Routing & Addressing

The opportunities and the issues given by alternatives routing and addressing schemes.

**presented by
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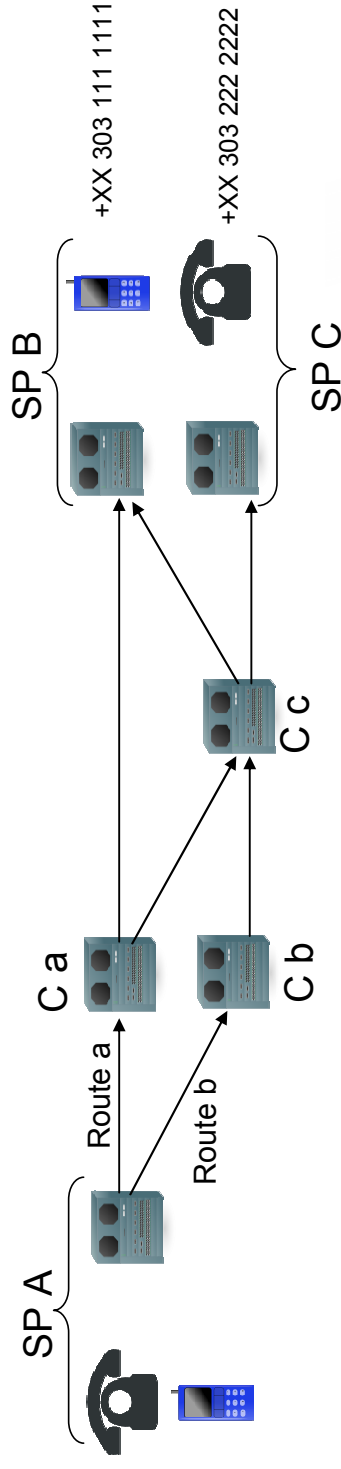
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Agenda

- I3forum Objectives and Progress Updates

- Today's business reality

- New opportunities and challenges

- Requirements to move forward

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i3 Objective and Progress Updates

- **Objectives**
  - Support alternative services to explore new revenue opportunities
  - Allow carriers to exchange addressing and service attribute information
  - Optimize carrier routing & addressing schemes
  - Evolve from country-to-country routing to network-to-network routing
  - Assist effective bilateral/multilateral traffic exchange

- **Progress Updates**
  - i3 carrier routing and addressing discussion started in late 2008
  - Documents published in May 2011
    - i3 Forum WS "Services" – Global SPID White Paper V1 May 2011
    - i3 Forum WS "Technical" – White Paper Techniques for Carriers' Advanced Routing and Addressing Schemes (Rel 2.0) May 2011
    - http://www.i3forum.org/library

