

O ENUM e os organismos de normalização



Workshop sobre ENUM – 28 e 29 de Outubro de 2009

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Outubro de 2009

ÍNDICE

- **Internet Engineering Task Force (IETF)**
- **International Telecommunication Union – Standardization Sector (ITU-T)**
- **European Telecommunications Standards Institute (ETSI)**

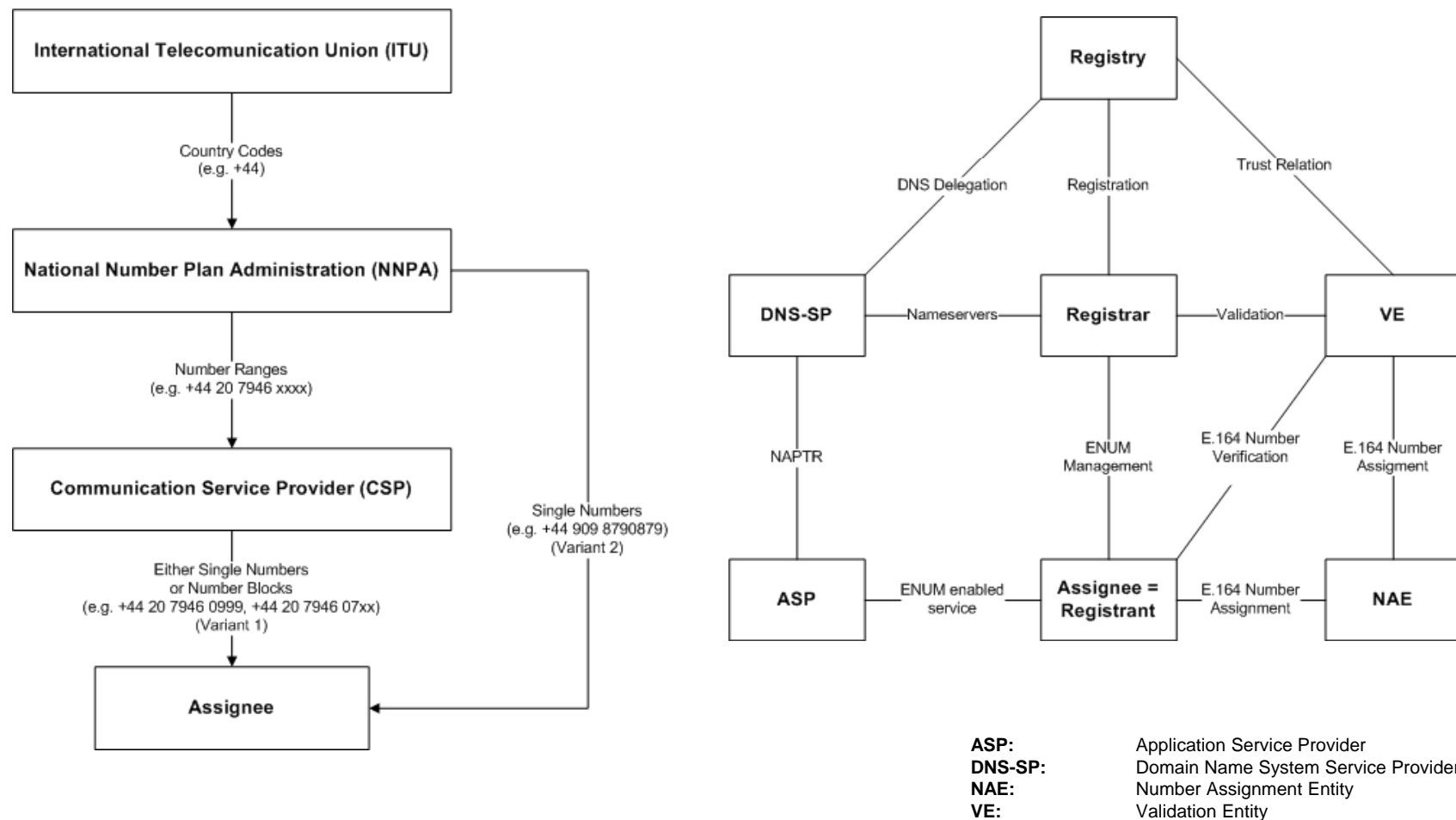
1. IETF

- RFC 3761 - The E.164 to Uniform Resource Identifiers (URI) Dynamic Delegation Discovery System (DDDS) Application (ENUM)
(<http://www.ietf.org/rfc/rfc3761.txt>)
- RFC 4725 - ENUM Validation Architecture
(<http://www.ietf.org/rfc/rfc4725.txt>)
- RFC 5526 - The E.164 to Uniform Resource Identifiers (URI) Dynamic Delegation Discovery System (DDDS) Application for Infrastructure ENUM
(<http://www.ietf.org/rfc/rfc5526.txt>)
- RFC 5527 - Combined User and Infrastructure ENUM in the e164.arpa tree
(<http://www.ietf.org/rfc/rfc5527.txt>)

Para verificar toda a normalização associada ao ENUM do IETF consulte a documentação do grupo de trabalho relevante:

<http://www.ietf.org/dyn/wg/charter/enum-charter.html>

Arquitetura de validação do ENUM



Como converter um endereço E.164



Converter um número E.164

+350217211000



0.0.0.1.1.2.7.1.2.1.5.3.e164.arpa

Obter os vários endereços



IN NAPTR 10 100 "u" "sip+E2U"	"!^.*\$!sip:anacom@sip.anacom.pt"
IN NAPTR 10 101 "u" "msg+E2U"	"!^.*\$!mailto:anacom@anacom.pt"
IN NAPTR 10 102 "u" "http+E2U"	"!^.*\$!http://www.anacom.pt"
IN NAPTR 10 103 "u" "tel+E2U"	"!^.*\$!tel:+351217211000"
IN NAPTR 10 104 "u" "tel+E2U"	"!^.*\$!tel:+351965984600"
IN NAPTR 10 105 "u" "h323+E2U"	"!^.*\$!h323:anacom@h323.anacom.pt"

2. ITU-T



- Global implementation of ENUM: A tutorial paper
- E.164 Supplement 3 (05/2004) - Operational and administrative issues associated with national implementations of the ENUM functions;
- E.164 Supplement 4 (05/2004) - Operational and administrative issues associated with the implementation of ENUM for non-geographic country codes;
- Interim procedures for Geographic Country Codes: ENUM administration ad interim (15 May 2008);
- Interim Procedures for the delegation of E.164 Shared Country Codes for Networks and Groups of Countries (15 May 2008);
