Number portability

Using ENUM and SIP

Dan Pascu

AG Projects

http://ag-projects.com

ENUM and User Identity

User identity

Personal information

- Dan Pascu
- 28 October 1969
- Earth
- Romania
- Bucharest
- C-tin Brancusi 11
- ID card
- CTO AG Projects

User identity

Contact information (phones)

- Home phone: +40213246122

- Work   phone: +31208005167

- Mobile phone: +40721275177

- Yet another phone: +40317105167

User identity

Contact information (cyberspace addresses)

- Email: dan@ag-projects.com

- Email: dan@windowmaker.org

- SIP: dan@ag-projects.com

- SIP: 317105167@eurovoice.ro

- WEB: http://ag-projects.com/

- WEB: http://windowmaker.org/

- Skype: dan.pascu

- IM addresses

User identity

- Personal information (who I am)

- Contact information (how to reach me)

Problems with user identity

- Too many contact addresses
- Ever tried to put them all on your business card? ☺
- The address you need to give away depends on context

- Addresses are centered around service providers
- +40213246122
- +31208005167
- +40721275177
- sip:317105167@eurovoice.ro

What users want?

- An addressing scheme centered around the user
- The smallest possible number of contact addresses
- Preserving the address when switching providers

What ENUM offers?

- Replaces all user's contacts with an ENUM number
- Addressing centered around this ENUM number
- Centralized address management for user contacts
- User controlled contact address mapping

ENUM and User Identity

- ENUM is about managing the user's contact information

- Attach only one unique ID to the user identity

- Use this ID to manage all user's contact addresses

+31208005167   ⟶   sip:dan@ag-projects.com

                 ⟶   sip:317105167@eurovoice.ro

                 ⟶   tel:+40721275177

                 ⟶   email:dan@ag-projects.com

                 ⟶   http://ag-projects.com

                 ⟶   skype:dan.pascu

ENUM helps User Identity with these issues

- An addressing scheme centered around the user
- Have one public contact for the user: the ENUM number
- Preserve the address when switching providers

ENUM, SIP
and number portability

Voice service today

The past but still the present:

- One socket in the wall
- One phone device
- One service provider

The telephone number is hardwired to the socket in the wall.

The service, device and address are hardwired to each other by the incumbent Telco.

Voice paradigm shift

Today and the future:

- Network access - WiFi in the hotel
- SIP device - Hitachi WIP500 WiFi phone
- PSTN service - my provider is in the Netherlands
- Identity - my address is sip:dan@ag-projects.com

Identity is the only common feature.

All items are connected together only at logical level.

All converge in the hands of the end users.

What changes over time?

Each of the ingredients may change:

- The phone I use

- The Internet provider

- The PSTN provider

- The place where I live

However I don't want to change my address every time!

Number portability today

Current telephone number portability works with limited success and dependent on regulatory in each country

- It takes 3 months to port a number from KPN to Vodafone
- Porting numbers between mobile and fixed operators is still a dream
- Cannot port numbers from one country to another

VoIP Providers depend on SS7 IN database for number portability. It's slow, expensive and not Internet ready.

Name portability on IP

On the Internet name portability is already available and everybody is using it even without being aware:

The Domain Name System (DNS).

- When you move your web from one hosting provider to another you get a new IP address but you do not change the name of your website

- By simply pointing the website name to the new IP address of the server you are done

Name portability on IP

There is no regulatory, agency or government office that intermediates any changes in the DNS.

- You don't send a fax

- You don't wait for 3 months

- You do it yourself when you want and how you want

Internet is much more cost effective, there are no administrative barriers that hinder the porting process

Number portability on IP

As Voice over IP is just another application over the Internet (observation of Jon Peterson) we can use the same principles that apply for web and e-mail

- SIP maps the phone's IP:port to a SIP address
- ENUM maps the E.164 number to a SIP address

