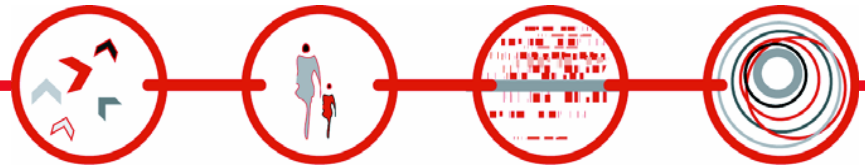


# Status of ENUM in Sweden



Joakim Strålmark  
PTS (NRA)

[joakim.stralmark@pts.se](mailto:joakim.stralmark@pts.se)

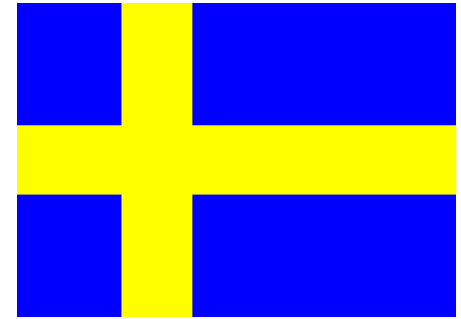


# Status of ENUM in Sweden

- *PTS*
- *What is ENUM*
- *Background*
- *ENUM trial in Sweden*
- *Entities in ENUM*
- *Tricky questions*
- *Choices to be made*
- *NRA proposal in final report to Government*
- *The next step*



# About PTS and Sweden



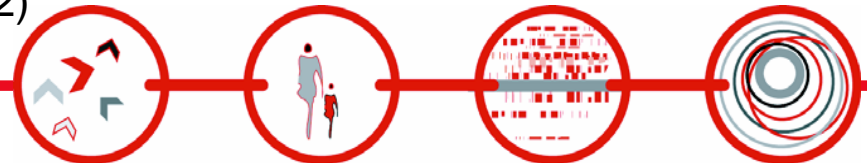
TeliaSonera

Ministry of Industry, Employment and Communications is responsible for telecom regulations (ITU Member State representative)

NRA/Administration - Post & Telestyrelsen

Telecommunication Act in force since 1 July 1993 - introduced competition (before that no direct legal framework - "*unregulated monopoly*") – new legislation for electronic communications since 25 July 2003

TeliaSonera is the incumbent (de-facto monopoly between 1918-1993 - competition in mobile since 1981) – 46,0 % state owned (19,4 % Finish state - merger 2002)



# What is ENUM

- ENUM - tElephone NUmber Mapping (IETF RFC 3761)
- E.164-number mapped to an Internet domain name – then ordinary DNS lookup
- ENUM – *associated facility* according to Framework Directive
- ENUM – facility to provide IP-telephony – SIP-based telephony
- ENUM – facility to move routing from PSTN/ISDN/PLMN to IP-based networks – different interconnection regime
- ENUM – facility for IP-based PABXs to use IP-based networks for calls to other IP-based PABXs – save call charges
- Many *flavours* of ENUM: "*User ENUM*", "*Private ENUM*", "*Enterprise ENUM*", "*Carrier ENUM*", "*Operator ENUM*", "*Infrastructure ENUM*"...



# Background

- NRA worked with ENUM since 2000 – attending ITU-T, ETSI, IETF, CEPT NNA, RIPE and ONP NNA subgroup
- NRA produced 4 reports to Government
  
- 2001 report - *wait for permanent introduction, but do national trial*
- 2001 – Ministry request - National trial together with interested authorities and the telecom and Internet players
- 2003 report - *suggest continuation of the trial until 2004-06-30 - ENUM still an interesting function for convergence, technology works for IP-telephony – administration needs much more work*
- 2004 report – *interim report with international update*
- 2004 final report – *permanent introduction would facilitate technology development which would improve competition between various stakeholders for the benefit of the end-user*



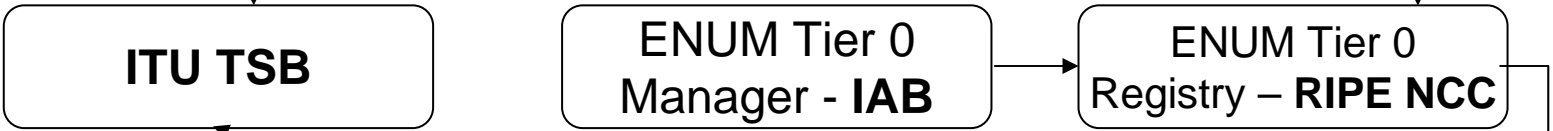
# ENUM trial in Sweden

- Pre-study for the trial made by industry working groups – applications, procedures and common infrastructure
- Trial in practice since December 2002
- ccTLD Registry acting as ENUM Tier 1 Registry – in contract with NRA acting as ENUM Tier 1 Manager
- 30 registrations of ENUM domain names (14 covers DDIs) - both company, private persons and organizations – University of Stockholm – a large trial user
- During 2004 industry working group produced procedures etc. for permanent ENUM introduction in Sweden – report to NRA
- An industry fora was formed December 2004 – ENUM Forum



