              Sleepy Devices: Do we need to Support them in CORE?
                draft-rahman-core-sleepy-nodes-do-we-need-00

Abstract

   This document summarizes the discussion in the CORE WG related to the
   question of whether support of sleepy devices is required for the
   CoAP protocol, CORE Link Format, CORE Resource Directory, etc. The
   only goal of this document is to trigger discussions in the CORE WG
   so that all relevant considerations for sleeping devices are taken
   into account.

Status of This Memo

Copyright Notice

Table of Contents

1. Terminology and Conventions

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 RFC 2119 [RFC2119].

This document assumes readers are familiar with the terms and
concepts that are used in [I-D.ietf-core-coap] and [RFC6690].

2. Introduction

At IETF-87 (Berlin), it was suggested to review/summarize the CORE WG
interest on the topic of Sleepy Node support. Specifically whether
the WG feels that support of sleepy endpoints is required for the
CoAP protocol, CORE Link Format, CORE Resource Directory, etc.
Alternatively, whether the WG feels that Sleepy Node support can be
completely done outside CORE such as in the lower Layer 2 (MAC)
scheduling and/or in Layer 7 (application) logic.

3. Drafts Related to Sleepy Nodes

There have been multiple drafts in the CORE WG related to the subject
of Sleepy Nodes including:

  o [I-D.rahman-core-sleepy-problem-statement] summarizes the overall
     problem space of Sleepy Nodes.

  o [I-D.cao-core-aol-req] defines requirements for Sleepy Nodes to
     behave as if they are "always on".

  o [I-D.dijk-core-sleepy-reqs] defines requirements for Sleepy Nodes
     based on home and building control use cases.

  o [I-D.rahman-core-sleeping] defines general requirements for Sleepy
     Nodes.

  o [I-D.bormann-core-roadmap] provides a classification and overview
     of CORE drafts (and features) including a section on Sleepy Nodes.

  o [I-D.arkko-core-sleepy-sensors] describes a sensor network
     implementation and shows how different communication models affect
     implementation complexity and energy consumption (including Sleepy
     Node support).

  o [I-D.giacomin-core-sleepy-option] defines a proxy that acts as a
     store-and-forward agent for a Sleepy Node.

  o [I-D.castellani-core-alive] defines a new CoAP message type which
     the Sleepy Node multicasts to all interested devices when it wakes
     up.

  o [I-D.fossati-core-publish-option] allows an endpoint to
     temporarily delegate authority of its resources (when it is
     sleeping) to a proxy server that is always on.

  o [I-D.fossati-core-monitor-option] extends the Observe
     functionality to handle the scenario when both the server and
     clients are Sleepy Nodes.

  o [I-D.dijk-core-sleepy-solutions] defines an architectural approach
     to support Sleepy Nodes.

  o [I-D.rahman-core-sleepy] defines new parameters that describe an
     endpoint's sleepy characteristics and stores them in the Resource
     Directory.

  o [I-D.vial-core-mirror-server] defines a special type of Resource
     Directory from which endpoints can fetch the resource regardless
     of the (sleep) state of the server.

4. WG Email List Poll for Sleepy Node Deliverable

A poll was taken on the WG Email list asking the following question:
"Should we have a CORE deliverable for CoAP support of Sleepy Nodes?"
[IETF87-Poll].

The results of the poll were as follows:

o Votes FOR a new CORE Sleepy Node support deliverable: 9

o Votes AGAINST a new CORE Sleepy Node support deliverable: 3

5. Summary

There have been over ten drafts related to the concept of CORE
support of Sleepy Nodes. The WG Email list poll on the topic had a
large majority of responders supporting creation of a CORE charter
item for support of Sleepy Nodes. However there were some important
and high profile dissenters that argued against such a charter item.
Another point to consider is that during WG discussions, the CORE
Mirror Server [I-D.vial-core-mirror-server] is sometimes referred to
as the "existing" solution for CORE Sleepy Node support. However,
this draft was never adopted as a WG draft.

6. Acknowledgements

Thanks to Carsten Bormann and Zach Shelby for valuable discussions
and feedback on the topic of Sleepy Nodes.