SIP with ENUM combine the logic of uniting the identity (from both Internet and PSTN) with the access, the device and the service
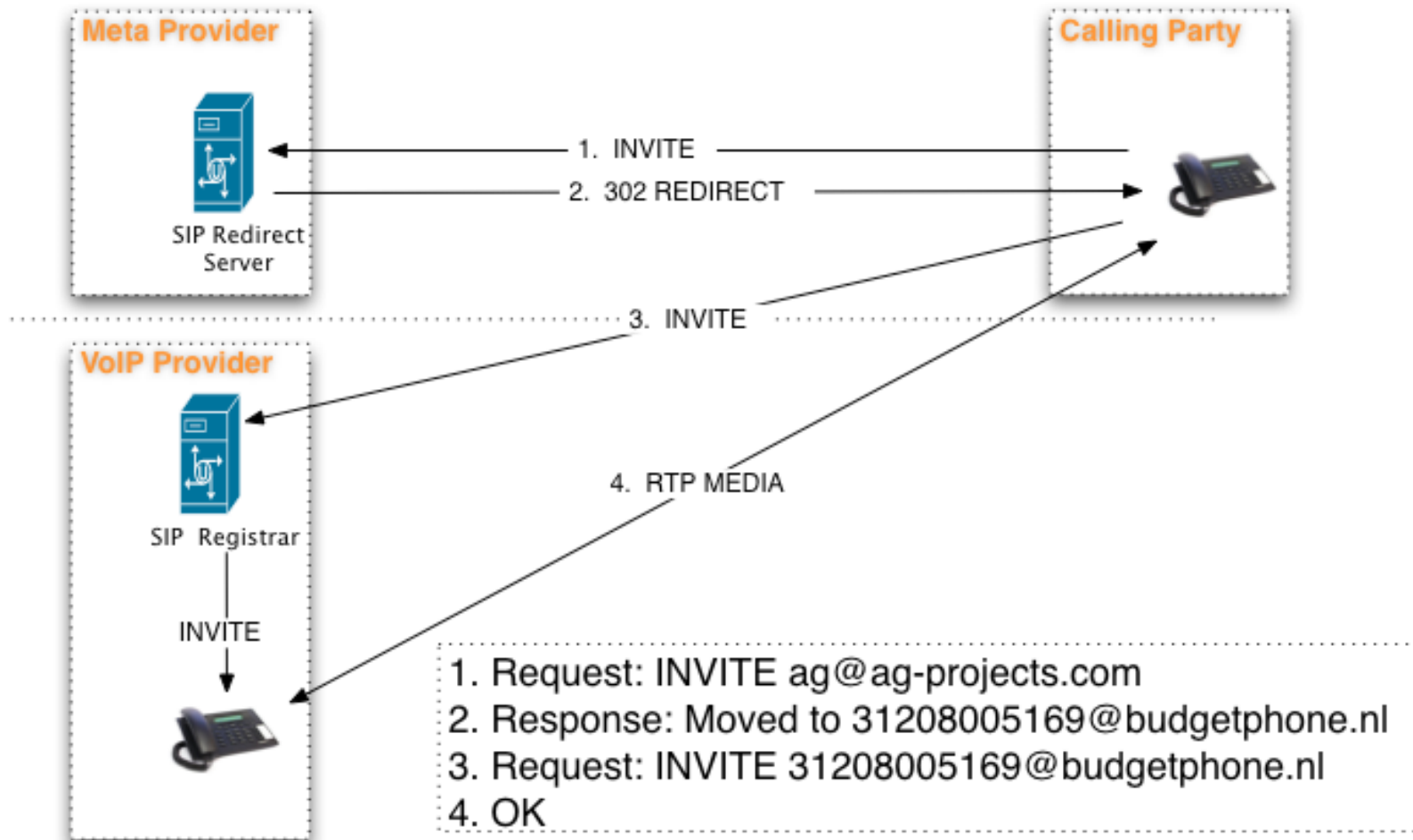
SIP redirect service

- A SIP redirect service unconditionally redirects all calls to another SIP address

- SIP as a location service supports redirection using 30X response codes (Moved temporary/permanently)

- sip:dan@ag-projects.com is merely an alias, which points to sip:31208005167@ag-projects.com

SIP redirection works much like email forwarding

SIP redirect service

SIP Redirect for Internet number portability

1. Request: INVITE ag@ag-projects.com
2. Response: Moved to 31208005169@budgetphone.nl
3. Request: INVITE 31208005169@budgetphone.nl
4. OK

