Open and closed models for Infrastructure ENUM in the Netherlands

Looking for models that match stakeholders' interests in VoIP interconnect

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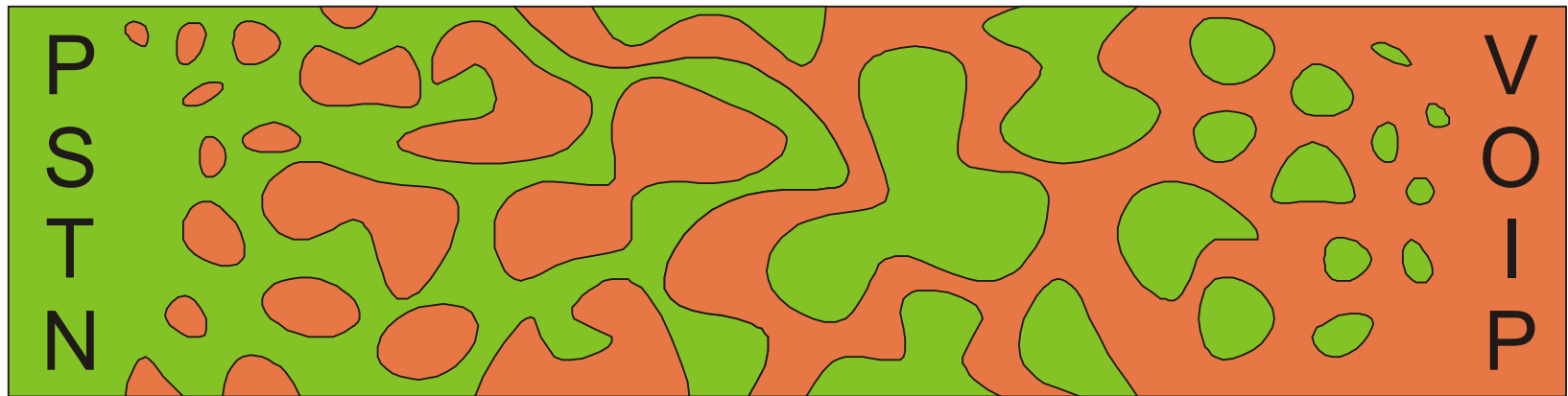
TNO | Knowledge for business

TU/e

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RIPE 55 ENUM WG, Amsterdam, October 25, 2007
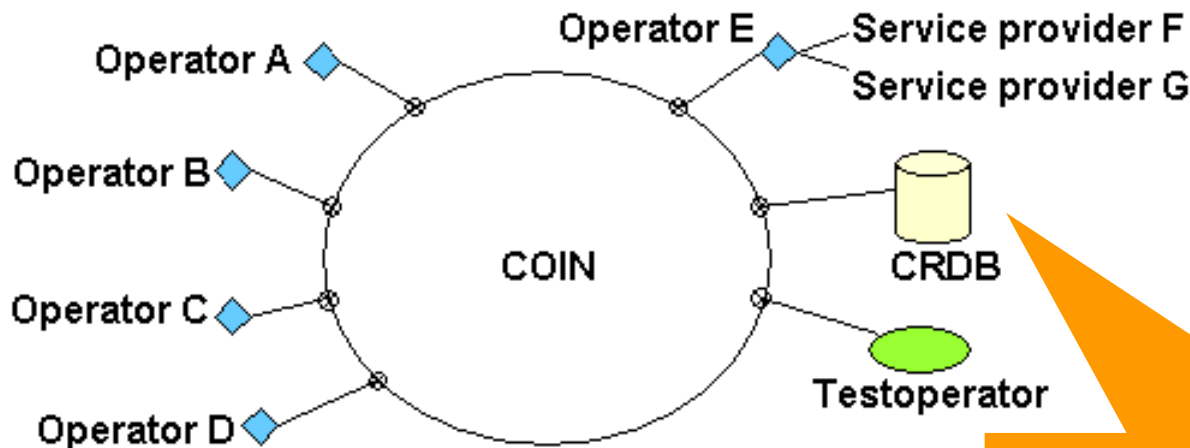pieter.nooren@tno.nl

