CORE WG
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Sleepy Devices: Do we need to Support them in CORE? draft-rahman-core-sleepy-nodes-do-we-need-01

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

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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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 explicit 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. Background

The base CoAP specification [I-D.ietf-core-coap] (section 2.3) provides indirect support of sleepy nodes via the support of caching by intermediaries. This allows resource representations (previously retrieved) from a sleepy node to be temporarily available to other clients from a caching proxy even though the node (origin server) is currently asleep.

4. Drafts Related to Sleepy Nodes

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

- [I-D.rahman-core-sleepy-problem-statement] summarizes the overall problem space of Sleepy Nodes.
- [I-D.cao-core-aol-req] defines requirements for Sleepy Nodes to behave as if they are "always on".
- [I-D.dijk-core-sleepy-reqs] defines requirements for Sleepy Nodes based on home and building control use cases.
- [I-D.rahman-core-sleeping] defines general requirements for Sleepy Nodes.
- [I-D.bormann-core-roadmap] provides a classification and overview of CORE drafts (and features) including a section on Sleepy Nodes.
- [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).
- [I-D.giacomin-core-sleepy-option] defines a proxy that acts as a store-and-forward agent for a Sleepy Node.
- [I-D.castellani-core-alive] defines a new CoAP message type which the Sleepy Node multicasts to all interested devices when it wakes up.
- [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.
- [I-D.fossati-core-monitor-option] extends the Observe functionality to handle the scenario when both the server and clients are Sleepy Nodes.
- [I-D.dijk-core-sleepy-solutions] defines an architectural approach to support Sleepy Nodes.
- [I-D.rahman-core-sleepy] defines new parameters that describe an endpoint's sleepy characteristics and stores them in the Resource Directory.

- [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.

5. WG Email List Poll for Sleepy Node Deliverable

A pulse was taken on the WG Email list asking for interest in a "CORE Sleepy Node support" deliverable [Post-IETF87-Poll], [Post-IETF88-Poll].

The interesting (but non-normative) results were as follows:

- Support FOR a new CORE Sleepy Node support deliverable: 11

- Support AGAINST a new CORE Sleepy Node support deliverable: 3

6. 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.

7. Acknowledgements

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

8. IANA Considerations

This memo includes no request to IANA.

9. Security Considerations

Not applicable.

10. References

10.1. Normative References

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Bormann, C., "CoRE Roadmap and Implementation Guide", draft-bormann-core-roadmap-05 (work in progress), October 2013.

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

[I-D.dijk-core-sleepy-reqs]
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[I-D.ietf-core-coap]
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[I-D.ietf-core-resource-directory]
Shelby, Z., Bormann, C., and S. Krco, "CoRE Resource Directory", draft-ietf-core-resource-directory-01 (work in progress), December 2013.

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[I-D.rahman-core-sleepy-problem-statement]
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[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.

[Post-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>.

[Post-IETF88-Poll]
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