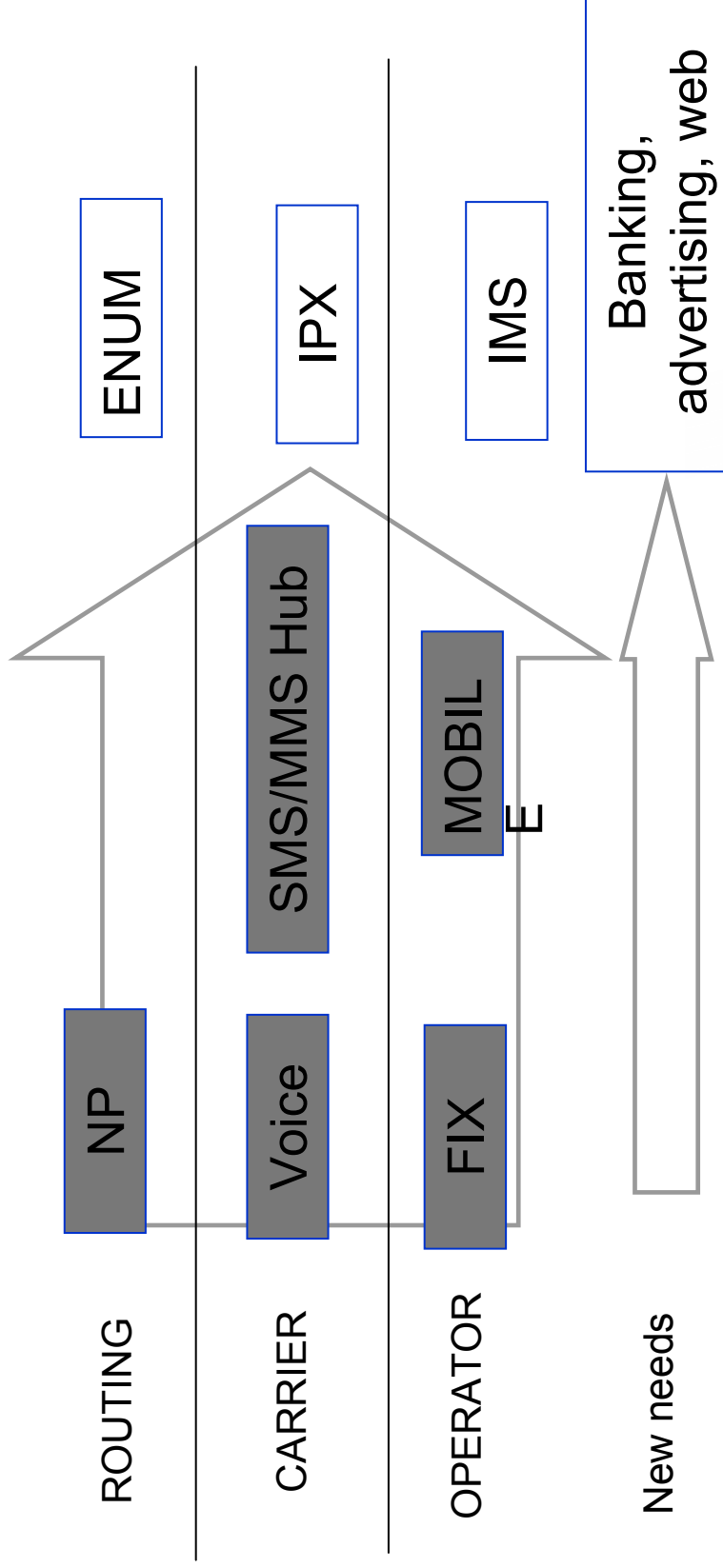i3 forum
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Carrier Routing Decision

- **Routing Decision Variables**
  - Business commitment, e.g. traffic volume commitment
  - Business cost optimization, e.g. Least Cost Routing
  - Capacity availability
  - Quality parameters
  - Service requested
  - Quality requested
  - Technology awareness, e.g. end-to-end IP, special codec support

- **Routing Decisions Managed by Carriers**
  - To identify optimal route rather than the most direct route

