

Service substitutability – some open ends

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Where innovation starts

Motivation

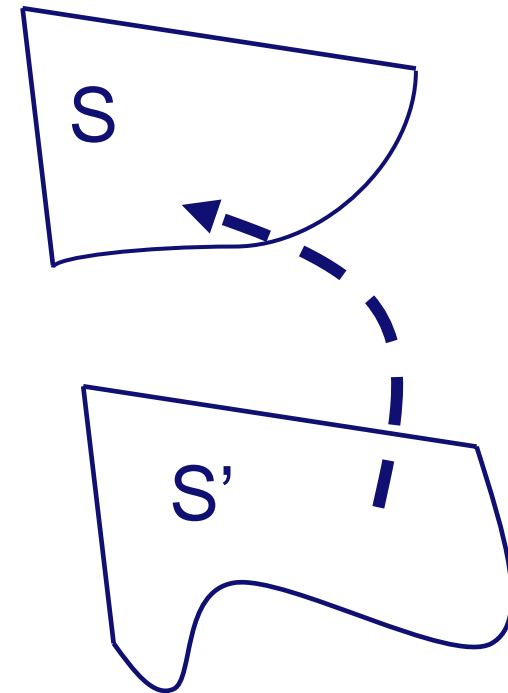
- substituting S by S' should **gain** or **preserve** some properties of S

