

NRENUM.NET COURSE - SECTION 2 - CONCEPTS

Content

1. Domain Name System (DNS)
2. ITU-T E.164 Standard
3. Uniform Resource Identifier (URI)
4. E.164 Number Mapping (ENUM)
5. References

Domain Name System (DNS)

This is a protocol located in the application layer of the OSI model that allows users, services and systems to consult domain names through a nomenclature and get, as a response, the IP address associated with that resource on a public or private network.

The main objective of a DNS service is to translate a domain name into an IP address; it runs through queries that systems interpret and uses the connection data to establish communications, as shown in the following figure :

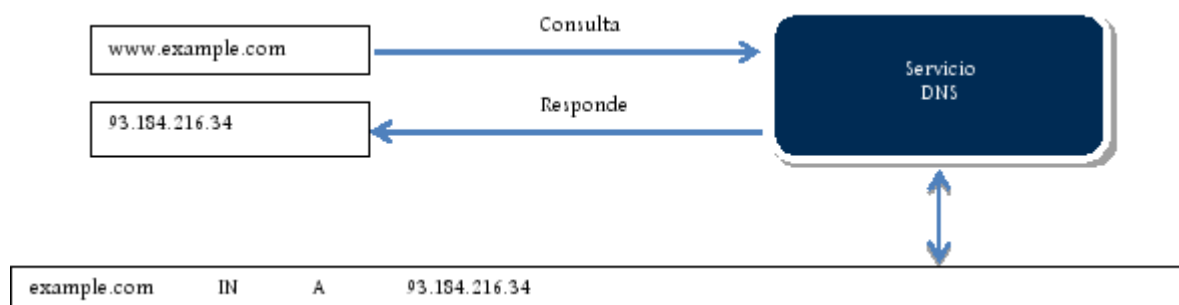


Figure 1. Consult of a domain name to a DNS server

1. Consult the domain name "www.example.com"
2. DNS Service consults internally the associated registration
3. Respond the IP address associated with the domain "www.example.com"

Each domain name is managed in a log file called "zone", and each domain associated with an institution is managed autonomously, creating a global network of DNS servers interconnected in a hierarchical form (tree-shaped), where servers known as 'Root servers' are managed by the IANA.

The Internet Assigned Numbers Authority (IANA) is the regulatory body of the global system of resolution of the international allocations. In the case of the Latin Americas, LACNIC (*Latin America and Caribbean Network Information Centre*) is the organization associated with the IANA.

* NOTE: DNS systems are vital for the Internet, allowing users to use an easy to remember name instead of an IP address.

The DNS systems have the ability to reverse resolution for translating an IP address to a domain name.

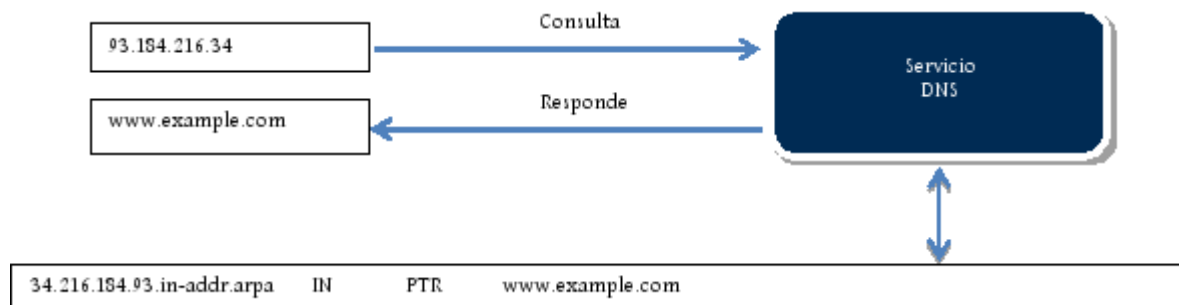


Figure 2. Query of an IP into a DNS server

1. Query of the IP 93.184.216.34
2. DNS Service consults the associated registration internally
3. Respond domain "www.example.com" associated with the IP 93.184.216.34

E.164 ITU-T Recommendation

The International Telecommunications Union (ITU) E.164 [1] recommendation defines the rules and structures of a telephone number used worldwide.

E.164 numbering structure: Country Code + Area Code + Terminal Number

Example of a number E.164: 57 01 5302604

Where:

Country code number 57 for Colombia

Area code 01 for Video-conference

Terminal Number 5302604

ITU-T E.164 [1] Available at: <http://handle.itu.int/11.1002/1000/10688>

Uniform Resource Identifier (URI)

This is a string of standard characters that identifies an online resource. As an identifier, it gathers information about the protocol used, the unique identifier of the resource and the domain to which it belongs.

Syntax of a URI:

<scheme>:<hierarchical part>[?<query>][#<fragment>]

Example of a URI:

h323: room@example.com

Where:
h323 is the protocol to be used
room is the identifier
example.com is the domain

Document developed by [RENATA®](#) as WP4 leader with the support of MAGIC Project partners.

* NOTE: The most common form of a URI is a URL (*Uniform Resource Locator*), commonly used to locate resources on the Internet and is best known as a "web address".

E.164 Number Mapping (ENUM)

ENUM comes from E.164 *Numbering Mapping*, and is a standard protocol resulting from the work of the *Telephone Number Mapping working group*, which uses the systems of reverse resolution of names of the DNS systems to translate telephone numbers to URIs.

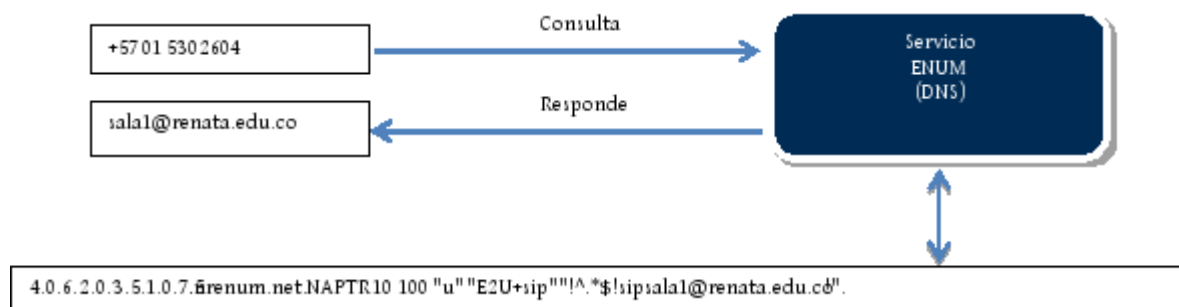


Figure 3. Query of the number +57 01 5302604 to ENUM server

ENUM is compatible with communication protocols in real time such as H.323 and SIP, and currently has a good degree of compatibility in communication systems.

References

- [1] International Telecommunications Union. (2010, 11). The international public telecommunication numbering plan. Standard. Available in: <http://handle.itu.int/11.1002/1000/10688>
- [2] S. Bradner, L. Conroy, K. Fujiwara (2011.03). IETF RFC 6116. Standard. Available in: <https://tools.ietf.org/rfc/rfc6116.txt>
- [3] P. Faltstrom, M. Mealling. (2004.04). IETF RFC 3761. Standard. Available in: <http://handle.itu.int/11.1002/1000/10688><http://www.ietf.org/rfc/rfc3761.txt>