



IN.20 Guidelines to sign IPX Agreements between Mobile Operators and Carriers

1.1

16 June 2009

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Document History

Version	Date	Brief Description
0.1	01 Apr 2008	For IWG Approval
1.0	July 2008	IWG Doc 08_024 Approved by IWG
1.1	June 2009	Document unrestricted, SOLU#35

Other Information

Type	Description
Document Owner	Interconnect Working Group
Revision Control	Semi Annual
Document editor/company	Maida Mas, Telefónica Móviles España

Feedback

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1 Background

For any background of GRX and IPX, please refer to IPX Whitepaper (ipx_white_paper_1_10_ic_231889)

The current transport network technology for supporting data services, the “GRX”, does not support the business models and quality guarantees that new IP based services require. It also excludes other players.

2 Purpose

This document is intended to provide mobile operators and other applicable Service Providers with guidelines on what you need to know to sign an Agreement for IP Packet eXchange (IPX) Services. .

This document provides a description on how to use the AA80 agreement.

3 AA80 STRUCTURE

3.1 Connectivity Options

IPX supports 3 different types of interconnect model.

- IPX Transport
- IPX Service Transit
- IPX Service Hub

It will be up to the Service Provider to determine which connection model it wants to select from its IPX provider.

IPX Transport (transport only, i.e. without service awareness)

The ‘IPX Transport’ connectivity option enables a bilateral connection between two Service Providers utilising the IPX Transport Layer provided by the IPX Provider with guaranteed Quality end-to-end, but without service awareness.

By choosing this model the IPX will just be responsible of carrying the data for the Service. The operator will have to sign additional bilateral contracts with the Service Providers he decides to establish a relationship. The IPX provider won’t do any billing for the Service Provider.

The IPX Transport option is an technical evolution of the current GRX service, and therefore can be accommodated in this type of interconnect model.

IPX Service Transit (i.e. Transport with Service Awareness)

The ‘IPX Service Transit’ Connectivity Option enables a bilateral agreement and connection between two Service Providers utilising the IPX Transport layer and IPX Service layer provided by the IPX Provider with guaranteed QoS end-to-end and with service awareness included.

IPX Service hub

This is a multilateral connectivity where traffic is routed from one Service Provider to tens or hundreds of Service providers. A Service Provider only needs to sign one agreement with an IPX Provider. The IPX Service Hub arrangement guarantees QoS end-to-end including service awareness.

This is also by default an arrangement where principles of cascading payments apply. The billing and reconciliation will take place between the IPX Provider and its connected Service Provider.

Interconnect Relationship	IPX Interworking Service	End to End QoS	Cascade Billing	Single Contract/ Connection
Internet				
Bilateral	Transport Only		Termination billing takes place directly between Service Providers	Single contract with IPX provider but multiple contracts with connecting Service Providers
Bilateral	Service Transit			Single contract with IPX provider but multiple contracts with connecting Service Providers
Multilateral	Service Hub			

3.2 Agreement Structure

AA80 Main Body

Annex 1 – Tax
Annex 2 – Financial Security
Annex 3 – Insurance
Annex 4 – Service Provider Contact Details
Annex 5 – IPX Provider Contact Details
Annex 6 – Connectivity Options
Annex 7 – Definitions

Annex 8 – Service Level Agreement for Transport
Annex 9 – Charges for Transport

Service Schedules.

Each Service Schedule will include:

Description of the Service
Annex 1: Billing
Annex 2: Technical
Annex 3: SLA

Currently there are 3 Service Schedules to the AA80 agreed:

AA81: Packet Voice Interconnect (PVI)
AA82: SMS
AA83: MMS.

Below there is diagram of the structure of the AA80.

The IPX Agreement is made up of AA80 (Main Body), AA81, the MMS Service Schedule, AA82, the SMS SS.....New services schedules will be added following the numbering sequence.

General Terms and Conditions, General Service Level Agreement and General Specifications make up the Main Body of the agreement.