- Draft E.A-ENUM New Recommendation: Principles and Procedures for the Administration of E.164 Geographic Country Codes to be Registered into the Domain Name System (Feb 2005).

Funções e responsabilidades



Table 1 – ENUM entities: Functions and responsibilities

Domain	Responsible organization for management of the domain (Designated manager)	Responsible organization for technical operation of the domain (Registry)	Registrar(s)	Note
"." (DNS root level)	DNS root manager ICANN through agreement with United States Department of Commerce	DNS root registry IANA, which is part of ICANN	DNS root registrar N/A	
.TLD (TLD level)	TLD manager Entity responsible for managing the TLD level	TLD registry Entity designated by the TLD Manager	TLD registrar	
.e164.TLD (ENUM root level)	ENUM Tier 0 manager Entity (see Note) responsible for managing the ENUM root level. NOTE – At present, the IAB, which, will instruct the registry to obtain approval from the TSB for any delegations.	ENUM Tier 0 registry Entity designated by the ENUM Tier 0 manager.	ENUM Tier 0 registrar TSB	The registrant will be the ITU Member states or the Administration
<CC>.e164.TLD (ENUM CC level)	ENUM Tier 1 manager The ITU Member State that has been assigned the CC	ENUM Tier 1 registry The ITU Member State/Administration can manage this in their own activities or designate someone else to act as the ENUM Tier 1 registry	ENUM registrar ENUM registrars provide direct registration services to ENUM subscribers involving: <ul style="list-style-type: none"> – verifying subscriber identity and authorization to use E.164 number; – interacting with ENUM Tier 2 name server provider and ASP to establish records for the applications desired by the ENUM subscriber; could be public telecommunication operators (PTO) or other ENUM service providers – i.e., <i>national matter</i>	
<N(S)N>.<CC>.e164.TLD (ENUM E.164 number level)	ENUM Tier 2 manager A <i>national matter</i> ensuring that the desires of the ENUM subscriber, as far as possible, are properly reflected in the choices available	ENUM Tier 2 name server provider ENUM Tier 2 name server provider stores NAPTR resource records in the DNS – i.e., <i>national matter</i>		The registrant will be the ENUM subscriber

