascade responsibility principle. This means that, in the typical scenario analysed in this annex, in order to guarantee end-to-end QoS there will be an SLA in place between the Service Provider and the IPX Provider and an SLA between the IPX Provider and the Third Party IPX Provider(s) (in the case when a Third Party IPX Provider is involved in the traffic handling). The IPX Provider must be held responsible for the behaviour of Third Party IPX Provider up to the Elected Participating Service Provider(s).
- in order to guarantee a full end-to-end SLA both ways from the Service Provider to the Elected Participating Service Provider, a similar SLA chain must be in place on the return path .
- assumes that any two Service Providers are interconnected by at most two IPX networks as a best solution. In the event that more than two IPX providers are needed to provide the connectivity, the QoS requirements shall remain unaltered.
- The following circumstances are considered out of scope:
- A fault in, or any other problem associated with, Service Provider -supplied power, any Service Provider Equipment, non-maintained structured cabling.
- Service suspension in accordance with the terms of the AA.80 Agreement.

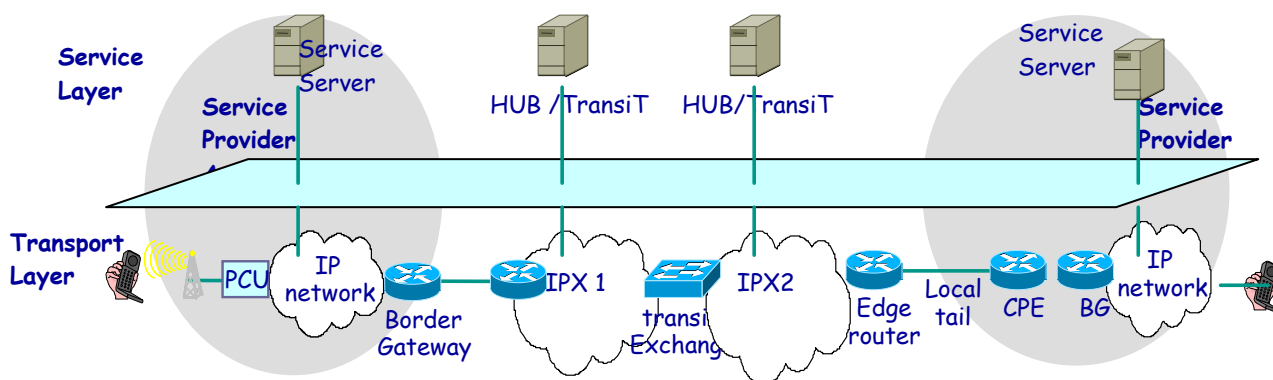
2 Service Definition

The requested Service is described at Clause 2. SERVICE DEFINITION of this Service Schedule.

3 IPX end-to-end responsibility

- The Parties intend this Annex to enable end-to-end QoS in the IPX Service rendered to the Service Provider in a way that all commitments of the IPX Provider are valid from the Service Provider's network to the Elected Participating Service Provider('s)' network whatever technical solution is used and operated by the IPX Provider.
- To achieve this goal this Annex defines a set of Key Performance Indicators (KPIs) that provide a measurement of the level of QoS associated to the Service rendered by the IPX Provider
- The Parties agree that it is the responsibility of the IPX Provider to provide the end-to-end quality as described in this Annex. In order to achieve end-to-end QoS all parties involved in the message flow should be compliant with the requirements expressed in this Annex.

- Parties understand that the end-to-end path in an IP Service connection is can be made up of many diverse components. The following drawing is only an illustration of what could be in the path:



4 Key Performance Indicators (KPI)

All KPIs are defined and must be calculated for the traffic sent and received by each Service Provider (i.e. the Originating Service Provider or the Recipient Service Provider).

For example if there are three Service Providers (A, B and C) exchanging SMS messages, there will be six sets of KPIs: A-B, B-A, A-C, C-A, B-C and C-B. The KPIs shall not be calculated for the total of the traffic, but for the traffic exchanged on each leg: A-B, B-A, A-C, C-A, B-C and C-B.

4.1 List of KPIs

The parties have agreed a set of KPIs that reflect the QoS rendered by IPX Provider. These KPI's are:

- MTRS in case of
 - Fatal errors: x hours
 - Severe errors: y hours
 - Warning errors: z hours
- Service Availability
- Service Provisioning Timeframes
- SS7 to SS7 connectivity KPIs
- SMPP to SMPP connectivity KPIs
- SS7 to SMPP connectivity KPIs
- SMPP to SS7 connectivity KPIs.

These indicators relate only to traffic sent by the Service Provider to each Elected Participating Service Provider via the IPX Provider. The origin of the measurements is from the BG of the Service Provider's network.

4.2 Definition of KPIs

Maximum Time to Restore the Service – MTRS –

4.2.1 Fatal Errors

A complete breakdown/outage, a critical performance degradation, functionality of a single Service causing service unavailability included but not limited to:

- Failure of connectivity and/or Traffic between IPX Provider and a connected Third Party IPX carrier
- Total loss of connectivity between Service Provider and IPX Provider platform
- Service affecting outage in the interconnection equipment
- Serious degradation of the quality as measured by the KPIs indicated within this SLA measured both by the Service Provider or the IPX Provider

4.2.2 Severe Errors

The functionality of the Service is affected to a large extent, major performance degradation or loss of important function occurs, legislation or security is critically affected. Degradation of the service, either of the performance or the quality, includes but it is not limited to:

- Loss of diversity or duplicity of the routes or/and signalling links, without isolation with the other network, i.e., one link of the redundant connections is out of service; backbone congestion causes excessive packet loss or jitter.
- Degradation of the QoS to any Elected Participating Service Provider, being defined as when any measured value for KPI is below the target threshold as indicated in the SLA

4.2.3 Warning Errors

A minimal limitation to the Service functionality. This Fault implies irregular network behaviour without operational constriction and without an impact on business, included but not limited to:

- Real-time reporting portal access problem;
- Asymmetric routing management issues
- Failure affecting isolated or individual service numbers.

4.3 Service Availability

Is the proportion of the time that IPX Service is available to the Service Provider on a monthly basis.

The Service shall be deemed unavailable when it cannot carry out its function properly, other than if due to any of the following:

- Access method unavailability (the unavailability of the underlining connectivity between the Service Provider and the IPX Provider covered by the IPX Transport SLA of this AA.80 Agreement)
- a Planned Outage or a Scheduled Maintenance Window within the thresholds mutually agree as per Clause 9.9 of this SLA.

The period of unavailability of the Service will be measured from the data contained in the monthly Quality of Service (QoS) Reports in accordance with the “Reporting” rules provided within this Schedule 10.1.

In these reports it will be shown:

- The time the Service was unavailable, and
- The time without service due to failures
- The hours for which the QoS report don't show any data, exceeding the threshold of “1 hour per day during 3 days of the month” will be considered also as unavailability.

It is important to remark that the Service unavailability is not restricted to the total or partial loss of the service for the total of the traffic sent from one Customer to the IPX Provider, but it applies to the traffic sent from every Originating Service Provider to any Recipient Service Provider.

Three different types of availabilities apply:

4.3.1 System Availability

It applies to the Service offered by the IPX Provider on its own network from the BG of the Service Provider.

Calculating Availability: The parameter System Availability describes the percentage of time that the System is carrying its function out properly (see calculation below).

$$\left[\% \right] = \frac{A_m - B_m}{A_m} \times 100$$

where:

- A_m = Number of hours in Month of System Availability
- B_m = Number of hours when System is unavailable (excluding planned outages)

System Unavailability time begins at time of detection of unavailability by either the IPX Provider or the Service Provider whichever the earlier and ends at time of Service restoration.

System Availability means that the IPX Provider is able to transit the Service Provider's traffic to the Elected Participating Service Provider's network or to the Third Party's IPX Provider, if any.

4.3.2 Transit Service Availability

Transit Service Availability applies to the service offered by the IPX Provider from the Service Provider's network up to the Elected Participating Service Provider's network.

Availability on the access is determined by the relevant IPX Provider type of connection.

Calculating Availability: The parameter Transit Service Availability describes the percentage of time that the Transit Service is carrying its function out properly (see calculation below).

$$\left[\% \right] = \frac{A_m - B_m}{A_m} \times 100$$

where:

- A_m = Number of hours in Month of Transit Service Availability
- B_m = Number of hours when IPX Provider's Transit Service is unavailable (excluding planned outages)

Transit Service Unavailability time begins at time of detection of unavailability by either the IPX Provider or the Service Provider whichever the earlier and ends at time of service restoration.

Transit Service availability means that the IPX is able to transit and terminate the Service Provider's traffic to the Elected Participating Service Provider's network.

