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The E.164 to Uniform Resource Identifiers (URI) Dynamic Delegation Discovery System (DDDS) Application for Infrastructure ENUM

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Abstract

This document defines a use case as well as a proposal for a parallel namespace to e164.arpa as defined in RFC3761, to be used for Infrastructure ENUM purposes.

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1. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC-2119.

2. Introduction

ENUM (E.164 Number Mapping, RFC 3761 [1]) is a system that transforms E.164 numbers [2] into domain names and then uses the DNS (Domain Name Service) [3] to discover NAPTR records that specify what services are available for a specific domain name.

ENUM as originally defined was based on the end-user opt-in principle. While this has great potential to foster new services and end-user choice in the long-term, the current requirements for IP-based interconnection of Voice over IP (VoIP) domains require the provisioning of all allocated or served (hosted) numbers of a participating service provider, without the need for individual users to opt-in or not. This is particularly important if Infrastructure ENUM is used for number portability applications, for example.

In addition, while it is possible that service providers could mandate that their users opt-in into e164.arpa through end-user contract terms and conditions, there are substantial downsides to such an approach. Thus, for all these reasons and many others, ENUM for end-user provisioning is ill-suited for use by service providers for the interconnection of VoIP domains.

As VoIP evolves and becomes pervasive, E.164-addressed telephone calls need not necessarily traverse the Public Switched Telephone Network (PSTN). Therefore, VoIP service providers have an interest

in using ENUM, on a so-called "Infrastructure" basis, to keep VoIP traffic on IP networks on an end-to-end basis, both within and between service provider domains.

The requirements for Infrastructure ENUM are provided in an ENUM Working Group document, Infrastructure ENUM Requirements [4]. This document defines that Infrastructure ENUM be implemented by means of a parallel namespace to e164.arpa dedicated to Infrastructure ENUM, in a domain which is to be determined.

Infrastructure ENUM Tier 2 resource records in the Infrastructure ENUM tree would be controlled by the service provider that is providing services to a given E.164 number, generally referred to in various nations as the "carrier of record". The definition of who controls a given E.164 number is a national matter or is defined by the entity controlling the numbering space.

3. IANA Considerations

IANA has created a registry for Enumservices as originally specified in RFC 2916 and revised in RFC 3761. Enumservices registered with IANA are valid for Infrastructure ENUM as well as end-user ENUM.

4. Zone Apex for Infrastructure ENUM

The domain name chosen for infrastructure ENUM and any parent domains must be hosted on name servers that have performance characteristics and supporting infrastructure which is comparable to those deployed for the Internet root name servers. Those name servers for Infrastructure ENUM should be configured and operated according to the guidelines described in RFC 2870.

5. Security and Privacy Considerations

Since Infrastructure ENUM is also implemented on the public Internet, the same security considerations apply as noted in RFC 3761.

In addition, since there is no opt-in for end-users, personally-identifiable information (PII) must not be disclosed for any end-user.

Thus, the information provided in the NAPTR records must not disclose any PII about the end-user such as a name in user-info. This can be achieved, for example, by entering the information in the format sip:<e164_phone_number>@provider.example, mailto:<e164_phone_number>@provider.example or sip:<opaque string>@provider.example.

6. Acknowledgements

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7. References

7.1 Normative References

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