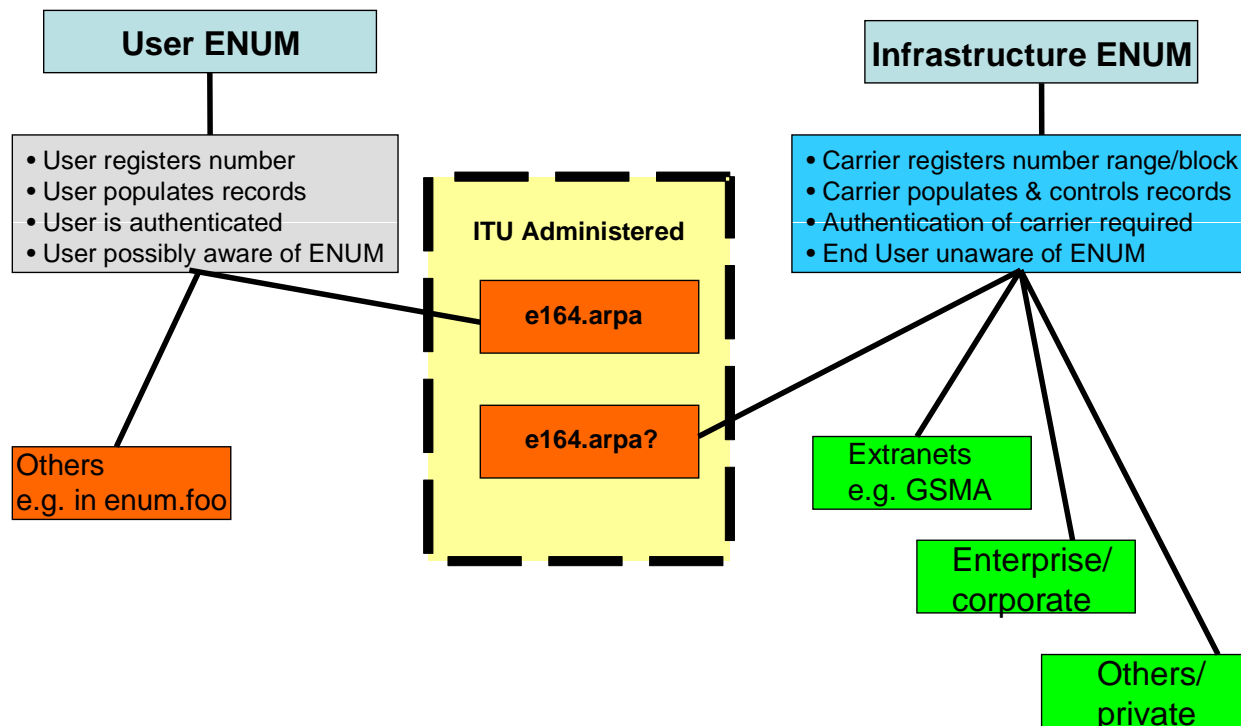
- Formal Validity of CC
 1. That the code is a currently-assigned country code, and
 2. For country codes shared by two or more Member States within an integrated numbering plan or in another framework, all Member States must endorse the request.
- National Position Known
 - The concerned Member State has notified the TSB of its position regarding delegation for ENUM of its CC, then the TSB will immediately make that position known to RIPE NCC.
- National Position Not Known
 - The delegation will not take place until the concerned Member State has notified the TSB that it approves the delegation
- Change in National Position
 - If a Member State notifies the TSB of a change in its position, the TSB will communicate that change to RIPE NCC, who will implement the change.