Direct interconnection of VoIP networks replaces indirect interconnection via PSTN

Today: exchange of routing information for circuit-switched interconnect through COIN system

Organizational model:
• COIN is an association (not-for-profit)
• Members are all telecom operators that have to offer number portability

Operator E
Service provider F
Service provider G

Operator A

Operator B

Operator C

Operator D

COIN

CRDB

Testoperator

◆ COMO (Communicaton Module)
⊗ Frame relayverbinding

Central Reference DataBase
• mapping (ported) number $\Rightarrow$ telco code
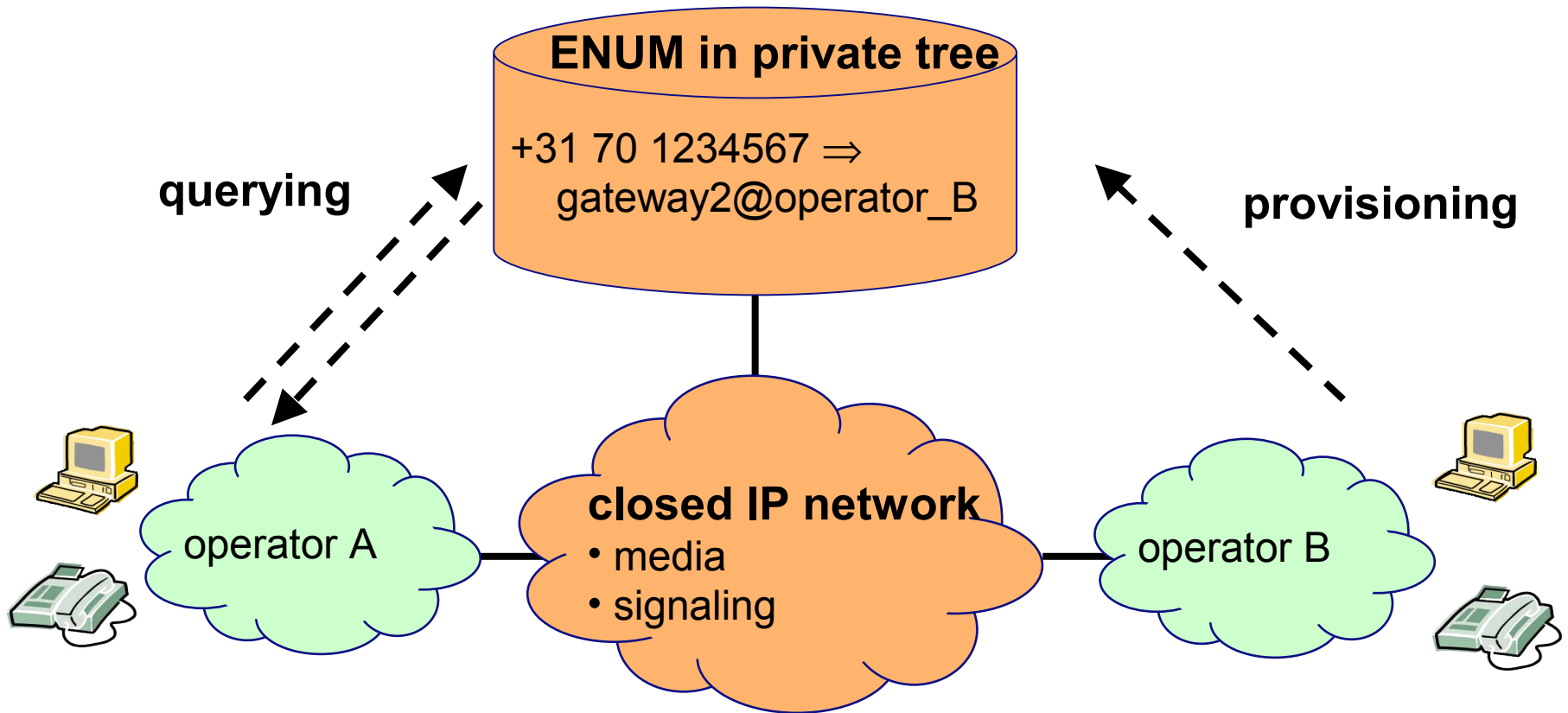
(source: www.coin.nl)

Tomorrow: exchange of routing information for VoIP interconnect through ENUM system?