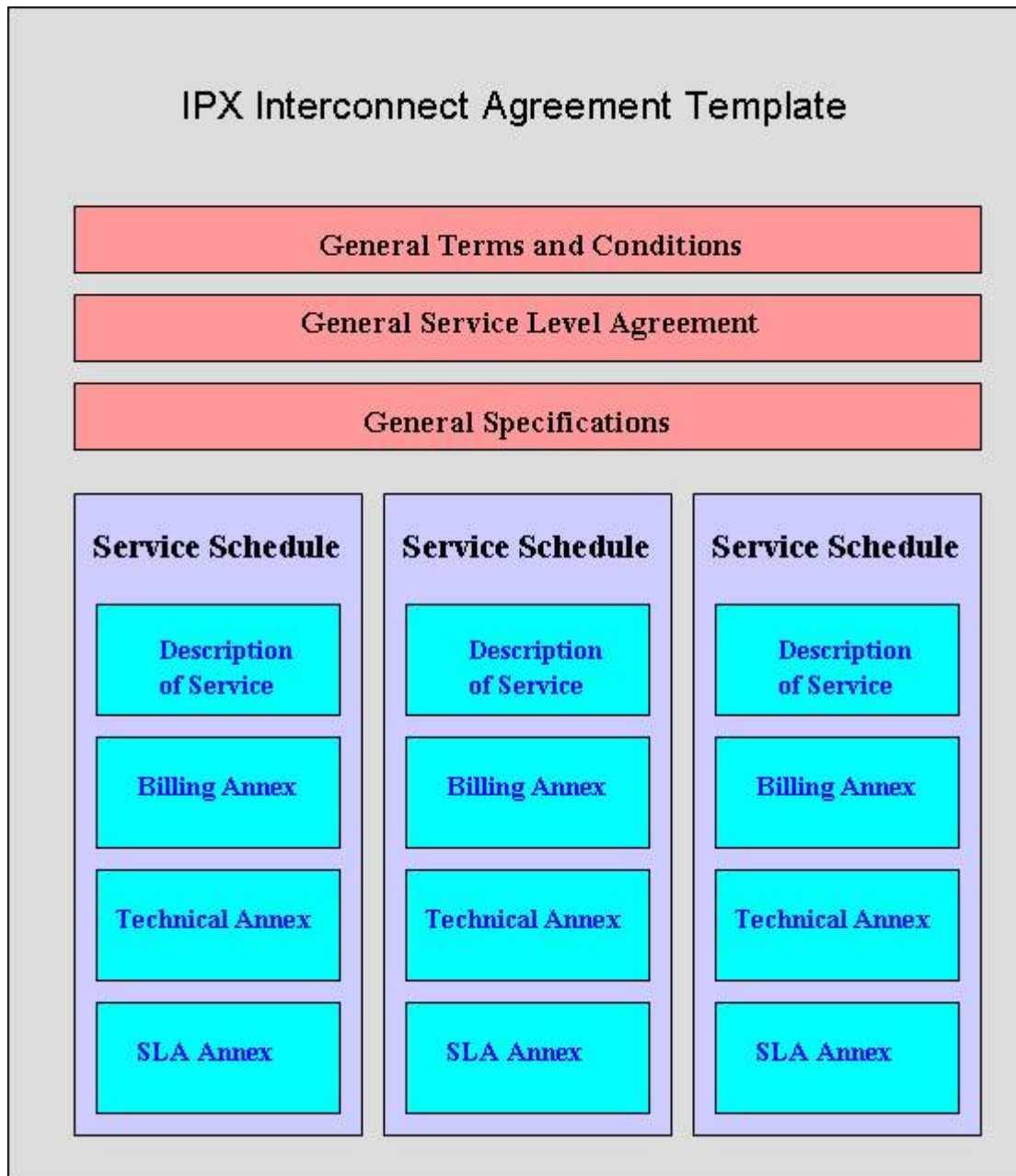
The Transport connectivity option only need the main body to be signed.

