



Packet Voice Interconnection Service Schedule to AA.80

1.2

1 July 2009

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AA81: PACKET VOICE INTERCONNECTION SERVICE SCHEDULE to AA.80

entered by and between

IPX Provider full name

[IPX_Provider_full_address]

registered in the [] register sub file # []

Vat# []

hereinafter "IPX PROVIDER" or "PARTY"

and

Service_Provider_full_name

[Service_Provider_full_address]

registered in the [] register sub file # []

Vat# []

hereinafter "SERVICE PROVIDER" or "PARTY"

Preamble

1 Preamble

1.1 General Introduction

The PARTIES have executed an agreement on IP Packet eXchange (IPX) Services.

The Parties now wish to extend the aforementioned agreement by this Packet Voice Interconnection Service Schedule. Unless provided otherwise the provisions (and therefore also the definitions) of the aforementioned agreement apply to this Service Schedule. For a short description of the Service in this service see clause 3 of ANNEX 3.

1.2 Structure

This Service Schedule consist a few general provisions which are complemented by 3 Annexes:

ANNEX 1 Billing

ANNEX 2 Technical

ANNEX 3 SLA

2 Commencement of Initial Services

The Service set out herein shall be provided no sooner than on this Service's Commencement Date: [State date agreed between parties with the following format MM/DD/YYYY]

In relation to the initial commencement of the Service and without prejudice to the other obligations of the Parties set out in this Service Schedule:

The Service Provider shall inform the IPX Provider about the commencement of the service interoperability in due time.

All billing and charging mechanisms shall start from the Commencement Date.

3 Regulatory Requirements

Emergency calls: [agreed requirements specific to this service schedule]

DRM (Digital Rights Management): [agreed requirements specific to this service schedule]

4 Termination of Service

A PARTY may terminate this Service at the end of a calendar month bay giving no less than ninety (90) days' prior notice.

5 Penalties

For all penalties regarding payment, licensing and suspending the service beyond cases indicated in the Main Body of this Schedule shall remain within the scope of the IPX Governance document XX [currently being defined by IPIAG].

6 Opt in-Opt out Process

All participating service providers and relevant information such as the termination charges and the service parameters, as well as the elected participating service providers are listed in the "ANNEX 2 Technical". The IPX Provider may modify ANNEX 2 by adding or removing any participating service providers. When adding new participating service providers the IPX Provider shall state their particulars (e.g. termination charges, currency and service parameters).

As for the opt-in/opt out model, OPT OUT is strongly recommended. In the case where OPT OUT is not feasible, the procedure to be applied is the one defined in the IPX Guidelines.

7 Signatures

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

Signed on this _____ in [City]

The IPX PROVIDER: IPX Provider full name	
----- [] (name + function)	----- [] (name + function)

Signed on this _____ in _____ (place)

The SERVICE PROVIDER: Service Provider full name	
----- [] (name + function)	----- [] (name + function)

ANNEX 1 Billing

1 Service provider termination charges

The Service Provider termination charges are based on call duration.

The Service Provider will charge the IPX Provider amount/currency...per minute/second...

2 IPX Transit Charges

The IPX Provider will charge the Service Provider amount/currency

3 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.

4 Data exchange and Invoice procedure

4.1 Invoice period

The invoice period is a one-month period (n), which lasts from 00.00.00AM of the 1st day of the calendar month (n) to the 11.59.59PM of the last day of the calendar month (n) (local dates/times).

4.2 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 minutes per destination,
- applied elected service provider's termination fee per minute.
- transit fee
- total invoice amount

ANNEX 2 Technical

1 Participating Service Parameter Change Notification

IPX Provider to Service Provider: The Service Provider will be notified once monthly of any parameter changes for existing and new participating service providers and (in the case of new participating service providers) also the wished dates for the openings. 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.

2 Participating Service Provider's Parameters

TBD based on the outcomes of the trial

3 Service Provider's Parameters

TBD based on the outcomes of the trial

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) and number of IPX used	Rate and currency per Minute						

--	--	--	--	--	--	--	--	--	--

5 Service Features for PVI

The following key Service Features are deemed to be mandatory for the operation of the SIP-I based Interconnect Service over the IPX;

