

Graceful Interruption of Request-response Service Interactions

M. Dalla Preda, M. Gabbrielli, I. Lanese, J. Mauro, G. Zavattaro

University of Bologna / FOCUS INRIA



ICSOC 2011

Paphos, Cyprus
Dec. 2011

Motivation example



Book hotel in Paphos,
but wait at most 5',
then go on with your
work



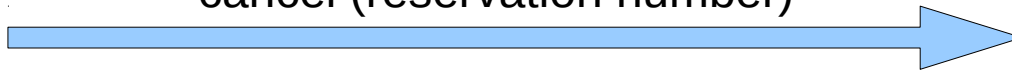
Motivation example



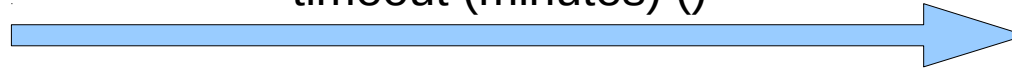
book (data + credit card) (reservation number)



cancel (reservation number)



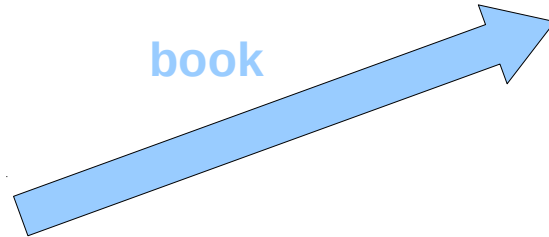
timeout (minutes) ()