SP A

Route a

Route b

C a

C b

C c

SP B

SP C

+XX 303 111 1111

+XX 303 222 2222

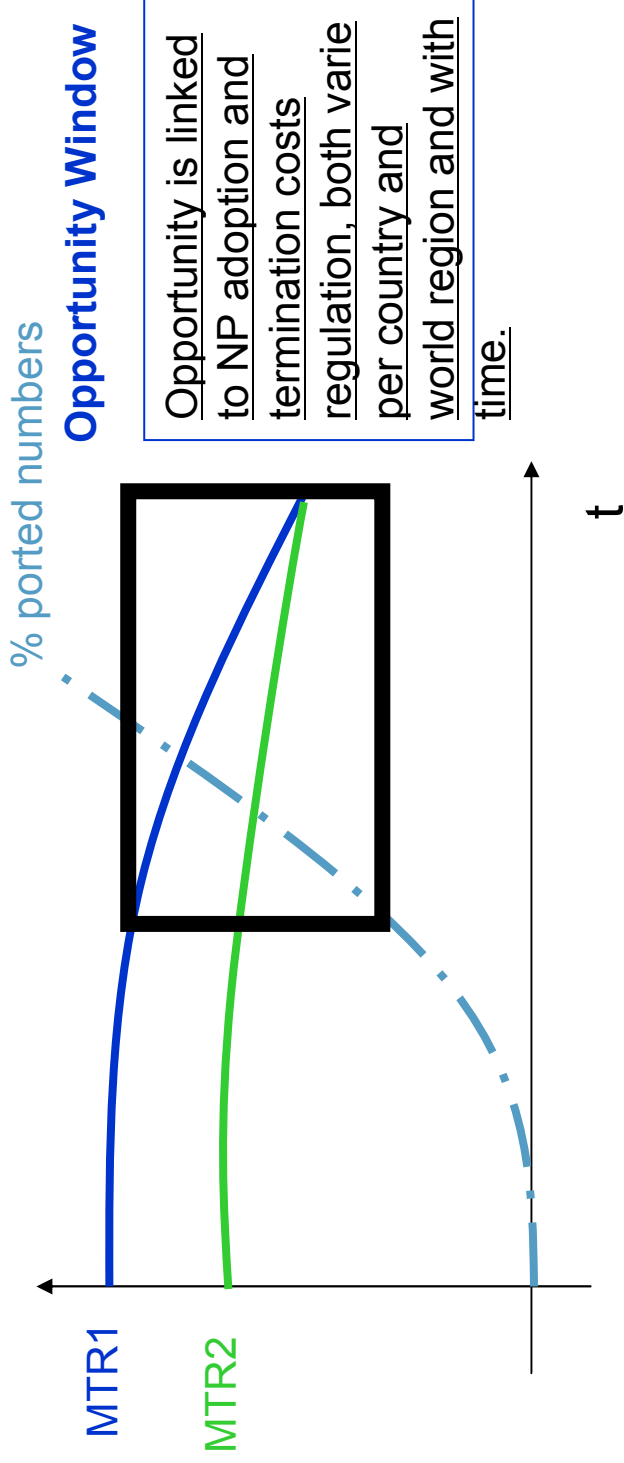i3 forum
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Routing and addressing Enablers

- Challenge
  - Respond to current needs
  - Prepare the future
  - Assure smooth evolution path
  - From existing needs and business models to new ones

ROUTING	NP	ENUM
CARRIER	Voice	SMS/MMS Hub	IPX
OPERATOR	FIX	MOBILE	IMS
New needs		Banking, advertising, web

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2.0

Opportunity window
International carrier look for a solution now

% ported numbers

Opportunity Window

Opportunity is linked to NP adoption and termination costs regulation, both varie per country and world region and with time.

MTR1

MTR2

t

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Routing and addressing beyond NP and voice

Routing and addressing means: identifying individual attributes of a unique phone number and make routing and service decisions upon these attributes.

Carrier of record => Number Portability

- Optimize existing arbitrage model, enables new models such as on-net, federation, IPX rules etc..