	Mobile Network	Fixed Network
Protocol Specification	3GPP SIP-I protocol specification (for TrFO/OoBTC) with International ISUP encapsulation (ITU-T Q.761-4 enc. as RFC 3204).	(a) 3GPP SIP-I protocol specification (for TrFO/OoBTC) with International ISUP encapsulation (ITU-T Q.761-4 enc. as RFC 3204). (b) ITU-T Recommendation Q.1912.5 (for no OoBTC) with international ISUP encapsulation (ITU-T Q.761-4 enc. as RFC 3204).
Codecs - Voice	G.711, EFR, FR, AMR, AMR-WB	G.711, G.729 (inc D and E), G.723,
Codecs - Video	3G-324M	H.261, H.263, H.264, mpv4-es
Codecs - Fax	T.38, G.711 (transport in RTP per RFC 3551)	T.38, G.711 (transport in RTP per RFC 3551)
Codecs – analogue data	G.711 (transport in RTP per RFC 3551)	G.711 (transport in RTP per RFC 3551)
Codecs – Text telephony	T.140	T.140
DTMF Support	In band G.711, RFC4733	In band G.711, RFC4733
Packetisation rate	5ms, 20ms	10ms (others?)
Transport – media plane	RTP	RTP
Transport – control plane	TCP, SCTP	TCP, SCTP
Supplementary Services	CLIP CLIR CFB CFNR CFU CW CUG CH CF Multiparty ECT	CLIP CLIR CFB CFNR CFU CW CUG CH CF Multiparty ECT

	Prioritised (Mandatory)	Later Phase
Protocol Specification	ITU-T Q.1912.5 Profile C; International ISUP encapsulation and 3GPP SIP-I; International ISUP encapsulation	3GPP SIP-I; International ISUP encapsulation
Codec	G.711	AMR 12.2 (TrFO)
Call establishment	A and B party establishment. Ring tone generation Abnormal conditions, clean handling of – calling busy subscriber, clearing before completion, etc	
Call clearing	Normal cases A and B. Abnormal cases – confirm clean handling with appropriate user indications	
Supplementary Services	CLIP; CLIR	UUS; Call Complete to Busy Subscriber; Multiparty; Multicall; Call Waiting; Call Hold; CFU; CFB; CFNRy; CFNRc; COLP; COLR; Closed User Group.
Charging	CDR Generation to determine duration of open media channel. Collection of expected event labels and cause codes	
Packetisation Period?	20ms for G.711	5ms for G.711
DTMF	In-band transport (G.711).	Method FFS
Echo Cancellation	None.	FFS, to be discussed with FNOs.
IPX Protocol Interworking	None	ISUP - FFS?
Other:		Video Telephony (3G-324M/UDI 64); Fax/Modem

ANNEX 3 SLA

SERVICE LEVEL AGREEMENT FOR PACKET VOICE INTERWORKING

1 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 Annex is intended to provide the requirements to ensure the end-to-end Quality of the IPX Service Hub/ IPX Service Transit.

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

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

2 SCOPE AND ASSUMPTIONS

The parties agree to:

- Provide a detailed description of end to end Quality of Packet Voice Service (QoS), including related terms definition, initial requirements, provisioning and measurement methods.
- do 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 Packet Voice Service layer only for the communications where PVI Service Provider is the originating network. That is, it is intended as a one way SLA, that is, traffic that starts from the PVI Service Provider, goes via the IPX Provider only or also via third party IPX Provider(s) and ends at a terminating PVI service provider (i.e. the participating PVI service provider on

whose network the traffic has to be terminated). The IPX Provider commits to send to the PVI Service Provider all the traffic it receives from other elected participating PVI service providers or third party IPX provider(s) at the same QoS by which the IPX Provider receives the traffic.

- apply 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 PVI 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 PVI service provider(s).
- in order to guarantee a full end-to-end SLA both ways from the PVI Service Provider to the elected participating PVI service provider, a similar SLA chain must be in place on the return path .
- assume that any two PVI 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, PVI Service Provider -supplied power, any PVI Service Provider equipment, non-maintained structured cabling.
- Packet Voice Service suspension in accordance with the terms of the AA.80 Agreement.

3 PACKET VOICE SERVICE DEFINITION

The Packet Voice Service Hub/ Packet Voice Service Transit rendered by IPX Provider to the PVI Service Provider to allow the connectivity between the PVI Service Provider and the elected participating PVI service providers listed in the Agreement with the QoS requirements described in this Annex, enabling Packet Voice Service interworking and (when applicable) Roaming Packet Voice Services.