Specific Service Schedules will apply for Service Transit. Specific Service Schedules will apply for Service Hub. Service Schedules must be mutually signed by Service Providers and IPX Providers. The Service Schedules can be signed at the same time or at a later time to the AA80 Framework Agreement. New Service Schedule for new services can be signed at any time during the term of the AA80 Framework Agreement.

Opt in or Opt out will be specifically recommended per service in each service schedule.

- Opt-In: Where the Service Provider chooses which Participating Service Provider it wishes to open interworking with. By default all connections will be closed.
- Opt-Out: Where the Service Provider chooses which Participating Service Provider it wishes not to open interworking with. By default all connections will be open.

Each Service Schedule has the same structure. First it will include a description of the Service and three annexes: billing, technical and SLA.



4 ANNEX A: SLA

4.1 Purpose

This document will form part of a handbook to help Service Providers (Mobile Network Operators, Fixed Network Operators, Internet Service Providers) and their chosen IPX Service provider to implement their IPX infrastructure and the associated services.

The architecture of the IPX domain is clearly split in two layers, Service and Transport. The Service layer is responsible for the Hub and Transit capabilities for the particular service in question, and the Transport layer is responsible for maintaining the technical characteristics of the communication along the entire physical path of the communication depending on the Traffic Class used for the service being carried.

This part of the handbook will describe the key aspects of the Service Level Agreements (SLA) and Operations and Maintenance agreements for both the **Transport** and **Service** layers.

4.2 What is the IPX?

The IPX or IP packet eXchange is an enabler for the exchange of IP packets between service providers globally in accordance with GSMA IPI principles.

Its development is aimed at achieving a number of key commercial and technical principles that ensure customer, namely the SP network operator, choice, quality and security whilst maintaining the traditional cascade pricing methodologies ensuring that all parties in the value chain are appropriately rewarded for the service that they provide.

The principles can be described as follows:

Openness

- Open to everyone
- Ubiquitous access (fixed and mobile)
- Choice in connectivity options

Quality

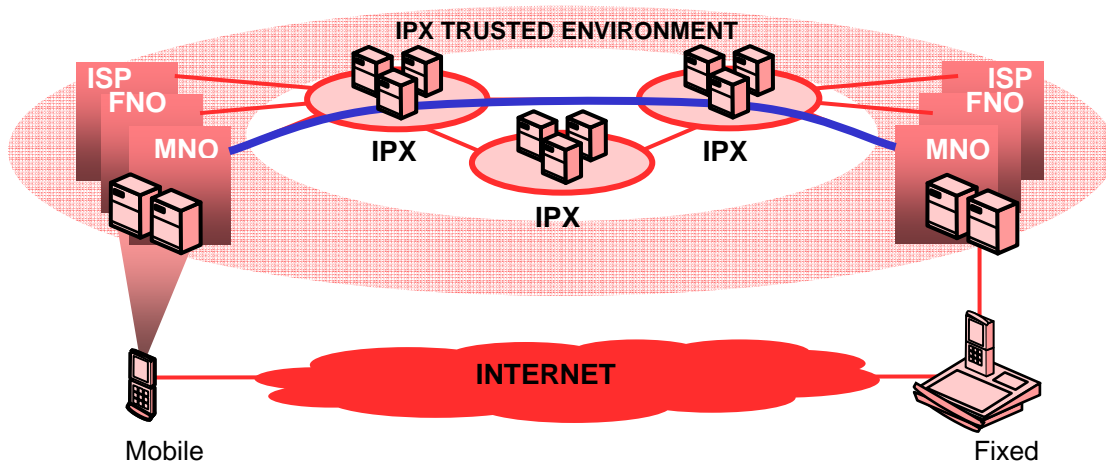
- Guaranteed QoS (E2E SLA, Reliability, Capacity)
- Enhance relationship with your IPX service provider and your fellow connected network operators
- Security (accountability, spam reduction)

Cascading payments

- Cascading of revenues from End to End
- Transparent value-based service pricing

Efficiency

- Multilateral commercial agreements
- Flexibility & scalability



The Service level agreements whether for the Transport or Service layers follow the same broad structure, with some notable exceptions with the MMS SLA. You will see that as this document evolves that the SLA's are not merely a list of key performance indicators, the documents define a whole operational and maintenance methodology which includes issues like customer care and troubleshooting procedures.

