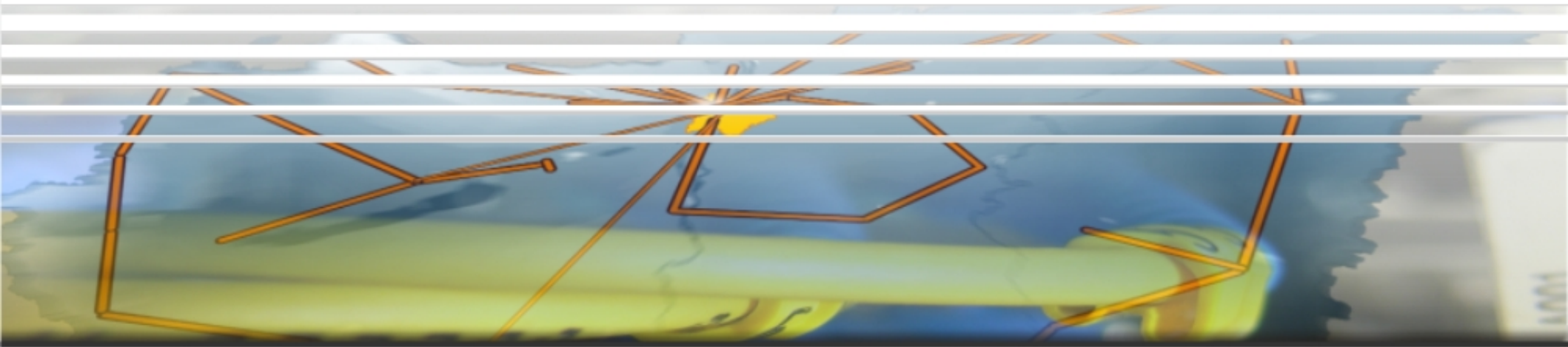


# Endpoint Identity

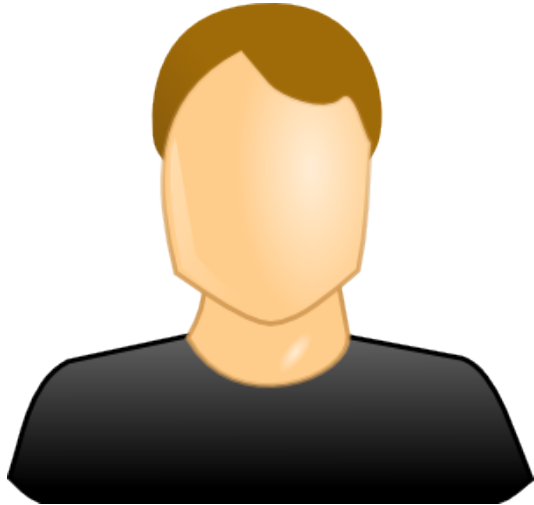


05/17/10  
Budapest / Hungary

MÉSZÁROS  
Mihály



# User, User Agent, Terminal, Address of Record, Domain, Context, Convergence



# Number(E.164) vs. Chars (URI)

- E.164

- max 15 digit
  - country code length: 1-3 digit
  - national number length: 15 - country code
- digits 0-9
- global number
  - +
- separator chars
  - space,-



- DTMF

- 4x4
  - 0-9
  - \*#
  - ABCD

- SIP

- sip:bob@biloxi.test
- sips:alice@atlanta.test

- TEL

- Global
  - tel:+1-201-555-0123
- Local
  - tel:7042;phone-context=example.com

- Tel => SIP

- tel:+358-555-1234567;postd=pp22
- sip:+358-555-1234567;postd=pp22@foo.com;user=phone