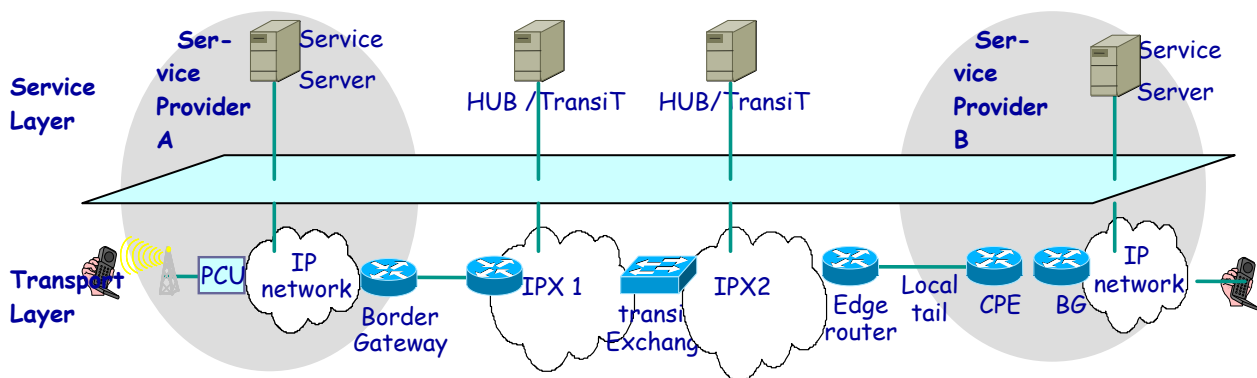
4 IPX END-TO-END RESPONSIBILITY

The Parties intend this SLA to enable end-to-end QoS in the IPX Service rendered to the PVI Service Provider in a way that all commitments of the IPX Provider are valid from the PVI Service Provider's network to the elected participating PVI service provider('s)' network whatever technical solution is used and operated by the IPX Provider.

To achieve this goal this SLA defines a set of Key Performance Indicators (KPIs) that provide a measurement of the level of QoS associated to the Packet Voice 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 SLA. In order to achieve end-to-end QoS all parties involved in the message flow should be compliant with the requirements expressed in this SLA.

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



5 KEY PERFORMANCE INDICATORS (KPI)

The parties have agreed a set of KPIs that reflect the QoS rendered by IPX Provider.

These KPI's are:

- MTRS
- Packet Voice Service Availability
- Packet Voice Service Provisioning Timeframes
- ASR
- ABR
- NER
- ALOC
- PGAD
- CLI Transmission

These indicators relate only to traffic sent by the PVI Service Provider to each elected participating PVI service provider via the IPX Provider. The origin of the measurements is from the BG of the PVI Service Provider's network otherwise state different.

5.1 Maximum Time to Restore the Packet Voice Service – MTRS –

Maximum Time to Restore the Service (MTRS) in case of (a) Fatal Errors, (b) Severe Errors or (c) Warning Errors. MTRS is the time that passes between the moment a trouble ticket in IPX Provider's trouble ticketing system is opened and the moment when the problem, which is dealt with in such trouble ticket, is resolved.

- Total loss of connectivity between PVI Service Provider and IPX Provider platform
- Packet Voice Service affecting outage in the interconnection equipment

5.1.1 Fatal Errors

A complete breakdown/outage, critical performance degradation, functionality of a single Packet Voice Service causing Packet Voice 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 PVI Service Provider and IPX Provider platform
- Packet Voice 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 PVI Service Provider or the IPX Provider

5.1.2 Severe Errors

The functionality of the Packet Voice 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 Packet Voice 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 Packet Voice Service; backbone congestion causes excessive packet loss or jitter.
- Degradation of the QoS to any elected participating PVI service provider, being defined as when any measured value for KPI is below the target threshold as indicated in the SLA.

5.1.3 Warning Errors

A minimal limitation to the Packet Voice 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 Packet Voice Service numbers.

5.2 Packet Voice Service availability

Is the proportion of the time that IPX Packet Voice Service is available to the PVI Service Provider on a monthly basis. Three different types of availabilities apply:

5.2.1 Packet Voice Service System Availability

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

Calculating Availability: The parameter [IPX Packet Voice Service] System Availability describes the percentage of time that the [IPX Packet Voice Service] 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 Packet Voice Service System Availability
- B_m = Number of hours when Packet Voice Service System is unavailable (excluding planned outages)

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

Packet Voice Service System Availability means that the IPX Provider is able to transit the PVI Service Provider's traffic to the elected participating PVI service provider's network or to the third party's IPX provider, if any.

5.2.2 Packet Voice Transit Service Availability

Packet Voice Transit Service Availability applies to the Packet Voice Service offered by the IPX Provider from the PVI Service Provider's network up to the elected participating PVI service provider's network.

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

Calculating Availability: The parameter Packet Voice Transit Service Availability describes the percentage of time that the Packet Voice 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 Packet Voice Transit Service Availability
- B_m = Number of hours when IPX Provider's Packet Voice Transit Service is unavailable (excluding planned outages)

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

Packet Voice Transit Service availability means that the IPX is able to transit and terminate the PVI Service Provider's traffic to the elected participating PVI service provider's network.

5.2.3 Packet Voice Transit Service Availability Per Destination

Packet Voice Transit Service Availability per destination applies to the Packet Voice Service offered by the IPX Provider from the PVI Service Provider's network up to the

elected participating PVI Service provider's network. This indicator reflects possibility for the PVI Service Provider to access a particular destination included in the Packet Voice Service offered by the IPX Provider.

