S-Expressions

draft-rivest-sexp-02

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S-Expressions

- S-expressions are data structures for representing complex data. They are either byte strings or ordered lists of simpler S-expressions.
- They were designed considering readability, transportability, flexibility, efficiency, and canonicalization.
- They include the following representation options:
  - Quoted-string
  - Token
  - Hexadecimal
  - Base-64
  - Canonical – a unique representation for digital signing and verification.

S-Expressions (continued)

- Ways to express the 3-byte sequence corresponding to hexadecimal 0x616263 as an S-expression:
  - abc - token
  - "abc" - quoted string
  - #616263# - hexadecimal string
  - 3:abc - verbatim/canonical encoding
  - |YWJj| - base-64 encoding
  - {MzphYmM=} - base-64 of verbatim encoding
- There is a provision for providing a “display hint”, which may be a MIME Type, for a byte string in an S-expression.
- A list is simply an open parenthesis, one or more S-expressions, and then a close parenthesis.

History

- S-expressions were developed for SDSI (Simple Distributed Security Infrastructure, Lampson and Rivest 1996) although their origins date back to McCarthy's LISP programming language.
- They were further refined during the merger of SDSI and SPKI (Simple Public Key Infrastructure) in 1997 (see RFCs 2692 and 2693).
- A file named draft-rivest-sexp-00.txt was made publicly available on 4 May 1997 but was not submitted to the IETF.

History (continued)

- There is a desire to provide permanent documentation of S-expressions, as a useful reference especially considering that it is used in RFCs.
- With permission from Ronald L. Rivest, the original draft-rivest-sexp-00.txt has been polished and updated to modern IETF Draft standards including conversion to XMLv3 and the following:
  - Replacing the BNF with corrected ABNF [RFC5234].
  - Change the default display hint from
    - **`text/plain; charset=iso-8859-1`**
  - to be
    - **`text/plain; charset=utf-8`**

Next Step

- Suggest AD sponsorship of draft-rivest-sexp-02 for Informational RFC.