ENUM Trial

Implementation and results

ENUM Workshop
ETSI HQ
Sophia Antipolis, France
February 2004

AG Projects

Background

AG Projects, based in the Netherlands, provides components for Next Generation Networks.

ENUM Trial started in May 2003 and ended in December 2003 (8 months).

Private initiative to which volunteers, customers and partners of AG Projects have contributed.

PSTN infrastructure provided by Budget Phone Company.

Scope

Establish a mechanism for commercial deployment of ENUM:

1. The infrastructure
2. Support processes
3. Subscriber in and invoice out

Business case

The Trial answered questions about:

1. Business model around ENUM
2. Marketing strategy and timing
3. Identifying CAPEX and OPEX

ENUM Platform

- ENUM Registrar
- ENUM Tier2 Provider
- Application Service Provider
- End-user interface

Disaster Recovery Plan (rehearsed)

High-availability infrastructure

(3 locations)

ENUM Entities

The Trial identified entities for which different functionality was implemented:

ENUM Provider - has resources ready to be traded to ENUM Subscriber

ENUM Subscriber - is interested in using the new services offered by ENUM Provider

ENUM Trial Infrastructure

Network, equipment and software

Location	Asset	Model	Vendor
PSTN Provider premises	Class5 switch (SS7)	AXE10 (IN+SSP)	Ericsson
	Class4 switch (SS7/Q931)	IPNX (SP)	World Telecom Labs
	Gateway (Q931/SIP)	Cisco 2621	Cisco Systems
	Gateway (Q931/SIP)	Asterisk	Digium
Customer premises	SIP soft-phone	X-lite	X-Ten Networks
	SIP hard-phone	Snom	Snom Technology
	SIP telephone adaptor	ATA	Cisco Systems
AG Projects premises	Domain registration	API for global TLDs	Network Solutions
	DNS server	BIND and Power DNS	ISC, Power DNS
	SIP Proxy/Registrar	SIP Express router	IPTEL
	Subscriber Provisioning	Managed DNS™ Platform	AG Projects
	NAPTR record manipulation	Managed DNS™ Platform	AG Projects
	NAT Traversal	SERMediaProxy	AG Projects
	CDR mediation and billing	CDRTool	AG Projects

