CoAP in space

Internet Draft being prepared...

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Introduction (I/II)

- draft-many-deepspace-ip-assessment-00
  - CoAP “is worth considering for application transport in deep space”

- Constrained Application Protocol (CoAP)
  - Base specification: RFC 7252 (2014)
  - IETF CoRE WG

- Principles
  - Application-layer protocol
  - Based on the REST architecture of the web
  - Designed for IoT environments:
    - Constrained nodes (processing, memory, energy)
    - Constrained-node networks (long delays, high error rate…)

Introduction (II/II)

- CoAP features:
  - Lightweight operation
    - 4-byte header
  - Flexibility
    - Underlying transport
      - » Optional functionality
    - Configurable parameters
    - Security
  - Asynchronous message exchanges
  - Proxy and cache
  - Stateless HTTP mapping

More details

- Several possible underlying transports
  - Including TCP, TLS, WebSockets
  - Originally, UDP
    - CoAP itself supports optional (and simple) ARQ for reliability
    - Parameters need to be adjusted to the space environment
- Blockwise transfers
  - RFC 7959
    - Stop and wait
  - RFC 9177
    - Intermediate ACKs not needed
    - Parameters need to be adjusted to the space environment
- Security
  - DTLS (default)
  - Object Security (OSCORE)

Thanks!
Questions? Comments?

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