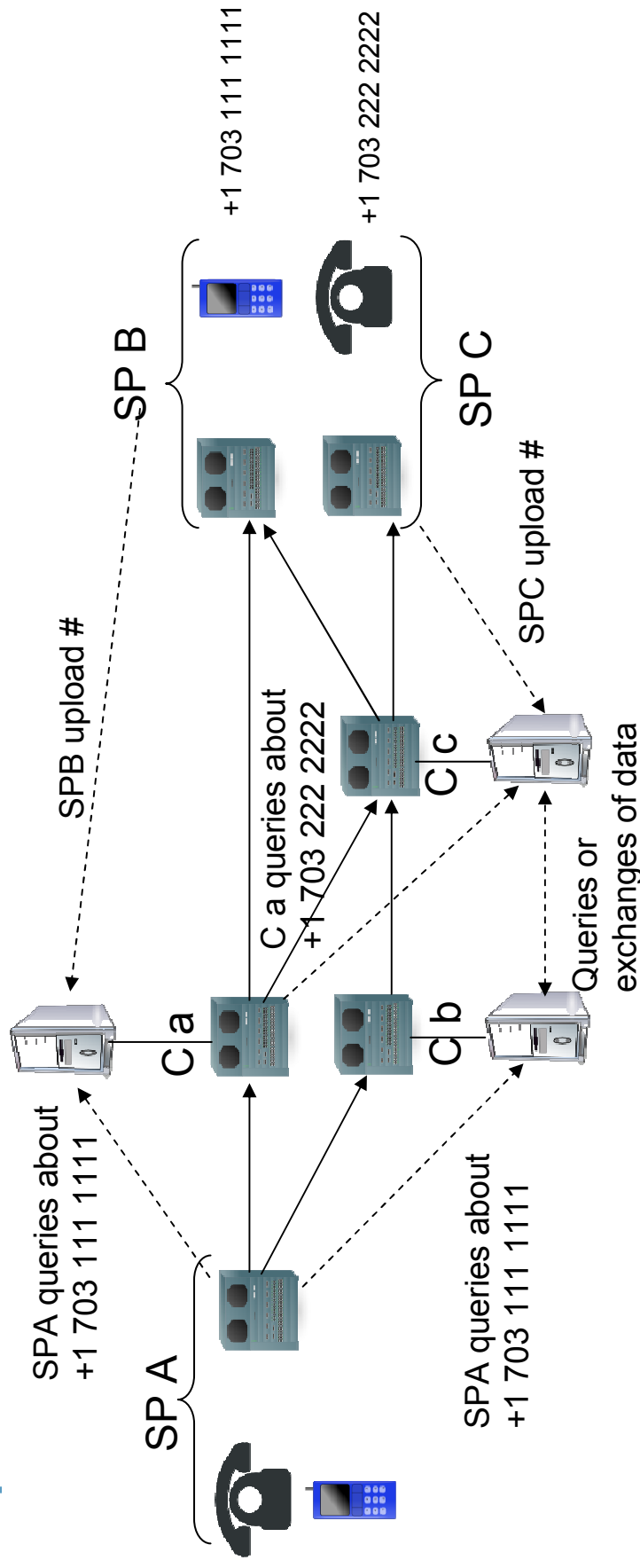## It can be used for new information and new telco services

- Terminating number characteristics => IMS services, full IP line, wideband capable, fixed, mobile, VoIP, TDM, wideband, and narrowband
- Supported services: SMS, PSTN, FAX/IFAX etc.

It can also be used for new information and non-telco services

- Classic banking, Mobile banking => number verification
- Social network services => universal number..
- Phone types:

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International routing an addressing, of the many possible uses

SP B

+1 703 111 1111

+1 703 222 2222

SP C

SPB upload #

SPC upload #

Ca queries about
+1 703 222 2222

C a queries about
+1 703 222 2222

Cc

Cb

Queries or
exchanges of data

SPA queries about
+1 703 111 1111

Ca

Cb

SPA queries about
+1 703 111 1111

SP A

- **SPA queries Ca and Cb about +1 703 111 1111**
  1. Do you know this number, how accurate is your information
  2. Can you terminate services directly or indirectly to this number, which services features do you enable for this number:….

- **Ca queries Cc**
  1. Do you know this number, how accurate is your information
  2. Can you terminate services directly or indirectly to this number, which services features do you enable for this number:….

- **Cb queries or exchange data with Cc**
  1. Do you know this number, how accurate is your information
  2. Share the information about this number or all data about SPc or all data about the 2 databases as per our business agreement

International routing an addressing

Multiple databases

- SPs and Carriers need a common technology to manage data, provision and make requests: this is needed to reduce costs, facilitate implementation, promote wide coverage…

Several uses and needs, which information and which services

- Which information is required. Number portability, route info… ?