3. ETSI



- *User* ENUM
 - ETSI TS 102 051 V1.1.1 (2002-07) - ENUM Administration in Europe;
 - ETSI TS 102 172 V1.1.1 (2003-03) - Minimum requirements for interoperability of European ENUM trials;
 - ETSI TS 102 172 V1.2.1 (2005-04) - Minimum requirements for interoperability of ENUM implementations.
- *Infrastructure* ENUM
 - ETSI TR 184 008 V2.1.1 (2009-02) - Infrastructure ENUM Options for a TISPAN IPX;
 - Draft ETSI TS 184 010 V0.1.11 (2009-09) - ENUM & DNS Principles for an Interoperator IP backbone network.
- Outros
 - ETSI TR 102 055 V1.1.1 (2005-05) - ENUM scenarios for user and infrastructure ENUM
 - Draft ETSI TR 184 003 V0.1.18 (2009-09) - Portability of telephone numbers between operators for Next Generation Networks (NGNs)

Types of User & Infrastructure ENUM



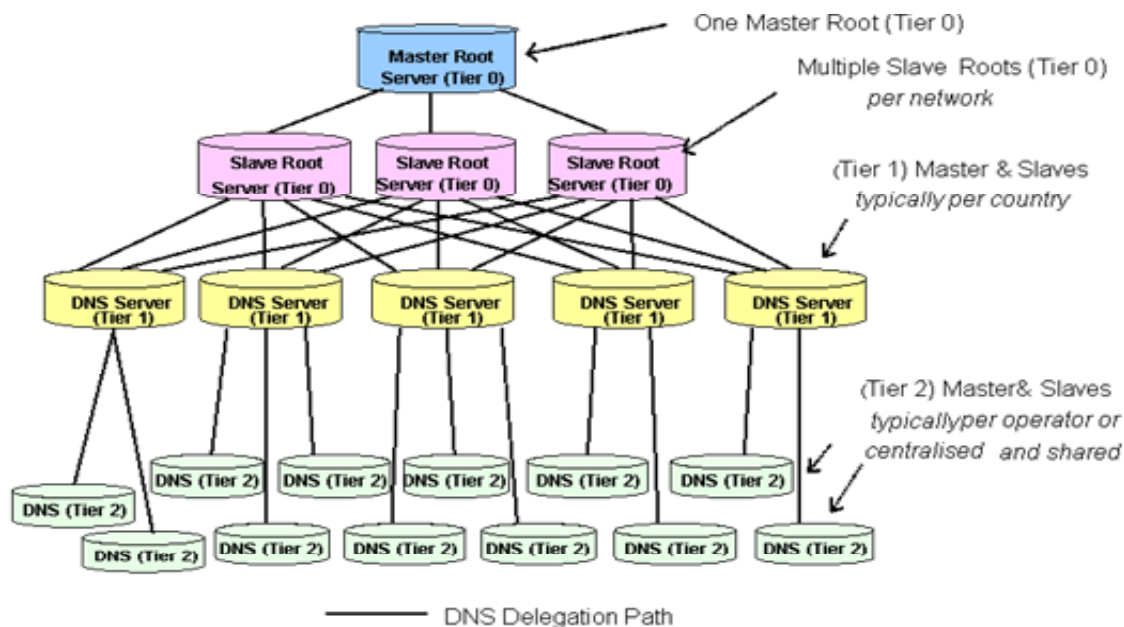
Requisitos para o I-ENUM nas NGN



- Adherence to relevant standards;
- single global approach worldwide across all participating communications providers fixed and mobile (aim);
- Secure environment;
- Shared control of infrastructure amongst all communications providers (technically and administrative);
- End to end service delivery (controlled);
- Service operability;
- Efficient interconnect and peering arrangements between communications providers (both bilateral and hierarchical dependent on levels of trust);
- Efficient service creation/amendment;
- Equitable playing field for all participating communications providers;
- Global approach.

