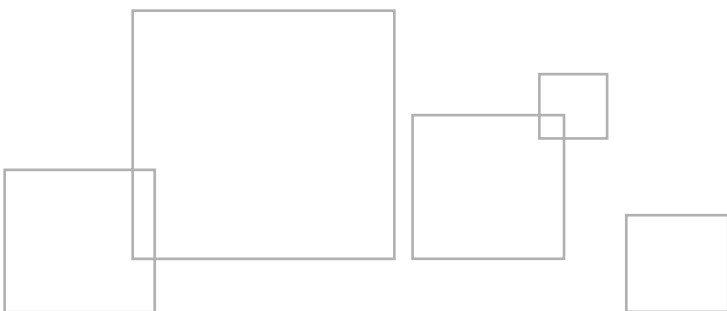


IP eXchange **IPX**



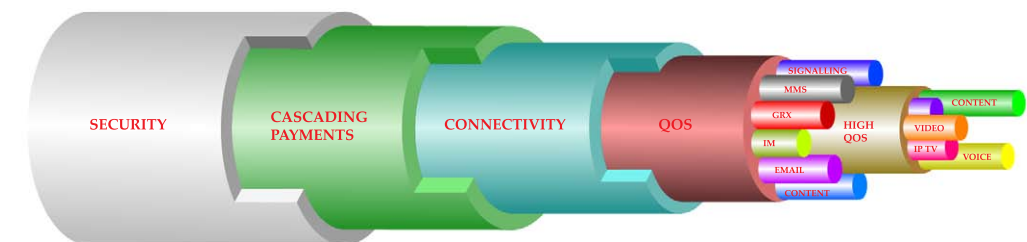
Providing a quality based solution
for IP Interconnect



In Brief

IP eXchange - IPX Providing a quality based solution for IP Interconnect

The IPX is an interconnect service that is offered by a variety of carriers on a competitive basis but with common agreed technical specifications and using consistent commercial models. It provides a range of technical and commercial features that enable a new business model to be implemented to ensure a sustainable IP service business.



- Secure environment – the IPX is a transparent IP network that is not addressable from the Internet
- Flexible IP Service interconnection – bilateral and multilateral connectivity - one contract, many connections
- Cascading payments - managing the flow of information necessary for settlements to be made between operators – rewarding all players who meet their mutual obligations in the value chain
- Premium quality environment – traffic managed with QoS levels and performance to SLAs that are mutually agreed

The IPX provides a next generation interconnect solution that follows the GSMA's four key principles vital for a successful IP Interworking solution: openness, quality, cascading payments and efficient connectivity.

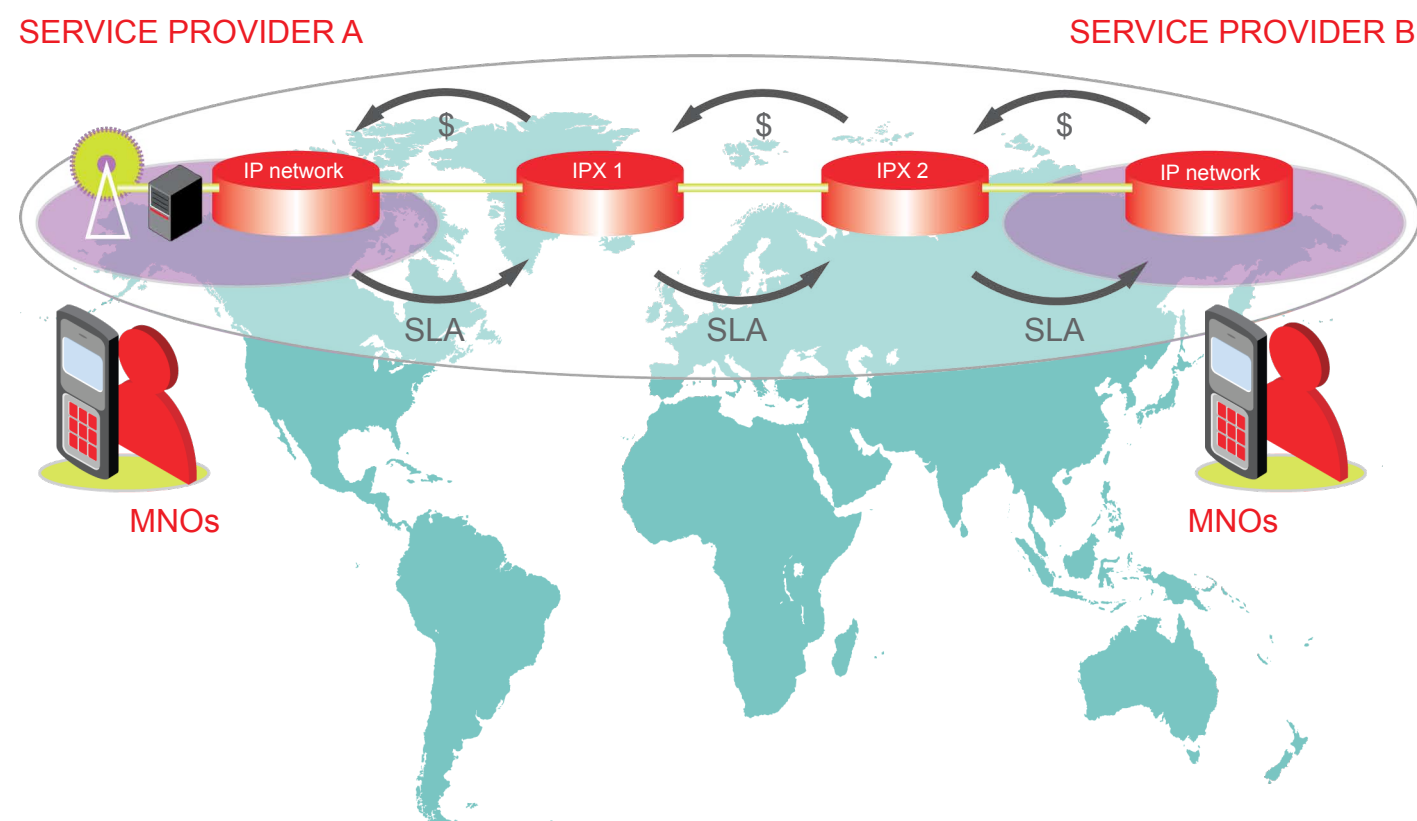
The IPX – a sustainable business solution for IP service delivery