Organizational model?
- Who runs ENUM database?
  - group of operators, SIDN, COIN, Verisign, combinations, …
- What is the scope of the ENUM database(s):
  some Dutch numbers, all Dutch numbers, numbers from all over the world, …

operator A

?

operator B

operator C

company X

ENUM distributed database
- mapping phone number $\Rightarrow$ telco ID, gateway ID
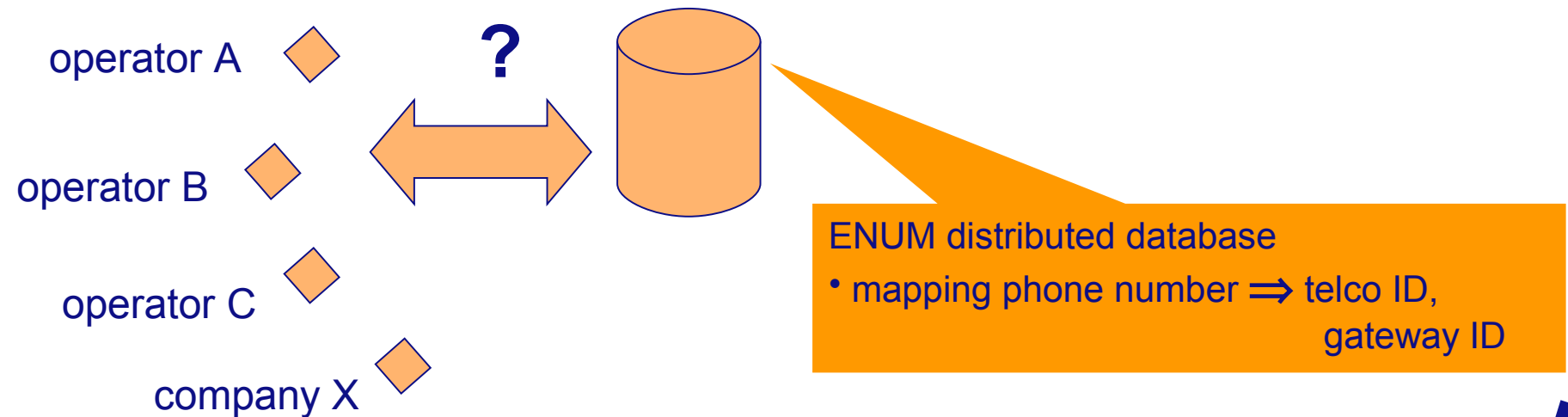
Model 1: Closed infrastructure ENUM (the federation model)