ETSI TR 184 008 V2.1.1

Arquitetura DNS & ENUM



Draft ETSI TS 184 010 V0.1.11

Tier-0: Delegates E.164 numbers for a specific country code to a country-defined Tier-1 server. "Where can I get information about E.164 numbers for a given country code?" All slave root servers contain the same information; an exact copy of the master.

Tier-1: Delegates a particular E.164 number or a block of numbers to a network operator-defined Tier-2 server.

"Where can I get information about a particular E.164 number or block of numbers?" Tier-1 is basically country level i.e every single country needs to have their own ENUM Tier-1 server.

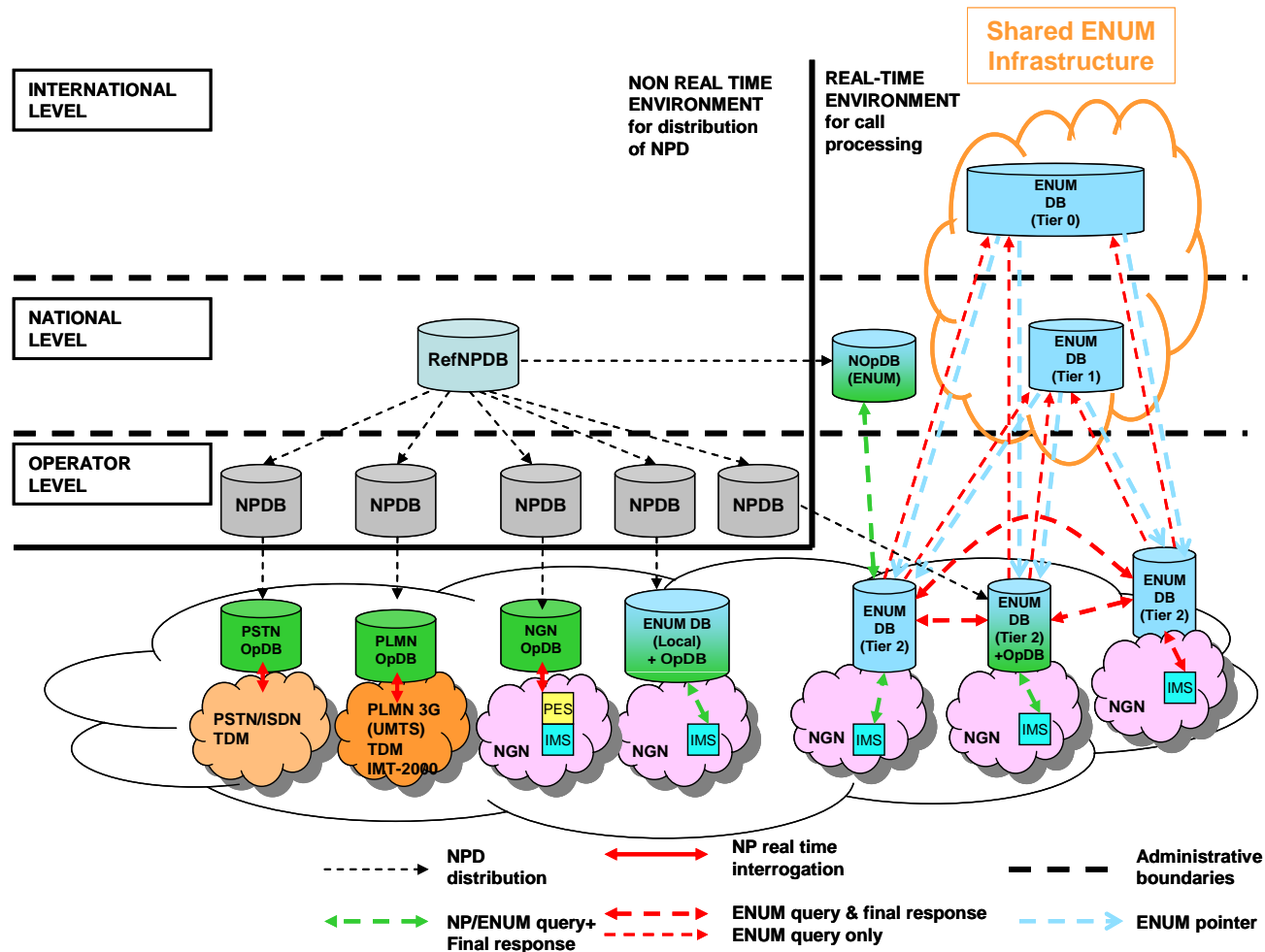
The ENUM Tier-1 server provider can be one operator in a country, or a designated third party, who has access to the Interoperator IP backbone network. The ENUM Tier-1 server could be shared between multiple network operators. In some instances the ENUM Tier-1 server provider can even be the same provider who provides the ENUM Tier-0 server.