- H323

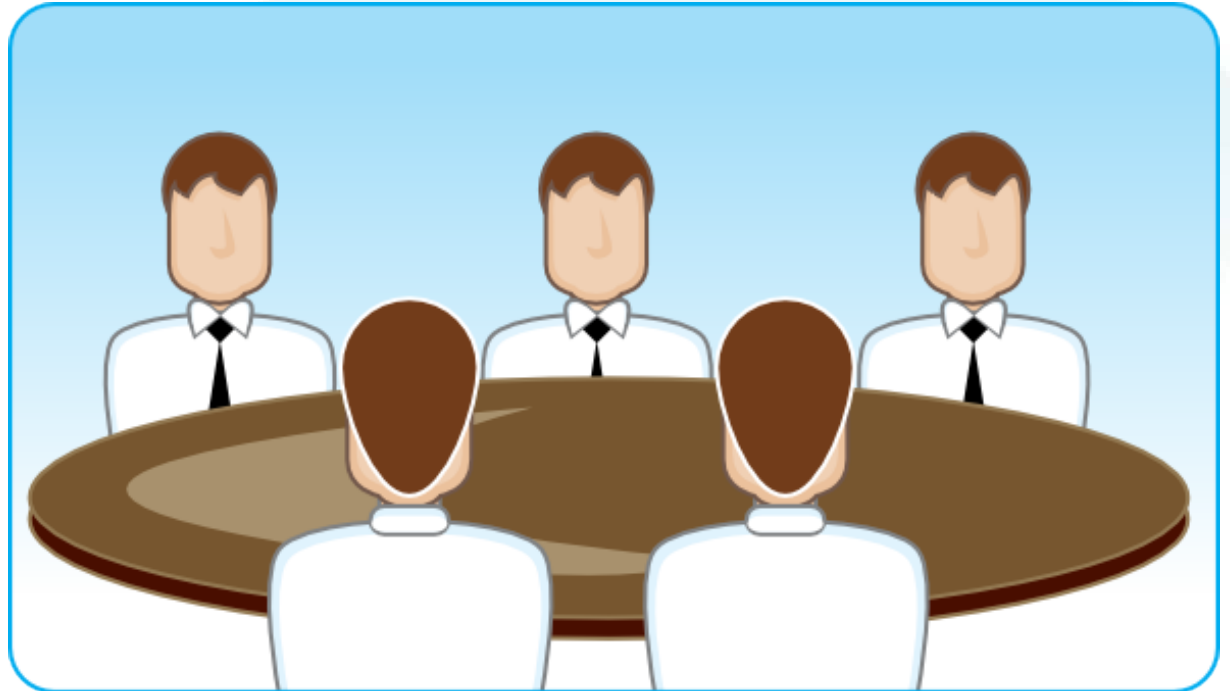
- RFC3508, H.323 Annex O
- h323:alice@atlanta.test

# Numbering plan

- Keep it simple
- Abbreviated dialing
- Future proof
  - extendable
  - Can't change numbering plan due to printed and advertised numbers
- Contexts
  - Internal extension
  - Local
  - National
  - International
- inter digit timeout
- Dialplan enforcement point
  - phone
  - proxy / pbx
  - gateway
  - service provider
- Normalization
  - calling called
  - "+" or 00
  - Lots of keypads aren't supporting "+" sign
- Mobility
  - Global or Local

# ID for Services

- IVR
- Call QUEUE
- Voicemail
- Call Park
- Call Pickup
- Meeting Rooms
- Recording
- Music on Hold
- Paging
- Echo loopback test
- Call Agents
- Meeting Room
- Operator



# ISN,ITAD,freenum.org

## ● ITAD

- RFC3219 (TRIP)
- IANA always assigns the sequentially next number
- no way to request custom ITAD

## ● ISN



- ITAD Subscriber Number
- <subscriber>\*<itad>
- example  
1234\*256
- ISN can't ported across organizations!