**"Exchange of letters ITU TSB – RIPE NCC"**

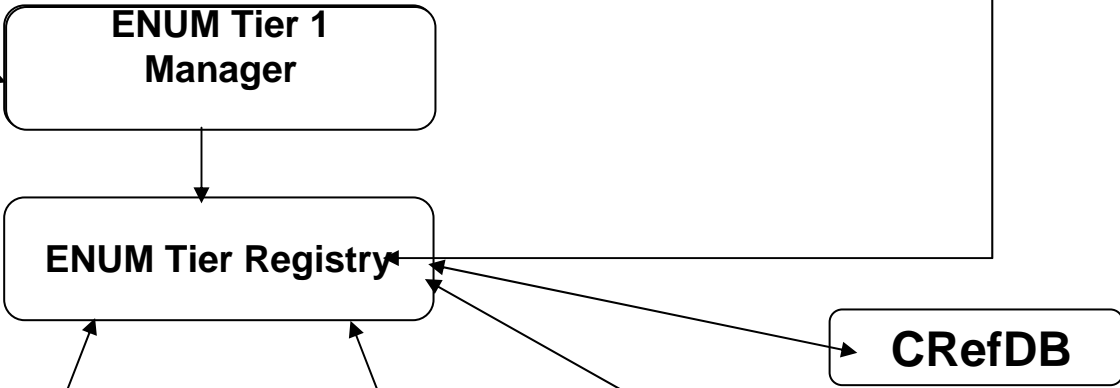
ENUM  
Tier 0  
level



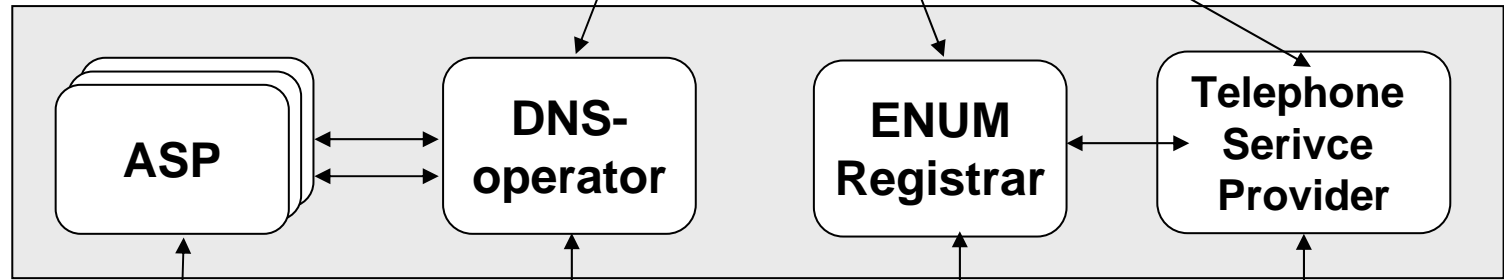
**IAB Instructions (RFC 3245)**

ENUM  
Tier 1  
level

- ITU:s ENUM administration ad interim (draft E.A-ENUM)
- IETF RFC 3761 - Country Code Domain delegated to the entity that has the CC assigned according to ITU-T E.164 Rec.



ENUM  
Tier 2  
level



**ENUM domain name = E.164 number**



# Tricky questions

- State involvement necessary for delegation of domain <CC>.e164.arpa based on IAB/ITU rules
- State will have operational responsibilities for functions (ENUM) in electronic communications networks – this is a consequence when requesting delegations the domain and according to the way DNS works today
- State will be responsible for the master zone file
- State only have administrative responsibility for the *national E.164 numbering plan* – no direct responsibility for *routing plans*
- Will “ENUM” only be in .e164.arpa?





# Choices to be made

- Who shall act as ENUM Tier 1 Manager (responsible administrative organization for <CC>.e164.arpa)
- Method to designate the ENUM Tier 1 Registry (responsible technical organization for <CC>.e164.arpa)
- Who can act as ENUM Registrars
- Methods for validation
- Subscribers choice
- E.164 number suitable for ENUM domain name
- Pre-paid SIM-cards for mobile telephony service
- Unlisted (ex-directory) numbers and privacy aspects
- Framework of regulation



# NRAs final report to Government

***Who shall act as ENUM Tier 1 Manager (responsible administrative organization for <CC>.e164.arpa)***

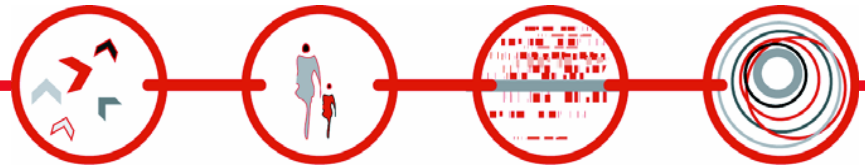
- ENUM Tier 1 Manager must set the rules for the ENUM framework, can designate the Registry etc.
- Could be NRA, Government, another authority, company, organization etc.
  