ENUM in private tree

+31 70 1234567 $\Rightarrow$ gateway2@operator_B

querying

provisioning

operator A

closed IP network
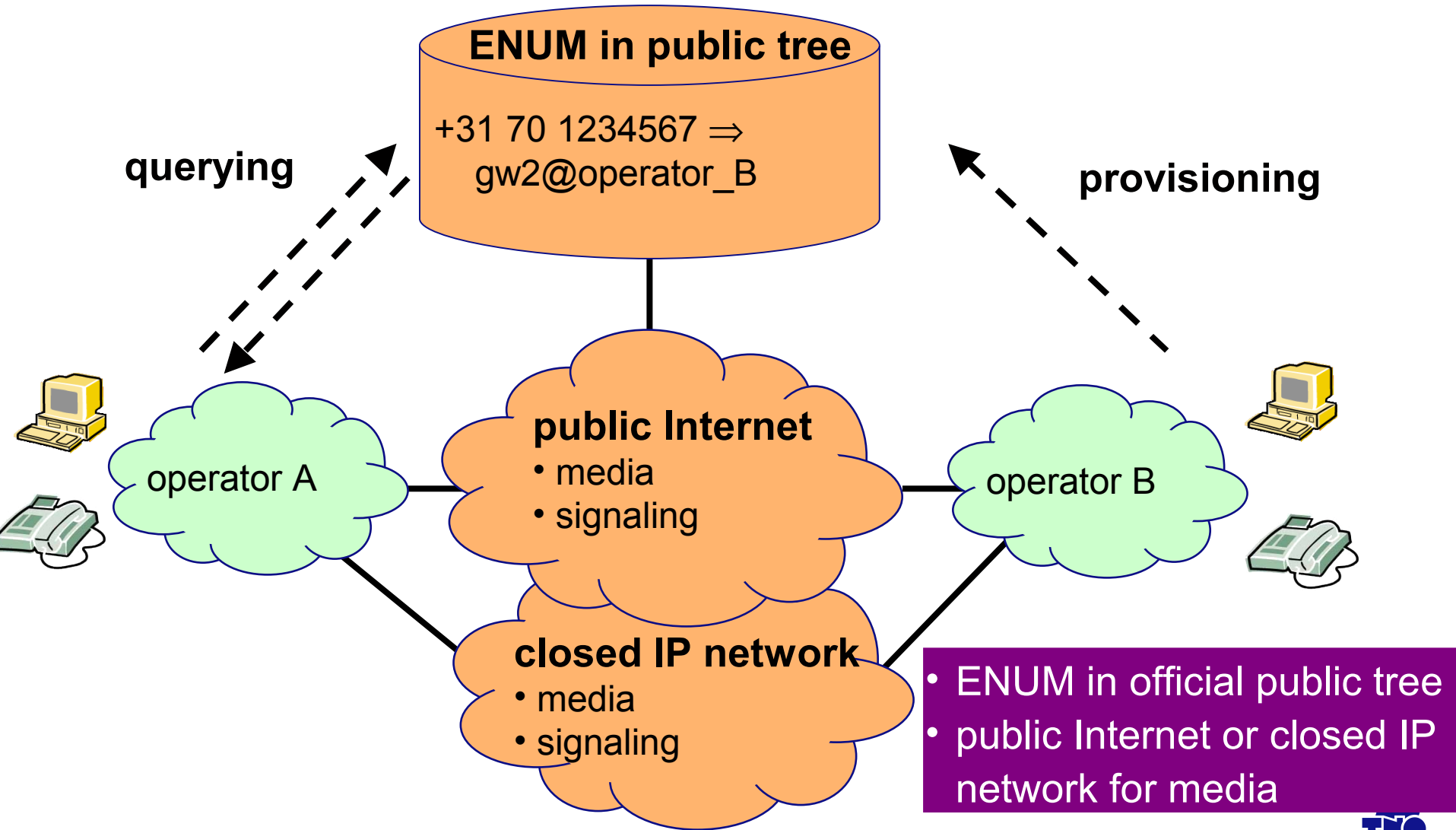- media
- signaling

operator B

- ENUM in private tree
- closed IP network for media

Model 2: Open infrastructure ENUM (the E-mail model)