The solution for the next generation of interconnect has to deliver secure, reliable and high quality IP services across a distribution network that links mobile and fixed operators as well as other service providers. All involved in the network delivery value chain should receive a fair commercial return for their work.

The IPX will respond to the needs of these key stakeholders to manage IP traffic flow and support a sustainable business interworking solution. It delivers a managed network solution that offers openness, focuses on quality, enables cascading payments and provides an extremely efficient connectivity regime – one contract, many connections.

This new interconnect business model for IP Services builds on the existing solutions and experiences in the circuit-switched world. For all stakeholders, this means they can be confident that the IPX's commercial and technical benefits will be delivered in a way that minimises investment and maximises the impact on their business opportunities.

SLAs guarantee performance



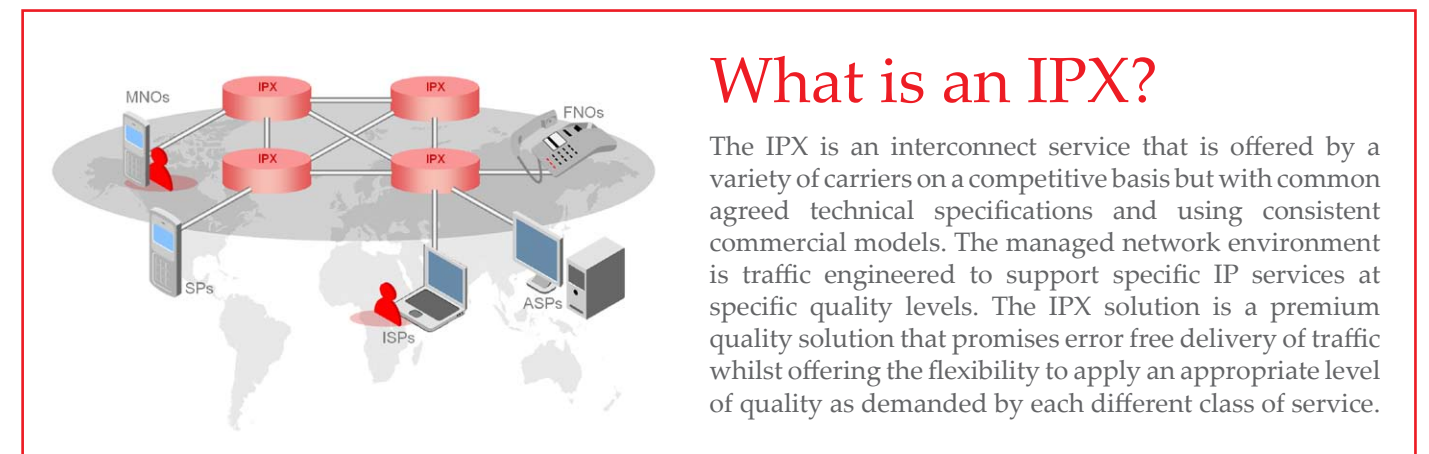
With QoS performance for different IP services monitored against mutually agreed SLAs, the delivered quality will maximise the user experience. There will be a system of governance that will ensure that each IPX provider adheres to the agreed performance and quality criteria for each IP service. The same governance will also ensure that interconnectivity is provided between any Service Providers where there is clear demand and that charging transparency is maintained.