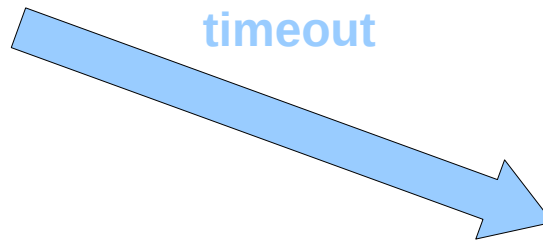
BPEL



book



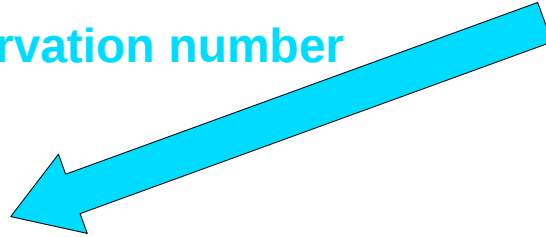
timeout



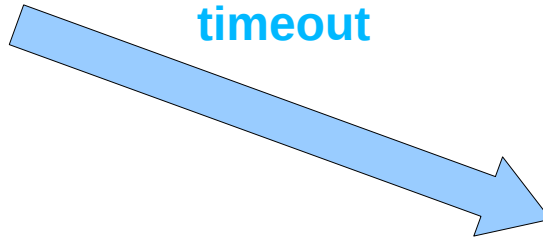
BPEL



reservation number



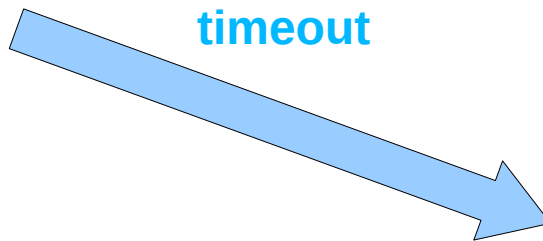
timeout



BPEL



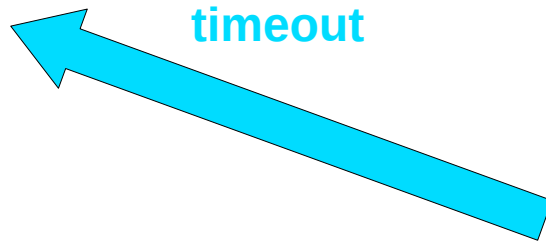
timeout



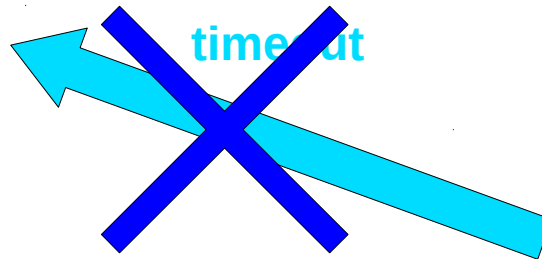
BPEL



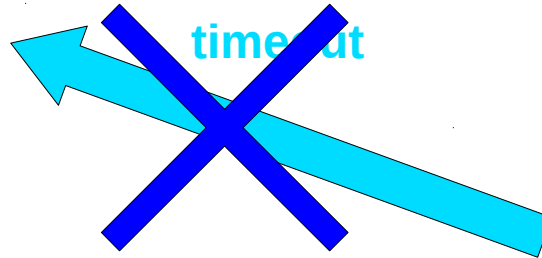
timeout



BPEL



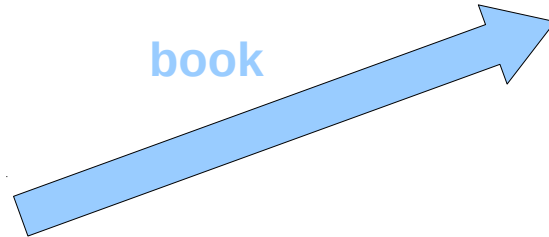
BPEL



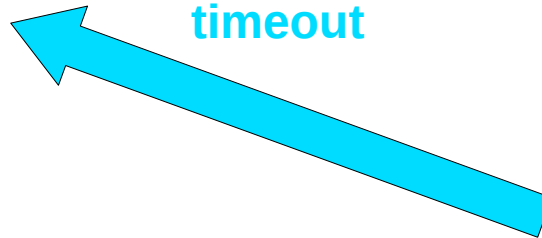
BPEL (but what if ...)



book



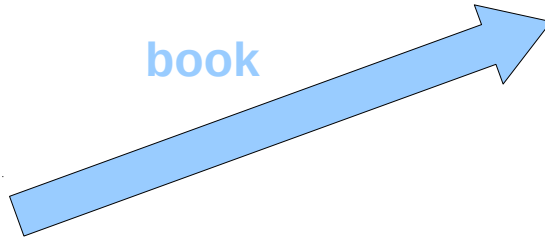
timeout



BPEL (but what if ...)



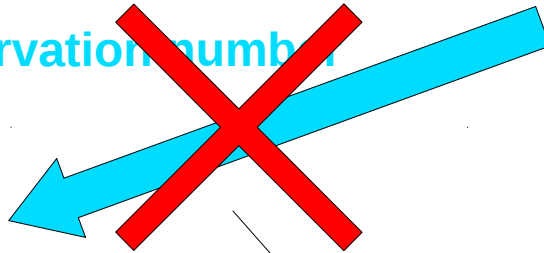
book



BPEL (but what if ...)



reservation number

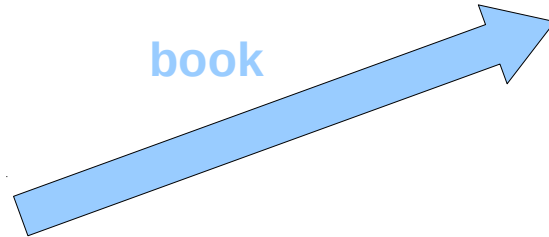


We would like to be able to cancel the reservation

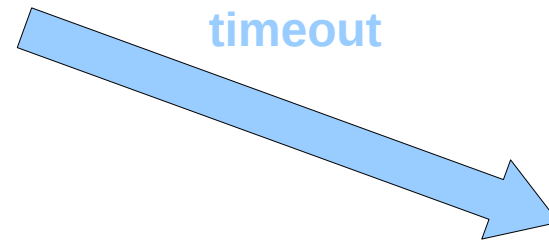
SOCK & JOLIE



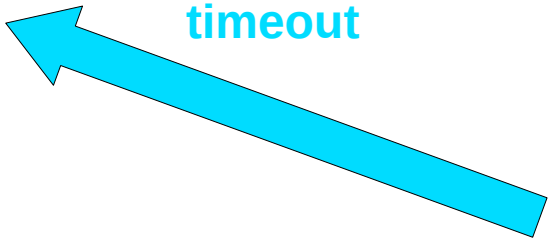
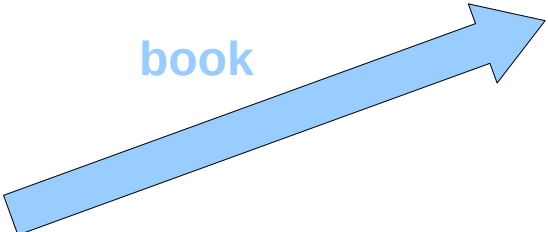
book