## ● freenum.org



## ● ENUM, NAPTR

- <subscriber-in-inverted-ENUM-format>.<itad>.freenum.org
- Example
  - ISN:1234\*256
  - 4.3.2.1.256.freenum.org
- Resolving ISN
  - Native ISN lookup
    - \_ NAPTR lookup in freenum.org
  - SIP redirector
    - \_ <subscriber>\*<ITAD>@public.freenum.org
  - Resolve ISN Through Private ENUM
    - \_ 216.218.159.179
    - \_ 6.5.2.\*.3.0.2.2.e164.arpa. ->  
3.0.2.2.256.freenum.org

# GDS, NRENUM

## ● GDS

- History
  - Pilot
  - TERENA VVC WG
- Virtual numbers
- Gatekeeper Hierarchy
  - Limited scalability
- Mostly used for identify videoconference terminals
- H.323 only
- Obsoleted, but used still now.

## ● NRENUM

- ENUM
- nrenum.net
- SIP/H.323 etc.
- Private tree
- Temporary use only till country e.164.arpa is not delegated.
- NIIF/HUNGARNET  
6.3.nrenum.net is delegated since 2006
- 13 country delegated already

# Routing

- Static

- Dynamic

- TRIP

- ITAD

- BGP

- ENUM

- DNS, NAPTR

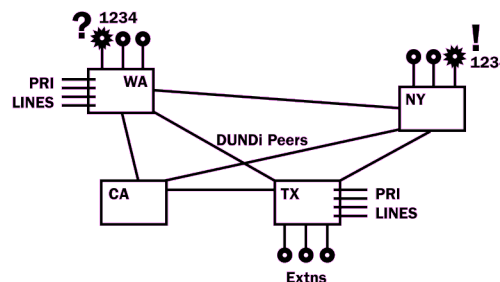
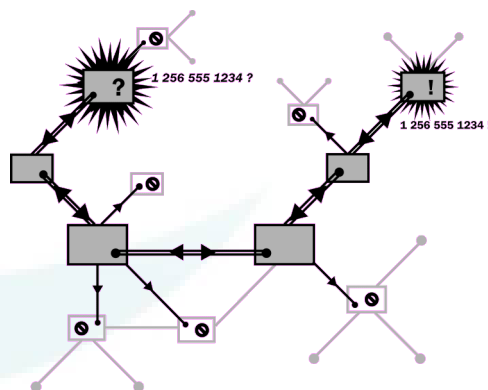
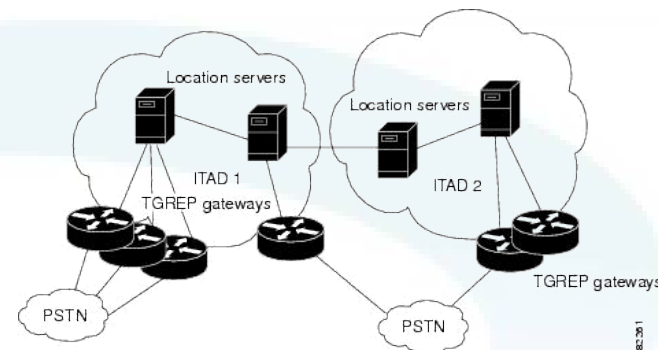
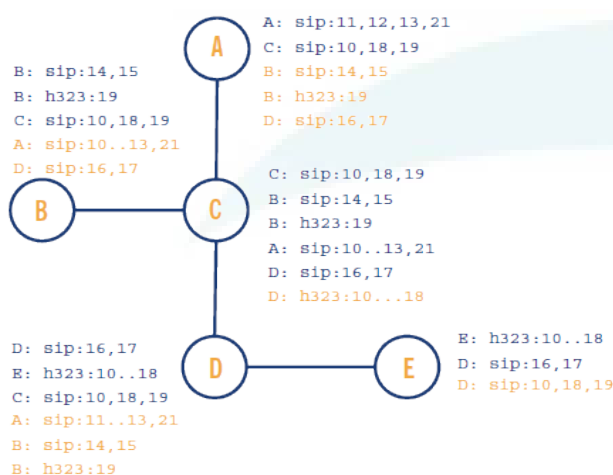
- DUNDi