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

Calculating Availability: The parameter Packet Voice Transit Service Availability per destination describes the percentage of time that the Packet Voice Transit Service is carrying its function out properly for the terminating PVI service provider (see calculation below).

$$\left[\% \right] = \frac{A_m - B_m}{A_m} \times \frac{100}{1}$$

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

Packet Voice Transit Service per destination unavailability time begins at time of detection of unavailability of a terminating PVI service provider by either the IPX Provider or the originating PVI service provider whichever the earlier and ends at time of Packet Voice Service restoration for a terminating PVI service provider.

Packet Voice Transit Service per destination availability means that the IPX Provider is able to transit and terminate the terminating PVI service provider's traffic to a specific elected participating PVI service provider's network.

5.3 Packet Voice 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 Packet Voice 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 PVI service provider) accepts traffic from the client PVI service provider.
- Maximum Time to Modifying existing client PVI service provider data

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

5.4 Answer Seizure Ratio (ASR)

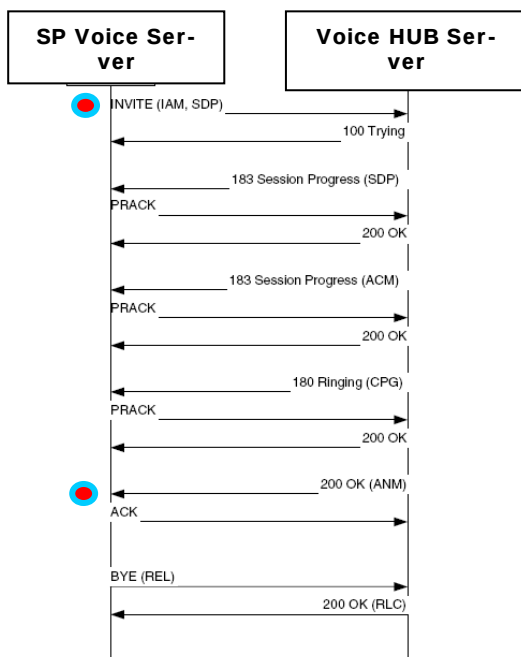
5.4.1 Abstract definition

ASR expresses the relationship between the number of call sessions started by SP voice server and the number of calls set-up normally in a given period of time.

ASR is the ratio of the relationship between the number of INVITE with an encapsulated IAM sent by the SP voice server and the number of response 200 OK INVITE with an encapsulated ANM received by SP voice server on a monthly basis.

5.4.2 Abstract equation:

$$[ASR] = \frac{\text{Total \# of 200 OK INVITE [ANM]}_{SP} \times 10}{\text{Total \# of INVITE [IAM]}_{SP \text{ Voice}} 0}$$



Normal flow for a call setup. Trigger points for ASR

5.5 Answer Bid Ratio (ABR)

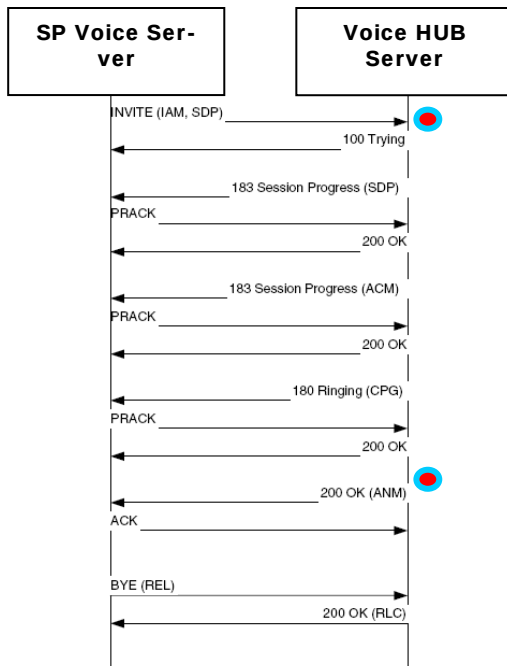
5.5.1 Abstract definition

ABR expresses the relationship between the amount of call sessions Voice HUB server is asked to set-up and the amount of then set-up normally in a given period of time.

ABR is the ratio of the relationship between the number of INVITE with an encapsulated IAM received by the voice HUB server and the number of responses with an encapsulated ANM sent by voice HUB server on a monthly basis.

5.5.2 Abstract equation

$$[ABR] = \frac{\# \text{ of } 200 \text{ OK INVITE [ANM]}_{\text{Voice HUB}}}{\# \text{ of INVITE [IAM]}_{\text{Voice HUB}}} \times 10^0$$



Normal flow for a call setup. Trigger points for ABR

5.6 Network Efficiency Ratio (NET)

5.6.1 Abstract definition

NER expresses the ability of a network to deliver a call without taking into account user interferences in a given period of time.

