

Contents

Special Report Notice of Disclaimer	iii
List of Figures	viii
List of Tables	ix
Foreword	xi
1 Introduction	
1.1 Purpose and Scope	1-1
1.2 Structure and Use of this Document	1-1
2 Overview of ENUM	
2.1 Problems that Motivate ENUM	2-1
2.2 What is ENUM?	2-4
3 Implementation of the Common Tree and of Alternative Trees	
3.1 ITU-T Progress on the Common Tree	3-1
3.2 Activities in the US	3-2
3.3 Activities in Europe and Asia	3-3
4 Examples of Communications Services that are Enabled by ENUM	
4.1 Plain Old Voice Calls	4-1
4.2 Voice Call Features	4-4
4.3 Voice Messaging	4-6
4.4 Directory Assistance Enrichment	4-7
4.5 Sending an E-mail Message Using a Telephone Number	4-8
4.6 Web Page Access using a Telephone Number	4-9
5 The Development of ENUM	
5.1 Prestandard	5-1
5.2 Development of the ENUM Protocol by the IETF	5-1
6 Attributes of the Common Tree	
6.1 Setting Up the Architecture	6-1
6.1.1 Domain Name Space	6-1
6.1.2 Need for a Cooperative Enterprise to Assure Access to an NAPTR Record	6-3
6.1.3 ENUM Zones	6-4
6.1.4 ENUM Zone Tiers in the US	6-5
6.1.4.1 US ENUM Tier-1	6-5
6.1.4.2 ENUM Tier-2	6-6

6.1.4.3 An Example	6-7
6.2 Provisioning	6-8
6.2.1 ENUM Registration by a Registrant	6-8
6.2.1.1 Opt-in Service	6-8
6.2.1.2 Provisioning Flow	6-8
6.2.2 Provisioning ENUM Tier-0 by US ENUM Tier-1	6-9
6.3 Resolution	6-10
6.3.1 "Opt-in" for the Calling User and Originating Service Provider	6-10
6.3.2 Worked Example	6-10
6.3.3 Service Quality	6-11
6.4 End-to-End Communication	6-12
6.4.1 Application Service Function	6-12
6.4.2 Service Applications	6-13
6.5 Mapping of Functional Groupings into Business Entities	6-13

7 Attributes of Alternative Trees

7.1 Setting Up the Architecture	7-1
7.1.1 Domain Name Space	7-1
7.1.2 Zones	7-2
7.2 Provisioning	7-2
7.3 Resolution	7-3

8 Interoperability Among Trees

8.1 Architectural Approaches	8-1
8.1.1 Client-based Search of Multiple Domains in a Predefined Order	8-1
8.1.2 Tree-based Referral to a Domain Name in Another Tree	8-2
8.1.3 Tree-based Referral to a Nameserver in Another Tree	8-2
8.2 Open versus Closed	8-3

9 Pacing Factors for ENUM Deployment

Appendix A: Alternatives to ENUM

A.1 Dialing Other Forms of Name and Address	A-1
A.2 V-Card Files	A-1
A.3 TRIP for IP to PSTN Telephony	A-1

Appendix B: Background on the Domain Name System

B.1 Domain Name Administration	B-1
B.2 Zone Administration	B-2

Appendix C: Background on the E.164 Numbering Plan

C.1 Description of E.164	C-1
C.2 E.164 International Number Structures	C-2

Appendix D: How the ENUM Protocol Works

D.1 URIs D-1
D.2 A Worked Example D-1
D.3 Order and Preference D-4

Appendix E: References

Note E-2
 To Contact Telcordia Customer Service or to Order Documents E-2
 To Order Documents From Within Telcordia (Employees Only) E-2

Appendix F: Glossary

Definition of Terms F-1
Acronyms F-2

List of Figures

Figure 2-1	Trend to Converged Communications Services	2-1
Figure 2-2	What's MY address?	2-2
Figure 2-3	What's YOUR address?	2-2
Figure 2-4	ENUM Solution	2-4
Figure 2-5	Lookup of ENUM Record – i.e., NAPTR Resource Record(s)	2-5
Figure 4-1	Voice Call from an IP Network to an IP Network	4-1
Figure 4-2	Voice Call from an IP Network to a PSTN	4-2
Figure 4-3	Voice Call from an IP Network to a PSTN – Scenario One	4-3
Figure 4-4	Voice Call from an IP Network to a PSTN – Scenario Two	4-4
Figure 4-5	Enriched Caller Identification – Scenario One	4-5
Figure 4-6	Enriched Caller Identification – Scenario Two	4-6
Figure 4-7	Voice Messaging	4-7
Figure 4-8	Directory Assistance Enrichment	4-8
Figure 4-9	Sending an E-mail Message Using a Telephone Number	4-8
Figure 4-10	Web Page Access Using a Telephone Number	4-9
Figure 6-1	The Common Tree Domain Name Space	6-2
Figure 6-2	The US Maps to Only a Portion of Country Code 1	6-3
Figure 6-3	ENUM Zones for a Country	6-4
Figure 6-4	Two-Tier Zone Structure for the US	6-5
Figure 6-5	Functions to Provision ENUM for an ENUM Registrant	6-9
Figure 6-6	Application Service Function	6-12
Figure 6-7	First Example Mapping of Functional Groupings to Business Entities	6-13
Figure 6-8	Second Example Mapping of Functional Groupings to Business Entities	6-14
Figure 7-1	Domain Name Space of an Alternative Tree	7-2
Figure 8-1	Client-Based Interoperability Among Trees	8-1
Figure 8-2	Aliasing Between Trees	8-2
Figure 8-3	Referrals to Nameservers Across Trees	8-3
Figure B-1	The DNS Top Level Domains	B-1
Figure B-2	Registry Functions	B-3
Figure C-1	International Public Telecommunication Number for Geographic Areas	C-2
Figure C-2	International Public Telecommunication Number for Global Services	C-2
Figure C-3	International Public Telecommunication Number for Networks	C-3
Figure D-1	A Worked Example	D-3

List of Tables

Table B-1	Internet Root Name Server Operators	B-2
-----------	---	-----