4.3.3 Transit Service Availability Per Destination

Service Transit Service Availability Per Destination applies to the service offered by the IPX Provider from the Service Provider's network up to the Elected Participating Service Provider's network. This indicator reflects possibility for the Service Provider to access a particular destination included in the Service offered by the IPX Provider.

Availability on the access is determined by the relevant IPX Provider type of connection.

Calculating Availability: The parameter Transit Service Availability Per Destination describes the percentage of time that the Transit Service is carrying its function out properly for the Terminating Service Provider (see calculation below).

$$\boxed{[\%] = \frac{A_m - B_m}{A_m} \times 100}$$

where:

- A_m = Number of hours in Month of IPX's Transit Service Availability for a Terminating Service Provider
- B_m = Number of hours when IPX Transit Service is unavailable for a Terminating Service Provider (excluding planned outages)

Transit Service Per Destination Unavailability time begins at time of detection of unavailability of a Terminating Service Provider by either the IPX Provider or the Originating Service Provider whichever the earlier and ends at time of service restoration for a Terminating Service Provider.

Transit Service Per Destination availability means that the IPX Provider is able to transit and terminate the Terminating Service Provider's traffic to a specific Elected Participating Service Provider's network.

4.3.4 Service Provisioning Timeframes

This defines the average timeframes for the IPX to perform and undertake certain activities in respect of provisioning/commissioning new customers and services. Such as:

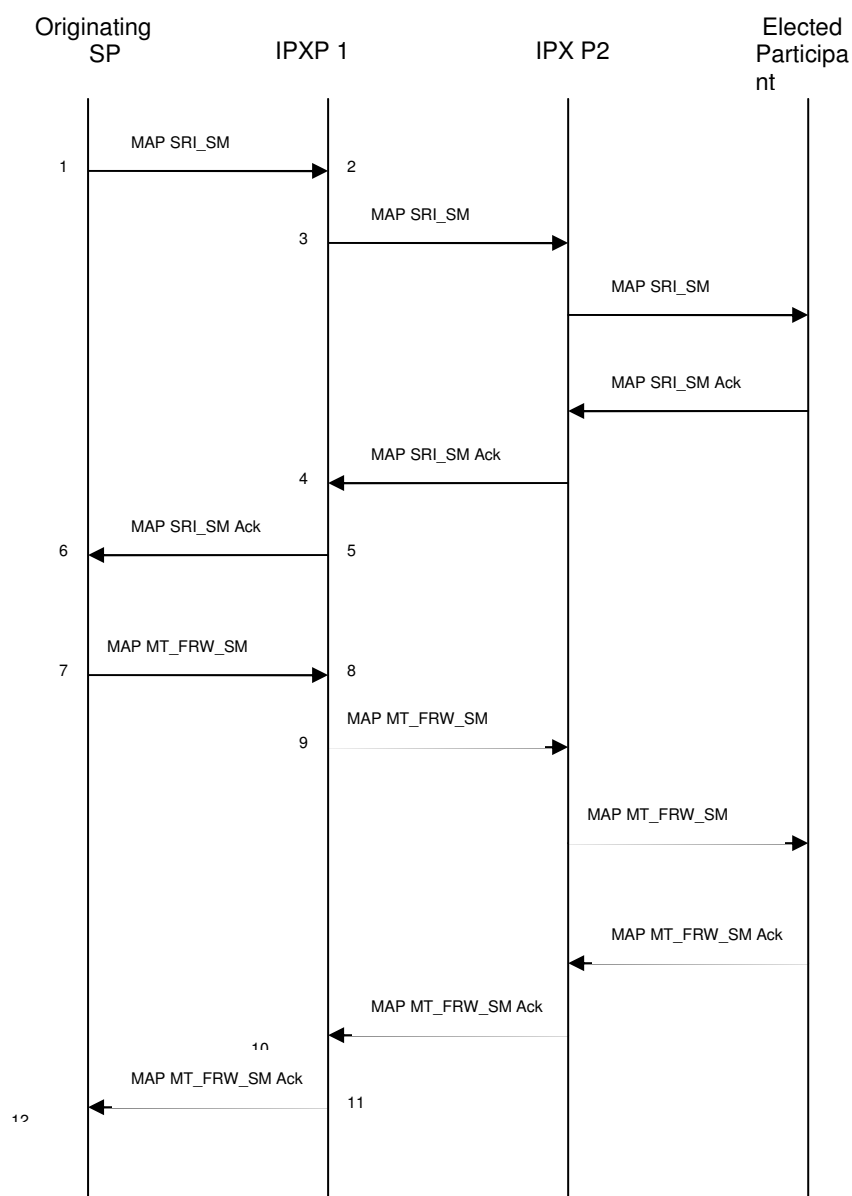
- **Maximum Time to Turn On a New Destination** that is included in the IPX connectivity list, assuming that the new destination (Elected Participating Service Provider) accepts traffic from the Client Service Provider.
- **Maximum Time to Modifying existing Client Service Provider data**

It represents an indication of the commitment of the IPX to commission new customers and new services for existing customers expeditiously.

4.3.5 Service indicators for SS7 Connection Type

The following set of KPIs are applicable when both sides are connected using SS7 messages.

The transport method used for carry the messages between SMSC (Originating SP) and SMS HUB (IPXP) is out of the scope of this Service Schedule (i.e SIGTRAN) but a Conversational Traffic Class on the Transport Layer will be applied for such transport method or protocol.

**Fig.1: SS7 Connection**

- SRI Message Transit Failure Ratio [%]**

Abstract definition: The parameter *SRI Message Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the MAP message Send Routing Info received (MAP SRI_SM) from the origin SMSC to the Elected Participant Service Provider.

This parameter is measured between Trigger 2 and Trigger 3 in Fig. 1.

Abstract equation:

$$\text{SRI Message Transit Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{SRI Sent to Recipient Operator}}{\sum \text{Deliverable SRI Received from SMSC origin}} \right)$$

SRI Sent to Elected Participant Service Provider is defined as the number of SRI messages that are sent to the Elected Participant Service Provider, based on the sending of the MAP SRI_SM message (Trigger 3).

Deliverable SRI Received from SMSC Origin is defined as a MAP SRI message received from the SMSC origin that can be delivered. A MAP SRI message is considered as being deliverable in case the message is retrieved in a valid format and with a routable address with a route which is advertised by the IPX Provider 1.

- **SRI Message Transit Time[s]**

Abstract definition: The parameter *SRI Message Transit Time* describes the time from receiving the MAP Send Routing Info message (MAP SRI_SM) from the SMSC origin until sending the message to the Elected Participant Service Provider.

This parameter is measured from Trigger 2 until Trigger 3 in Fig. 1.

Abstract equation:

$$\text{SRI Message Transit Time [s]} = \frac{\sum t_{\text{SRI_sent to destination}} - t_{\text{SRI_received from origin}}}{\sum \text{SRI Sent to Recipient Operator}}$$

- **SRI Message Failure Ratio [%]**

Abstract definition: The parameter *SRI Message Failure Ratio* describes the percentage of cases where the IPX Provider 1 receives the SRI request from the Originating Operator (MAP SRI_SM) but it does not send an (regardless of the status=OK or error) acknowledgement (MAP SRI_SM Ack) to the Originating Operator

This parameter is measured between Trigger 2 and Trigger 5 in Fig.1.

Abstract equation:

$$\text{SRI Message Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{Ack Sent to Origin Operator}}{\sum \text{SRI received from Origin Operator}} \right)$$

- **SRI Message Process Time [s]**

Abstract definition: The parameter *SRI Message Process Time* describes the time from receiving the message from the origin SMSC (Map SRI_SM) until sending the acknowledgement to the origin SMSC (MAP SRI_SM Ack).

This parameter is measured from Trigger 2 until Trigger 5 in Fig. 1.

Abstract equation:

$$SRI\ Message\ Process\ Time\ [s] = \frac{\sum_{Ack_{sent}} t_{Ack_sent\ to\ origin} - t_{SRI_received\ from\ origin}}{\sum Ack\ Sent\ to\ origin}$$

- **SRI Acknowledgement Transit Failure Ratio [%]**

Abstract definition: The parameter *SRI Acknowledgement Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the acknowledgement received (MAP SRI_SM Ack) from the Elected Participant Service Provider to the origin SMSC.

This parameter is measured between Trigger 4 and Trigger 5 in Fig. 1.