NER is the ratio of the relationship between the number of INVITE with an encapsulated IAM sent by SP voice server with encapsulated IAM and the responses received by SP voice server that result in:

- a response 200 OK INVITE with an ANM encapsulated (normally setup) or
- a BYE response or message type '486 Busy Here' with REL encapsulated and cause release 17 or
- a BYE response or message type '600 Busy everywhere' with REL encapsulated with cause release 17 or
- a BYE response or message type '480 Temporarily unavailable' with REL encapsulated with cause value 18 or 19 or 20 or 21 or 31, or
- a BYE response or message type '484 Address Incomplete' with REL encapsulated with cause value 28 or
- a BYE response or message type '404 Not Found' with REL encapsulated with cause value 1 or

- a BYE response or message type '604 Does not exist anywhere' with REL encapsulated with cause value 1 or
- a BYE response or message type 500 'Server Internal Error' with REL encapsulated with cause value 50 or 55 or 57 or 87 or 88 or 90.

on a monthly basis.

5.6.2 Abstract equation

$$[NER] = \frac{\left[\begin{array}{l} \# 200 \text{ OK INVITE}[ANM] + \# BYE[REL=1, 17-21, 28, 31, \\ 50, 55, 87, 88, 90] + \# 404 [REL=1] + \# 604 [REL=1] + \\ \# 486 [REL=17] + \# 600 [REL=17] + \# 480 [REL=18- \\ 21, 31] + \# 484 [REL=28] + \# 500 [REL=50, 57, 87, 88, \end{array} \right]}{\text{Total \# of INVITE [IAM]}_{SP \text{ Voice}}} \times 10^0$$

5.7 Post Gateway Access Delay (PGAD)

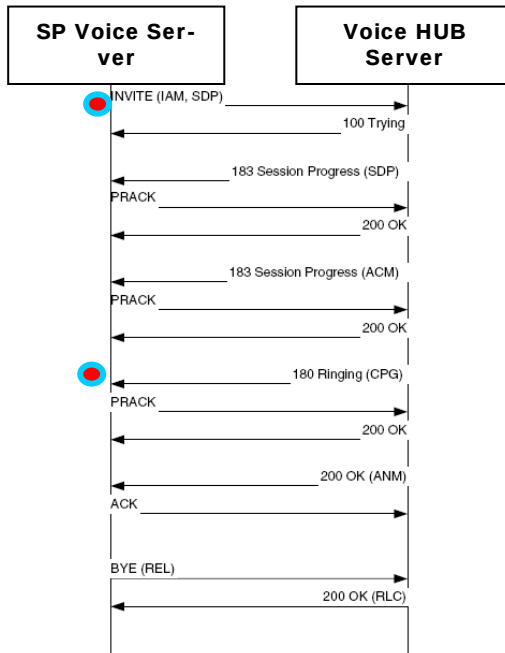
5.7.1 Abstract definition:

PGAD expresses the time elapsed between the SP voice server asking for a call setup and the ringing tone for that call in a given period of time.

PGAD is the average time between SP voice server sending an INVITE with an encapsulated IAM and the SP voice server receiving a 180 'Ringing' with encapsulated ACM on a monthly basis.

5.7.2 Abstract equation

$$[PGAD] = \frac{\sum [T_{180 \text{ 'ringing'}[ACM]} - T_{INVITE [IAM]}]_{SP \text{ Voice Server}}}{\# \text{ of INVITE [IAM]}_{SP \text{ Voice}}} \times 10^0$$



Normal flow for a call setup. Trigger points for PGAD

5.8 Average Length of Call (ALOC)

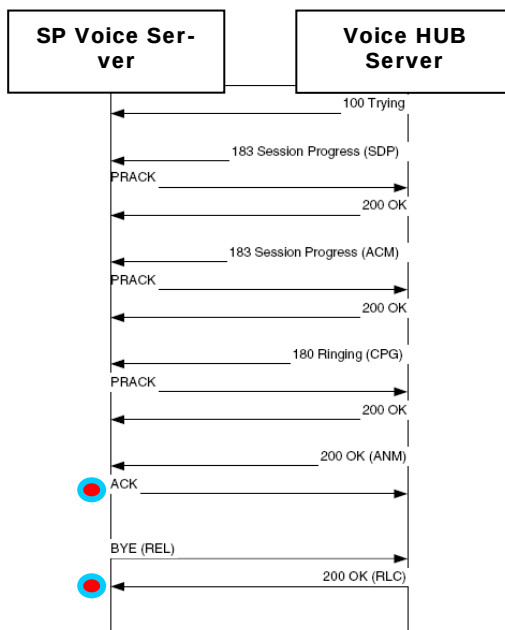
5.8.1 Abstract definition

ALOC expresses the average time of conversation for all the calls successfully setup in a given period of time.

ALOC is the average time between SP voice server receiving a 200 OK INVITE with an encapsulated ANM and the SP voice server receiving a BYE message with encapsulated REL on a monthly basis.

