CoAP Alive Message
draft-castellani-core-alive-00

Abstract

   In the context of a Constrained RESTful Environment (CoRE), hosts
   could frequently be energy-constrained and be turned off the vast
   majority of time for energy-saving purposes.

   In the case of a CoAP server, while it is offline, it is neither
   available to serve requests. Clients desiring to access its
   resources have no way to understand when they will find it up again.

   This specification provides a simple new message that gives to a CoAP
   server the ability to signal its current availability in the network.

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1. Introduction

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   could frequently be energy-constrained and be turned off the vast
   majority of time for energy-saving purposes.

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   available to serve requests. Clients desiring to access its
   resources have no way to understand when they will find it up again.

   This specification provides a simple new message that gives to a CoAP
   server the ability to signal its current availability in the network.

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
   document are to be interpreted as described in [RFC2119].

2. Alive (ALV) Message Type

   This specification defines a new message type for the CoAP message-
   layer (see Section 4.4 of [I-D.ietf-core-coap]). The type of a
   message is specified by the T field of the CoAP header.

   An "Alive" message (ALV) indicates that a CoAP server is up and ready
   to serve requests. Alive shares T value with the Non-Confirmable
   (NON) message type, but is univocally distinguishable by the fact
   that it MUST be empty.

   When a client receives an ALV message from a server, if it is
   interested in any resource served by it, the client SHOULD try
   sending a request to it since the Alive message provides an
   indication of its current availability.

3. Examples

   Figure 1 shows a sample use case where a server notifies its wake up
   to clients using multicast.

```
C1  C2  C3    S
|   |   |       . server is sleeping
|   |   |       .
|   |   |       .
|   |   |       .
|   |   |       . server wakes up
|<--|<--|<----| ALV MID=0xfefe
|   |   |     |
|   |   |     | CON MID=0x1234
|------------>| GET /a
|   |   |     |
|   |   |     | ACK MID=0x1234
|<------------| 2.05 "A"
|   |   |       .
|   |   |       . server goes sleeping again
|   |   |       .
|   |   |       .
|   |   |       .
```
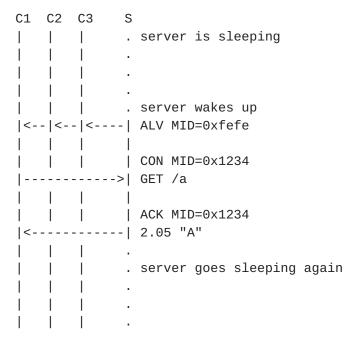
                     Figure 1: Alive usage example

Figure 2 shows a sample application on how the Alive message can fix
the "Observer Model" problem discussed in Section 4.2.3 of
[I-D.arkko-core-sleepy-sensors].

```
   C1  C2  C3    P    S
    |   |   |     |    .  server is sleeping
    |   |   |     |    .
    |   |   |     |    .  CON MID=0x1234
    |   |   |     |    .  GET
    |   |   |     |    .  Proxy-URI: coap://S/temp
    |------------>|    .  Observe: 0
    |   |   |     |    .
    |<-----------|     .  ACK MID=0x1234
    |   |   |     |    .
    |   |   |     |    .  (time passes..)
    |   |   |     |    .
    |   |   |     |    .  server wakes up
    |   |   |    |<---| ALV MID=0xfefe
    |   |   |     |    |
    |   |   |     |    | CON MID=0xabcd
    |   |   |     |    | GET /temp
    |   |   |    |--->| Observe:0
    |   |   |     |    |
    |   |   |     |    | ACK MID=0xabcd
    |   |   |     |    | 2.05 "22.5 C"
    |   |   |    |<---| Observe: 789
    |   |   |     |    .
    |   |   |     |    .  CON MID=0xabce
    |   |   |     |    .  2.05 "22.5 C"
    |<-----------|     .  Observe: 3013
    |   |   |     |    .
    |------------>|    .  ACK MID=0xabce
    |   |   |     |    .
    |   |   |     |    .  (time passess..)
    |   |   |     |    .
    |   |   |     |    .  resource state changes
    |   |   |     |    .  NON MID=0xfeff
    |   |   |     |    .  2.05 "21.5 C"
    |   |   |    |<---| Observe: 1384
    |   |   |     |    .
    |   |   |     |    .
    |   |   |     |    .  NON MID=0xabcf
    |   |   |     |    .  2.05 "22.5 C"
    |<-----------|     .  Observe: 3013
    ...
```

                    Figure 2: Alive with Observe

4. Acknowledgements

   TBD

5. References

5.1. Normative References

   [I-D.ietf-core-coap]
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   [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
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5.2. Informative References

   [I-D.arkko-core-sleepy-sensors]
              Arkko, J., Rissanen, H., Loreto, S., Turanyi, Z., and O.
              Novo, "Implementing Tiny COAP Sensors",
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              July 2011.

Authors' Addresses

   Angelo P. Castellani
   University of Padova
   Via Gradenigo 6/B
   Padova 35131
   Italy

   Email: angelo@castellani.net

   Salvatore Loreto
   Ericsson
   Hirsalantie 11
   Jorvas 02420
   Finland

   Email: salvatore.loreto@ericsson.com