ENUM in public tree

+31 70 1234567 ⇒ gw2@operator_B.net

querying

provisioning

public Internet
- media
- signaling

operator A

operator B
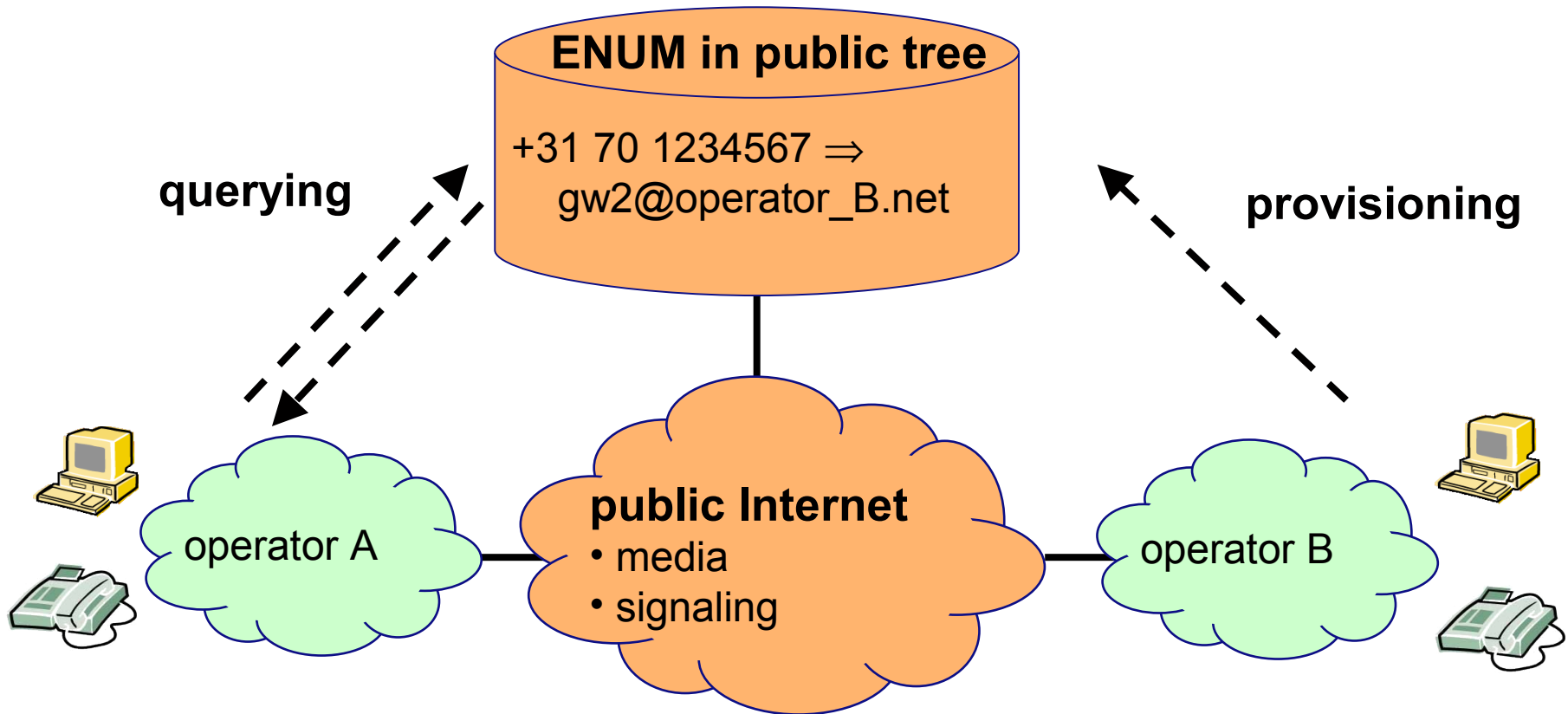
- ENUM in official public tree
- public Internet for media

Model 3: Open infrastructure ENUM supporting closed IP networks (the combined model)