ENUM mappings

+31208005167   ⟶   sip:dan@ag-projects.com

                   ⟶   sip:317105167@eurovoice.ro

                   ⟶   tel:+40721275177

                   ⟶   email:dan@ag-projects.com

                   ⟶   http://ag-projects.com
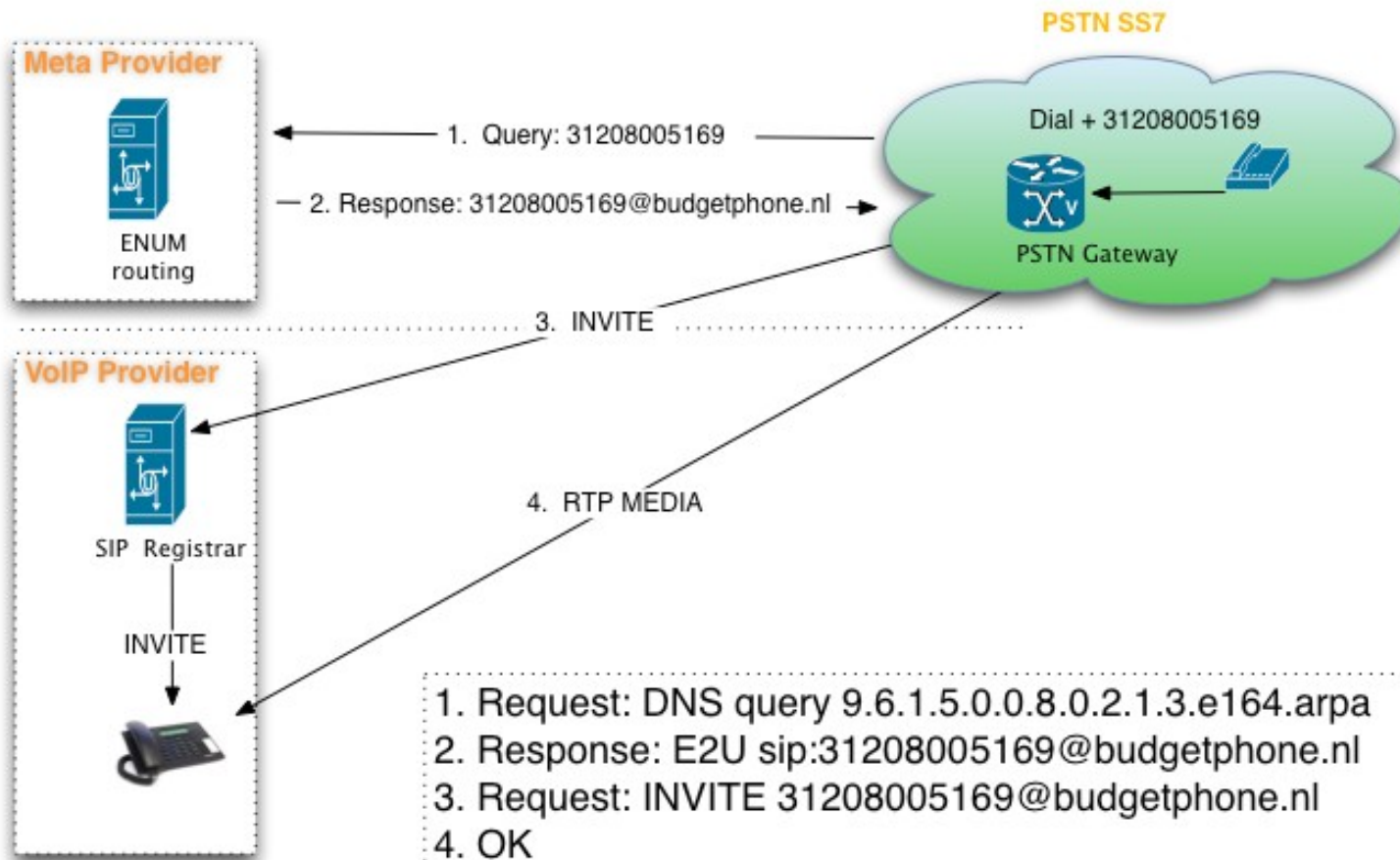
                   ⟶   skype:dan.pascu

ENUM mappings

ENUM is an address translation database that maps E.164 numbers into IP addressing schemes

- My ENUM number +31208005167 points to my SIP address sip:dan@ag-projects.com
- The ENUM mappings are records hosted in the DNS like any other DNS records

Both the SIP alias and the ENUM record point to my SIP account which I use for telephony, video and IM.