5.8.2 Abstract equation:

$$[\text{ALOC}_{\text{[in seconds]}}] = \frac{\sum [T_{\text{BYE[REL]}} - T_{200 \text{ OK INVITE [ANM]}_{\text{SP}}}]_{\text{Voice}}}{\# \text{ of } 200 \text{ OK INVITE [ANM]}_{\text{SP Voice}}} \times 10^0$$



Normal flow for a call setup. Trigger points for ALOC

5.9 CLI Transmission

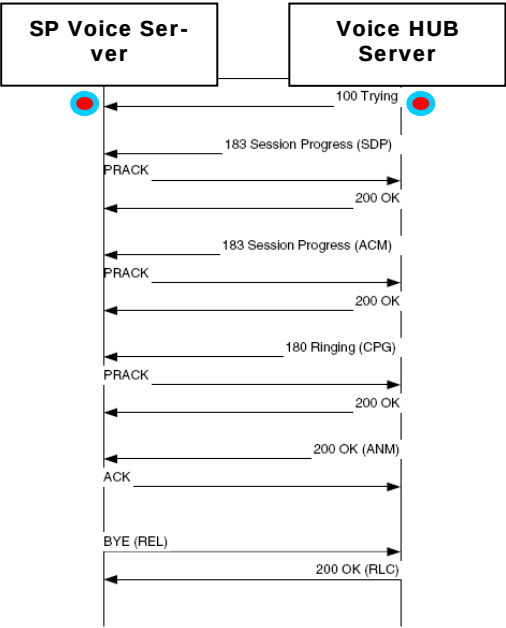
5.9.1 Abstract definition

CLI Transmission expresses the ability of a network to successfully transmit the Calling Line Identification/P-Asserted Identity through the network in a given period of time.

CLI Transmission is the ratio of the relationship between the number of INVITE with an encapsulated IAM with CLI information encapsulated sent by the SP voice server and the number of INVITE with an encapsulated IAM with CLI information encapsulated received by the voice HUB server on a monthly basis.

5.9.2 Abstract equation:

$$[\text{CLI Transmission}] = \frac{\# \text{ of INVITE [IAM<CLI present>]}_{\text{Voice}}}{\times 10^0}$$



Normal flow for a call setup. Trigger points for CLI Tx.

6 TARGETS FOR KPI

6.1 Maximum Time to Restore the Packet Voice Service – MTRS –

Severity	Maximum restoration times	Initial Feed-back	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 PVI service provider during the year’s quarter.

6.2 Packet Voice Service availability

Packet Voice System Availability target applies: [XX.X%].
Packet Voice Transit Service Availability target applies: [XX.X%].
Packet Voice Transit Service Availability per destination target applies: [XX.X%]
for an elected participating PVI service provider or a set of elected participating PVI service provider, as indicated by PVI Service Provider
For example: 99,5% for top 20 elected participating PVI service provider, as indicated by PVI Service Provider and 98.0% for remaining elected participating PVI service provider

6.3 Packet Voice Service Provisioning Timeframes

Maximum Time to Turn On a New Destination (elected participating PVI service provider): [State number of days agreed between Parties]days

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

6.4 Answer Seizure Ratio

ASR: XX.X% [To be agreed between Parties]:

6.5 Answer Bid Ratio

ABR: XX.X % [To be agreed between Parties]

6.6 Network Efficiency Ratio

NER: XX.X % [To be agreed between Parties]

6.7 Post Gateway Access Delay

PGAD: XX.X milliseconds [To be agreed between Parties]

6.8 Average Length Of Call

ALOC: XX.X milliseconds [To be agreed between Parties]

6.9 CLI Transmission

CLI Tx: XX.X % [To be agreed between Parties]

7 QUALIFYING FAULTS

When according to the PVI Service Provider's own measurement, the average daily level of QoS falls below the KPIs, the PVI Service Provider may raise a "qualifying fault".

The PVI Service Provider may request the IPX Provider to handle and investigate all qualifying faults, and to commit to resolve ___% of them within ___ hours when the fault lies in its own network.

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

8 PACKET VOICE SERVICE CREDITS

8.1 Qualifying Claims

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

8.2 Packet Voice Service Credit Level

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

8.3 Packet Voice Service Credits Claim Procedure

In order to claim for a Packet Voice Service credit, PVI Service Provider may provide the following details of the faults to the IPX Provider`s commercial contact:

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

The mechanism for compensating any eventual Packet Voice Service credit due will mutually agree between parties.

9 CONTROLLED CONNECTIVITY POLICY

In order to avoid deterioration of the quality of Packet Voice Service, information on the connectivity for each terminating PVI service provider shall be made transparent to the PVI Service Provider.