Abstract equation:

$$SRI\ Acknowledgement\ Transit\ Failure\ Ratio\ [\%] = 100 * \left(1 - \frac{\sum Ack\ Sent\ to\ SMSC\ origin}{\sum Ack\ Received\ from\ destination} \right)$$

- **SRI Acknowledgement Transit Time [s]**

Abstract definition: The parameter *SRI Acknowledgement Transit Time* describes the time from receiving the acknowledgement (regardless of the status=OK or error) (MAP SRI_SM Ack) from the Elected Participant Service Provider until sending the acknowledgement to the SMSC origin.

This parameter is measured from Trigger 4 until Trigger 5 in Fig. 1.

Abstract equation:

$$SRI\ Acknowledgement\ Trans.Time\ [s] = \frac{\sum_{Ack_{sent}} t_{Ack_sent\ to\ origin} - t_{Ack_received\ from\ destination}}{\sum Ack\ Sent\ to\ SMSC\ origin}$$

- **SMS Message Transit Failure Ratio [%]**

Abstract definition: The parameter *SMS Message Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the MAP message MT Forward Short Message received (MAP MT_FRW_SM) from the origin SMSC to the Elected Participant Service Provider.

This parameter is measured between Trigger 8 and Trigger 9 in Fig. 1.

Abstract equation:

$$\text{SMS Message Transit Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{SMS sent to Recipient Operator}}{\sum \text{Deliverable SMS Received from SMSC origin}} \right)$$

SMSSenttoRecipientOperator is defined as the number of SMS messages that are sent to the Elected Participant Service Provider, based on the sending of the MAP MT_FRW_SM (Trigger 9).

DeliverableSMSReceivedfromSMSCorigin is defined as an SMS message received from the SMSC origin that can be delivered. An SMS message is considered as being deliverable in case the message is retrieved in a valid format and with a routable address with a route which is advertised by the IPX PROVIDER 1.

- **SMS Message Transit Time[s]**

Abstract definition: The parameter *SMS Message Transit Time* describes the time from receiving the MAP MT Forward Short Message message (MAP MT_FRW_SM) from the SMSC origin until sending the message to the Elected Participant Service Provider.

This parameter is measured from Trigger 8 until Trigger 9 in Fig. 1.

Abstract equation:

$$\text{SMS Message Transit Time [s]} = \frac{\sum t_{\text{SMS_sent to destination}} - t_{\text{SMS_received from origin}}}{\sum \text{SMS Sent to Recipient Operator}}$$

- **SMS Message Failure Ratio [%]**

Abstract definition: The parameter *SMS Message Failure Ratio* describes the percentage of cases where the IPX Provider 1 receives the SMS from the Originating Operator (MAP MT_FRW_SM) but it does not send an (regardless of the status=OK or error) acknowledgement (MAP MT_FRW_SM Ack) to the Originating Operator.

This parameter is measured between Trigger 8 and Trigger 11 in Fig.1.

Abstract equation:

$$\text{SMS Message Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{Ack Sent to Origin Operator}}{\sum \text{SMS Received from Origin Operator}} \right)$$

- **SMS Message Process Time [s]**

Abstract definition: The parameter *SMS Message Process Time* describes the time from receiving the message from the Originating Operator (Map MT_FRW_SM) until sending the acknowledgement to the origin SMSC (MAP MT_FRW_SM Ack).

This parameter is measured from Trigger 8 until Trigger 11 in Fig. 1.

Abstract equation:

$$SMS\ Message\ ProcessTime\ [s] = \frac{\sum t_{Ack_sent\ to\ origin} - t_{SMS_received\ from\ Origin}}{\sum Ack\ Sent\ to\ origin}$$

- **SMS Acknowledgement Transit Failure Ratio [%]**

Abstract definition: The parameter *SMS Acknowledgement Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the acknowledgement received (MAP MT_FRW_SM Ack) from the Elected Participant Service Provider to the origin SMSC.

This parameter is measured between Trigger 10 and Trigger 11 in Fig. 1.

Abstract equation:

$$SMS\ Acknowledgement\ Transit\ Failure\ Ratio\ [\%] = 100 * \left(1 - \frac{\sum Ack\ Sent\ to\ SMSC\ origin}{\sum Ack\ Received\ from\ destination} \right)$$

- **SMS Acknowledgement Transit Time [s]**

Abstract definition: The parameter *SMS Acknowledgement Transit Time* describes the time from receiving the acknowledgement (regardless of the status=OK or error) (MAP MT_FRW_SM Ack) from the Elected Participant Service Provider until sending the acknowledgement to the SMSC origin.

This parameter is measured from Trigger 10 until Trigger 11 in Fig. 1.

Abstract equation:

$$SMS\ Acknowledgement\ TransitTime\ [s] = \frac{\sum t_{Ack_sent\ to\ origin} - t_{Ack_received\ from\ destination}}{\sum Ack\ Sent\ to\ SMSC\ origin}$$

- **SMS Overall Transmission Time[s]**

Abstract definition: The parameter *SMS Overall Transmission Time* describes the time from receiving the MAP Send Routing Info message (MAP SRI_SM) from the SMSC origin until sending the MAP MT Forward Short Message Ack back to the SMSC origin.

This parameter is measured from Trigger 2 until Trigger 11 in Fig. 1.

This parameter can only be evaluated for those SMS messages successfully delivered to the Elected Participant Service Provider. An SMS message is considered as being delivered to the Elected Participant Service Provider based on the reception of the MAP MT_FRW_SM Ack message from the IPX Provider 1(trigger 10) as illustrated in Figure 1 above.

Abstract equation:

$$SMS \text{ Overall Transmission Time } [s] = \frac{\sum_{SMS_{sent}} t_{SMS_Ack_sent \text{ to } SMSC_{Origin}} - t_{SRI_received \text{ from } SMSC_{Origin}}}{\sum SMS \text{ Successfully Sent to Recipient Operator}}$$

4.3.6 Service indicators for SMPP Connection Type

The following set of KPIs are applicable when both sides are connected using SMTP messages.

The transport method used for carry the messages between SMSC and SMS HUBs is out of the scope of this Service Schedule but a Conversational Traffic Class on the Transport Layer will be applied for such transport method or protocol.

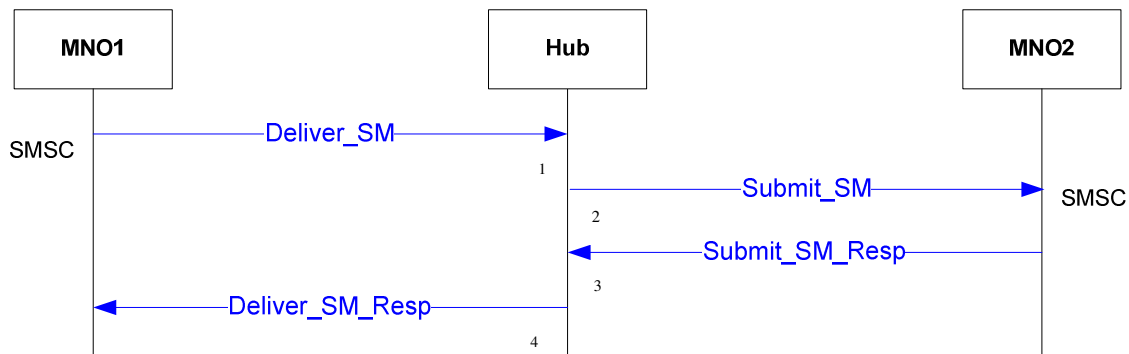


Fig.2: SMPP Connection

- **SMS Message Transit Failure Ratio [%]**

Abstract definition: The parameter *SM Message Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the SMPP message Deliver_SM received from the origin SMSC to the Elected Participant Service Provider.

This parameter is measured between Trigger 1 and Trigger 2 in Fig.2.

Abstract equation:

$$SMS \text{ Message Transit Failure Ratio } [\%] = 100 * \left(1 - \frac{\sum SM \text{ Sent to Recipient Operator}}{\sum DeliverableSM \text{ Received from SMSC origin}} \right)$$

SMSenttoRecipientOperator is defined as the number of SM messages that are sent to the Elected Participant Service Provider, based on the sending of the Submit_SM message.

DeliverableSMReceivedfromSMSCorigin is defined as a SMPP Deliver_SM message received from the SMSC origin that can be delivered. A SMPP Deliver_SM message is

considered as being deliverable in case the message is retrieved in a valid format and with a routable address with a route which is advertised by the IPX Provider 1.

- **SMS Message Transit Time[s]**

Abstract definition: The parameter *SM Message Transit Time* describes the time from receiving the SMPP Deliver_SM message from the SMSC origin until sending the Submit_SM message to the Elected Participant Service Provider.

This parameter is measured from Trigger 1 until Trigger 2 in Fig. 2.

