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.