ENUM in public tree

+31 70 1234567 $\Rightarrow$ gw2@operator_B

querying

provisioning

operator A

public Internet
- media
- signaling

operator B

closed IP network
- media
- signaling

- ENUM in official public tree
- public Internet or closed IP network for media

Survey among service providers, regulators, vendors and other stakeholders
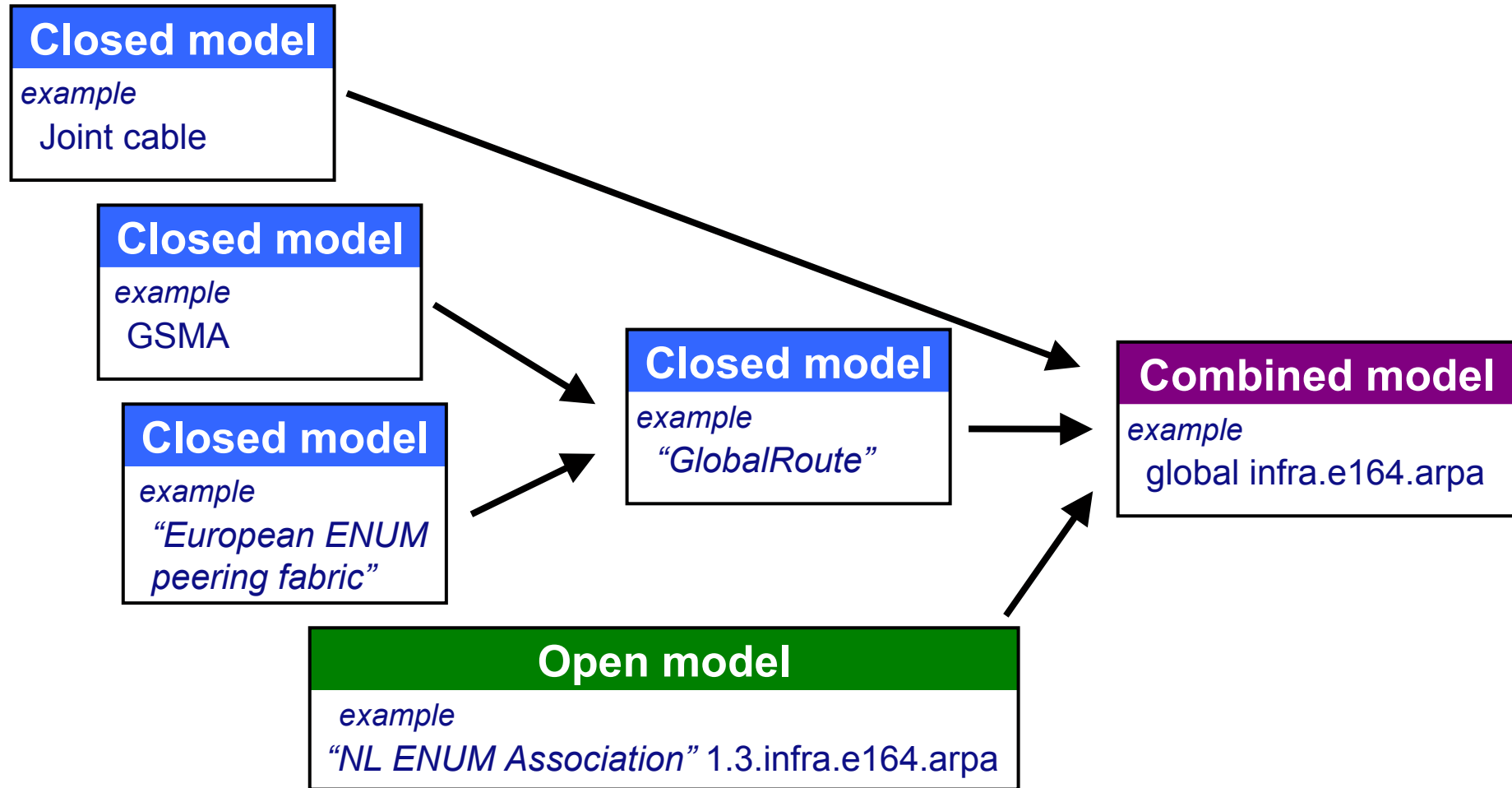
Main conclusions survey

- Phone numbers remain important for many years
- Infrastructure ENUM is important ingredient for VoIP interconnect
    - no serious alternative were mentioned
- Different stakeholder groups prefer different implementation models $\Rightarrow$ no overall "winner"

Closed model	Open model	Compromise model
Service providers with own networks	Facilitators, vendors, service providers without network	No strong views

Migration from today's pilots to large-scale infrastructure ENUM implementation

Closed model
example
Joint cable

Closed model
example
GSMA

Closed model
example
"European ENUM peering fabric"

Closed model
example
"GlobalRoute"

Open model
example
"NL ENUM Association" 1.3.infra.e164.arpa

Combined model
example
global infra.e164.arpa

today ⟶ long run

Revisiting the conclusions after one year of further Infrastructure ENUM development by the industry

- Infra ENUM is a key ingredient for VoIP interconnect
    - no alternatives emerge in survey

  ✓

- Initial closed implementations pave the way

  examples: Dutch cable companies, GSMA, US cable operators, ...

  ✓

- Closed implementations pave the way for scaling up: merging/interconnecting with other closed implementations to achieve larger footprint

  example: SPIDER "registry of registries"

  ✓

  but: merging and interconnection is not needed if multiple implementations can access the same authoritative data

  ???