Abstract equation:

$$SMS\ Message\ Transit\ Time\ [s] = \frac{\sum_{SRI_{sent}} t_{SM_sent\ to\ destination} - t_{SM_received\ from\ origin}}{\sum SM\ Sent\ to\ RecipientOperator}$$

- **SMS Response Transit Failure Ratio [%]**

Abstract definition: The parameter *SM Response Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the acknowledgement received (Submit_SM_Resp) from the Recipient operator to the origin SMSC (Deliver_SM_Resp).

This parameter is measured between Trigger 3 and Trigger 4 in Fig. 2.

Abstract equation:

$$SMS\ Response\ Transit\ Failure\ Ratio\ [%] = 100 * \left(1 - \frac{\sum Ack\ Sent\ to\ SMSC\ origin}{\sum Ack\ Received\ from\ destination} \right)$$

- **SMS Response Transit Time [s]**

Abstract definition: The parameter *SM Response Transit Time* describes the time from receiving the acknowledgement (regardless of the status=OK or error) (Submit_SM_Resp) from the Elected Participant Service Provider until sending the acknowledgement to the SMSC origin (Deliver_SM_Resp).

This parameter is measured from Trigger 3 until Trigger 4 in Fig. 2.

Abstract equation:

$$SMS\ Response\ Trans.Time\ [s] = \frac{\sum_{Ack_{sent}} t_{Ack_sent\ to\ origin} - t_{Ack_received\ from\ destination}}{\sum Ack\ Sent\ to\ SMSC\ origin}$$

- **SM Message Failure Ratio [%]**

Abstract definition: The parameter *SM Message Failure Ratio* describes the percentage of cases where the IPX Provider 1 receives the SM request from the Originating Operator (Deliver_SM) but it does not send an (status=OK or error) acknowledgement (Deliver_SM_Resp) to the Originating Operator.

This parameter is measured between Trigger 1 and Trigger 4 in Fig.2.

Abstract equation:

$$\text{SMS Message Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{Ack Sent to OriginOperator}}{\sum \text{SM received from OriginOperator}} \right)$$

- **SMS Message Process Time [s]**

Abstract definition: The parameter *SM Message Process Time* describes the time from receiving the message from the origin SMSC (Deliver_SM) until sending the acknowledgement to the origin SMSC (Deliver_SM_Resp).

This parameter is measured from Trigger 1 until Trigger 4 in Fig. 2.

Abstract equation:

$$\text{SMS Message Process Time [s]} = \frac{\sum_{Ack_{sent}} t_{Ack_sent\ to\ origin} - t_{SM_received\ from\ origin}}{\sum \text{Ack Sent to origin}}$$

4.3.7 Service indicators for Hybrid Connection Type SS7 to SMPP

The following set of KPIs are applicable when Originating Service Provider uses SS7 messages and the IPX Provider uses SMTP messages.

Same principal as applied on the previous scenarios (pure SS7 and pure SMTP Interworking), the transport method used for carry the messages between SMSC and SMS HUBs is out of the scope of this Service Schedule but a Conversational Traffic Class on the Transport Layer will be applied for such transport method or protocol.

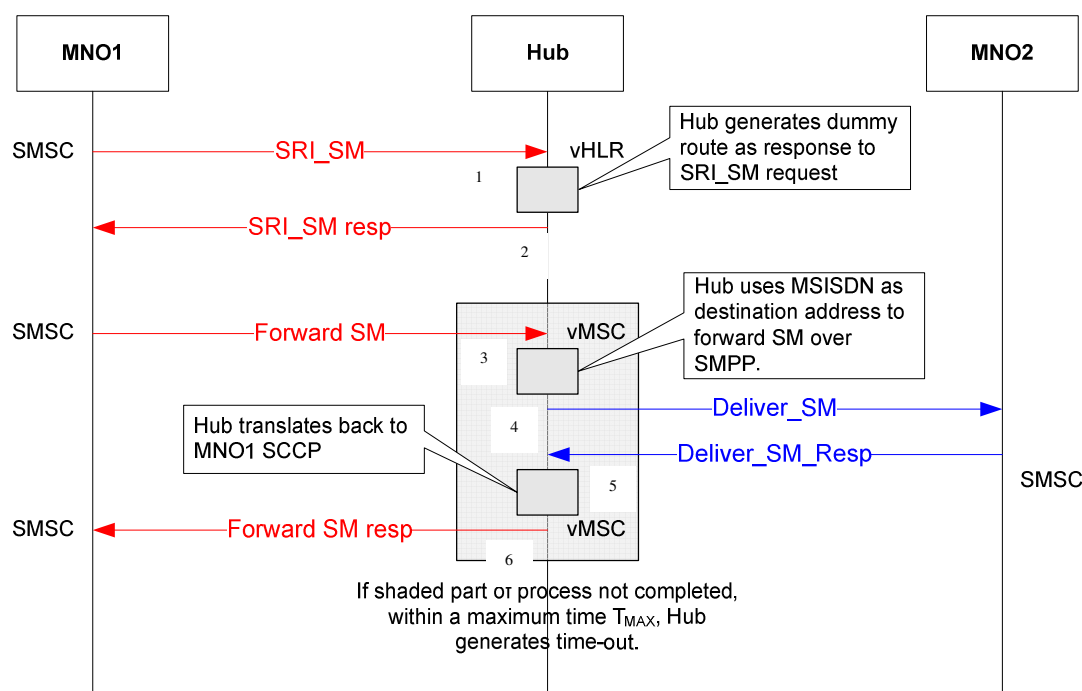


Fig.3: Hybrid Connection. SS7 to SMPP

- SMS Message Transit Failure Ratio [%]**

Abstract definition: The parameter *SMS Message Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the SMS message received (MAP MT_FRW_SM) from the origin SMSC to the Elected Participant Service Provider (Deliver_SM).

This parameter is measured between Trigger 3 and Trigger 4 in Fig. 3.

Abstract equation:

$$\text{SMS Message Transit Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{SMS sent to Recipient Operator}}{\sum \text{Deliverable SMS Received from SMSC origin}} \right)$$

SMSSenttoRecipientOperator is defined as the number of SMS messages that are sent to the recipient operator, based on the sending of the Deliver_SM message.

DeliverableSMSReceivedfromSMSCorigin is defined as an SMS message received from the SMSC origin that can be delivered. An SMS message is considered as being deliverable in case the message is retrieved in a valid format and with a routable address with a route which is advertised by the IPX Provider 1.

- SMS Message Transit Time[s]**

Abstract definition: The parameter *SMS Message Transit Time* describes the time from receiving the Short Message (MAP MT_FRW_SM) from the SMSC origin until sending the message to the Elected Participant Service Provider (Deliver_SM).

This parameter is measured from Trigger 3 until Trigger 4 in Fig. 3.

Abstract equation:

$$SMS \text{ Message Transit Time [s]} = \frac{\sum_{SMS_{sent}} t_{SMS_sent \text{ to destination}} - t_{SMS_received \text{ from origin}}}{\sum SMS \text{ Sent to Recipient Operator}}$$

- SMS Acknowledgement Transit Failure Ratio [%]

Abstract definition: The parameter *SMS Acknowledgement Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the acknowledgement received (Deliver_SM_Resp) from the Elected Participant Service Provider to the origin SMSC (MAP MT_FRW_SM Ack).

This parameter is measured between Trigger 5 and Trigger 6 in Fig. 3.

Abstract equation:

$$SMS \text{ Acknowledgement Transit Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum Ack \text{ Sent to SMSC origin}}{\sum Ack \text{ Received from destination}} \right)$$

- SMS Acknowledgement Transit Time [s]

Abstract definition: The parameter *SMS Acknowledgement Transit Time* describes the time from receiving the acknowledgement (status=OK or error) (Deliver_SM_Resp) from the Elected Participant Service Provider until sending the acknowledgement to the SMSC origin (MAP MT_FRW_SM Ack).

This parameter is measured from Trigger 5 until Trigger 6 in Fig. 3.

Abstract equation:

$$SMS \text{ Acknowledgement TransitTime [s]} = \frac{\sum_{Ack_{sent}} t_{Ack_sent \text{ to origin}} - t_{Ack_received \text{ from destination}}}{\sum Ack \text{ Sent to SMSC origin}}$$

- SMS Message Failure Ratio [%]

Abstract definition: The parameter *SMS Message Failure Ratio* describes the percentage of cases where the IPX Provider 1 receives the SMS from the Originating Operator (MAP MT_FRW_SM) but it does not send an (status=OK or error) acknowledgement (MAP MT_FRW_SM Ack) to the Originating Operator.

This parameter is measured between Trigger 3 and Trigger 6 in Fig.3.