The solution for a next generation of IP service interconnection

Service providers, whether they are Mobile or Fixed Network operators, are the key players in a large, globally distributed population. For them there is a critical need for a new interconnect environment to handle a wide range of IP services. Some may have a dedicated solution to handle IP service traffic within their own network. However there is an immediate need to be a player in an interconnected world in order to enjoy all the benefits this will bring.

The IPX is the GSMA's proposal for the next generation interconnect solution. It provides a commercial and technical solution to manage IP traffic and follows the GSMA's four key IPI principles that we believe are vital for a successful and sustainable IP Interworking solution:

- Openness** - any potential player in the delivery of IP services - MNOs, FNOs, Carriers and ISPs - has the freedom of choice to be involved.
- Quality** - reliable and secure delivery of services in conformance to agreed QoS levels ensures benefits for all players and end users.
- Cascading Payments** - parties who meet their mutual obligations in the value chain will receive a fair commercial return.
- Efficient Connectivity** - the IPX is a Gateway to a managed IP network - managing data flow and commercial information and providing the benefits of multilateral connectivity to all players.



What is an IPX?

The IPX is an interconnect service that is offered by a variety of carriers on a competitive basis but with common agreed technical specifications and using consistent commercial models. The managed network environment is traffic engineered to support specific IP services at specific quality levels. The IPX solution is a premium quality solution that promises error free delivery of traffic whilst offering the flexibility to apply an appropriate level of quality as demanded by each different class of service.

Concept of an IPX

Traffic is conveyed through the IPX so that each service is transported according to a specified Quality of Service (QoS) profile. Voice and video that demand high QoS may use high tolerance bearers whilst other services such as MMS or IM can use less demanding QoS bearers. This brings many benefits in terms of efficiency, capacity and investment.

Next, the payments – set according to the business model for each traffic type - are identified by the IPX and the necessary data is collected and exchanged in order for settlements to be made between entities. The IPX offers operators a great deal of flexibility in terms of the interconnect modes they choose. They can choose between a bilateral approach or the much more efficient multilateral interconnect mode of interconnection – one contract, many connections, depending on the operator's strategy.

Finally, all the IP traffic is passed in a secure environment. The IPX is a private IP network and is not addressable from the Internet.

Power of the IPX



SECURITY

For Service Providers and users alike, security is of vital importance. The commercial and technical design of the IPX has been developed and tested to offer a great deal of protection on many fronts.

- Commercial agreements give protection to all players - those connected to the IPX agree to sign up to a security code of conduct and a trusted community is created
- The IPX is not addressable from the Internet – which makes attacks much more difficult
- Individual operator traffic is segregated – thus localising any security breaches
- End user terminals have no visibility of the IPX – so they are unable to probe the core networks involved in the management and delivery of the IP services