ENUM mappings

ENUM mappings for Internet number portability

PSTN SS7

Meta Provider

1. Query: 31208005169

2. Response: 31208005169@budgetphone.nl

Dial + 31208005169

ENUM routing

PSTN Gateway

3. INVITE

VoIP Provider

SIP Registrar

4. RTP MEDIA

INVITE

1. Request: DNS query 9.6.1.5.0.0.8.0.2.1.3.e164.arpa
2. Response: E2U sip:31208005169@budgetphone.nl
3. Request: INVITE 31208005169@budgetphone.nl
4. OK

VoIP providers today

What most of the VoIP providers today don't do is give their subscribers a public SIP URI: number@telco.com

- Most of the VoIP providers allow their users to use only numbers for addressing (new technology with old habits)
- The only way in or out of the VoIP island is the PSTN gateway (like Vonage)

Without ENUM and public SIP URIs users will not be able port their numbers between VoIP providers
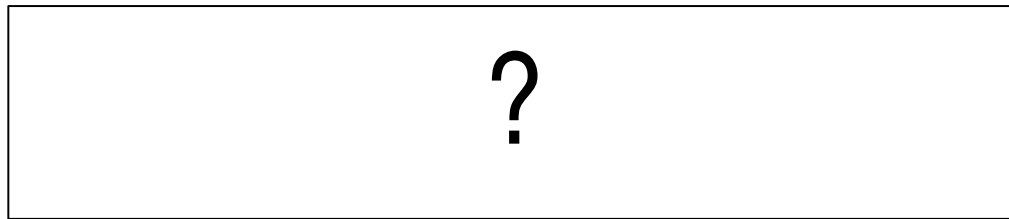
Recipe for number portability

Meta providers

- National ENUM registry with opt in for users
- A name translation service using Internet domain registration and a SIP Redirect service
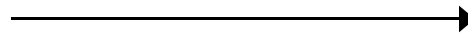
And open garden VoIP providers

- SIP service provider that uses public SIP URIs
- ENUM enabled PSTN operator

What the Users can do

?

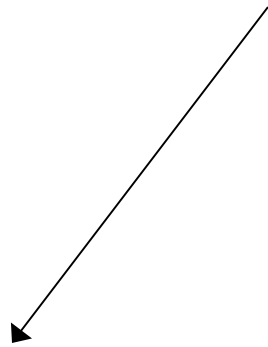Sip:1234@provider1.com   Sip:5678@provider2.com

What the Users can do

Meta provider

firstName@lastName.com

+1-123-456789

Sip:1234@provider1.com   Sip:5678@provider2.com

What the Users can do

Meta provider
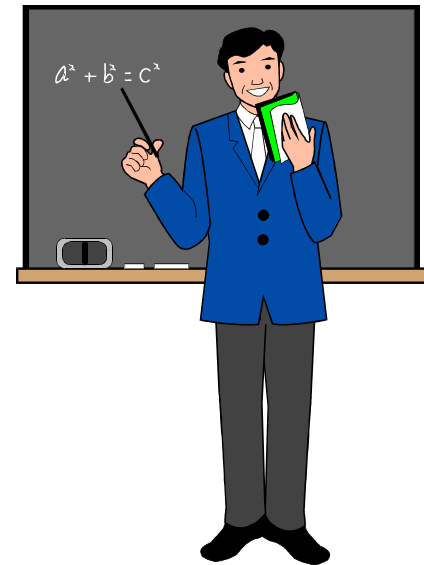

firstName@lastName.com

+1-123-456789

Sip:1234@provider1.com   Sip:5678@provider2.com

What the Regulator should do

- Explain what ENUM is because nobody knows

- Require VoIP Operators to provide SIP URIs

- Require national domain registry to support ENUM

- Require Telco's to have ENUM enabled gateways

What VoIP providers shouldn't do

Today subscribers have a choice. They can bypass your service starting with their dual-mode phone. You cannot compete against your own customers (Richard Stastny)

The VoIP providers shouldn't try building walled-gardens. They are expensive to build and it's hard to keep your customers inside them.

"By the time they finish up building their walled-garden, the customers will be safe outside."

What VoIP providers should do

- Provide the subscribers with public SIP URIs like sip:18016666269106@sipgate.de, because with SIP URIs users can do more than just VoIP

- Use ENUM lookups in the routing decision, because it will save money on customer acquisition and reduce churn. You can still make money on call termination for calls that end up on IP with 100% margin. And not to mention that the customers will be happier as they can manage their contacts using ENUM to simplify their identity.

This is not a fantasy anymore

Number portability based on DNS is already in production status:

• ENUM.at (Austria)

• EUROVOICE.ro (Romania)

This presentation is available at
http://ag-projects.com/ENUM/

Thank you,

Dan Pascu

Sip/Email: dan@ag-projects.com