Abstract equation:

$$\text{SMS Message Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{Ack Sent to OriginOperator}}{\sum \text{SMS Received from OriginOperator}} \right)$$

- **SMS Message Process Time [s]**

Abstract definition: The parameter *SMS Message Process Time* describes the time from receiving the message from the origin operator (Map MT_FRW_SM) until sending the acknowledgement to the origin SMSC (MAP MT_FRW_SM Ack).

This parameter is measured from Trigger 3 until Trigger 6 in Fig. 3.

Abstract equation:

$$\text{SMS Message ProcessTime [s]} = \frac{\sum_{\text{Ack received}} t_{\text{Ack_sent to origin}} - t_{\text{SMS_received from Origin}}}{\sum \text{Ack Sent to origin}}$$

4.3.8 Service indicators for Hybrid Connection Type SMPP to SS7

The following set of KPIs are applicable when Originating Service Provider uses SMTP messages and the IPX Provider uses SS7 messages.

Same principal as applied on the previous scenarios (pure SS7 and pure SMTP Interworking), the transport method used for carry the messages between SMSC and SMS HUBs is out of the scope of this Service Schedule but a Conversational Traffic Class on the Transport Layer will be applied for such transport method or protocol.

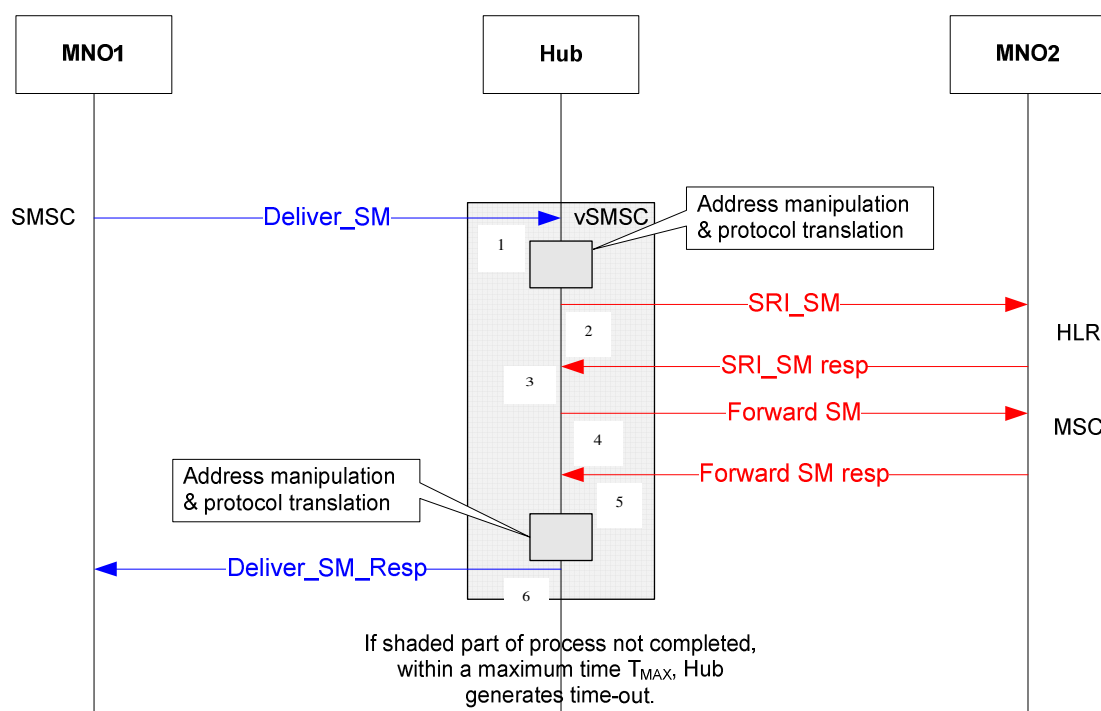


Fig.4: Hybrid Connection. SMPP to SS7

- **SMS Message Transit Failure Ratio [%]**

Abstract definition: The parameter *SM Message Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the Short Message (Deliver_SM) received from the origin SMSC to the Elected Participant Service Provider (MAP SRI_SM).

This parameter is measured between Trigger 1 and Trigger 2 in Fig.4.

Abstract equation:

$$\text{SMS Message Transit Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{SRI Sent to Recipient Operator}}{\sum \text{Deliverable SM Received from SMSC origin}} \right)$$

SRI Sent to Recipient Operator is defined as the number of SRI messages that are sent to the Elected Participant Service Provider, based on the sending of the MAP SRI_SM message.

Deliverable SM Received from SMSC origin is defined as a SMPP Deliver_SM message received from the SMSC origin that can be delivered. A SMPP Deliver_SM message is considered as being deliverable in case the message is retrieved in a valid format and with a routable address with a route which is advertised by the IPX Provider 1.

- **SM Message Transit Time[s]**

Abstract definition: The parameter *SM Message Transit Time* describes the time from receiving the SMPP Deliver_SM message from the SMSC origin until sending the MAP SRI_SM message to the Elected Participant Service Provider. This parameter is measured from Trigger 1 until Trigger 2 in Fig. 4.

Abstract equation:

$$SMS\ Message\ Transit\ Time\ [s] = \frac{\sum_{SRI_{sent}} t_{SRI_sent\ to\ destination} - t_{SM_received\ from\ origin}}{\sum SRI\ Sent\ to\ RecipientOperator}$$

- **SM Response Transit Failure Ratio [%]**

Abstract definition: The parameter *SM Response Transit Failure Ratio* describes the percentage of cases where the IPX Provider 1 is not able to perform the transit of the acknowledgement received (MAP MT_FRW_SM Ack) from the Recipient operator to the origin SMSC (Deliver_SM_Resp).

This parameter is measured between Trigger 5 and Trigger 6 in Fig.4.

Abstract equation:

$$SMS\ Response\ Transit\ Failure\ Ratio\ [%] = 100 * \left(1 - \frac{\sum Ack\ Sent\ to\ SMSC\ origin}{\sum Ack\ Received\ from\ destination} \right)$$

- **SM Response Transit Time [s]**

Abstract definition: The parameter *SM Response Transit Time* describes the time from receiving the acknowledgement (status=OK or error) (MAP MT_FRW_SM Ack) from the Elected Participant Service Provider until sending the acknowledgement to the SMSC origin (Deliver_SM_Resp).

This parameter is measured from Trigger 5 until Trigger 6 in Fig. 4.

Abstract equation:

$$SMS\ Response\ Trans.Time\ [s] = \frac{\sum_{Ack_{sent}} t_{Ack_sent\ to\ origin} - t_{Ack_received\ from\ destination}}{\sum Ack\ Sent\ to\ SMSC\ origin}$$

- **SM Message Failure Ratio [%]**

Abstract definition: The parameter *SM Message Failure Ratio* describes the percentage of cases where the IPX Provider 1 receives the SM request from the Originating Operator

(Deliver_SM) but it does not send an (status=OK or error) acknowledgement (Deliver_SM_Resp) to the Originating Operator.

This parameter is measured between Trigger 1 and Trigger 6 in Fig.4.

Abstract equation:

$$\text{SMS Message Failure Ratio [\%]} = 100 * \left(1 - \frac{\sum \text{Ack Sent to OriginOperator}}{\sum \text{SM received from OriginOperator}} \right)$$

- **SM Message Process Time [s]**

Abstract definition: The parameter *SM Message Process Time* describes the time from receiving the message from the origin SMSC (Deliver_SM) until sending the acknowledgement to the origin SMSC (Deliver_SM_Resp).

This parameter is measured from Trigger 1 until Trigger 6 in Fig. 4.

Abstract equation:

$$\text{SMS Message Process Time [s]} = \frac{\sum_{\text{Ack sent}} t_{\text{Ack sent to origin}} - t_{\text{SM received from origin}}}{\sum \text{Ack Sent to origin}}$$

4.4 Targets for KPIs

4.4.1 Maximum Time to Restore the Service – MTRS –

Severity	Maximum restoration times	Initial Feedback	Update Interval
Fatal	4 hours	30 minutes	1 hour
Severe	6 hours	30 min	4 Hours
Warning	5 working days	30 minutes	2 working day

The maximum number of qualified Fatal faults during the quarter must not be higher than

[State number of faults agreed between Parties]

Additionally, the maximum number of qualified Fatal faults associated with the same problem, must never be more than one in the same Terminating Service Provider during the year's quarter.

