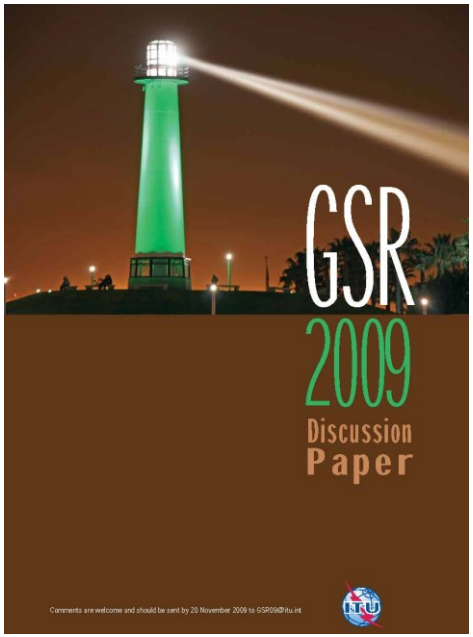

The Future of Interconnection

Rudolf van der Berg
Logica Management Consulting
The Netherlands

12/11/2009
Beirut, Lebanon

VoIP is changing the traditional telephony world. It challenges many assumptions, but will it also dramatically change interconnection?

•Telephony is important to people. There is no other technology that can bring us so quickly and directly in touch with over 5 billion subscribers in the world

•Mobile telephony has more than 4 billion subscribers. The internet only 1.5 billion and VoIP a smaller proportion of that e.g. Skype has only 400 million registered users.

•However, Skype has 8% of all international voice calls and VoIP is embedded in every Instant Messaging client and every Xbox /Playstation

•VoIP challenges the role of the telecommunications company. It shows that you don't need a telephony service provider to talk and that talk can be (almost) free

•Interconnection makes it possible to connect with people who are using different telephony service providers and/or different technologies.

•Will the way interconnection works also change dramatically because of the introduction of VoIP?

VoIP can support all traditional interconnection processes, business models and regulation. Using ENUM for lookup would enable innovation.

•Interconnection functions the same regardless of technology. It consists of:
✓Lookup,
✓Signaling and
✓Transcoding & Transfer.

•VoIP supports the same way of interconnection to E.164 telephone numbers as the traditional fixed and mobile networks and it can offer new services.

•With VoIP comes ENUM as a new lookup mechanism. This could support a national E.164 database and number portability platform with additional services

•VoIP supports all traditional business models for interconnection, but prices could be much lower. VoIP providers will likely move to specialized interconnection platforms.

•For regulators the lookup process warrants the most attention. Signalling, transcoding and transfer may not need regulatory attention

Interconnection functions the same regardless of technology. It consists of: Lookup, Signaling and Transcoding & Transfer.

- Interconnection of telegraphy networks was the reason the ITU was established in the 19th century

- The basic process for interconnection hasn't changed since then.

- *Lookup* determines at what network and line/cell site the dialled number is located.

- *Signalling* notifies the receiving party that there is a call for them.

- *Transcoding and Transfer* delivers the call with, if necessary, a change in codecs that have encoded the voice stream.

VoIP supports the same way of interconnection to E.164 telephone numbers as the traditional fixed and mobile networks and it can offer new services.

•Much effort has been put in making sure that VoIP protocols can seamlessly interact with the PSTN and Mobile networks. Even Skype allows in and outgoing calls.

•VoIP is more flexible as it is can work over any IP network in fixed, mobile and nomadic settings.

•VoIP can be easily extended with or integrated in new services like video and games as this only requires an update to the client and not to the network.

• It is less relevant whether SIP, H.323 or another protocol is chosen for the signalling as there is almost always a way to guarantee interoperable interconnection.

•Even new VoIP protocols (if properly designed) should have no problem interconnecting with existing PSTN and VoIP protocols.

With VoIP comes ENUM as a new lookup mechanism. This could support a national E.164 database and number portability platform with additional services

•ENUM allows the translation of E.164 telephone numbers to internet domain names. Every telephone number can be seen as a domain name.

•ENUM also allows the translation to e-mail addresses, SKYPE-ID's, Instant Messaging etc. It is more extensible than traditional PSTN lookup

•The original version, called Public ENUM, gave full control of the routing and services to the end-user and seemed to cut out the telephony service provider

•Public ENUM is active in only 9 nations (www.enumdata.org)

•ENUM can also be used in more closed settings, where the telephony service provider has more control than with Public ENUM, making it more acceptable

•ENUM could be an ideal platform for a national E.164 database and number portability platform with additional services.

ENUM could be an ideal platform for a national E.164 database and number portability platform with additional services.

- In most liberalized markets a customer can take his telephone number from one telephony service provider to another. (number portability)

- This requires that there is a central facility that knows to which network the E.164 number currently belongs.
  - Options like call forwarding are also possible but are anti-competitive.

- ENUM the technology could very well function as the national lookup platform. It can not only offer telephony related lookup services, but also additional ones like e-mail

- Checking of number portability rules can be done in a separate system, before the change is made to the ENUM-database

- ENUM is already in use in this capacity in many international interconnection databases, such as the GSMA's Pathfinder service.

VoIP supports traditional business models for interconnection, with lower prices. VoIP providers will likely move to specialized interconnection platforms.

•A move to VoIP doesn't mean a move to the internet's way of interconnecting using Peering and Transit. Calling Party Pays can still apply.

•A move to VoIP does show the great disparity between the costs of IP interconnection and the costs of voice interconnection
- The wholesale transit cost of IP is as low as $4/mbps/month or $4 for 250.000 minutes
- A 10Gbit IXP-connection is €2500/month = 150.000 simultaneous calls

•In order to facilitate interconnection and sometimes to move to peering and transit for voice, telephony service providers establish or join VoIP interconnection platforms
- Examples are: GSMA IPX, JSX (Netherlands), KINX VoIP Peering (Korea)
- Xconnect, Neustar and The Voice Peering Fabric offer commercial VoIP interconnection platforms

•The benefit of voice interconnection platforms lie in the possibility for global interconnnection and the introduction of new services.

For regulators the lookup process warrants the most attention. Signalling, transcoding and transfer may not need regulatory attention

- The regulator is responsible for the national number plan and needs to ensure E.164 numbers are reachable.

- It can push operators to move to a national number database based on ENUM that also facilitates number portability.

- VoIP is less of a regulatory concern, as long as it works and meets certain standards.

- Where the actual interconnection takes place is also less relevant. As long as it takes place and there is competition.

- With regards to emergency numbers, the question shouldn't only be if VoIP is able to support it, but whether the emergency services can support new services like video, etc.

- Regulators should accept that no or flat rate for voice is the future.

Rudolf van der Berg
Logica Management Consulting
The Netherlands
Rudolf.van.der.berg@logica.com
+31 6 13414512