• <i>Transport SLA</i>	• <i>Service SLA</i>
• Service Definitions	Packet Voice Service Definitions
• Definition of Terms	Definition of Terms
• Service Quality commitments	Packet Voice Service Quality commitments
• Qualifying faults	Qualifying faults
• Service credits	Packet Voice Service credits
• Service Credits claim procedures	Packet Voice Service Credits claim procedures
• IPX Provider and Service Provider commitment to end-to-end quality	IPX Provider and Packet Voice Service Provider commitment to end-to-end quality
• Commitments to achieve guaranteed Service Level	
• Troubleshooting	Troubleshooting
• Customer Care	Customer Care
• Fast response times	Fast response times
• Monthly reporting on QoS indicators	Monthly reporting on QoS indicators
• SLA Review	SLA Review

4.3 Scope and assumptions

The aim of this section of the SLA is to provide a detailed description of the end to end quality of service, including all related terms and definitions of those terms. It also details any requirements technical and commercial and measurement methods. They are summarised in the attached document.



Scope and assumptions AA80

There are some events and circumstances where the above would not apply. They are:

- In either case a fault in the power supply of the Service Provider and any fault in non-maintained structured cabling and a suspension of the service in accordance with the terms laid out in the AA.80.
- With regard to the Transport SLA only, if there were no SLA between IPX Provider's.

4.4 Service definition

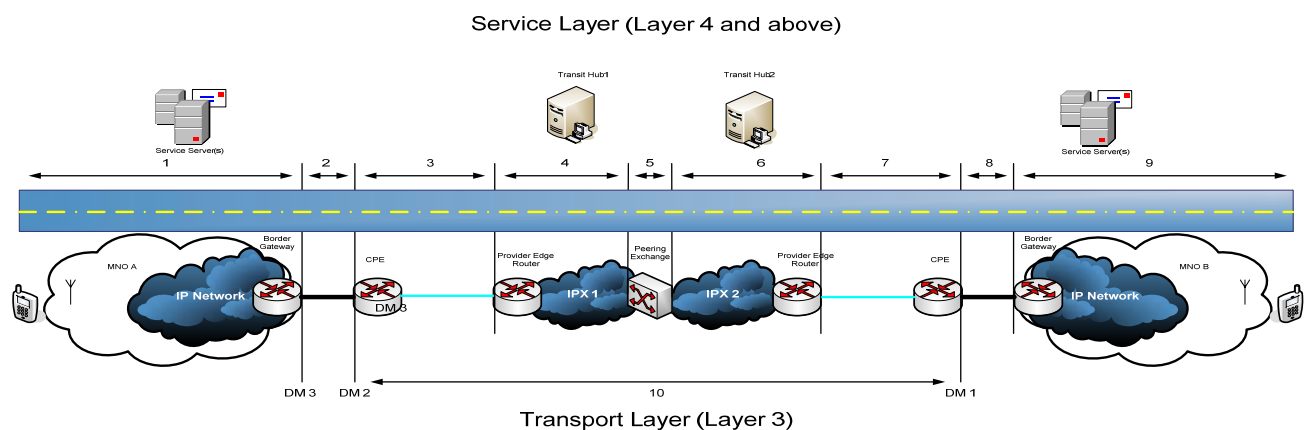
The transport SLA is a little more complex than the service SLA's because of the issues around demarcation points. A demarcation point defines the point at which one party hands responsibility for the quality of service to the next party in the value chain. The transport version is broken down into the following categories:

- IPX end to end responsibility
- Demarcation points in different scenarios and examples are also given

The examples given in the SLA are a selection of possibilities; however, it was considered that not all are relevant in the development of the SLA. The scenarios considered are:

Depending who provides the local tail for connecting the SP network and IPXP network, two different places for the Demarcation Point are possible to guarantee the end-to-end QoS.