4.4.2 Service Availability

- System Availability target applies: [XX.X%]
- Transit Service Availability target applies: [XX.X%]
- Transit Service Availability Per Destination target applies: [XX.X%]

for an Elected Participating Service Provider or a set of Elected Participating Service Provider, as indicated by Service Provider
(e.g. [*State percentage agreed between Parties*%]) for top 20 Elected Participating Service Provider, as indicated by Service Provider and (*State percentage agreed between Parties*%) for remaining Elected Participating Service Provider)

4.4.3 Service Provisioning Timeframes

Maximum Time to Turn On a New Destination (Elected Participating Service Provider): [*State number of days agreed between Parties*] days

Maximum Time to Modifying existing Service Provider: [*State number of days agreed between Parties*] days

[To be agreed between Parties]

4.4.4 Service indicators for SS7 Connection Type

[To be agreed between Parties]

SRI Message Transit Failure Ratio target applies: [x.xx%]
 SRI Message Transit Time target applies: [x s]
 SRI Message Failure Ratio target applies: [x.xx%]
 SRI Message Process Time target applies: [x s]
 SRI Acknowledgement Transit Failure Ratio target applies: [x.xx%]
 SRI Acknowledgement Transit Time target applies: [x s]
 SMS Message Transit Failure Ratio target applies: [x.xx%]
 SMS Message Transit Time target applies: [x s]
 SMS Message Failure Ratio target applies: [x.xx%]
 SMS Message Process Time target applies: [x s]
 SMS Acknowledgement Transit Failure Ratio target applies: [x.xx%]
 SMS Acknowledgement Transit Time target applies : [x s]
 SMS Overall Transmission Time target applies: [x s]

4.4.5 Service indicators for SMPP Connection Type

[To be agreed between Parties]

SM Message Transit Failure Ratio target applies: [x.xx %]
 SM Message Transit Time target applies: [x s]
 SM Response Transit Failure Ratio target applies: [x.xx %]
 SM Response Transit Time target applies : [x s]

SM Message Failure Ratio target applies: [x.xx %]
SM Message Process Time target applies : [x s]

4.4.6 Service indicators for Hybrid Connection Type. SS7 to SMPP

[To be agreed between Parties]

SMS Message Transit Failure Ratio target applies: [x.xx %]
SMS Message Transit Time target applies: [x s]
SMS Acknowledgement Transit Failure Ratio target applies: [x.xx %]
SMS Acknowledgement Transit Time target applies: [x s]
SMS Message Failure Ratio target applies: [x.xx %]
SMS Message Process Time target applies: [x s]

4.4.7 Service indicators for Hybrid Connection Type. SMPP to SS7

[To be agreed between Parties]

SM Message Transit Failure Ratio target applies: [x.xx %]
SM Message Transit Time target applies: [x s]
SM Response Transit Failure Ratio target applies: [x.xx %]
SM Response Transit Time target applies: [x s]
SM Message Failure Ratio target applies: [x.xx %]
SM Message Process Time target applies: [x s]

5 Qualifying Faults

When according to Service Provider own measurement, the average daily QoS indicators listed above achieved by IPX Provider fall below the values agreed, Service Provider may raise a “qualifying fault”

Service Provider must request IPX Provider to handle and investigate all disturbances in QoS Performance and to commit to resolve *[State percentage agreed between Parties]*% of qualifying faults within *[State number of hours agreed between Parties]*hrs where the fault lies in its own network and when the fault lies in a third Party network involved in the traffic conveyance/termination.

When according to the Service Provider’s own measurement, the average weekly or monthly QoS indicators listed above fall below the target point, Service Provider is entitled to raise a “qualifying weekly/monthly fault”.

6 Service Credits

When the Monthly Report (Schedule B) or other source of information agreed between the IPX Provider and the Service Provider show that the actual level of performance achieved

in the relevant period deviates from the commitments specified in this SLA (KPIs' target values committed in Schedule A), the Client Operator reserves the right to:

- Request a Service Credit. The precise amount of Service Credits to be applied by the IPX Provider to the Client Operator for the relevant period is to be agreed by the parties e.g. deduct x% from the total out payment due to the IPX Provider for the month in question. The Service credit will be applied through a credit note relating to the concerned month; and/or
- To cease its obligations under the Agreement, e.g. to continue to route traffic to the IPX Provider on the effected destination(s).

6.1 Qualifying Claims

Service Provider may submit a claim for a service credits when a Qualifying fault as been raised and not resolved in the committed time.

6.2 Service Credit Level

Service Providers can use Schedule A attached to this SLA as reference

6.3 Service Credits Claim Procedure

In order to claim for a service credit, Service Provider may provide the following details of the faults to the IPX Provider Account Manager:

- IPX Provider fault reference
- Service Provider fault reference
- Destination
- Time of notification
- Time of resolution
- Severity of error
- Amount of credit claimed

The mechanism for compensating any eventual service credit due will mutually agree between parties.

7 Controlled connectivity policy

In order to avoid deterioration of the quality of service, information on the connectivity for each Terminating Service Provider shall be made transparent to the Service Provider.

The direct termination of traffic by the IPX Provider on the Terminating Service Provider shall be favoured whenever it is technically possible.

The Service Provider may request the IPX Provider to provide all connectivity information associated to its offer, namely identifying the type of routing used per each Terminating

Service Provider. In particular, the minimum information that the IPX Provider shall provide to the Service Provider consist on the type of connectivity used to reach each Terminating Service Providers, classifying the connection into two groups depending if the connectivity is made through: direct connectivity or, connectivity through a Third Party IPX Provider.

7.1 Direct connectivity

Direct connectivity to Participating Service Providers is when the IPX Provider offers a direct connectivity with Participating Service Providers network to the Service Provider. That is, only one hop from the Service Provider and the Elected Participating Service Provider.

7.2 Indirect connectivity

Indirect connectivity to Participating Service Providers is when the IPX Provider uses a Third Party IPX Provider to offer connectivity to such Third Party IPX Providers networks. That is, at least two hops are needed to reach the Elected Participating Service Provider.

8 Customer Care

IPX Provider must provide a 24x7 Help Desk connectivity to support the needs of this Agreement and to attend the Service Provider enquiries.

8.1 Monitoring

- IPX Provider must provide a web access monitoring tool where the Service Provider must be able to see the performance of IPX Provider for the traffic object of this agreement.
- For avoidance of doubt the measurements shown in the web access must be only related with the traffic where Service Provider is the originating network.

9 Operation & Maintenance Agreement – Fault Management

9.1 Introduction

This section details the operational processes to be provided to Service Provider by IPX Provider and vice versa for IPX services.

The terms used in the Service Level Agreement between IPX Provider and Service Provider have the same meaning in the Operations and Maintenance Section unless otherwise stated.

9.2 Central Notification Addresses

9.2.1 Each Party must name a central entity (single point of contact) that is reachable 24 hours a day, 365 days a year and responsible for official notification processes in case of faults affecting the Service.

9.2.2 The requirements for the central notification contact are:

- Contact must be available 24 hours a day at a single telephone contact number
- Competency concerning operational issues for IPX Services
- Remote access to decentralized operational network elements
- Relevant access to tools, resources and knowledgebase to solve problems

24 x7 Reference Details	IPX Provider Details	Service Provider Details
Contact Point		
Telephone Number		
Facsimile Number		
Email Address		

Matrix 1: O&M Contact Details

9.3 Fault Classification

The IPX Provider shall open a trouble ticket in the case of any fault on the Service reported by the Service Provider or as identified by the IPX Provider at the contact points indicated in the Matrix above. A severity level shall be assigned to each trouble ticket to describe the effect of the fault.

The following three levels of severity will be used:

9.3.1 Fatal Errors

A complete breakdown/outage, critical performance degradation, functionality of a single Service causing Service unavailability included but not limited to:

- Failure of connectivity and/or Traffic between IPX Provider and a connected Third Party IPX Provider
- Total loss of connectivity between Service Provider and IPX Provider platform
- Service affecting outage in the interconnection equipment
- Serious degradation of the quality as measured by the KPIs indicated within this SLA measured by the Service Provider or the IPX Provider

9.3.2 Severe Errors

The functionality of the Service is affected to a large extent, major performance degradation or loss of important function occurs, legislation or security is critically

affected. Degradation of the service, either of the performance or the quality, includes but it is not limited to:

- Loss of diversity or duplicity of the routes or/and signalling links, without isolation with the other network, i.e., one link of the redundant connections is out of service; backbone congestion causing excessive packet loss or jitter.
- Degradation of the QoS to any Elected Participating Service Provider, being defined as when any measured value for KPI is below the target threshold as indicated in this ANNEX 3.

9.3.3 Warning Errors

A minimal limitation to the functionality of the Service. This Fault implies irregular network behaviour without operational constriction and without an impact on business, included but not limited to:

- Real-time reporting portal access problem;
- Asymmetric routing management issues;
- Failure affecting isolated or individual service numbers.

The fault category can be changed at any time, during a particular fault outage, to Fatal / Severe / Warning, by notification of either party to the other.

