

ENUM for the masses?

CZ.NIC

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CZ.

nic

CZ DOMAIN
REGISTRY

Contents

- What is ENUM
- User ENUM
- Infrastructure ENUM

What is ENUM

What is ENUM

Call over the internet

- Have you ever used?
- Why?
- Benefits: free, easy to use, mobility
- But ...

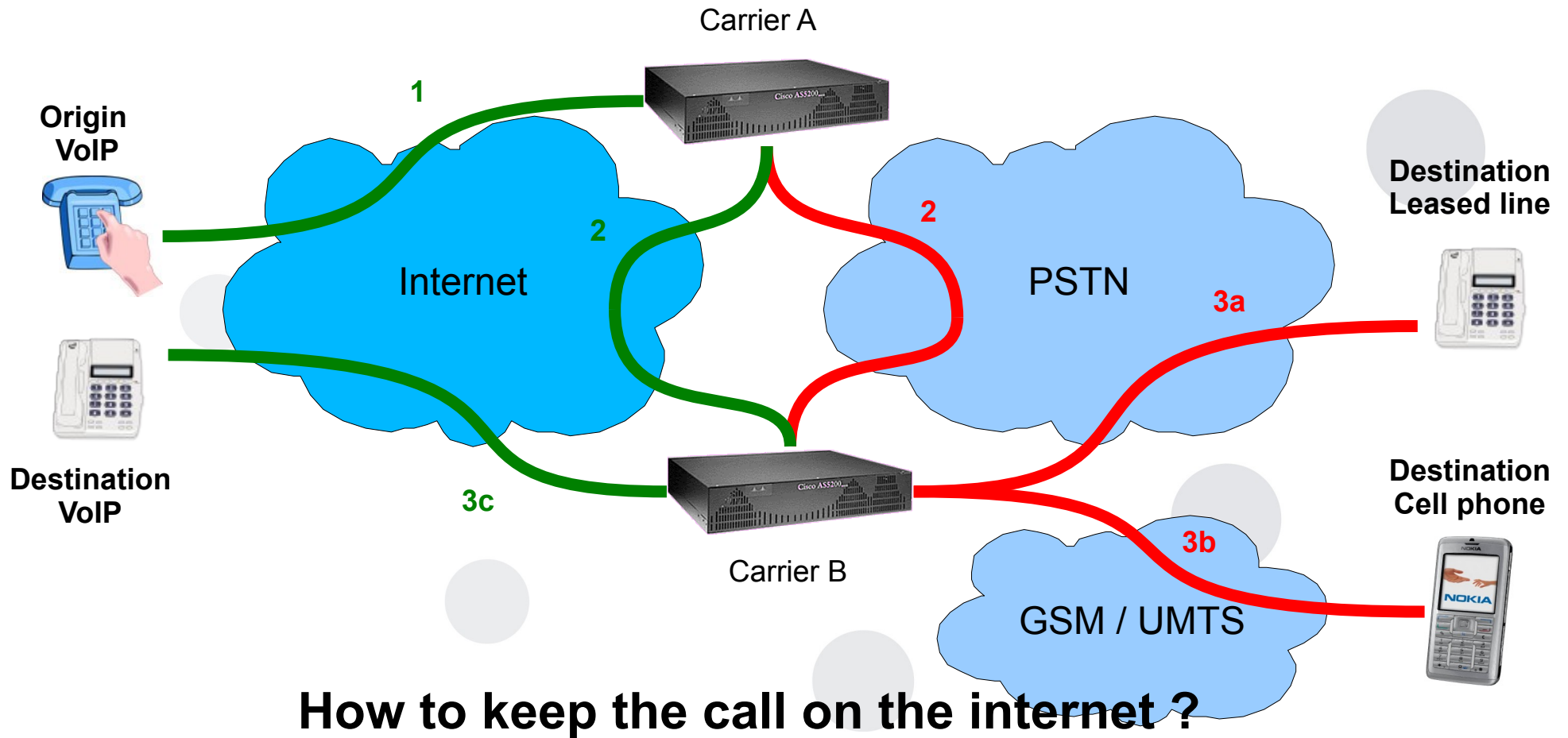


What now

?