- The report recommend the Government to be the Manager – this makes the supervision function clear for the NRA and no operational responsibility for ENUM DNS – i.e. no "operator" role for the NRA in accordance with the former directive 90/388/EU



# NRAs final report to Government

## ***Method to designate the ENUM Tier 1 Registry (responsible technical organization for <CC>.e164.arpa)***

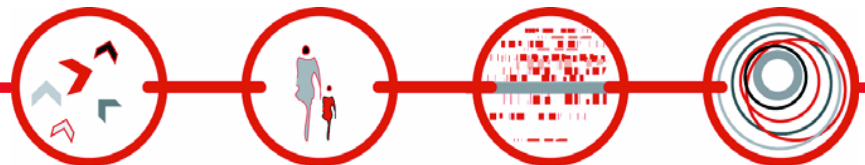
- The Registry should be designated according to procedures applicable to award of public contracts for allocation of service concession
- In the concession contract it can be ensured the Registry will perform its assignment in a satisfactory manner and not abuse its position
- The Registry will not receive any money from ENUM Tier 1 Manager but have possibility to finance its operation from subscribers, Registrars etc.



# NRAs final report to Government

## *Who can act as ENUM Registrars*

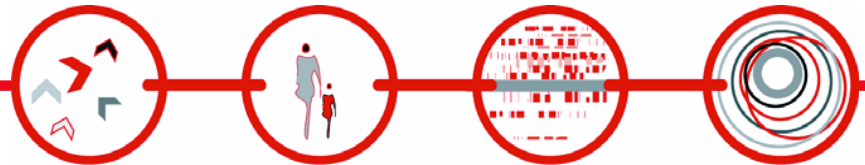
- Any entity accepting the requirements in the contract with the ENUM Tier 1 Registry
- These requirements might be included in the concession contract between the Manager and the Registry
- Industry working group suggested only Telephony Service Providers providing the E.164 number to be ENUM Registrars but not all agreed to that
- Competition Authority disliked the recommendation from the industry



# NRAs final report to Government

## *Methods for validation*

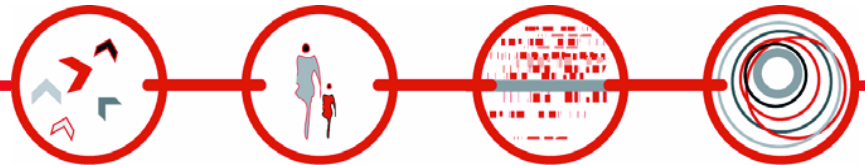
- Show of subscriber contract, invoice
  - ENUM Registrar checks with Telephony Service provider
  - ENUM Registrar checks with directory companies
  - Etc.
- 
- Authorisation Directive might hinder new obligations on Telephony Service Providers to provide validation service – art. 6 and the Annex
- 
- Industry fora ENUM Forum will continue work with procedures for validation



# NRAs final report to Government

## ***Subscribers choice***

- Registered ENUM domain name could be used in similar way as domain names under .se, .com or similar domains
- The ENUM subscriber should have possibility to choose DNS operator and application service providers independent of the choice of Telephony Service Provider who serves the E.164 number
- Opt-in procedures shall be used



# NRAs final report to Government

## *E.164 number suitable for ENUM domain name*

- Present geographic, mobile, freephone, shared cost and personal numbers
- Not for mass calling, paging, premium rate and other special routing numbers
- Not for non-E.164 numbers, e.g. in 11x-range
  
- No special number range for ENUM requested by the market players



# NRAs final report to Government

## *Pre-paid SIM-cards for mobile telephony service*

- Today around 60% have pre-paid cards in Sweden
- ENUM domain names for pre-paid cards needs special procedures
- Industry fora ENUM Forum will continue work with procedures to handle pre-paid SIM-cards





# NRAs final report to Government

## *Unlisted (ex-directory) numbers and privacy aspects*

- Hard to be unlisted in the open DNS
  - It should be possible to register unlisted numbers as ENUM domain names
  - Important with information to subscribers who wants there numbers in ENUM about the consequences
  - WHOIS will not be used
- 
- Industry fora ENUM Forum will continue work with proper information for subscribers with unlisted numbrers



# NRAs final report to Government

## *Framework of regulation*

Will consist of

- Present legal regulation
  - Concession contract
  - Selfregulation from ENUM Forum
- 
- At present there is no need for new legal regulation to start ENUM i Sweden



# The next step

- Government shall consult NRA proposals with market players
- The choice of ENUM Tier 1 Manager
- Procurement of the Registry function – ENUM Tier 1 Registry and NRA regulation for the plan of ENUM domain name
- ENUM Forum to enhance the selfregulation framework with the topics identified in the NRA final report

