IPX: The Next Generation Network for a New Generation of Services

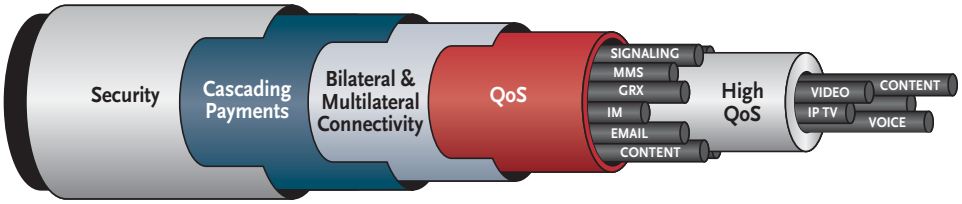
Today, fixed carriers, mobile operators, content providers and other service providers operate in separate network spheres. Crossing the boundaries to a fully converged IP domain requires individual and collective initiative, investment, and operating overhead to establish commercial terms, quality guarantees, and technical alignment. The GSM-Association (GSMA) began its IP eXchange (IPX) development effort to facilitate the creation of the converged interconnect environment, an ecosystem, that is far more efficient and commercially viable for the thousands of different carriers, operators, content providers and service providers looking to capitalize on the growing demand for global multimedia services.

The IPX is a global, private, secure, multi-service IP network that supports end-to-end high quality of service for end-users and cascaded payments for fixed and mobile operators as well as ISPs, content providers, and other service providers.

iBasis
a KPN company

The IPX has been developed with industry-wide support. At the center of this ecosystem is a private IP backbone that offers direct interconnection to the service provider and the following features:

- Security—the IPX is a private IP backbone that is not addressable from the Internet;
- Quality—the IPX manages end-to-end quality by prioritizing real-time services like voice and video distinctly from less sensitive traffic such as SMS, and IPX providers commit to meet agreed upon service level agreements (SLA) with other service providers and IPX providers;
- Multi-service—the IPX is designed to support a variety of services, such as voice, video, messaging, signaling, and roaming, and is a critical component for All-IP networks such as LTE for both direct traffic and roaming;
- Multiple interconnect business models—the IPX supports bilateral, bilateral service hub (with cascading payments) and multilateral business models; *and*
- Cascading payments—the IPX manages the flow of information required for settlements between operators.



The GSMA's IPX model defines a next generation IP Interconnect network that is secure, supports cascading payments and multilateral connectivity and provides end-to-end quality of service for multiple voice, video and data services.

Ultimately, the IPX ecosystem will consist of a number of IPX carriers operating in open competition and bound by GSMA guidelines on peering and interconnection. The IPX providers will be selling connectivity to the IPX platform and to other Service Providers (mobile and fixed operators, ISPs, content providers, etc.). Multiple IPXs will be mutually peering and interconnecting in accordance with demand from service providers.

Network Operator Benefits

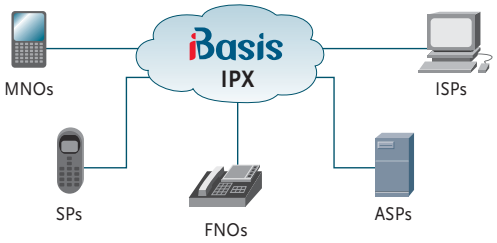
As service providers migrate their network to a converged IP in their core or at the edge, via emerging architectures, such as LTE, some of the benefits of using an IPX for interconnecting to other service providers include

- Enhanced Voice Quality: made possible by reducing the number of TDM transcodings and by using direct termination interconnects;
- Capital and Operating Expense Savings: IP interconnects are more cost effective, more flexible, faster to install and require fewer resources for network maintenance and development as multiple services can be provisioned across a single service-aware IPX interconnect;
- Higher-Quality Services: Service Level Agreements between providers ensure consistent service-specific quality, and new quality enhancements, such as high definition voice codecs, can be more easily implemented across service providers, resulting in higher value services; and
- Cascaded Billing and Payments: the IPX provider will charge based on the specific service across downstream IPXs and service providers.

The iBasis IPX

iBasis will initially offer international voice termination over the iBasis IPX with support for Short Message Service (SMS) and GPRS Roaming Exchange (GRX) services over the same interconnect to follow in the near future. Customers that stand to benefit from the iBasis IPX are carriers that have already migrated part of their network infrastructure to IP, customers that have multiple interconnects across different services to the same wholesale provider, and groups of operators with All IP networks that want to outsource their group interconnection using a transport model and also connect to non-group traffic using the quality, lower costs and expertise of the IPX provider.