ENUM Trial Infrastructure

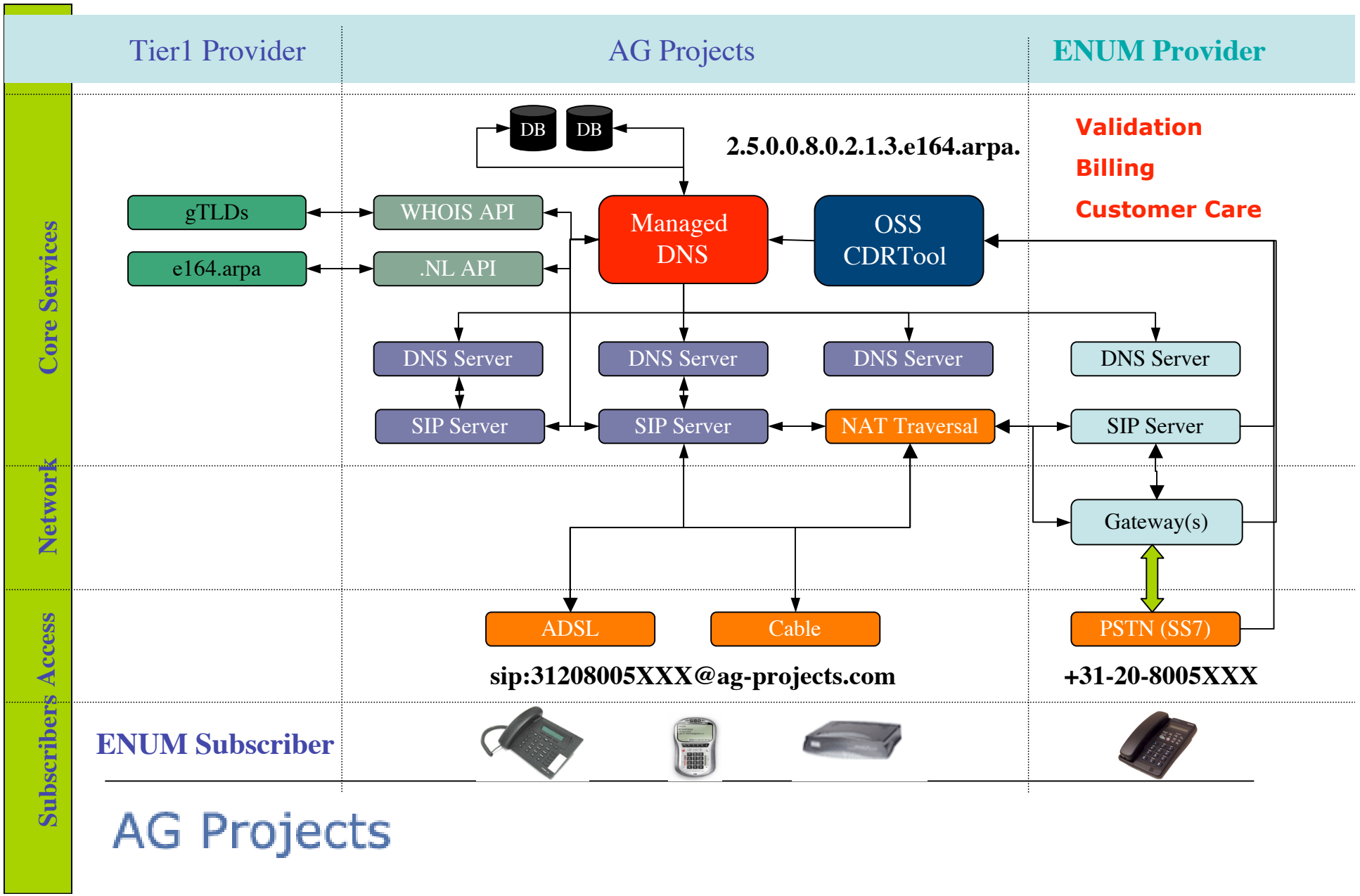
Numbering plan

Geographical numbers	+31-20-80051XX
Geographical numbers	+31-20-80052XX
ENUM Range:	5.0.0.8.0.2.1.3.e164.arpa

People

ENUM Subscribers	76 private individuals
ENUM Subscribers	4 commercial companies
ENUM Providers	2 Telecom providers
Labor costs	1480 man/hours

ENUM Trial Infrastructure



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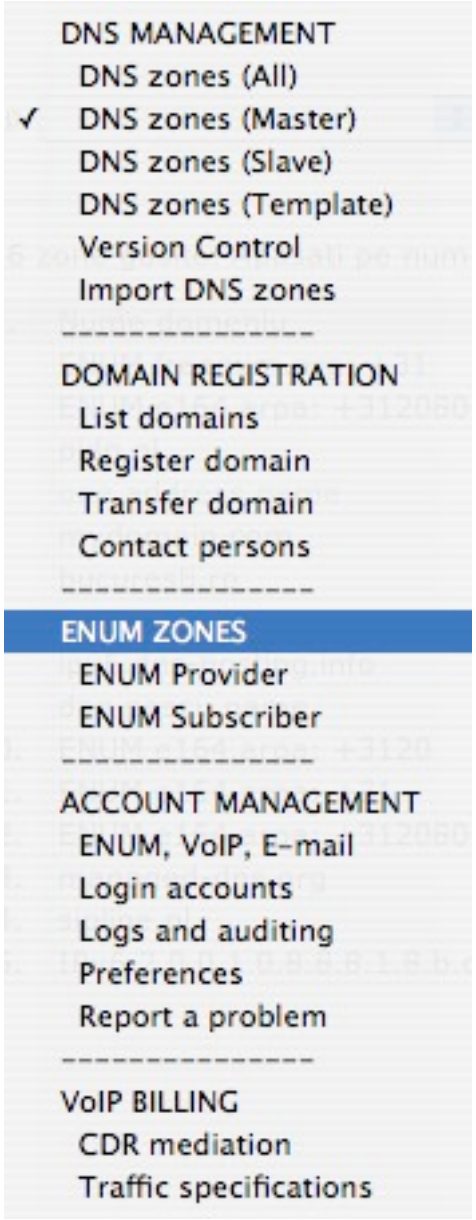
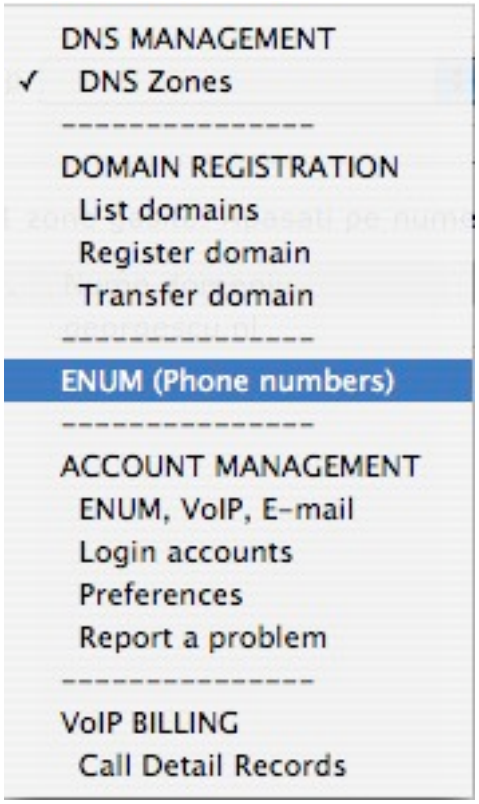


