IPX
What It Is and What It Isn't

A definition by the i3forum

i3forum
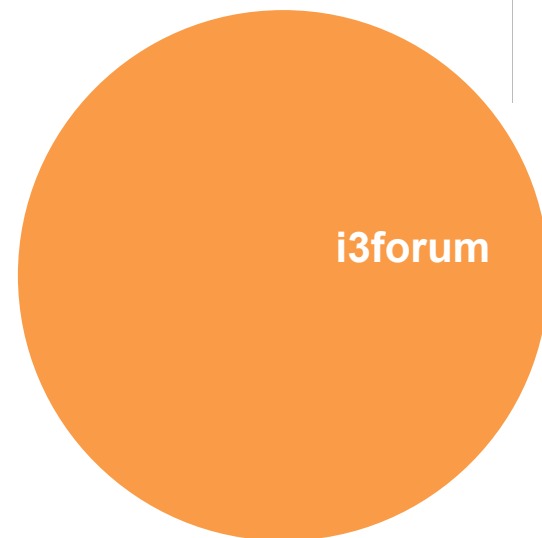
April 2013

i3 forum

IPX – Why a definition by the i3forum?

- The i3forum's goal is to promote and help accelerate the transition of International Interconnections to IP

- The i3forum recognizes that IPX is one of the paths forward, and as such it is part of its recommendations to the Industry, along side other IP-based interconnection models

- There is currently a lack of clarity in the Industry as to what IPX is and isn't. This is creating confusion and thus potentially slowing down adoption of IP interconnections
  - How can IPX be defined?
  - How does IPX differ from other IP-based interconnection models?

- In order to improve common understanding, the i3forum proposes the IPX definition outlined in the next slide

IPX – i3forum's definition

- IPX (IP Packet eXchange) is a generic term that refers to a class of IP-based interconnection models and implementations that share the following features:
  - Based on private IP Domain (i.e. no use of the Public Internet) which spans from Service Provider to Service Provider
  - Multi-service capable (implementation of multi-service offers is a commercial matter)
  - Designed and operated to support High Quality IP based services (break-outs and break-ins to/from non-IPX services are possible and disclosed)
  - Allows a cascading business model
  - Guarantees service assurance across the whole IPX Domain, being (among others):
    - SLA capable (SLAs can be offered, actual implementation is a commercial matter)
    - Secure (e.g. MPLS based but other technique can be used)
  - Scalable (as opposed to dedicated bilateral private IP interconnects)

- IPX services are offered by an IPX Provider (e.g. international carrier) to a Service Provider

- IPX Providers can interconnect among themselves in order to guarantee a worldwide coverage

i³ forum

IPX – Additional considerations

- An IPX platform can support both pure transport services, where the IPX Provider is unaware on the type of carried information, and higher layer services involving additional capabilities of the IPX Provider network (e.g. switched services).

- IPX implementations and offers all share the characteristics listed on the previous slide, but differ in multiple ways, both technical and commercial
    - Additional features/services e.g. transcoding, codec transparency…
    - Services supported (voice, signaling, data…)
    - SLAs
    - Price
    - …

- While IPX commercial/features implementations may vary per service and per IPX provider, there are some technical/service core requirements that are common to all IPX providers and that are further described in the I3 forum IPX core and service schedules available at www.i3forum.org

- GSMA's IPX specifications define a specific implementation of IPX

international ip interconnection   www.i3forum.org   i³ forum

Appendix – VoIP vs. VoIPX

- This appendix addresses the issue of the differences between a common Voice over IP (VoIP) service and a Voice over IPX (VoIPX) service.

- The analysis is qualitative based on existing specifications and on an observation of the current VoIPX offers.

- Scope: the analysis has been made distinguishing between a VoIP / VoIPX interface and a VoIP/ VoIPX service

- Assumptions:

  - *VoIP Interface*: an interface *substantially* compliant with i3f specifications (e.g. "Technical Interconnection Model for Int. Voice Services, Rel. 5)

  - *VoIP PRIVATE Interface*: an interface (i.e. the IP addresses) not advertised onto the Public Internet (as per i3f specifications)

  - *VoIPX Interface*: as per GSMA (e.g. IR.83 and AA.81) and i3f specifications (e.g. VoIPX Rel.3)

  - *Int. VoIP service*: as commonly traded by Carriers and Service Providers, covered by i3f deliverables

  - *VoIPX service*: as per GSMA (e.g. AA.80, AA.81) and i3f specifications (e.g. VoIPX Rel.3)