The iBasis IPX offers Premium Voice service over IPX, including the highest level of voice quality, ASR, NER and ALOC, plus fax support to all destinations, guaranteed support of Roaming and end-to-end CLI delivery to all destinations. The service also supports ISUP V2 signaling transparency (via SIP-I) and Originally Called Number (OCN) and Re-Directing Number (aRDN).



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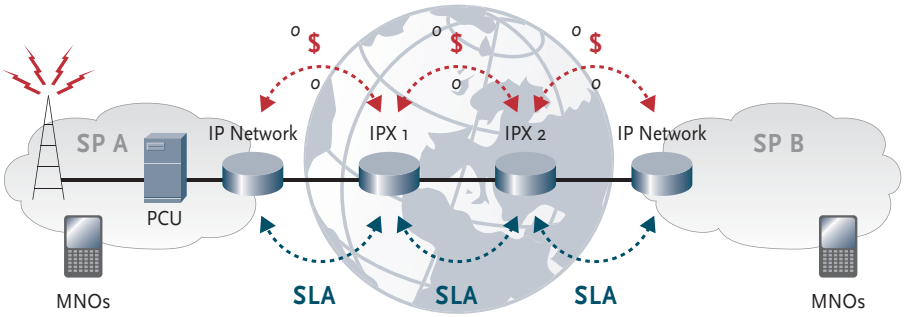
The iBasis IPX covers 180 countries worldwide and is physically and logically separated from the public Internet, ensuring security. Quality of Service is agreed to on a per-application basis according to four classes of service ranging from Real-Time, with the highest possible guarantees on throughput and latency, to Best Effort, for delay-tolerant and bursty applications. While iBasis supports multiple services and connection types, the company expects initial demand for IPX service to be focused on migrating international voice traffic, including bilaterals, to IP. iBasis recently announced the migration of its bilateral interconnection with Telecom Italia-Sparkle to managed IP via SIP-I, a configuration that complies with the GSMA IPX guidelines.

Consistent with GSMA specifications, the iBasis IPX supports three different business models: transport, service transit, and multilateral hubbing, with cascaded payments.

iBasis is an active participant in industry efforts to develop standards and guidelines for IP Interconnects and IPX. The company is a founding member of the IP Interworking Alliance (IPIA) and a member of the i3 Forum, both independent associations of communications service providers committed to developing guidelines and specifications for next generation interconnect networks and services.



The IPX supports cascading payments between providers and manages quality through Service Level Agreements between providers.

About iBasis

Founded in 1996, iBasis is a leading wholesale carrier of international long distance telephone calls and a provider of retail prepaid calling services and enhanced services for mobile operators. The company offers a comprehensive portfolio of voice termination services, value-added messaging, signaling and roaming services for mobile operators, as well as outsourcing services for many of the world's largest fixed and mobile operators and VoBB service providers. In December 2009 iBasis became a wholly-owned subsidiary of KPN. iBasis customers include KPN, KPN Mobile, E-Plus, BASE, TDC and many other large telecommunications carriers such as Verizon, Vodafone, China Mobile, China Unicom, IDT, Qwest, and Skype.

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HD Voice: Making a Clear Case for IPX

Are your ears sometimes mistaking "s" for "f" during a phone call? On a conference call, do you have trouble getting a word in while other participants ramble on? With HD voice these may be things of the past. High-definition voice, also called wideband voice, refers to the use of wideband technology to provide deeper clarity and overall a better audio experience in VoIP.

Traditional telephony is based on sampling the sound stream 8,000 times a second and constraining the reproduction of the sound spectrum to between the range of 200Hz to 3.3KHz—and fitting it into a 64 Kbps bandwidth. In HD voice, a wideband codec doubles the sampling rate and more than doubles the width of the sound spectrum reproduced, from 50Hz to 7KHz. This adds significant depth and nuance to the transmitted sound—and it reduces the bandwidth requirement to 32Kbps, half that of PSTN transmission. HD voice technology provides CD quality sound and double the quality of typical mobile 12 Kbps calls.

With the ever-growing data capacity of IP networks we can expect to soon see a world in which virtually every IP connection will be voice-enabled with true HD capability. HD voice opens a myriad of applications and, for service providers, access to new markets in a more global environment. The first applications you can expect to see include:

- HD Audio conferencing
- HD contact centers
- HD IVRs, voicemail
- HD ring-back tones
- Point-to-point HD voice—both domestic and international

Many service providers have HD Voice strategies on the wireless side, where there's a sizable benefit in improving voice quality. But it's still "early days", as moving to HD Voice requires an advanced IP core, which is where iBasis has a strategic advantage. HD Voice also requires a great deal of cooperation to make the traffic run in a multi-carrier environment, to achieve consensus on codecs used in the network and for endpoints, and to develop effective industry standards.

HD voice can become a key differentiator for carriers and service providers and will be more easily implemented in the new open-standard IP connectivity environment for multiple types of service providers—IPX.