  ⇒ growing emphasis on National NP database with operator ID URIs added

Revisiting the conclusions after one year of Infrastructure ENUM development by the industry

NP database with operator URIs country A

NP database with operator URIs country B

multiple infra ENUM registries using same authoritative data
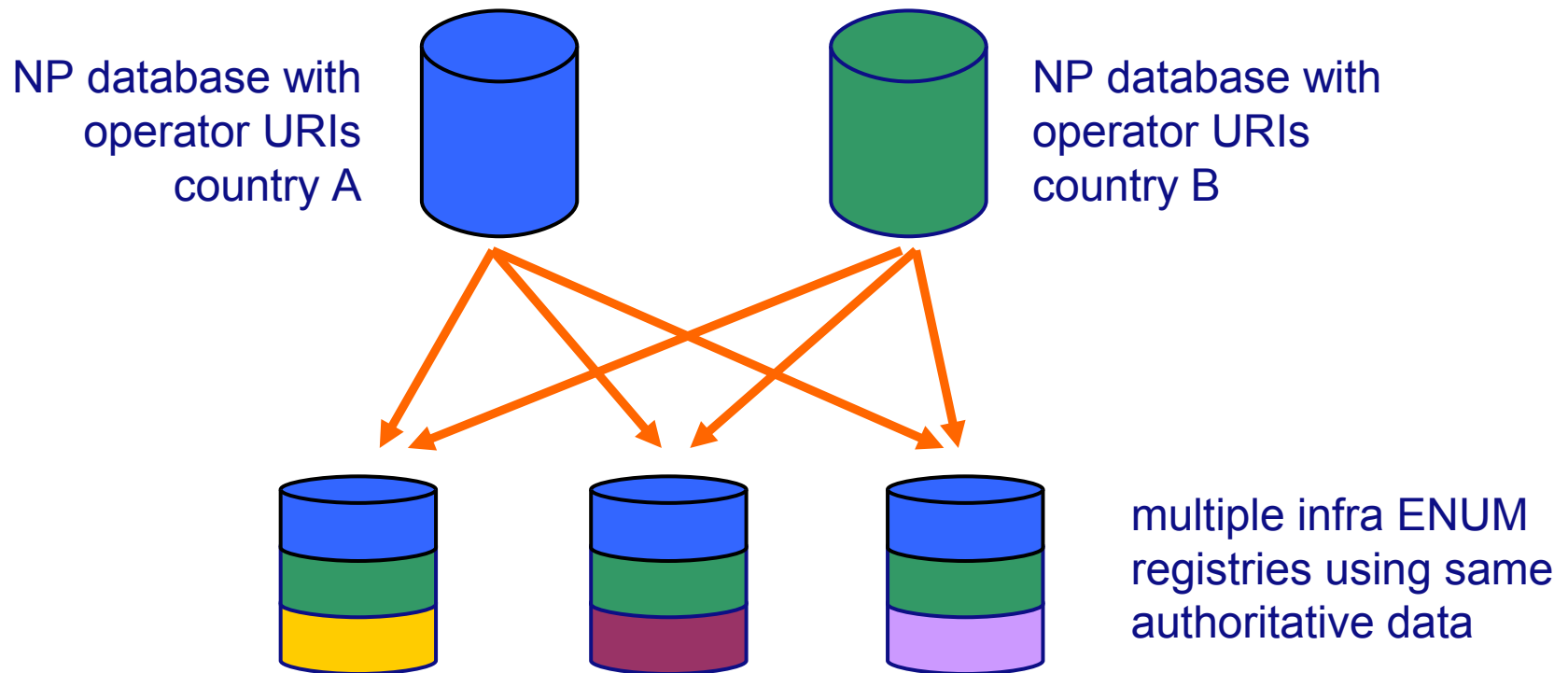
Revisiting the conclusions after one year of Infrastructure ENUM development by the industry

- Closed implementations pave the way for opening up: publishing routing information in public ENUM tree after publishing information in expanding closed trees   ???

    Questionable. Not one operator expressing desire to store routing data for VoIP and other services on the public Internet

    Netheads vs Bellheads again?