

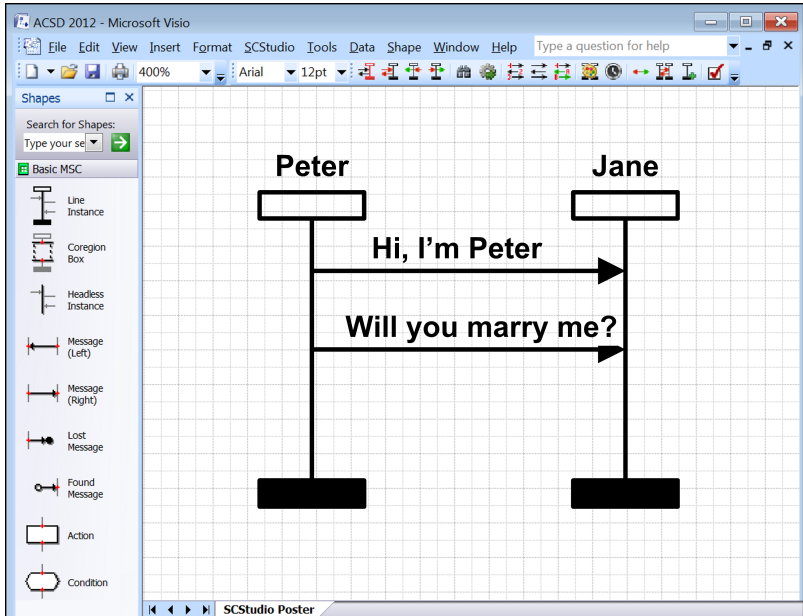
# Time Features in SCStudio

Ľuboš Korenčiak

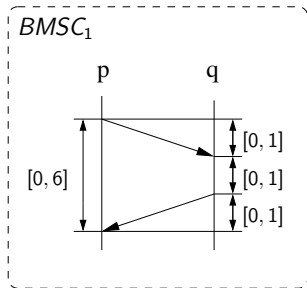
14. 11. 2011



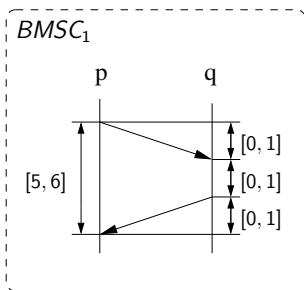
INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ



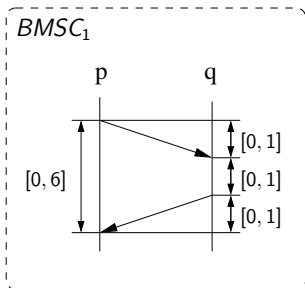
# basic Message Sequence Chart (BMSC)



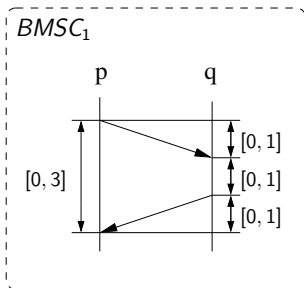
$$L_{BMSC_1} = \{(p!q, 1)(q?p, 2)(q!p, 3)(p?q, 3), \dots\}$$



Algorithm checks whether introduced time constraints are in conflict.  
There is no execution which could satisfy all time constraints.



The purpose of Tighten Time algorithm is to "tighten" the constraints to contain only values which are possible in at least one execution.

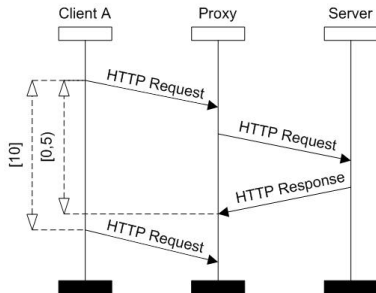
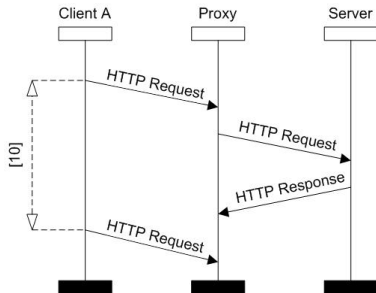


The purpose of Tighten Time algorithm is to "tighten" the constraints to contain only values which are possible in at least one execution.

Race condition is a property when events are drawn to take place in some order but they can take place in different order.

The introduction of time constraints can eliminate some race conditions.

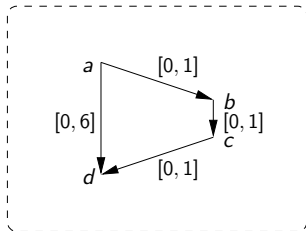
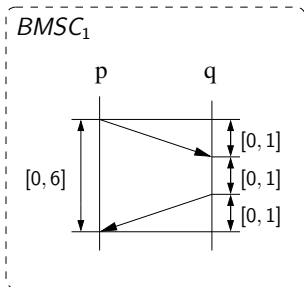
# Time Race





# Solving of Tightening

Translation to the Temporal Constraint Satisfaction Problem (TCSP).



- translation to oriented graph
- shortest paths
- Floyd-Warshall

# Solving of TCSP

- $x := \max\{x, y + z\}$
- $x' := \min\{x', y' + z'\}$
- $y := \min\{y, x - z'\}$
- $y' := \min\{y', x' - z'\}$

- introduction of timed MSC
- definition time problems
- solving of time problems



MINISTERSTVO ŠKOLSTVÍ,  
MLÁDEŽE A TĚLOVÝCHOVY



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