Tier-2: Returns NAPTR records for an E.164 number. "What services can this E.164 number support and what are the URIs to be able to contact it?". Tier-2 is basically operator level.

Arquitetura das BD Portabilidade nas NGN



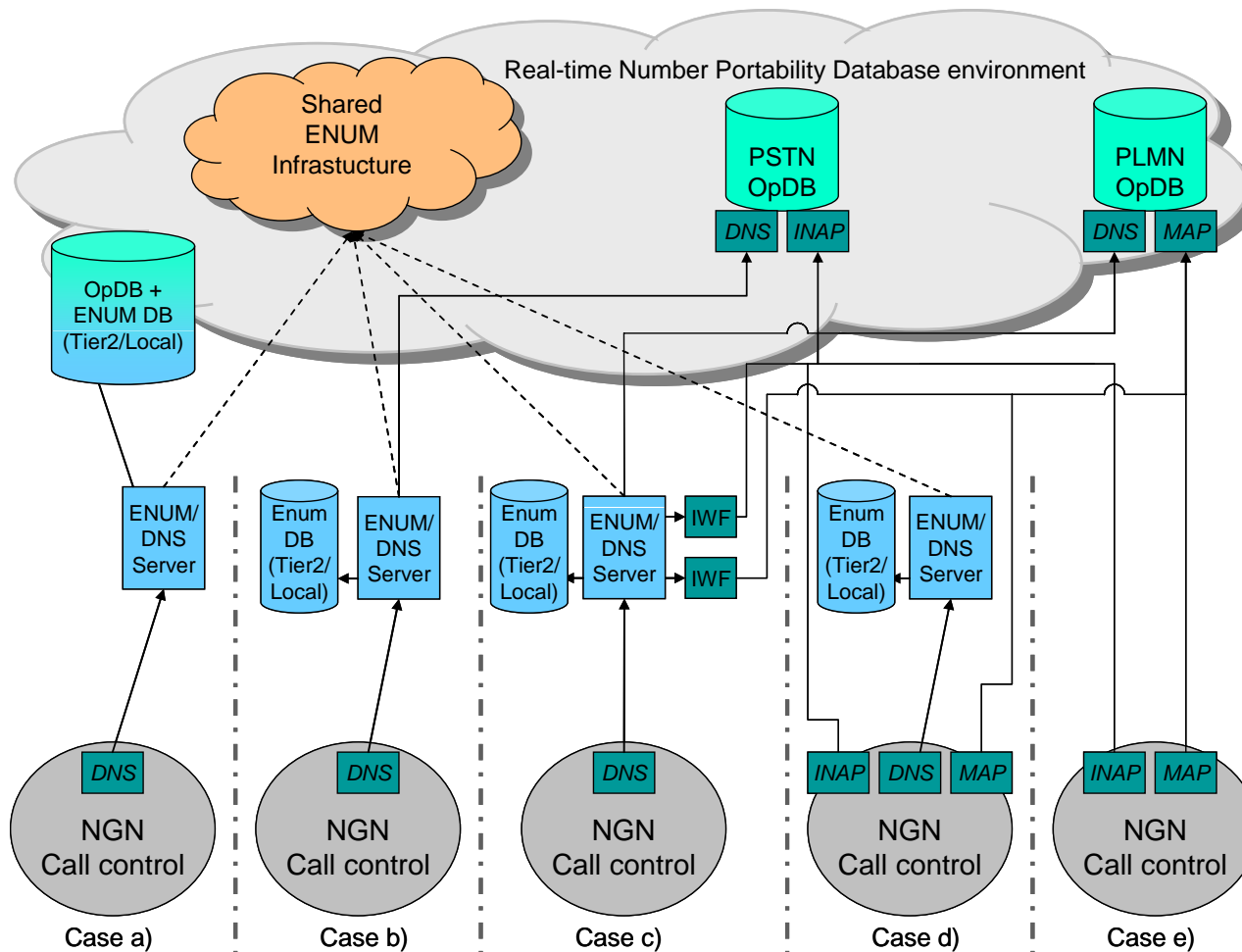
Draft ETSI TR 184 003 V0.1.18



Métodos de acesso às BD

Portabilidade das PSTN/PLMN

Draft ETSI TR 184 003 V0.1.18



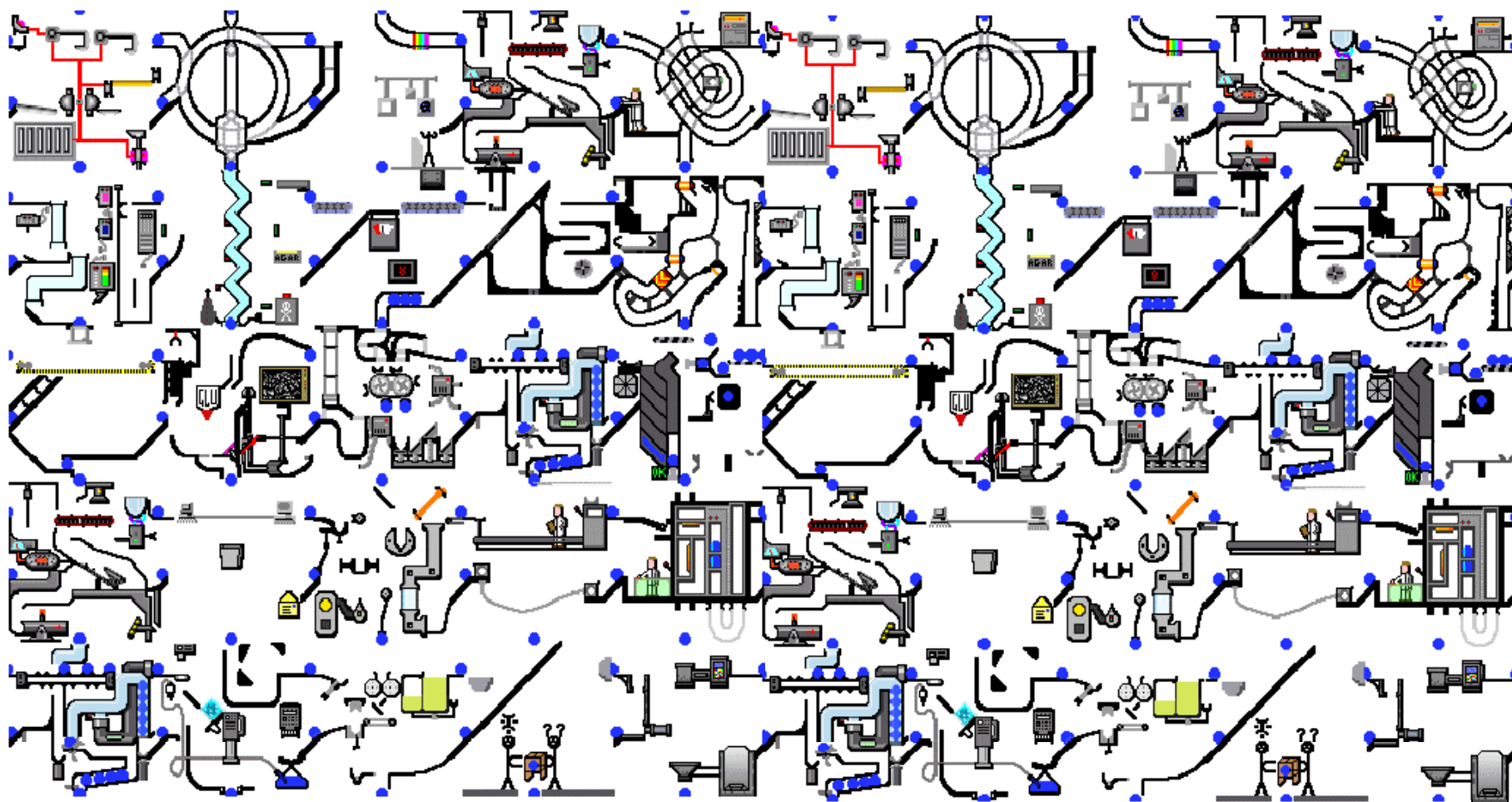
Métodos de obtenção da informação de encaminhamento