7. IANA Considerations

This memo includes no request to IANA.

8. Security Considerations

Not applicable.

9. References

9.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
           Requirement Levels", BCP 14, RFC 2119, March 1997.

9.2. Informative References

[I-D.arkko-core-sleepy-sensors]
           Arkko, J., Rissanen, H., Loreto, S., Turanyi, Z., and O.
           Novo, "Implementing Tiny COAP Sensors", draft-arkko-core-
           sleepy-sensors-01 (work in progress), July 2011.

   [I-D.bormann-core-roadmap]
              Bormann, C., "CoRE Roadmap and Implementation Guide",
              draft-bormann-core-roadmap-04 (work in progress), May
              2013.

   [I-D.cao-core-aol-req]
              Cao, Z., "Allways-online Requirement for Sleeping CoAP
              Node", draft-cao-core-aol-req-00 (work in progress), July
              2011.

   [I-D.castellani-core-alive]
              Castellani, A. and S. Loreto, "CoAP Alive Message", draft-
              castellani-core-alive-00 (work in progress), March 2012.

   [I-D.dijk-core-sleepy-reqs]
              Dijk, E., "Sleepy Devices using CoAP - Requirements",
              draft-dijk-core-sleepy-reqs-00 (work in progress), June
              2013.

   [I-D.dijk-core-sleepy-solutions]
              Dijk, E., "Sleepy Devices using CoAP - Possible
              Solutions", draft-dijk-core-sleepy-solutions-01 (work in
              progress), June 2013.

   [I-D.fossati-core-monitor-option]
              Fossati, T., Giacomin, P., and S. Loreto, "Monitor Option
              for CoAP", draft-fossati-core-monitor-option-00 (work in
              progress), July 2012.

   [I-D.fossati-core-publish-option]
              Fossati, T., Giacomin, P., and S. Loreto, "Publish Option
              for CoAP", draft-fossati-core-publish-option-00 (work in
              progress), July 2012.

   [I-D.giacomin-core-sleepy-option]
              Fossati, T., Giacomin, P., Loreto, S., and M. Rossini,
              "Sleepy Option for CoAP", draft-giacomin-core-sleepy-
              option-00 (work in progress), February 2012.

   [I-D.ietf-core-coap]
              Shelby, Z., Hartke, K., and C. Bormann, "Constrained
              Application Protocol (CoAP)", draft-ietf-core-coap-18
              (work in progress), June 2013.

   [I-D.ietf-core-resource-directory]
              Shelby, Z., Krco, S., and C. Bormann, "CoRE Resource
              Directory", draft-ietf-core-resource-directory-00 (work in
              progress), June 2013.

   [I-D.rahman-core-sleeping]
              Rahman, A., Zuniga, J., and G. Lu, "Sleeping and Multicast
              Considerations for CoAP", draft-rahman-core-sleeping-00
              (work in progress), June 2010.

   [I-D.rahman-core-sleepy-problem-statement]
              Rahman, A., Fossati, T., Loreto, S., and M. Vial, "Sleepy
              Devices in CoAP - Problem Statement", draft-rahman-core-
              sleepy-problem-statement-01 (work in progress), October
              2012.

   [I-D.rahman-core-sleepy]
              Rahman, A., "Enhanced Sleepy Node Support for CoAP",
              draft-rahman-core-sleepy-04 (work in progress), October
              2013.

   [I-D.vial-core-mirror-server]
              Vial, M., "CoRE Mirror Server", draft-vial-core-mirror-
              server-01 (work in progress), April 2013.

   [IETF87-Poll]
              Rahman, A., "Do we need a CORE charter item for CoAP
              support of Sleepy Nodes?", August 2013, <http://
              www.ietf.org/mail-archive/web/core/current/msg04750.html>.

   [RFC6690] Shelby, Z., "Constrained RESTful Environments (CoRE) Link
              Format", RFC 6690, August 2012.

Author's Address

   Akbar Rahman
   InterDigital Communications, LLC
   Montreal, Quebec H3A 3G4
   Canada

   Phone: +1-514-585-0761
   Email: akbar.rahman@interdigital.com