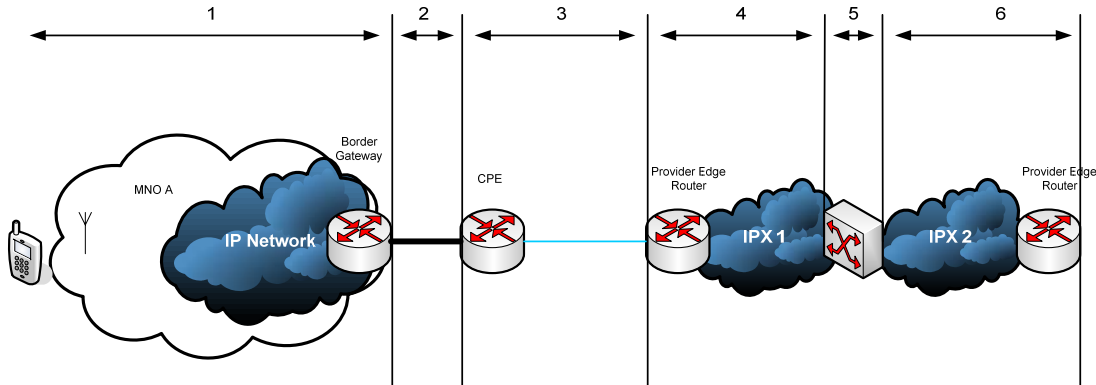
Any other configuration of the Local Tail between the Parties' networks is unlikely because it cannot be assured the QoS end-to-end.



It must be mutually agreed between the Parties which of the following scenarios would apply to their Service Level Agreement.

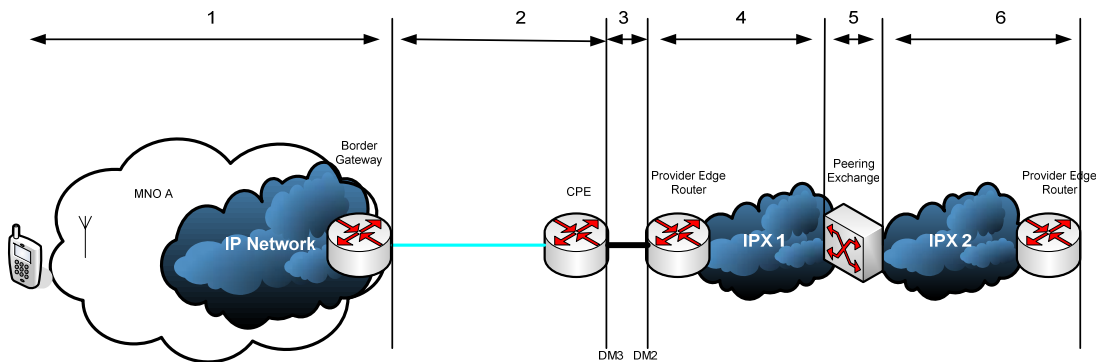
Scenario 1 – Local loop provided by IPXP and CPE managed by IPX Provider at customer premises. Clearly, in this case the SP has no commitment with regard to the QoS of the local tail. See clause 4.8 of the document.

The Demarcation Point shall be the CPE and the IPXP has the responsibility for the Local Tail.



Scenario 2 – Local loop provided by Originating Service provider and CPE managed by SP at IPXP premises.

The Demarcation Point shall be DM3. The Service Provider has the responsibility for the Local Tail.