Draft ETSI TR 184 003 V0.1.18

Info of Ported-to-OP provided as	Orig/Transit network	Terminating ported-to-OP network	Interworking with PSTN networks using prefix-method
<p>a)</p> <p>Domain name (FQDN) in right-hand side of Request URI:</p> <p>•Sip:+CC-NDC-SN@Ported-to-OP;user=phone</p>	Simple to route on Domain name only, no indication of ported number	If NGN user: simple to find, If non-NGN user: no info that NP query have been made	Info about Ported-to OP is lost, Cannot be used for interworking with PSTN/ISDN.
<p>b)</p> <p>As prefix to National (Significant) Number and indicating National specific in phone context:</p> <p>•Tel:PPPPP-NDC-SN;phone-context=+CC •Sip:PPPPP-NDC-SN;phone-context=+CC@Ported-to-OP;user=phone</p>	Phone context specific tables for routing needed	Number need be modified before ENUM DB or subscriber DB (UPSF) can be accessed	Translates well to CdPN in IAM
<p>c)</p> <p>use of RFC 4694 [i.10] rn= Prefix only or corresponding SIP URI domain field:</p> <p>•Tel:+CC-NDC-SN;npdi;rn=+CC-PPPPP •Tel:+CC-NDC-SN;npdi;rn-context=+CC •Sip:+CC-NDC-SN;npdi;rn=+CC-PPPPP@Ported-to-OP;user=phone •Sip:+CC-NDC-SN;npdi;rn=PPPPP;rn-context=+CC@Ported-to.OP</p>	Routing based on RN. RN specific tables needed or corresponding SIP URI domain field	The canonical form of R-URI can be used for OpDB access. No format checking of number translation needed	Manipulation of CdPN in IAM required to remove/add "prefix" and populate RN
<p>d)</p> <p>use of RFC 4694 [i.10]; rn= full prefixed national (significant) number or corresponding SIP URI domain field:</p> <p>•Tel:+CC-NDC-SN;rn=PPPPP-NDC-SN;rn-context=+CC;npdi; •Tel:+CC-NDC-SN;rn=+CC-PPPPP-NDC-SN;npdi; •Sip:+CC-NDC-SN;npdi;rn=PPPPP-NDC-SN;rn-context=+CC@Ported-to-OP;user=phone •Sip:+CC-NDC-SN;npdi;rn=+CC-PPPPP-NDC-SN@Ported-to-OP;user=phone</p>	Routing based on RN. RN specific tables needed or corresponding SIP URI domain field	The canonical form of R-URI can be used for DB access. No format checking of number translation needed	To PSTN: RN translates well to CdPN. From PSTN: CdPN translates well to RN, Prefix need be removed (and the number as a global number according to RFC 3966 [i.22]) for "main user part"

A simplicidade do IMS



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Obrigado!