9.3.4 Fault Restoration Times

Severity	Maximum restoration times	Initial Feedback	Update Interval
Fatal	4 hours	30 minutes	1 hour
Severe	6 hours	30 min	4 Hours
Warning	5 working days	30 minutes	2 working day

Matrix 2: Fault Restoration Times

The maximum number of qualified Fatal faults during the quarter must not be higher than

[State number of faults agreed between Parties]

Additionally, the maximum number of qualified Fatal faults associated with the same problem, must never be more than one in the same Terminating Service Provider during the year's quarter.

9.3.5 Fault Reporting Procedures

The following sections describe the fault reporting procedure for both the Service Provider and the IPX Provider.

i) Fault Reporting by Service Provider:

The IPX Provider shall provide a fault reporting capability that is available 24x7x365.

Suspected faults on the Service shall be reported to the IPX Provider by any of the approved methods listed above (phone/fax/email) to the contact indicated in the matrix detailed in 9.2.2 within this Operations and Maintenance Agreement. Fatal faults shall be also followed by a phone call to the same contact. Faults will be logged and each call will be time-stamped and allocated a unique call reference number in the IPX Provider trouble ticket system to be used for all progress updates. The Service Provider will also provide its internal reference number for tracking.

To diagnose and resolve suspected faults, IPX Provider requires certain information when the problem is first reported. This will normally include:

- Company name
- Name, telephone number and email of the person reporting the fault
- Service Provider's contact name, telephone number and email, if different from the above
- Service Provider's Fault Trouble Ticket Number
- Physical location of the fault if identified.
- Details of the fault (IPX Provider's services at site, symptoms, any tests carried out in attempting to isolate the problem)
- Any environmental conditions, such as a power failure, that may be causing the fault
- Severity (Fatal / Severe / Warning)
- Service Providers domain/DNS details (if applicable)
- IPX Provider traffic details should be included if available

ii) Fault Reporting by IPX Provider

The IPX Provider shall immediately inform the Service Provider, by telephone using the contact points given in the matrix detailed in 9.2.2 within this Operations and Maintenance section, when it becomes aware of any Fatal fault in:

- The IPX System,
- Any system run by any Third Party IPX Provider
or with
- Any Elected Participating Service Provider System or Service Provider System or other system involved in the traffic delivery impacting the relationship with the Service Provider.

IPX Provider also agrees to work towards the implementation of an electronic notice board solution for the delivery of such notifications. Following the issue of any such notice in respect of a fault, IPX Provider shall keep the Service Provider informed of the progress of remedial works according to the time interval agreed in Clause 4.4.1 of this ANNEX 3.

9.3.6 Fault Resolution

IPX Provider shall immediately start proper fault handling intervention actions and inform Service Provider accordingly, in line with the procedure stated within Clause 9.4.

- Fault Duration Time (FDT) – This is the elapsed time between the Fault Start Time and the Fault Closure Time, $FCT - FST = FDT$
- Fault Start Time (FST) – Any fault is deemed to start from the precise time of day (to the nearest minute) that a trouble ticket is raised, either by the IPX Provider or the Service Provider.
- Fault Closure Time (FCT) – A fault is deemed to have closed at the precise time of day (to the nearest minute) that the Trouble Ticket has been closed at the written agreement of the Service Provider.

Both Parties shall provide each other with the agreed progress updates as reported in Clause 4.4.1 above.

The minimum information required in the update is:

- Liability for the fault
- Expected resolution date/time
- Any information as to the cause of the fault
- All actions undertaken to date
- Any further information required
- Results of end-to-end measurement if applicable.

If IPX Provider cannot resolve a fault within the defined MTRS targets defined in Clause 4.4.1, IPX Provider shall allocate extra resources, via an escalation procedure as defined in Clause 9.4 below, to achieve its resolution.

In all cases, if the fault is not resolved within the timeframe agreed from the Fault Start Time and there is a degradation of the service quality level provided by IPX Provider to below the contractually agreed targets as measured by the KPIs indicated within the SLA, Service Provider reserves the right to:

- Request IPX Provider to re-route the traffic to another Third Party IPX Provider if appropriate or
- Re-route the traffic to another IPX provider

In such cases, the time to restore the proper functionality of the Service shall be taken into account when measuring the monthly MTRS level.

9.4 Escalation procedure

Both Parties must name contact persons as single point of contact for escalation (i.e. Fault Reporting Points). The escalation procedure can be delayed at the discretion of the Fault

Reporting Points for a mutually agreed period when the fault has been identified and is being addressed by engineering staff of either Party.

Both Parties are to comply with internal procedures for the escalation of faults. However, the reporting Party may (at any time) request that a fault is escalated in advance of the times set out below. This is done if in the reasonable opinion of that Party, an escalation is required to increase the resources dedicated to a fault.

The recipient of the trouble ticket may escalate a fault in advance of the times set out below if it requires further information to progress the fault and that information has not been provided within a reasonable timescale.

In some cases certain faults need not be escalated automatically. A case can occur where the investigation of a fault is in progress and any escalation out of hours would serve no practical purpose. Both parties are to use reasonable and mutually agreed judgment regarding the benefit of escalating a particular fault.

All escalation between Service Provider and IPX Provider must be accomplished using the following steps:

Escalation Level	IPX Provider	Service Provider
Level I	<Contact Details>	<Contact Details>
Level II	<Contact Details>	<Contact Details>
Level III	<Contact Details>	<Contact Details>

Matrix 4: Escalation Contact Points

Note: Non-service affecting faults will not be escalated outside of working hours, as defined in Clause 10.1.

Fault Status	Max Escalation Time to Level II	Max Escalation Time to Level III
Fatal	<Time>	<Time>
Severe	<Time>	<Time>
Warning	<Time>	<Time>

Matrix 5: Escalation Times

9.5 Official Status Information

9.5.1 After the initial information, updates in accordance with Clause 4.4.1 will apply. On any reasonable request by either Party, the Central Notification Addresses are able to give information on the status of the trouble/problem.

9.6 Fault Clearance Procedures

Only the Central Notification Addresses can issue an official fault clearance (closure of trouble ticket for fault resolution).

On mutual agreement of both Parties that the fault has been cleared and normal IPX Service has been restored, faults will be classified as «cleared» and the «Response and Restoration Time Clock» are stopped.

9.7 Duration of a fault

9.7.1 The duration of a fault shall be defined as per Clause 9.3.6.

9.8 Communications

9.8.1 IPX Provider will undertake to communicate the following events within the timescales below:

- Planned Outages (including product upgrades/updates): minimum 15 days.
- Communication of Suspension of IPX Services: maximum 30 days.

9.8.2 Parties agree that:

- Emergency situations shall be expedited.
- The contact persons for such communications will be those identified in clause 9.2.2 unless otherwise agreed.
- Reduced periods of notice will only be accepted as an exception and mutually agreed. The number of reduced periods of notice will be closely monitored by each Party and subject to review at regular service review meetings.
- Where an event is planned, each Party is required to notify the other in advance of full details concerning that event. A brief explanation of the operation shall be included and the impact or risk of impact, of the IPX Service shall be always specified.

9.9 Planned Outages, Product Updates/Upgrades

9.9.1 IPX Provider shall provide updating packages with documentation, support tools and specifications, planned in advance (1-4 per year), containing permanent solutions to any severe or major failures that require such action.

9.9.2 Such updating packages shall be scheduled together with introduction of new functionality (upgrades), unless otherwise agreed. Such packages shall also include solutions to problems detected in other countries and in operating systems supplied.

-
- 9.9.3** IPX Provider shall verify and test these correction packages on an appropriate test plant and shall make such tests available for inspection, auditing and testing by the Service Provider.
- 9.9.4** IPX Provider will provide upgrade packages with documentation, support tools and specifications, planned in advance (1-2 per year) as required.
- 9.9.5** Before planned work is undertaken that might affect the Service, each Party shall give a notice to the other Party (receiving Party), as per 9.2.2 Matrix 1: O&M Contact Details, in line with the timescales stated in Clause 9.9.7 and 9.9.11; if such timescales are not respected, the work will be considered as an unplanned outage, that is, a fault.
- 9.9.6** This work could be:
- Configuration changes (physically, logically)
 - Changes of expected traffic (amount, quality)
 - Hardware changes
 - Software changes (software updates / software upgrades)
 - Maintenance works in the transmission network
 - Periodical maintenance tests
- The IPX Provider shall perform regular tests to check:
- The proper functionality of the [Service Provider]'s connection to the IPX platform;
 - The Interworking between the [Service Provider] and its Elected Participating Service Providers
 - A brief explanation of the operation shall be included and the impact or risk of impact, on the service shall be always specified.