The focus of the service SLA is only upon a description of the end to end responsibility. This is demonstrated in the diagram above where the physical path is broken by different equipment and transmission points.

The differences in the service definition are demonstrated in the attached document:



Service Definitions
 AA80

4.5 Quality of service and Key Performance Indicators

The transport service has different levels of performance depending upon the service being carried thereon e.g. video call, voice, email etc.

The 3GPP TS 23.107 has defined four QoS types which have their own characteristics and hence are associated with different levels of transport performance. The main distinguishing feature between them is the level of sensitivity to delay. These classes are:

- Conversational – supporting real time services and sensitive to delay
- Streaming – again support real time applications but less sensitive to delay
- Interactive – application where real time is not expected
- Background – captures the remainder of non real time applications

Voice services belong to the conversational class of QoS as a result the Service Level parameters around them are varied and there are some similarities to the transport service kpi's. However, they relate only to traffic sent by the voice service provider to the elected voice service provider, via the IPX provider. The origin of the measurement is from the border gateway of the originating service provider.

The MMS service however is not “conversational” and is more “interactive”. As a result the kpi’s are a mix of operational and kpi’s that acknowledge physical delivery of the message.

A summary of the kpi’s used for the transport and service layers can be found in the attached spreadsheet:



Quality of Service
KPIs AA80

4.6 Qualifying faults

The concept of the qualifying fault is aimed at ensuring that there is an appropriate reason for raising a fault and hence, helps both supplier and customer assess the priority of a fault before applying resources in resolving the problem.

So when according to the Service Provider’s own measurement, the average daily level of QoS achieved by the IPX provider as measured by the agreed QoS indicators agreed above, falls below the values agreed the Service Provider can raise a qualifying fault.

4.7 Service credits

Both the Transport and Service SLA for the IPX make provision for Service Credits which can be claimed by the Service Provider given that a qualifying fault as defined above was raised and that the problem was not resolved in the contracted time frame.

The mechanism for claiming the credits and the parameters are broadly agreed between the contracting parties. However, where they exist, the rules against which the size or value of the claim is defined in the attached document.



Service credits AA80

4.8 Controlled connectivity policy

The concept of controlled connectivity refers to the IPX provider’s ability to route IP traffic directly to the terminating operator’s network or whether it has to be terminated indirectly via another IPX provider. The objective being that the Quality of Service is maximised in a direct routing scenario.

The clauses associated with controlled connectivity are in the attached spreadsheet.



Controlled
connectivity AA80

4.9 Customer care

This part of the agreement moves away from defining key performance indicators and the more engineering aspects of ensuring high quality standards, and now starts to define the relationship between supplier and customer and defining each others expectations.

In most cases all it says is that the IPX provider needs to supply the web interface tools to enable the customer to monitor the performance of the service or transport layer.

4.10 Operations and maintenance – fault management scenario

The operations and maintenance part of the agreement develops the operational interface and defines the parameters within which the relationship operates. The areas covered are:

- Notifications addresses and points of contact in the event of a fault
- Fault classification definitions, for example, fatal, severe and warning
- Fault reporting procedures
- Escalation procedures, in the even that a fault is not resolved and the relevant contact points
- Fault status and reporting information, so communications regarding the status of a fault
- Fault clearance procedures, including the time limits in which the fault should be cleared
- Change management and network upgrade procedures
- Reporting mechanisms and procedures regarding fault handling

This helps to create an operational structure in which the relationship is managed on a day to day basis. However, depending upon the service not all aspects might be covered or indeed might be relevant to that service.

4.11 Operations and maintenance – non-fault management scenario

Having developed the operational relationship in a fault environment they are in some cases also defined in a non-fault scenario. This section typically includes:

- Service management procedures
- Traffic management and reporting
- Change management procedures
- Production of the quality of service report, covering content and regularity

In conclusion the Operations and Maintenance agreement helps to formulate the supplier governance structure.