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GRASP Configuration Management Objective

Abstract

This document specifies a technical objective for dynamic configuration of the GeneRic Autonomic Signaling Protocol (GRASP) defined by RFC 8990.

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1. Introduction

The GeneRIC Autonomic Signaling Protocol (GRASP) is specified in [RFC8990]. It has a few parameters that might need configuration to non-standard values, but since any form of manual configuration is to be avoided in an autonomic network, this document describes how GRASP can configure itself within a given autonomic network. For the general model of such a network, see [RFC8993].

The method is for an authoritative source in the autonomic network, most likely associated with the Network Operations Center (NOC), to use GRASP's flooding mechanism to periodically distribute a GRASP objective (as defined in [RFC8990]) to all GRASP nodes in that network. Each node will then validate the contents of the objective as much as possible, and then apply any relevant configuration changes locally.

2. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Format of the GRASP Objective

The formal definition of the GRASP objective is as follow, defined in fragmentary CDDL [RFC8610].

```

objective = ["GraspConfig", objective-flags, loop-count, objective-value]

loop-count = 0..255          ; as in the GRASP specification
objective-flags /=           ; as in the GRASP specification

objective-value /= { 1*gc-element }

gc-element = ( gc-element-codepoint => gc-element-value )
gc-element-codepoint = uint
gc-element-value      = any

```

Initially, the following codepoints are defined:

```

gc-element-codepoint //= ( &(amp)sender:0) => ipv6-address )
ipv6-address = bytes .size 16

```

This provides the address of the original sender of the flooded objective.

```

gc-element-codepoint //= ( &(amp)sender-loop-count:1) => 1..255 )

```

This provides the original loop count at the sender, so that the receiver can compute how many hops the flood has taken.

```

gc-element-codepoint //= ( &(amp)grasp-version:2) => 1..255 )

```

At the moment there is only one version of GRASP. This element is reserved for possible future use.

```

gc-element-codepoint //= ( &(amp)max-multicast:3) => 1..65535 )
gc-element-codepoint //= ( &(amp)max-unicast:4)   => 1..65535 )

```

These elements can be used to change the default maximum message sizes for multicast and unicast GRASP messages respectively. The sizes **MUST NOT** be reduced below the default specified by [\[RFC8990\]](#).

4. Validation

Upon receipt of a changed configuration element, each GRASP node **MUST** validate it to the extent possible. The sender and sender-loop-count elements may be used as part of the validation process.

5. Implementation Status [RFC Editor: please remove]

An experimental Autonomic Service Agent (ASA) supporting the "GraspConfig" objective has been added to the Python prototype implementation of GRASP. This ASA periodically checks for the flooded objective and reconfigures GRASP's multicast and unicast maximum message sizes accordingly. Another experimental ASA has been implemented to periodically flood the "GraspConfig" objective as

would be done by a NOC, based on a JSON file expressing the required configuration. No problems were observed while running these two ASAs at the same time as other GRASP operations. Code is [on Github](#).

6. IANA Considerations

This document defines a new GRASP Objective Option name, "GraspConfig". The IANA is requested to add this to the GRASP Objective Names Table registry defined by [RFC8990] (if approved).

Open issue: Should IANA also register the gc-element-codepoints? (A similar registration is described in [I-D.eckert-anima-grasp-dnssd] for the proposed "SRV." group of GRASP objectives. Another option would be to change "GraspConfig" to "SRV.GraspConfig".)

7. Security Considerations

The security considerations of [RFC8990] apply.

8. Acknowledgements

TBD

9. References

9.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
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- [RFC8610] Birkholz, H., Vigano, C., and C. Bormann, "Concise Data Definition Language (CDDL): A Notational Convention to Express Concise Binary Object Representation (CBOR) and JSON Data Structures", RFC 8610, DOI 10.17487/RFC8610, June 2019, <<https://www.rfc-editor.org/info/rfc8610>>.
- [RFC8990] Bormann, C., Carpenter, B., Ed., and B. Liu, Ed., "GeneRIC Autonomic Signaling Protocol (GRASP)", RFC 8990, DOI 10.17487/RFC8990, May 2021, <<https://www.rfc-editor.org/info/rfc8990>>.

9.2. Informative References

[I-D.eckert-anima-grasp-dnssd]

Eckert, T., Boucadair, M., Jacquenet, C., and M. H. Behringer, "DNS-SD Compatible Service Discovery in GeneRic Autonomic Signaling Protocol (GRASP)", Work in Progress, Internet-Draft, draft-eckert-anima-grasp-dnssd-02, 12 July 2021, <<https://datatracker.ietf.org/doc/html/draft-eckert-anima-grasp-dnssd-02>>.

[RFC8993] Behringer, M., Ed., Carpenter, B., Eckert, T., Ciavaglia, L., and J. Nobre, "A Reference Model for Autonomic Networking", RFC 8993, DOI 10.17487/RFC8993, May 2021, <<https://www.rfc-editor.org/info/rfc8993>>.

Appendix A. Change Log

A.1. Draft-00

*Original version

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