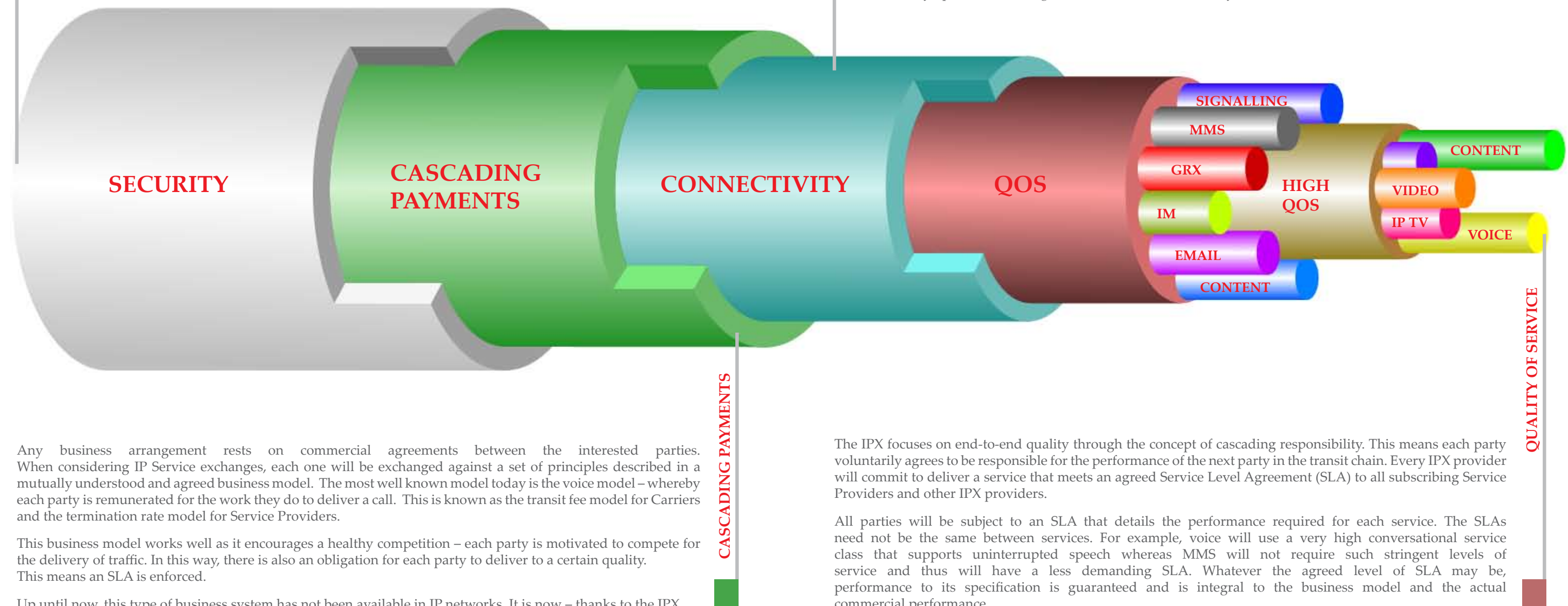
CONNECTIVITY

The IPX offers three standard modes of interconnect: bilateral, bilateral service hub and multilateral. These all have different benefits when considering QoS levels, Cascade Billing and Efficiency.

- Bilateral – the Service Provider is buying a QoS enabled bit pipe, most probably for private proprietary interworking services
- Bilateral service hub – extends the QoS bit pipe approach by adding the facility for cascade billing
- Multilateral – with one contract with many connections, a Service Provider can reach a multitude of different destinations around the world.

Multilateral connectivity is the driving reason for the GSMA's development of the IPX. Not only is this connectivity necessary for the global mobile community (currently in excess of 700 mobile operators), it is also necessary to accommodate connection to and between other communities – Fixed Network Operators, Application Service Providers and ISPs. It is important that there is a simple method for all of them to become connected to exchange IP traffic. The same IPX that manages the traffic will, in the multilateral case, manage the process of passing on monies in either direction as compensation for the work done.

The IPX provides a lot of IP connectivity for very little effort. As new operators connect to the IPX, the IPX carriers can easily open interworking with them in a controlled way.



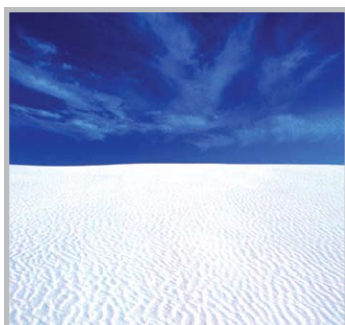
Any business arrangement rests on commercial agreements between the interested parties. When considering IP Service exchanges, each one will be exchanged against a set of principles described in a mutually understood and agreed business model. The most well known model today is the voice model – whereby each party is remunerated for the work they do to deliver a call. This is known as the transit fee model for Carriers and the termination rate model for Service Providers.

This business model works well as it encourages a healthy competition – each party is motivated to compete for the delivery of traffic. In this way, there is also an obligation for each party to deliver to a certain quality. This means an SLA is enforced.

Up until now, this type of business system has not been available in IP networks. It is now – thanks to the IPX.

The IPX focuses on end-to-end quality through the concept of cascading responsibility. This means each party voluntarily agrees to be responsible for the performance of the next party in the transit chain. Every IPX provider will commit to deliver a service that meets an agreed Service Level Agreement (SLA) to all subscribing Service Providers and other IPX providers.

All parties will be subject to an SLA that details the performance required for each service. The SLAs need not be the same between services. For example, voice will use a very high conversational service class that supports uninterrupted speech whereas MMS will not require such stringent levels of service and thus will have a less demanding SLA. Whatever the agreed level of SLA may be, performance to its specification is guaranteed and is integral to the business model and the actual commercial performance.



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