In any case, the direct termination of traffic by the IPX Provider on the terminating PVI service provider shall be favoured whenever it is technically possible.

The PVI 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 PVI Service Provider. In particular, the minimum information that the IPX Provider shall provide to the PVI Service Provider consist on the type of connectivity used to reach each terminating PVI 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.

9.1 Direct connectivity

Direct connectivity to participating PVI service providers is when the IPX Provider offers a direct connectivity with participating PVI service providers network to the PVI Service Provider. That is, only one hop from the PVI Service Provider and the elected participating PVI service provider.

9.2 Indirect connectivity

Indirect connectivity to participating PVI 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 PVI service provider.

10 CUSTOMER CARE and MONITORING

IPX Provider must provide a 24x7 Help Desk.

The IPX Provider must provide a web access monitoring tool where the PVI Service Provider sees the traffic performance of the IPX Provider.

This monitoring tool will only show the traffic originating from the Service Provider's network.

11 OPERATION & MAINTENANCE – FAULT MANAGEMENT

11.1 Introduction

This section details the operational processes to be provided to PVI Service Provider by IPX Provider and vice versa for IPX Packet Voice Services.

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

11.2 Central Notification Addresses

Each Party must name a central entity (single point of contact) who shall fulfil the duties in the notification processes in case of faults affecting the PVI Service.

This contact must be available 24 hours a day at a single telephone contact number.

The requirements for the central notification contact are:

- Competency concerning operational issues for IPX Packet Voice Services
- Remote access to decentralized operational network elements
- Relevant access to tools, resources and knowledgebase to solve problems

This contact has to be competent in operational issues for PVI Services, he has to have remote access to decentralized operational network elements as well as relevant access to tools, resources and knowledgebase to solve problems.

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

11.3 Fault Classification:

The IPX Provider shall open a trouble ticket in the case of any fault on the Packet Voice Service reported by the PVI 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:

- Fatal Errors [see clause 5.1.1]
- Severe Errors [see clause 5.1.2]
- Warning Errors [see clause 5.2.3]

11.4 Fault Reporting procedures:

The following section describes the fault reporting procedure for both the PVI Service Provider and the IPX Provider.

11.4.1 Fault Reporting by Packet Voice Service Provider

The IPX Provider shall provide a contact to receive fault reports 24x7. This contact is set out in clause 11.2 above.

Suspected faults on the Packet Voice 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 11.2.

Reporting of 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 PVI Service Provider will provide also its internal reference number for tracking.

Whenever a fault is reported the below information has to be given:

- Company name
- Name, telephone number and email of the person reporting the fault
- PVI Service Provider's contact name, telephone number and email, if different from the above
- PVI Service Provider's Fault Trouble Ticket Number
- Physical location of the fault if identified.
- Details of the fault (IPX Provider's Packet Voice 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
- PVI Service Provider's domain/DNS details (if applicable)
- IPX Provider traffic details should be included if available.

11.4.2 Fault Reporting by IPX Provider

The IPX Provider shall quickly inform the Service Provider's contact (see clause 11.2) by telephone and email of any fatal fault, no matter in which part of the systems involved the fault occurs.

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 no-

tice in respect of a fault, IPX Provider shall keep the PVI Service Provider informed of the progress of remedial works according to the time interval agreed in this SLA.

11.5 Fault Resolution:

IPX Provider shall immediately start proper fault handling intervention actions and inform PVI Service Provider accordingly, in line with the procedure stated within clause 11.4.

The time interval to calculate MTRS shall start from the moment when the TT is opened.

Both Parties shall provide each other with the agreed progress updates as reported in clause 6.1 above.

The minimum information required in the update are:

- 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 6.1, IPX Provider shall allocate extra resources, via an escalation procedure, to achieve its resolution.

In all cases, if the fault is not resolved within the timeframe agreed from when a trouble ticket is opened and there is a degradation of the Packet Voice Service quality level provided by IPX Provider to below the contractually agreed targets as measured by the KPIs indicated within the SLA, PVI 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 and in any case, the time to restore the proper functionality of the Packet Voice Service shall be taken into account when measuring the monthly MTRS level.

11.6 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 PVI Service Provider and IPX Provider must be accomplished using the following steps:

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

Note: Non-Packet Voice Service affecting faults will not be escalated outside of normal working hours.

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

11.7 Official Status Information

After the initial information, updates in accordance with clause 6.1 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.

11.8 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 Packet Voice Service has been restored, faults will be classified as «cleared» and the «Response and Restoration Time Clock» are stopped.

11.9 Duration of a fault

The duration of a fault shall be defined as per clause 6.1

11.10 Communications

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

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

Parties agree that:

- Emergency situations shall be expedited.

- The contact persons for such communications will be those identified in clause 11.2 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 Packet Voice 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, in the IPX Packet Voice Service shall be always specified.

