UNDERSTANDING SIP THROUGH MODEL-CHECKING

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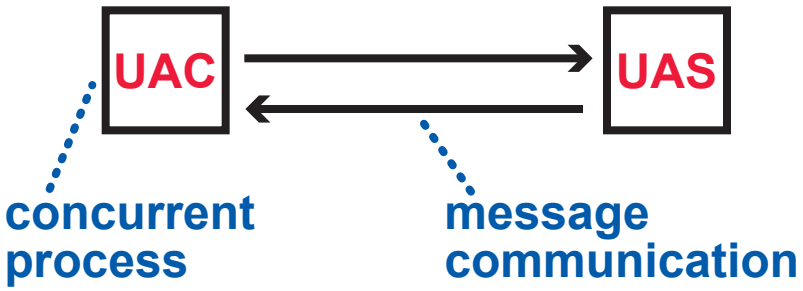
OVERVIEW

MODELING

- wrote formal models of SIP INVITE dialogs in Promela



- the models have a special emphasis on media control (offer/answer exchange)
- limitations and simplifications are documented carefully
- all versions of the model are available on my Web site

ANALYSIS

- analyzed the models using the model-checker Spin

  verification of embedded assertions, completeness in the sense of being responsive to all inputs, etc.

- discovered a few problems in the SIP RFCs
- collected data on the analysis of several model versions
- made some recommendations

WHY?

Because there are thousands of pages of RFCs, scattered with rules such as:

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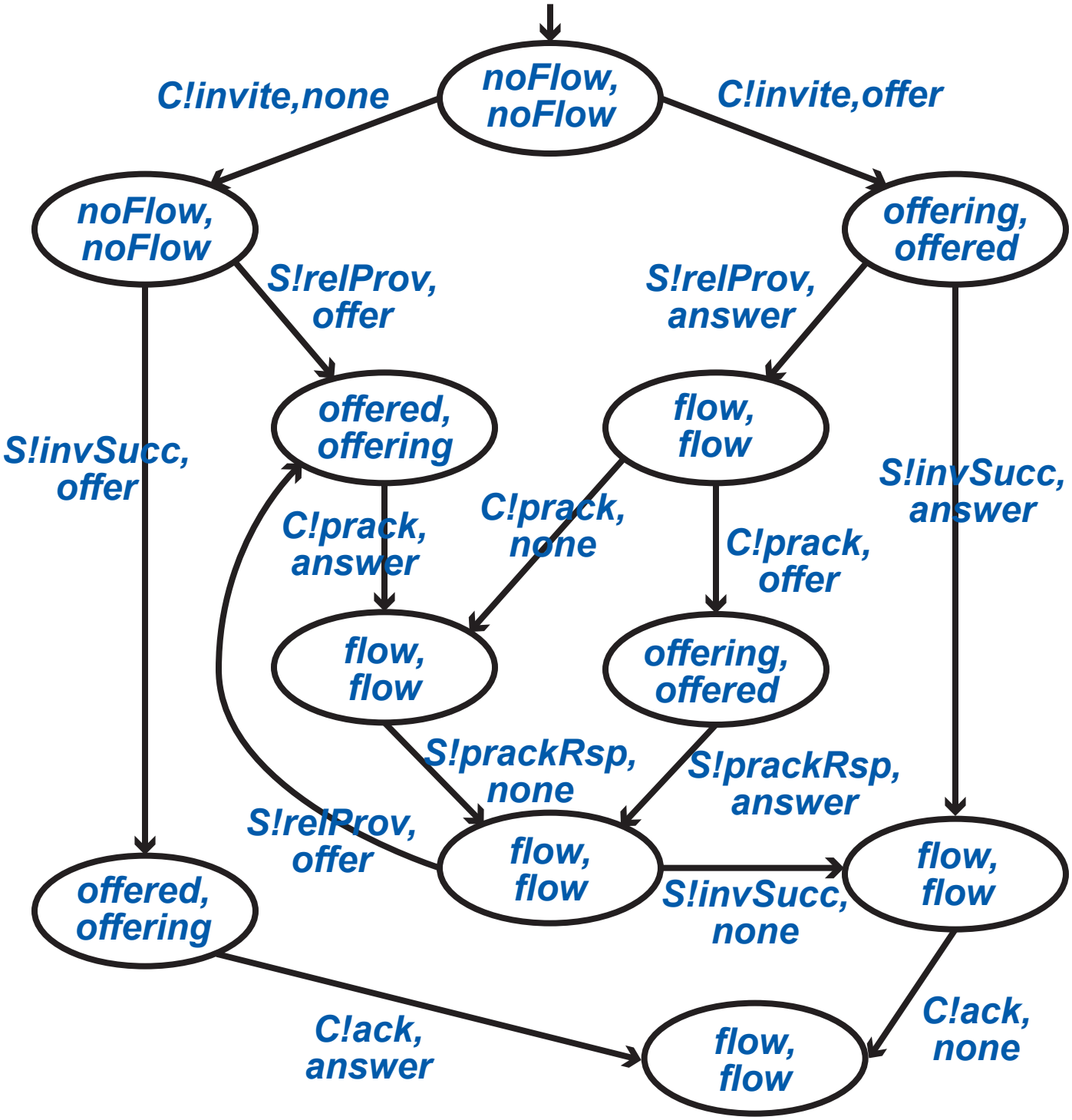

Reliable provisional responses must be handled in exactly this way.

This state-oriented view has many advantages as supplementary documentation of SIP:

- centralized, rather than distributed over RFCs
- formal, and therefore unambiguous
- can be checked automatically
- shows the state information that user agents must maintain
- can be used for other purposes such as testing