- binary

- contexts

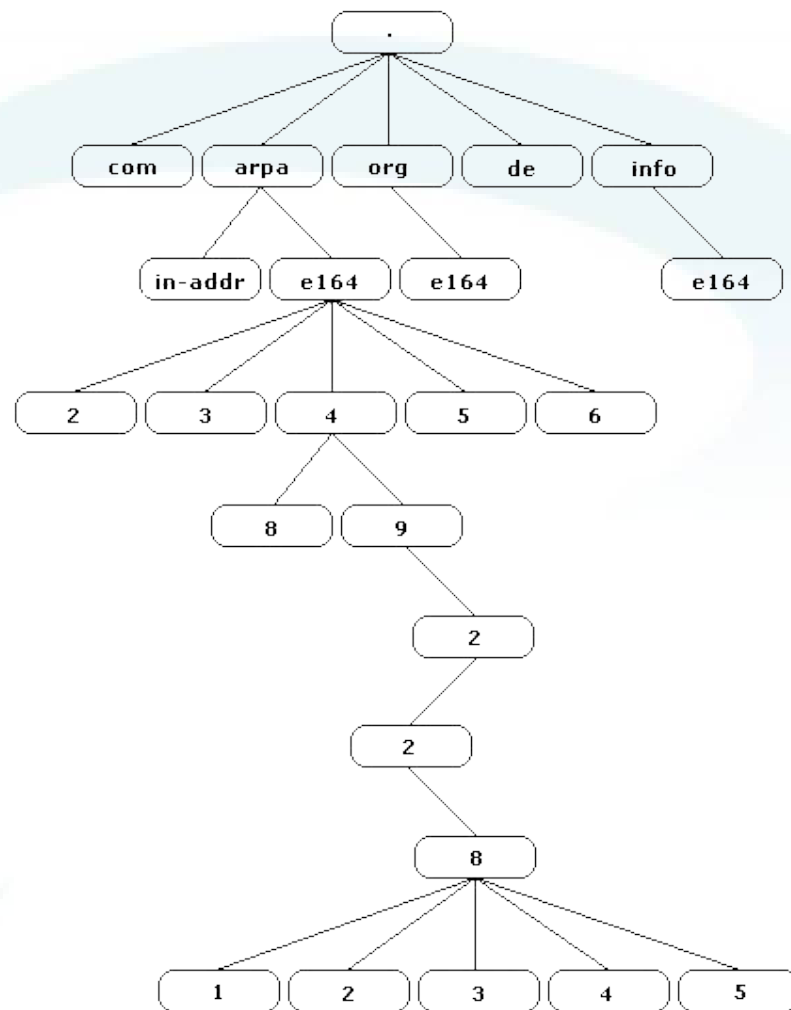
- e164 reserved

- General Peering Agreement (GPA)