11.11 Planned Outages, Product Updates/Upgrades

Before any planned work is undertaken that might affect the Packet Voice Service, each Party shall give an advanced notice to the other Party (receiving Party).

Unless agreed otherwise all planned works shall be made Monday through Thursday (if working day) between 02:00 am and 06:00 am local time.

If such timescales are not respected, the work will be considered as an unplanned outage, that is, a fault.

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

In all cases described above, each Party's network management organization will take action to reduce disruption of traffic flows to the minimum.

For all works affecting PVI 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.

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.

Advice of proposed planned work shall be notified by e-mail always at the contact points indicated in clause 11.2 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, which is an MTRS impacting fault.

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 its original working state. In such a case, the time to restore the proper functionality of the Packet Voice Service shall be taken into account when measuring the MTRS levels.

The Parties shall make no changes to their systems and any outage is defined as fatal during this freeze period: [] (set out days and time zone, e.g. 24 December – 26 December country time).

11.12 Fault Handling Performance Reporting

11.12.1 General provisions

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.

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.
- PVI Service Provider commits to validating the data provided by the IPX Provider not later than the 20th calendar day.

Reports and validations shall be emailed to the other Party's contact set out below:

IPX Provider's contact details	Service Provider's contact details
Fill in name, position, email	Fill in name, position, email

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

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

11.12.2 Monthly Fault Report

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).

IPX Provider is to the PVI Service Provider supply a monthly "Fault Report", with the following fields completed:

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

11.12.3 Monthly Review Fault Report

Based on the fault report the IPX Provider shall supply a monthly review fault report including the following statistics for the past month and the past 6 months in total.

- Reporting Party
- Reporting Period (calendar month)
- Faults by severity and terminating service provider
- Number of open tickets at the end of the reporting period
- Number of tickets opened during the reporting period
- Number of tickets closed during the reporting period
- Average resolution time based on the closed tickets during the reporting period
- Number of opened fatal trouble tickets

11.12.4 Monthly 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 PVI Service Provider.

The results shall be monthly reported in the traffic report.

11.12.5 Monthly Quality of Service Report (= Monthly Performance Report = MPR)

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

The MPR must include hourly values for the KPIs defined. The values should be measured 24 x 7.

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 PVI 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.

12 OPERATION & MAINTENANCE – NON-FAULT MANAGEMENT

12.1 Packet Voice Service Management

Such customer care Packet Voice 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, 9 am - 5 pm (of the IPX Provider`s local time) excluding Public Holidays.

12.2 Traffic Management

The PVI Service Provider commits to providing traffic forecasts at least monthly. 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 PVI service provider. They shall not have any binding effect unless otherwise agreed between IPX Provider and the PVI Service Provider.

12.3 Participating Service Provider Management

Pursuant to the provisions for election and activation of the participating PVI services providers, PVI Service Provider may request IPX Provider from time to time to activate the interworking between its own network and a new terminating PVI service provider not included in the IPX Provider list of participating PVI service providers.

In such cases, the IPX Provider shall inform PVI Service Provider within one month from his request, of the road map for implementation of the interworking between the PVI Service Provider and the required terminating PVI service provider.

If feasible, the IPX Provider shall offer this as a directly connected terminating PVI service provider to his own Packet Voice Service, otherwise shall use a third party's IPX to implement the required terminating PVI service provider in the shortest possible time.

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

12.4 Maintenance Operations management

Where an outage is planned by the PVI Service Provider or the IPX Provider, the Party shall notify the other in advance with full details concerning that outage causing the outage is required to notify the other in advance at the contact points indicated in clause 11.2 with full details concerning that outage. A brief explanation of the operation as well as the impact or risk of impact on the service shall be included.

The IPX Provider shall periodically conduct maintenance tests to check:

- The proper functionality of the PVI Service Provider's connection to the IPX platform;
- The Interworking between the PVI Service Provider and its elected participating PVI service providers

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

12.5 Parameter Change Notification & contact points update

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

12.6 Connection between IPX Provider System and the PVI Service Provider's System

IPX Provider shall designate a central contact to be responsible for the operational management of the IPX Packet Voice Service from date of signature of the Agreement until six calendar months after the Effective Date.

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

12.7 Operating period

IPX Provider shall designate an central contact to manage all technical and rollout operations required when a new terminating PVI service provider (new elected participating PVI service provider) has to be activated.

This shall take place from the moment the PVI Service Provider requests to implement the interworking with that elected participating PVI service provider and until 1 month after the relevant Commencement Date.

12.8 SLA Review

The PVI Service Provider and IPX Provider agree to perform a review of SLA's QoS benchmark levels every 6 months 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 PACKET VOICE SERVICE CREDIT LEVEL

[TO BE AGREED BETWEEN PARTIES]

DOCUMENT MANAGEMENT

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Feedback

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