Anima Signaling design team
draft-carpenter-anima-gdn-protocol-04

Brian Carpenter (editor)
Bing Liu (editor)
Michael Richardson
Tom Taylor
Laurent Ciavaglia
Michael Behringer
Jéferson Campos Nobre

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Topics

- Design team goals & methods
- Requirements status
- Design status
- Validation status
- Issues to discuss
- Discussion, next steps

Goals & methods

- Main goal: Analyse the issues and recommend an approach to the WG
- Specific goals:
  - Validate & update the list of requirements
  - Recommend how the milestone components of Anima should use the signaling protocol(s)
- Used email, wiki, github to hammer at the requirements & issues
  - Explored API needs
  - Explored JSON formulation

http://trac.tools.ietf.org/wg/anima/trac/wiki/Signaling

Disclaimer

- It is not the case that the design team has reached consensus on all of the following.

Requirements status

- Requirements repeatedly clarified (now 25 items).
- They are now mainly stated as requirements for use by Autonomic Service Agents (ASAs).
- Main addition: “Synchronization might concern small groups of nodes or very large groups” which led to a protocol change.
- It’s time to stabilize the requirements.

Why design a protocol?

- Appendix A of the draft discusses numerous existing protocols.
- None of them combines discovery, synchronization and explicit negotiation in a single framework.
- Most of them assume a hierarchical north-south scenario.
- Most of them are specialized in one way or another.

GDNP -04 Design status

- Main addition: Flooding synchronization mode (“unsolicited response”) as well as request/response synchronization.
- Removed intrinsic security, require external security (e.g. ACP)
- Strictly aligned TLV format with DNCP
- Resolved various other issues.
- Evaluation code for the –03 draft is available on github.

“Competing” protocols

- We need to handle any kind of technical objective, so we need a generic design. But this might not be optimal for some use cases and ASAs. Therefore:
  - The AN environment may require some usage of GDNP, but an ASA may also use an existing protocol for its job. Example:
    - If DNCP is more appropriate than GDNP Synchronization, an ASA may use it.

Validation status (1)

- We’ve started the process of validating GDNP features against use cases. We aren’t done yet.
- As an aid to this, there is a “toy” conceptual API for ASAs to use in the wiki.
  - We realised that each ASA must run asynchronously from the GDNP protocol engine, because of wait states.
  - The GDNP protocol engine and its API will be part of the Autonomic Networking Infrastructure layer.

Validation status (2)

- Validation example: draft-jiang-anima-prefix-management.
  - An ASA uses Anima signaling to get a pool of IPv6 prefixes for subsequent delegation, from any peer that has free space.
  - One ASA is pre-loaded with a supply of free IPv6 prefixes. As time goes on, this pool is shared autonomically among all relevant ASAs.
- No difficulty mapping this to GDNP operations
  - This revealed that the use case itself needs more work, but that is another discussion.

Validation status (3)

- Using a simple JSON mapping for the protocol elements made this work much easier.
- We need more such validation work for other basic use cases, but so far the signs are positive.

Open Issues (1)

- We suggest to rename the protocol as GRASP (GeneRic Autonomic Signaling Protocol)
  - Easier to say than GDNP
  - Leaves scope for future extensions
- We need to evaluate whether the discovery process scales robustly. (The equivalent solution for multihop DNS-SD is still TBD.)
- We want advice whether to stick with a traditional binary TLV format or change to an object-oriented format using JSON and CBOR. (continued...)

Open Issues (2)

- Current design:

```
0                   1                   2                   3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|          MESSAGE_TYPE         |                4              |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|    Reserved   |               Session ID                      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                       Options  (variable length)              |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
...
```

- JSON design:

```
{"neg": [54321, {"money":
["bank.example.com", {"ct": 4},
50]}]}
```

Open Issues (3)

- Current design:
  - Efficient
  - Error prone, slow to design & code
  - Inaccessible to app programmers (and an ASA is an app)
- JSON/CBOR design
  - Less efficient (by a factor <10 in payload size)
  - Less error prone, much quicker to design & code
  - Can be made accessible to app programmers

Open Issues (4)

- See the draft and wiki, because we’ve run out of time...
- Next steps? WG adoption call?