Common language to interpret the data

- Depending on the information needed, the data must be provided in a way that is understood by all players in a standard manner
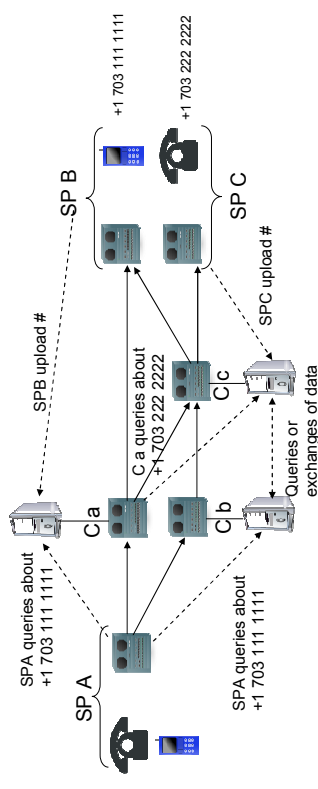
Commercial models

- Several models can govern the commercial models to upload, querie, exchange data

Security and business rules

- Several business rules to secure data can be required and how can they be enforced
- Risk of fraud and abuse can appear, how to avoid these risks

Regulatory aspects

Challenges to use Number Portability with LCR

Current ENUM schemes using URIs integrate badly with LCR routing schemes:

- Assume direct routes available via peering interconnects are best commercially and for quality

- Ignore the possibility of two separate routes via peering federations to the same peering partner

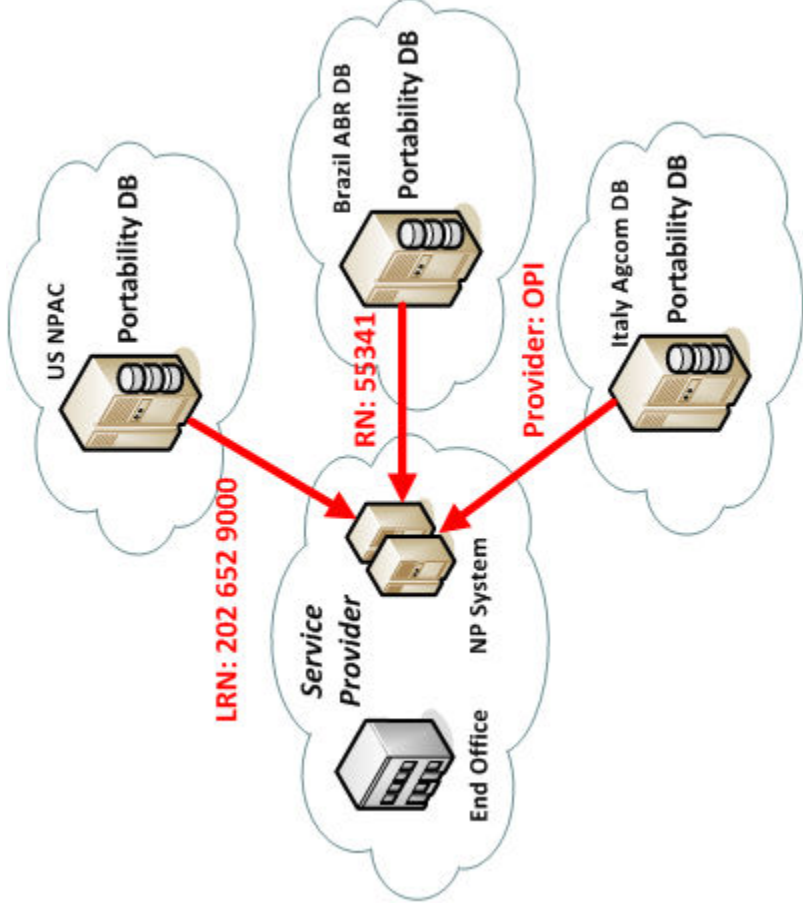- URIs are not designed to be worked within the LCR system