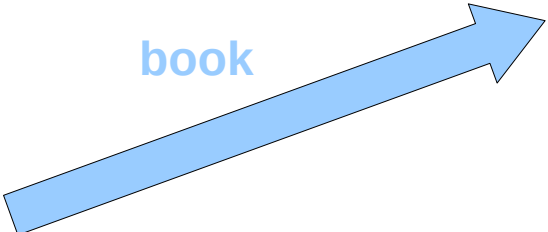
timeout



SOCK & JOLIE



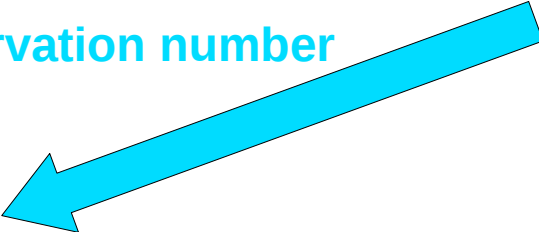
SOCK & JOLIE



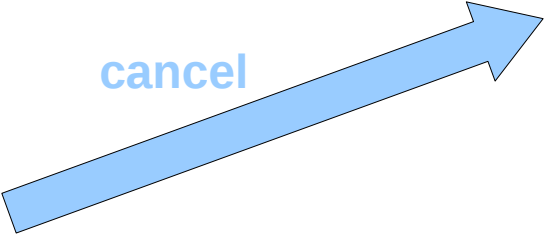
SOCK & JOLIE



reservation number



SOCK & JOLIE



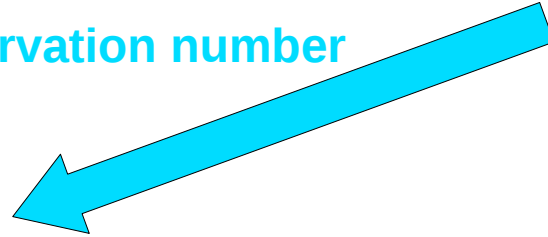
SOCK & JOLIE



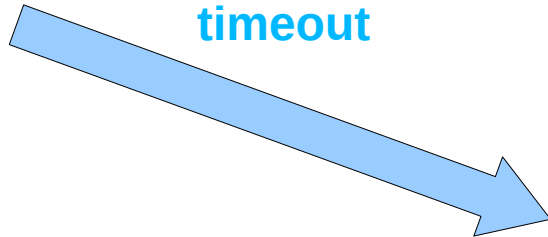
SOCK & JOLIE



reservation number



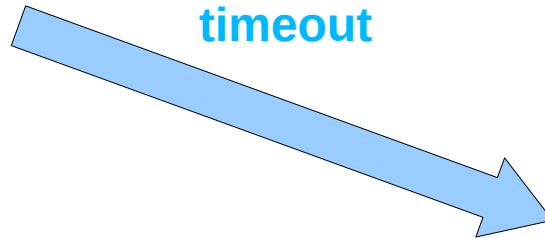
timeout



SOCK & JOLIE



timeout



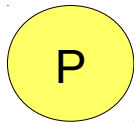
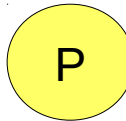
We need to wait for the timeout event before going on with our work

Our solution



Extend the request response primitive

book (data + credit card) (reservation number)



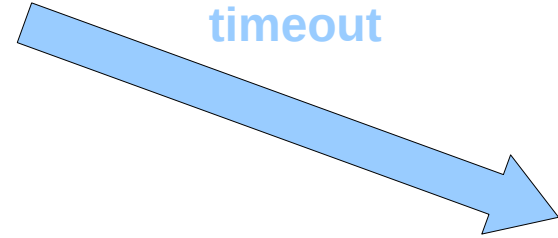
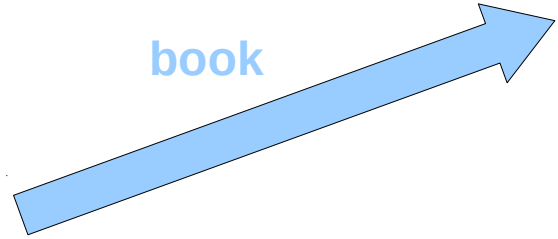
= code to execute to compensate the arrival of a response

For the hotel example: P = cancel(reservation number)