  Note: other Public Referenced Documents have been issued by GSMA on IPX

VoIP vs. VoIPX Interface: macro analysis

	Market VoIP Private	GSMA VoIPX	i3f VoIPX
Architecture	Mono service	Multiservice environment	Multiservice environment
Physical Interconnect	VLAN over L1 (direct), L2 (Ethernet) in few cases L3 (IP VPN)	VLAN over (note 0) L1 (direct), L2 (Ethernet) in few cases L3 (IP VPN)	VLAN over (note 0) L1 (direct), L2 (Ethernet) in few cases L3 (IP VPN)
IP Packet Marking	based on DSCP	based on DSCP	based on DSCP
IP Addressing & Routing	IPV4 (IPV6) BGP-4	IPV4 (IPV6) BGP-4	IPV4 (IPV6) BGP-4
Class of Service Mngmt	Conversational (media) + Interactive (signalling)	Conversational (media) + Interactive (signalling) *(note1)*	Conversational (media) + Interactive (signalling) *(note1)*
Media *(note 2)*	Main: G.711, G .729 family + others	Very large set of codecs (G.711 mandatory)	Mandatory: G.711 and G. 729 family Others: optional
Signalling *(note 3)*	SIP-I and SIP	SIP-I and IMS-SIP (and IETF SIP to be agreed?)	SIP-I and SIP
Addressing	ITU T – Recc. E.164	ITU T – Recc. E.164	ITU T – Recc. E.164

Note 0: there is no standard on how to use VLAN for voice as well as in a multiservice environment
Note 1: in a multiservice environment other Class of Service have to be managed
Note 2: codec limited to standard voice quality
Note 3: differences in signalling profiles are possible

VoIP vs. VoIPX Service: macro analysis

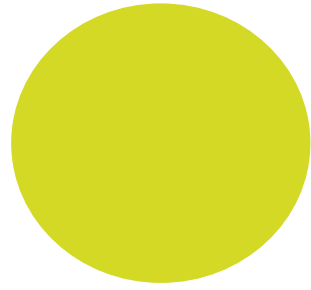|	Market VoIP Private	GSMA VoIPX	i3f VoIPX
Security	SBC de facto standard + other actions carrier dependent	Border Gateway + set of recommended actions	SBC mandatory + set of recommended actions
Routing (at the service layer)	No specific rule	Max 2 IPX Providers (3 IPX P as exceptional case with no quality impairment)	Max 2 IPX Providers (3 IPX P are possible with no quality impairment)
QoS monitoring (Note 0 and 1)	In most cases for Service parameters only	For Transport parameters and Service parameters	For Transport parameters and Service parameters
QoS reporting	In most cases for Service parameters only	For Transport parameters and Service parameters	For Transport parameters and Service parameters
Business Model	Sending Party Pays	Sending Party Pays	Sending Party Pays
Customer Care	Depends on Carrier policy	Depends on Carrier policy (in general high level of cust. care)	Depends on Carrier policy (in general high level of cust. care)

- 🟩 Low difference
- 🟧 High difference

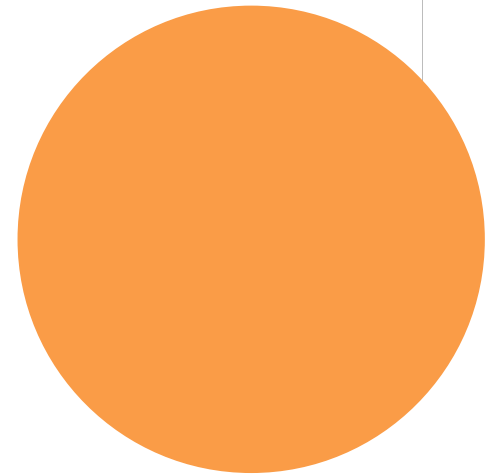|	Market VoIP Private	Market VoIPX (current view)
Type of Traffic	In general high quality traffic	Trend to qualify as VoIPX top quality traffic on the direct route between 2 countries

Note 0: Transport parameters: Delay, Loss and Jitter; Service parameters: NER, ALOC, ASR, ABR,....
Note 1: the E2E monitoring (i.e. from SP to SP) is possible only via aggregating the measures of each involved network
Note 2: Border Gateway is similar to SBC for voice

Thank You !

i3 FORUM

international ip interconnection

www.i3forum.org

i³ forum