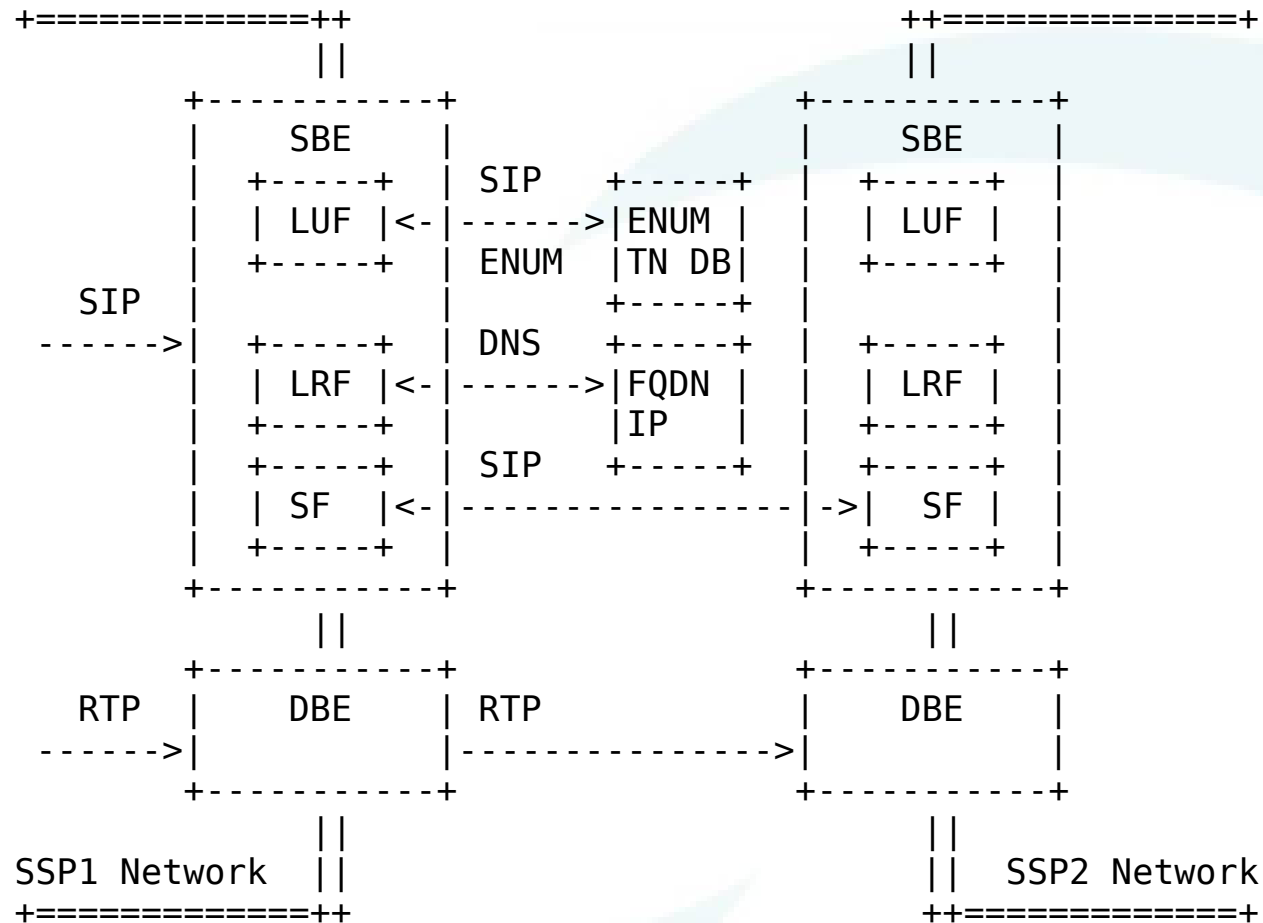


# ENUM tree

- E.164 => URI
  - one way lookup
- DNS based
  - NAPTR
- User ENUM
  - e164.arpa
  - golden tree
- Private tree
  - HBONE VoIP
  - enum.voip.niif.hu
- Infrastructure ENUM
- Example
  - 8.4.3.0.6.9.4.6.1.1.4.4.e164.arpa
  - +44-116-496-0348



# SPEERMINT Peering Architecture



# References

- [http://www.cisco.com/en/US/docs/ios/12\\_3/feature/guide/triplite.html](http://www.cisco.com/en/US/docs/ios/12_3/feature/guide/triplite.html)
- <http://www.dundi.com/dundi.txt>
- <http://www.terena.org/activities/iptel/contents1.html>
- <http://en.wikipedia.org/wiki/E.164>
- <http://www.wvn.ac.uk/support/h323address.htm>
- <https://www.nrenum.net>
- <http://educonf.geant2.net/wiki/index.php/H323-gds>
- <http://datatracker.ietf.org/wg/>

**Thank You!**