ENUM Provider functionality

- Register ENUM domains
- Provision DNS zones in real time
- Receive notifications
- Validate ENUM applications
- Notify users approval/rejection
- Provision records in DNS or E164 notation
- Provision SIP accounts <-> to NAPTR records
- Provision DDIs/CLIs in PSTN switch (both way)
- Delegate records to ENUM Subscriber
- Syntax+logic checks for NAPTR records
- Version control and roll-back capability
- Access to Call Details Records
- Monthly specifications and electronic invoices

ENUM Subscriber functionality



- Apply for ENUM numbers
- Select SIP domain for IP telephony account
- Receive notification on activation
- Receive ENUM and SIP usage instructions
- Download and configure SIP software
- Provision NAPTR records in friendly interface
- Register Internet domains
- Access to VoIP or PSTN subscribers
- Access from PSTN to VoIP phone
- Access to Call Detail Records
- Usage specifications and electronic invoices

Usage statistics

The following usage statistics have been collected at the end of the Trial:

ENUM Subscribers	76
Non 0 second calls	3674 calls
Call time duration	179750 minutes
Number of domains	12 domains
Number of e164.arpa zones	6 zones
E1 trunks	2

Recommendations

Provider perspective

- ENUM should be implemented in the form of discrete records
- Version control: Record based and not Zone based
- Storage of WHOIS information per subscriber is not feasible
- High level of control (access to all NAPTR fields)
- Access to NAPTR records from a Helpdesk with multiple operators
- Changes in ENUM zones should be performed in real time
- Syntax checks based on RFCs combined with human logic checks
- Changes of NAPTR records can be rolled-back if necessary
- There should be a Disaster Recovery Plan in place
- Access to easy usage information and easy invoicing

Recommendations

Security and privacy

- ENUM Numbers should not be mapped to meaningful names
- Aliases should be used to point to the real names
- Caller ID assigned by Provider (prevent id theft and evade billing)
- User awareness of exposure when populating DNS

Issues not covered here

but covered by other Trials

- Validation of applications
- Interaction with Tier1 ENUM registry
- …

Concerns about ENUM deployment

- Political will
- Regulatory (EC has done good efforts)
- Standardization should happen outside RFCs in practical inter-op field tests (like ETSI Plug tests)
- Reluctance of Providers to open their minds to new concepts (the new recurring revenue business models should provide the incentive)

Conclusions

- ENUM was embraced with enthusiasm by all testers (none gave up)
- ENUM was easy to integrate within existing TELCO environment (now in production phase)
- ENUM allowed creation of new services
- ENUM delivers a business model with recurring revenues

Thank you!

This presentation is available at:

http://ag-projects.com/ETSI-200402/

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