SOCK+



P

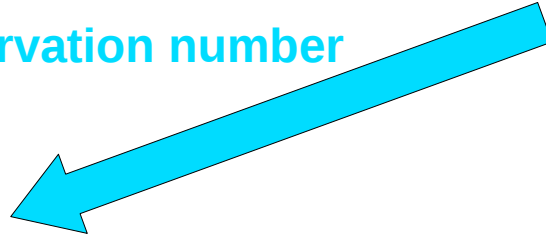


SOCK+

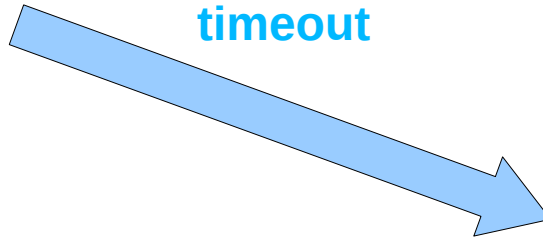


P

reservation number



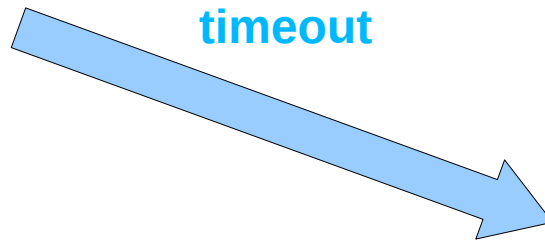
timeout



SOCK+



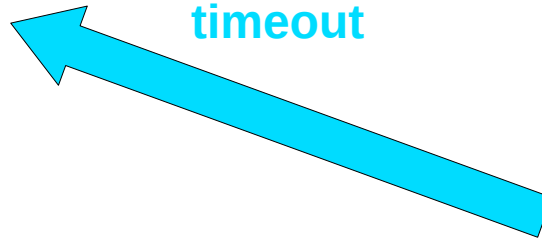
timeout



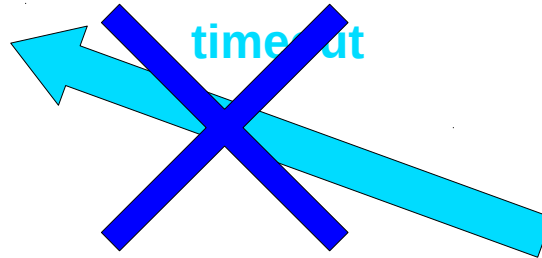
SOCK+



timeout



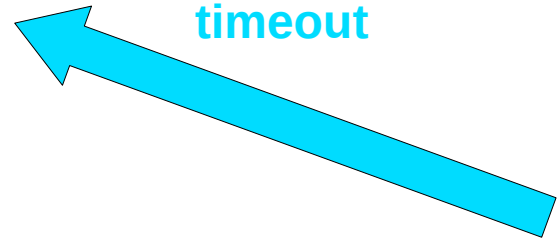
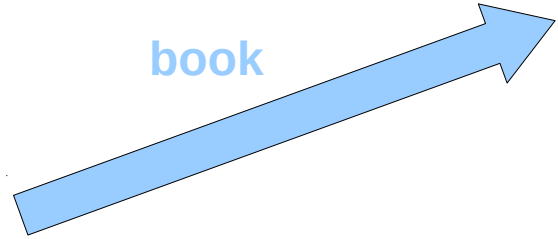
SOCK+



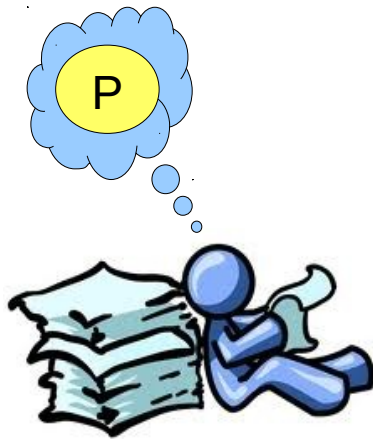
SOCK+



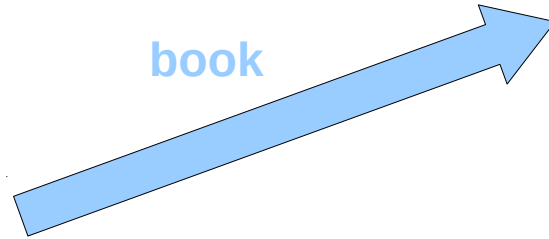
P



SOCK+



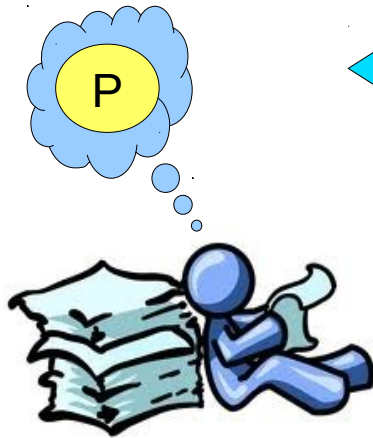
book



SOCK+



reservation number

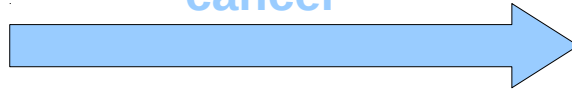


SOCK+



P

cancel



Contribution



- introduce new solicit response primitive
- allow compensation of responses of discarded solicit responses
- formalization in SOCK calculus (syntax + operational semantics)
- introduce multiple solicit response \rightarrow capture speculative parallelism scenarios

Future works



- implementation in JOLIE
- prove conjecture: multiple solicit response can not be encoded using solicit responses