A standardized SPID would allow integration with LCR systems:

- Standardized SPID must be numerical for this approach

- A standardized SPID can be treated within the LCR system as another prefix

- Use standardized SPIDs in addition to, or in place of destination prefix breakouts, to integrate

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Inconsistency of current methods to identify Service Providers

Current situation with NP:

- Different identifiers & architectures used in NP resolution
  - LRN used in NPAC
  - RN used in Brazil
  - Provider ID used in Italy
  - ...
- SPs need to adapt to each:
  - Increased complexity
  - Increased cost
  - Slower adoption internationally
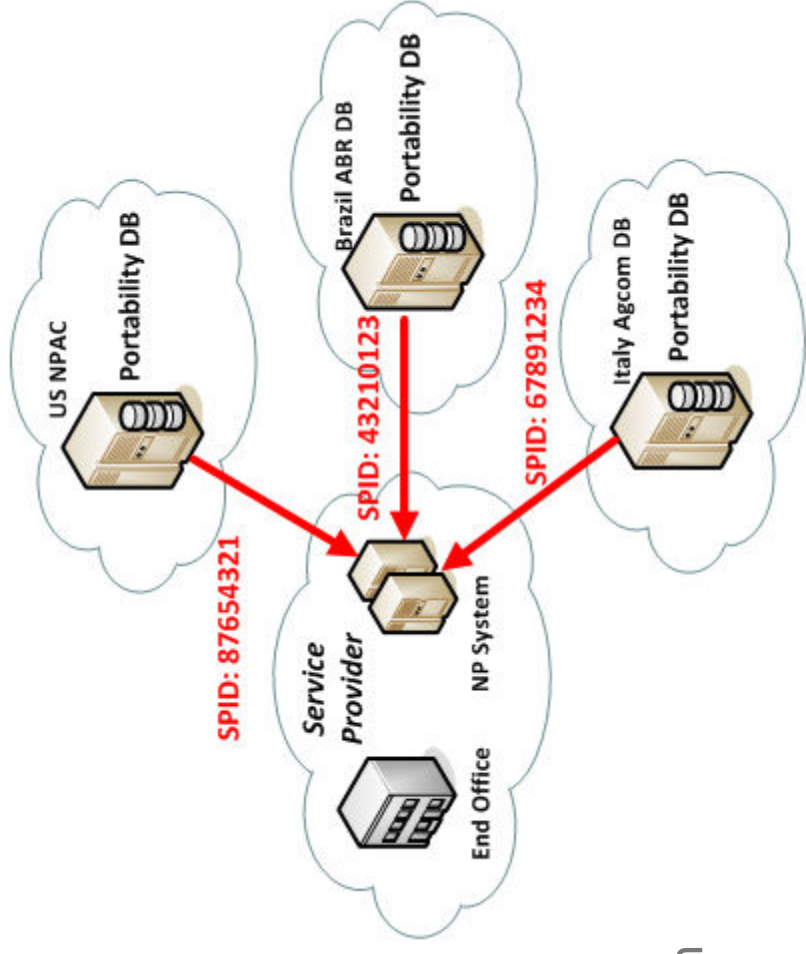- Slows adoption of peering using NP

US NPAC
Portability DB

Brazil ABR DB
Portability DB

Italy Agcom DB
Portability DB

LRN: 202 652 9000

RN: 55341

Provider: OPI

Service Provider

NP System

End Office

Need to standardize Service Provider Identifiers for the international connections

Solution using standardized SPID:

- SPID used to harmonize NP queries
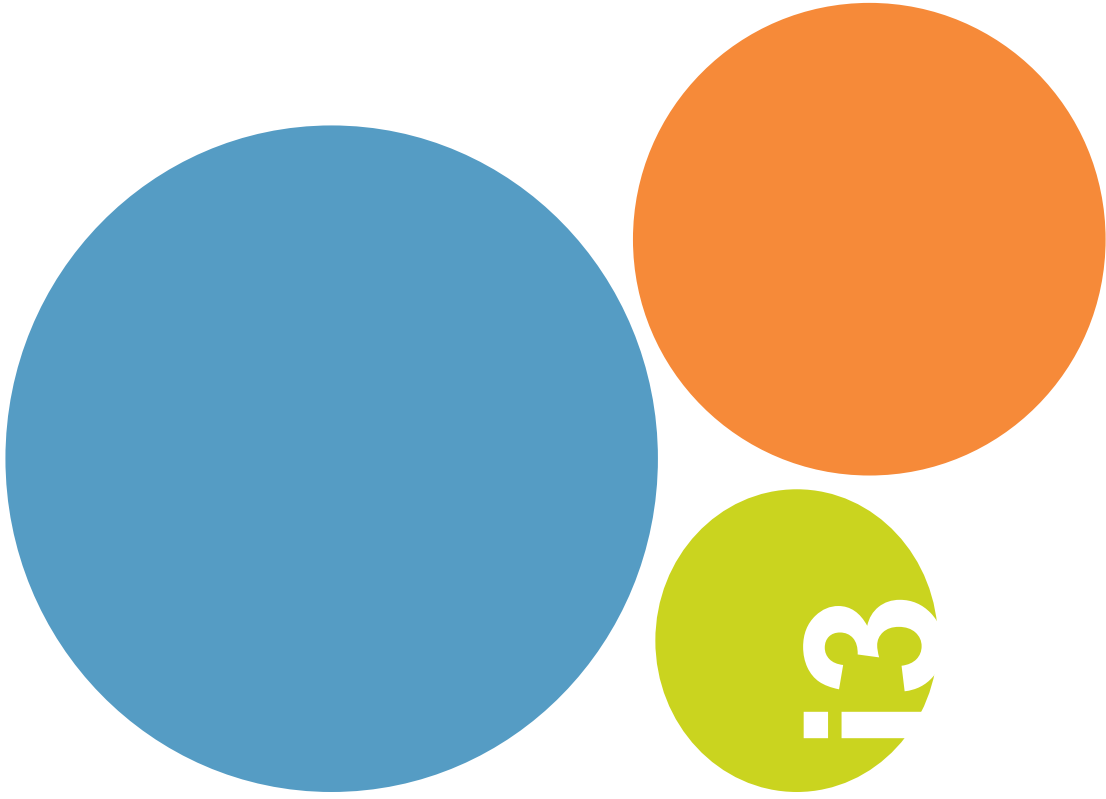- Reduce cost of implementation
- Speed adoption of NP peering

But:

- NP database will take a long time to convert or never convert
- Possible solution by mapping current response types to SPID at NP platform

US NPAC
Portability DB

Brazil ABR DB
Portability DB

Italy Agcom DB
Portability DB

SPID: 87654321

SPID: 43210123

SPID: 67891234

Service Provider
NP System

End Office

Global SPID I3forum recommendations

- Globally Unique

- Flat Structure

- Only numeric digits (0-9)

- Fixed Length, 8 digits, giving 100 million possible identifiers

- Available to all entities that require them and not limited to licensed operators or 'Carriers of Record'.

- Reassignable and reusable by the entity they have been assigned to.

- Entities should be able to apply for multiple Global SPID identifiers

- A Range of Global SPIDs provided for the use within a network for internal purposes.

- The Global SPID identifier numberings space should include the ability to encode MCC/MNC combinations as specified in ITU-T E.212 .

- The assigning entity should maintain a public database of Global SPID identifiers along with the assigned entity name and a description of the SPID purpose.

- Global SPID managed by an open/neutral entity such as IANA or ITU

Thank You!

And check the I3forum white paper on Global SPID available at www.i3forum.org

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