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Fully Qualified Domain Name on Aeronautical IP network

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SUMMARY

This paper proposes to be able to use a Fully Qualified Domain Name (FQDN) as an identifier instead of an IP address. Almost nobody use IP addresses directly on IP networks to determine servers (e.g. SIP servers, Web servers, E-mail servers, etc.) because the Domain Name Service (DNS) is a most popular service on IP network.
For example, my proposal is that: a host name identification as
`‘‘ja8801.jp.atn.aero.’’`
is better for use than
`‘2001:02f8:0027:0100:0023:6cff:fe95:50e2’’`.

1 Introduction

In this paper, I propose to use Domain Name System (DNS) to specify IP address(es). On ATN, Context Managers have a function of directory service for ATN addresses. In Doc 9896, the word “DNS” is only appeared once and formats of describing a Fully Qualified Domain Name (FQDN) is not defined. This paper proposes to use DNS for IP based network because 128bits IPv6 address is too long to remember.

For Voice over Internet Protocol (VoIP), Session Initiation Protocol (SIP) is typically used and SIP requires DNS to resolve NAPTR (The Naming Authority Pointer) field or writing SIP URI.

2 Discussion

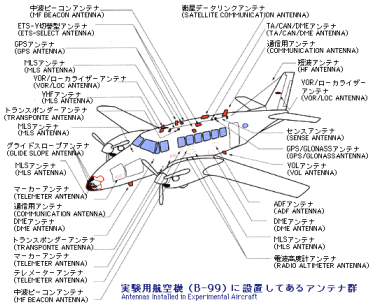
2.1 Proposed Format

IP address(es) may described as a FQDN. A FQDN on DNS will be consisted of some :

- (Optional Component) Subdomain(s)
- An aircraft registration code (airborne) or an ICAO 4-letter code (ground)
- ISO-3166-2 alpha-2 (Two letter) country code
- and upper domain (for example, atn.icao.int.)

2.2 Example of the format

(1) An address corresponds to JA8801, an experimental aircraft of ENRI, can be described in this scheme as:
`ja8801.jp.atn.icao.int.`
instead of an IPv6 address like that:
`2001:02f8:0027:0100:0023:6cff:fe95:50e2.`



(2) An address of a VoIP server at Tokyo Area Control Center (Tokyo ACC, ICAO 4-letter code: RJTG) can be described in this scheme as:
`voip.rjtg.jp.atn.icao.int`
instead of an IPv6 address:

`2001:02f8:0027:0cab:020d:93ff:fe89:900b`.

2.3 Advantages and Disadvantages of the proposal

2.3.1 Advantages

Multi prefixes: All IPv6 interfaces can have multi prefix IPv6 addresses. At least, they can have a link-local IPv6 address (fe80::/16) and a global IPv6 address (2001::/16). This means that all IPv6 interfaces can have multiple addresses assigned by different regional Internet registries (RIRs). The DNS can help this implementation because it can answer multiple addresses for a domain name query. (e.g. www.google.com is consisted by many IP addresses.)

Dynamic DNS: Dynamic DNS (RFC 2136) is a popular service for mobile nodes. This may be useful for future extensions.

Easy to remember: We always use a "host name" served by DNS because we cannot remember all IP addresses directly. We also use the DNS on E-mail systems like as `''@enri.go.jp''`.

URI: Typically, Session Initiation Protocol (SIP) Uniform Resource Identifier (URI) is written as: `''sip:4823@enri.go.jp''`.
The DNS gives a translation from enri.go.jp to an IP address. Without DNS, we need a directly description of an IP address.

2.3.2 Disadvantages

Traffic Some rounds are necessary to resolve a name since DNS query is recursive. This may be a problem for a high latency network such as a GEO satellite communication in the far future.

2.4 Action for proposed for Doc 9896

WG is invited to consider to inclusion of the section 2.1 of this document as DNS subsection after Section 2.3.5 of Doc9896,

3 Conclusion

DNS may be useful for identify IP addresses instead of directory service like as LDAP (Lightweight Directory Access Protocol) in the huge system. DNS is already verified to work because it used widely in worldwide network system. DNS is also necessary for SIP. For example, NAPTR (Naming Authority Pointer) depends on DNS.