What is ENUM

Regular VoIP service problem



What is ENUM

ENUM in 21 seconds

- ENUM relates phone number with an internet service
- VoIP: internet service = SIP service
- +420 222 745 120 – sip:hudba@nic.cz
- Other services of course possible – e-mail, web, ...
- **ENUM are yellow pages of VoIP enabled users**

- Uses DNS
- ENUM domains

What is ENUM

How ENUM works

- ENUM domain is created from phone number
 1. +420 222 745 120
 2. 420222745120
 3. 021547222024
 4. 0.2.1.5.4.7.2.2.2.0.2.4
 5. 0.2.1.5.4.7.2.2.2.0.2.4.e164.arpa
- Same as any other domain
 - Query (domain) / Reply (SIP address)
- Call routing to SIP instead of phone number

What is ENUM

ENUM in DNS

- RR Name Authority Pointer – NAPTR

Order
Not used

Flags
„U“ only
means URI

Replacement
Not used

```
IN NAPTR 100 50 "u" "E2U+sip" "!^.*$!sip:hudba@nic.cz!" .
```

Preference
Lower numbers
preferred ala MX

ENUM service
E2U+type:subtype

email:mailto
web:http
sms:tel

Rule
Regular expression, ! separates
substitution parts

What is ENUM

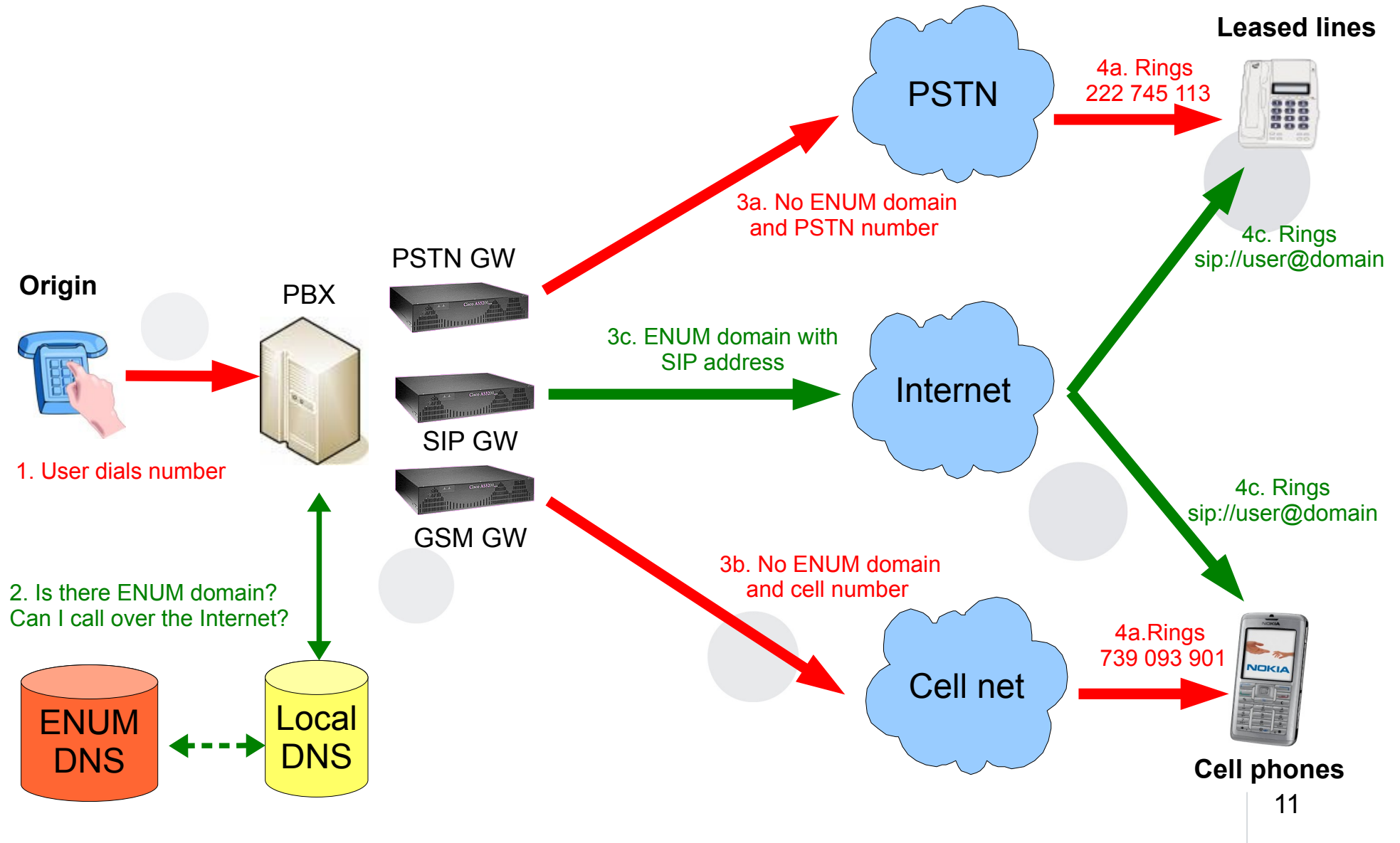
ENUM types

- SIP address meaning in ENUM DNS
- End users
 - Call I reach destination party over the Internet (for free)?
 - ENUM for users: User ENUM
- Carriers
 - To which network the number belongs to and how to route there?
 - ENUM for carriers: Infrastructure ENUM

User ENUM

User ENUM

Call routing with User ENUM



User ENUM

Deployment differences?

