

draft-bortzmeyer-language-state-machines

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The question

You have two extremely different ways to write specs / standards:

- 1 Use only a formal language and write specs in Lotos or similar. Hard, very hard (may be impossible) but allows to automatic processing (checking, pretty-printing, ...).
- 2 Use only natural language. Easy but you cannot check it or translate to code automatically.

An intermediate solution is to use mostly natural language with a few formal languages for specific tasks. This is what IETF does: English + (ABNF and / or MIB).

Other formal languages are being developed

(`draft-ietf-rohc-formal-notation` for describing packet headers).

There are many of them in RFCs but no formal language.

- 1 Stuck to ASCII-ART, informal tables or lists of tuples,
- 2 No automatic checking possible (these checks catch a lot of ABNF mistakes, for instance)
- 3 No code generation possible

Cosmogol, a candidate

- 1 Based on the “list of tuples” approach,
- 2 Current state, message, next state, action: a transition,
- 3 Formal syntax,
- 4 A reference implementation which can:
 - 1 Check the SM (for instance its connectivity),
 - 2 Translate to Graphviz or Graph::Easy.

Example

```
# RFC 2461, "Neighbor Discovery for IP Version 6"
START : "Packet to send" -> INCOMPLETE : "Send multicast NS";

INCOMPLETE : "Retransmit timeout, less than N" -> INCOMPLETE :
            "Retransmit NS";

INCOMPLETE : "Retransmit timeout, N or more" -> START :
            "Send ICMP error";

INCOMPLETE : "NA not solicited" -> STALE;

INCOMPLETE : "NA solicited" -> REACHABLE;
```

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- ① Do we want a formal SM language?
- ② If so, do we develop one?
 - ① If not, which one to use? State Chart XML, UML, Z.100/SDL?
 - ② If yes, is Cosmogol a good candidate? If yes, **all the following issues should be for the WG to work on**
 - ① Named sets of states / messages?
 - ② Substates
 - ③ Syntax details?
 - ④ Unicode identifiers?

Creating a WG?

Depends on the output of the previous discussions.

Volunteers to work?

See proposed charter sent on the mailing list.