The Parties will mutually agree, and document in the relevant Service Schedule, the appropriate maintenance tests to be performed including the allocation of any costs.

- 9.9.7** It is recommended that the agreed schedule for all planned works fits with low peak times as defined in writing by the Service Provider, e.g. between 02:00 and 06:00 am local time, on working days from Monday through Thursday. If the event starts or ends out of this window time provided by the Service Provider, the excess will be deemed to be treated as unavailability otherwise agreed between the parties.
- 9.9.8** In all cases described above, each Party's network management organization will take action to reduce disruption of traffic flows to the minimum.
- 9.9.9** For all works affecting Service Provider traffic, it is also essential to have in advance a contact available during the planned work who can be contacted to know the status of the work.
- 9.9.10** Both Parties reserve their right to refuse a scheduled event when an important reason exists. A scheduled event is only approved and can be carried out if both Parties agree on the event.
- 9.9.11** Advice of proposed planned work shall be notified by e-mail always at the contact points indicated in Clause 9.2.2 above, the receiving Party must acknowledge receipt

of the advice by a return e-mail within one (1) working day of the receipt of the advice. If the receiving Party does not acknowledge the receipt, the originating Party will call the contact number of the receiving Party and ask for a “GO” or “NO GO” decision. The originator must not proceed with the work without concurrence of the receiving Party, which cannot be unreasonably withheld, otherwise the work will be considered as an unplanned work/outage, that is an MTRS impacting fault.

9.9.12 If a new release does not work properly for any reason, then IPX Provider will have a proven rollback process in order to revert the system back to it's original working state. In such a case, the time to restore the proper functionality of the Service shall be taken into account when measuring the MTRS levels.

9.9.13 IPX Provider will respect the Service Provider right to declare a freeze period such that no changes may be made to the system by IPX Provider and any outage is defined as fatal (e.g. during Christmas, special events etc).

9.10 Fault Handling Performance Reporting

9.10.1 This section details the reports that shall be supplied and measured by both Parties. The information to be supplied shall be agreed between the Parties at the Agreement's signature.

9.10.2 To be measured:

- Date and hour of the receipt of information pertaining to each Fault notification;
- Date and hour of acknowledgement of receipt of Fault notification;
- Date and hour of Fault resolution (and notification).

9.10.3 IPX Provider is to supply the Service Provider a monthly “Fault Report”, with the following fields completed:

Monthly Fault Report								
IPX Provider Trouble Ticket No	Service Provider Trouble Ticket No	Priority	Brief description of the problem	Brief description of cause of the problem	Start Fault Date & Time	Response Date & Time	Resolution Date & Time	Time to Restore the Service

9.10.4 Based on this information, IPX Provider is to supply a monthly performance report including the following statistics for the past month and the past 6 months in total.

- Reporting Party
- Reporting Period (Calendar Month, i.e. January 2006)
- by severity and Elected Participating Service Provider
- Number of open tickets at the end of the reporting period
- Number of open tickets during the reporting period
- Number of closed tickets during the reporting period
- Average resolution time based on the closed tickets during the reporting period
- Number of opened Fatal trouble tickets.

9.10.5 Parties agree that:

- The report shall be provided no later than the 10th calendar day of the month following the month to which the report applies.
- Service Provider commits to validating the data provided by the IPX Provider not later than the 20th calendar day.
- Reports shall be delivered by IPX Provider to Service Provider according to this distribution list (by email):

	Name	Position	E-mail Address
1	Service Provider Contact #1		
2	Service Provider Contact #2		

Matrix 6: Fault report contacts

9.10.6 Either party may change contact names by providing written notice seven days in advance of the change being valid.

9.10.7 In the event there is a discrepancy in the reporting of the KPI, between the reports provided by IPX Provider, and Service Provider's own measurements, then the Parties will agree the reconciliation process to follow.

10 Operation & Maintenance – Non-fault Management

10.1 Service Management

Such Customer Care Service shall be provided on Non-Faults situations to include, non-fault related operational problems, operations and maintenance routines and documentation, pricing and billing queries and technical information.

This service shall be provided Monday – Friday, 0900 - 1700 excluding Public Holidays as a minimum, or with a different timing mutually agreed between the IPX Provider and the Service Provider.

10.2 Traffic Management

10.3

The Service Provider commits to providing traffic forecasts at mutually agreed intervals. The traffic forecasting provisions shall be used for dimensioning the capabilities of the IPX Provider network and the IPX Provider termination capabilities on the Terminating Service Provider. They shall not have any binding effect unless otherwise agreed between IPX Provider and the Service Provider in writing.

10.4 Participating Service Provider Management

Pursuant to the provisions for Election and Activation of the Participating Services Providers, Service Provider may request IPX Provider from time to time to activate the Interworking between its own network and a new Terminating Service Provider not included in the IPX Provider list of Participating Service Providers.

In such cases, the IPX Provider shall inform Service Provider within one month from his request, of the road map for implementation of the Interworking between the Service Provider and the required Terminating Service Provider.

If feasible, the IPX Provider shall offer this as a directly connected Terminating Service Provider to his own service, otherwise shall use a Third Party's IPX to implement the required Terminating Service Provider in the shortest possible time.

At mutually agreed intervals the IPX Provider shall provide the Service Providers with its Terminating Service Provider forecasts on the activation of new Terminating Service Providers. Those forecasts shall be used by IPX Provider for implementing all necessary technical and charging parameters and by Service Provider for systems configuration.

10.5 Traffic Report

IPX Provider will produce traffic statistics in order to show:

- The total volume of traffic transmitted per quarter, per month
- The maximum amount of traffic transmitted during the busiest hours,
- The average according with size definition.

The Traffic Report shall be used for forecast and billing management by both the IPX Provider and the Service Provider.

The results shall be monthly reported in the traffic report.

10.6 Quality of Service (QoS) Reports

IPX Provider shall provide Monthly Performance Reports (MPR) and optionally Weekly Performance Reports (WPR) on the QoS for the traffic handled from [Service Provider]. These reports should be available to check the level of performance of the service provided. Such level of performance is measured through the KPIs as indicated in this ANNEX 3.

Monthly Performance Report (MPR):

- The MPR generated by IPX Provider will record only statistics referring to traffic specifically originated or terminated by the Service Provider and must not include blended performance statistics of non-related traffic.
- The IPX Provider agrees to report on all destinations, using the KPIs that have been agreed between the IPX Provider and the Service Provider.
- The MPR must include hourly values for the KPIs defined. The values should be measured 24 x 7 x 365.
- The MPR shall be available to Service Provider no later than the 10th calendar day of each month. By definition, the MPR shall detail the performance of the previous month.
- All MPRs, without exception, must be sent to the contact provided for the effect by the Service Operator identified within the Agreement in Clause X.
- The IPX provider agrees to support the development of quality measurements undertaken, as considered appropriate.

10.7 Parameter Change Notification & contact points update

IPX Provider and the Service Provider shall agree at signature of their Agreement on ad hoc timing for notification of network and billing parameters' change & contact points update.

10.8 Connection between IPX Provider System and the [Service Provider]'s System

IPX Provider shall designate an account manager to be responsible for the operational management of the IPX Service from date of signature of the Agreement until six calendar months after the Effective Date.

The account manager shall co-ordinate all technical and implementation operations with the Service Provider and shall report weekly to them on the project progress, unless otherwise agreed between the parties.

10.9 Operating Period

IPX Provider shall designate an account manager to manage all technical and rollout operations required when a new Terminating Service Provider (new Elected Participating Service Provider) has to be activated.

Activation is considered to take place from the moment the Service Provider requests to implement the Interworking with that Elected Participating Service Provider and until 1 month after the relevant Commencement Date.

11 SLA Review

Both parties agree to attend regular meetings to assess the quality performance of the Service rendered by the IPX provider to the Service Provider. Additionally, these meetings can produce agreements (e.g. SLA updates) to improve quality.

The Service Provider and IPX Provider agree to perform a review of SLA's QoS benchmark levels every 6 months, or as mutually agreed in writing, to verify the necessity to update such levels in order for them to be always in line with the current technology and market trends.

SCHEDULE A – SERVICE CREDIT LEVEL

If the IPX Provider breaches any KPIs, the IPX Provider shall report the breach to the Service Provider.

If the Service Provider accrues the right to a Performance rebate, such rebate shall be automatically applied by the IPX Provider within the invoice of the relevant invoicing month, without the need of a request made by the Customer.

In the case where the Service Provider accrues the right to more than one rebate for a single event (e.g. Service availability and MTRS threshold exceeded) only the highest rebate shall apply.

[TO BE AGREED BETWEEN PARTIES]

SCHEDULE B – MONTHLY REPORT

[TO BE AGREED BETWEEN PARTIES]