                Dynamic Delegation Discovery System (DDDS)
                     Part One: The Comprehensive DDDS

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Abstract

   This document specifies the exact documents that make up the complete
   Dynamic Delegation Discovery System (DDDS). DDDS is an abstract
   algorithm for applying dynamically retrieved string transformation
   rules to an application-unique string.

   This document along with RFC 3402, RFC 3403 and RFC 3404 obsolete RFC
   2168 and RFC 2915, as well as updates RFC 2276.

1. Intended Audience

   This document and the documents that it references are intended for
   anyone attempting to implement or understand the generic DDDS
   algorithm, URI Resolution, ENUM telephone number to URI resolution,
   and the NAPTR DNS resource record. The reader is warned that reading
   one of the documents in this series without reading the others will
   probably lead to misunderstandings and interoperability problems.

2. Introduction

   The Dynamic Delegation Discovery System is used to implement lazy
   binding of strings to data, in order to support dynamically
   configured delegation systems. The DDDS functions by mapping some
   unique string to data stored within a DDDS Database by iteratively
   applying string transformation rules until a terminal condition is
   reached. This document defines the entire DDDS by listing the
   documents that make up the complete specification at this time.

This document along with RFC 3402, RFC 3403 and RFC 3404 obsoletes
RFC 2168 [8] and RFC 2915 [6], as well as updates RFC 2276 [5]. This
document will be updated and or obsoleted when changes are made to
the DDDS specifications. Thus the reader is strongly encouraged to
check the IETF RFC repository for any documents that obsoletes or
updates this one.

3. The Algorithm

   The DDDS algorithm is defined by RFC 3402 [1]. That document defines
   the following DDDS concepts:

   o The basic DDDS vocabulary.

   o The algorithm.

   o The requirements on applications using the algorithm.

   o The requirements on databases that store DDDS rules.

   RFC 3402 is the actual DDDS Algorithm specification. But the
   specification by itself is useless without some additional document
   that defines how and why the algorithm is used. These documents are
   called Applications and do not actually make up part of the DDDS core
   specification. Applications require databases in which to store
   their Rules. These databases are called DDDS Databases and are
   usually specified in separate documents. But again, these Database
   specifications are not included in the DDDS core specification
   itself.

4. DDDS Applications

   No implementation can begin without an Application specification, as
   this is what provides the concrete instantiation details for the DDDS
   Algorithm. Without them the DDDS is nothing more than a general
   algorithm. Application documents define the following:

   o the Application Unique String (the thing the delegation rules act
      on).

   o the First Well Known Rule (the Rule that says where the process
      starts).

   o the list of valid Databases (you can't just use any Database).

   o the final expected output.

Some sample Applications are documented in:

o "E.164 number and DNS" (RFC 2916) [7]. This Application uses the
   DDDS to map a telephone number to service endpoints such as SIP or
   email.

o "Dynamic Delegation Discovery System (DDDS) Part Four: The Uniform
   Resource Identifiers (URI) Resolution Application" (RFC 3404) [3].
   This Application uses the DDDS to resolve any URI to a set of
   endpoints or 'resolvers' that can give additional information
   about the URI independent of its particular URI scheme.

5. Currently Standardized Databases

   Any DDDS Application must use some type of DDDS Database. Database
   documents define the following:

   o the general spec for how the Database works.

   o formats for Keys.

   o formats for Rules.

   o Key lookup process.

   o rule insertion procedures.

   o collision avoidance measures.

   A Database cannot be used on its own; there must be at least one
   Application that uses it. Multiple Databases and Applications are
   defined, and some Databases will support multiple Applications.
   However, not every Application uses each Database, and vice versa.
   Thus, compliance is defined by the combination of a Database and
   Application specification.

   One sample Database specification is documented in:

   o "Dynamic Delegation Discovery System (DDDS) Part Three: The Domain
      Name System (DNS) Database" (RFC 3402) [1]. (This document is the
      official specification for the NAPTR DNS Resource Record.)

6. Security Considerations

   Any known security issues that arise from the use of algorithms and
   databases must be specified in the respective specifications. They
   must be completely and fully described. It is not required that the
   database and algorithms be secure or that it be free from risks, but

that the known risks be identified. Publication of a new database
type or algorithm does require a security review, and the security
considerations section should be subject to continuing evaluation.
Additional security considerations should be addressed by publishing
revised versions of the database and algorithm specifications.

7. IANA Considerations

While this document itself does not create any new requirements for
the IANA, the documents in this series create many varied
requirements. The IANA Considerations sections in those documents
should be reviewed by the IANA to determine the complete set of new
registries and requirements. Any new algorithms, databases or
applications should take great care in what they require the IANA to
do in the future.

References

   [1] Mealling, M., "Dynamic Delegation Discovery System (DDDS) Part
       Two: The Algorithm", RFC 3402, October 2002.

   [2] Mealling, M., "Dynamic Delegation Discovery System (DDDS) Part
       Three: The Doman Name System (DNS) Database", RFC 3403, October
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   [3] Mealling, M., "Dynamic Delegation Discovery System (DDDS) Part
       Four: The Uniform Resource Identifiers (URI) Resolution
       Application", RFC 3404, October 2002.

   [4] Mealling, M., "Dynamic Delegation Discovery System (DDDS) Part
       Five: URI.ARPA Assignment Procedures", RFC 3405, October 2002.

   [5] Sollins, K., "Architectural Principles of Uniform Resource Name
       Resolution", RFC 2276, January 1998.

   [6] Mealling, M. and R. Daniel, "The Naming Authority Pointer (NAPTR)
       DNS Resource Record", RFC 2915, August 2000.

   [7] Faltstrom, P., "E.164 number and DNS", RFC 2916, September 2000.

   [8] Daniel, R. and M. Mealling, "Resolution of Uniform Resource
       Identifiers using the Domain Name System", RFC 2168, June 1997.

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