- DNS?
- None
- Registry system?
- Validation / re-validation – Must know who is the registrant
- Higher registration period granularity
- Domain level overlay – blocks: +420 222 745 XXX
- Less informative WHOIS – registrant not disclosed
- FRED out-of-the-box

User ENUM

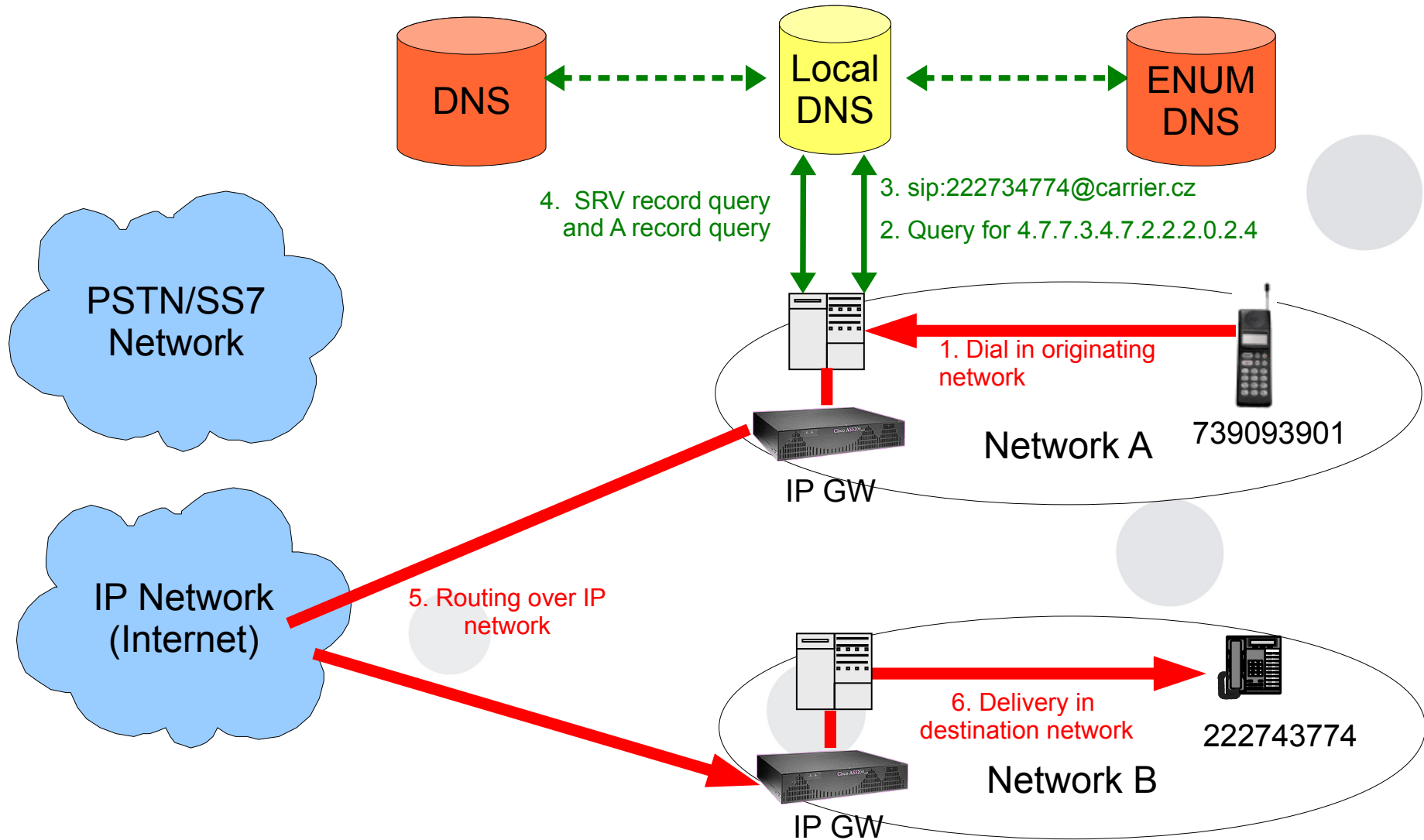
Status worldwide

- Deadlock
- Some countries operate country prefix ENUM, but ...
- Reasons?
- Big carriers: cash cow
- Small carriers: interconnection fees
- Complicated – Skype, FaceTime, Google Voice, Viber, ...
- Unless ... applications?
- ENUM Federation

Infrastructure ENUM

Infrastructure ENUM

Call routing with Infrastructure ENUM



Infrastructure ENUM

Status worldwide

- Never took off
- Carriers do not really need registries ...
- ... **number portability database opportunity!**

- Reasons?
- Big: ancient equipment
- Small: low priority (manual peering)

Thank you

Questions?

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