Termination criteria

- deadlock freedom
- weak termination

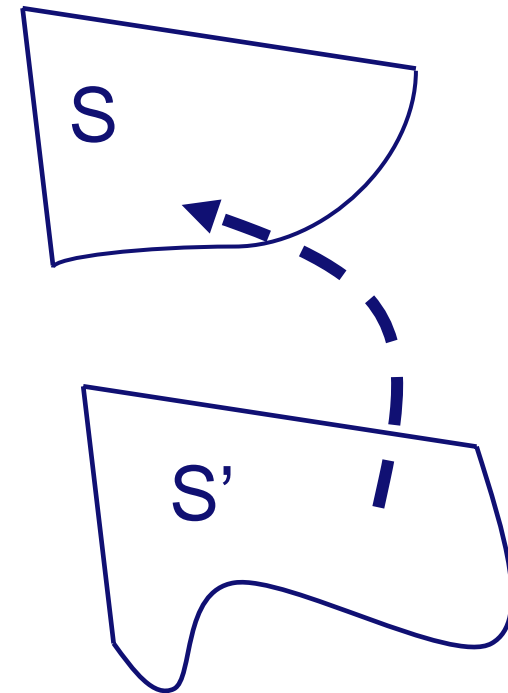
Behavioral constraints

- enforce
- exclude
- cover

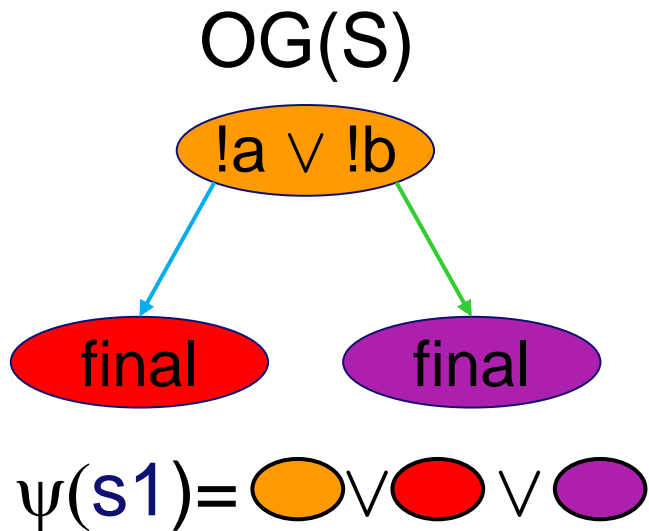
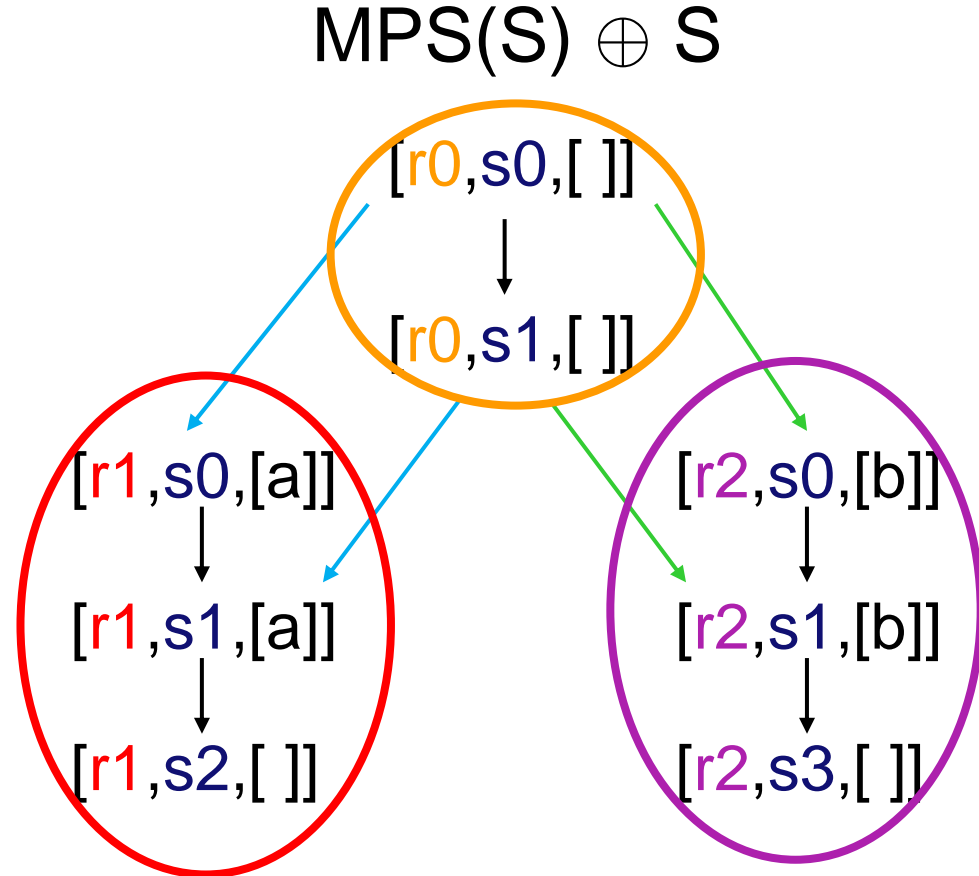
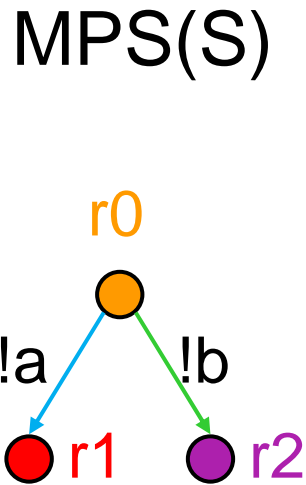
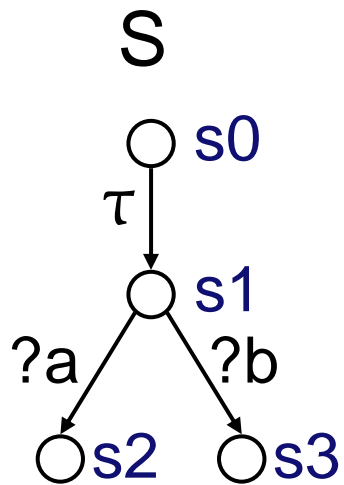


Motivation

- substituting S by S' should **gain** or **preserve** some properties of S
- use **strategy** notion to characterize those properties
- use **finite representation of all strategies** to decide substitutability



Finite representation of all strategies



Substitutability notions

classification	finite repres.	Conformance	Scenarios
{DF}-Strat	OG(S)	✓	✓
{DF, cover}-Strat	(OG(S), ψ)	✓	✓
{WT}-Strat	(Frag, Con)	?	✓
{WT, cover}-Strat	(Frag, Con, ψ)	?	✓

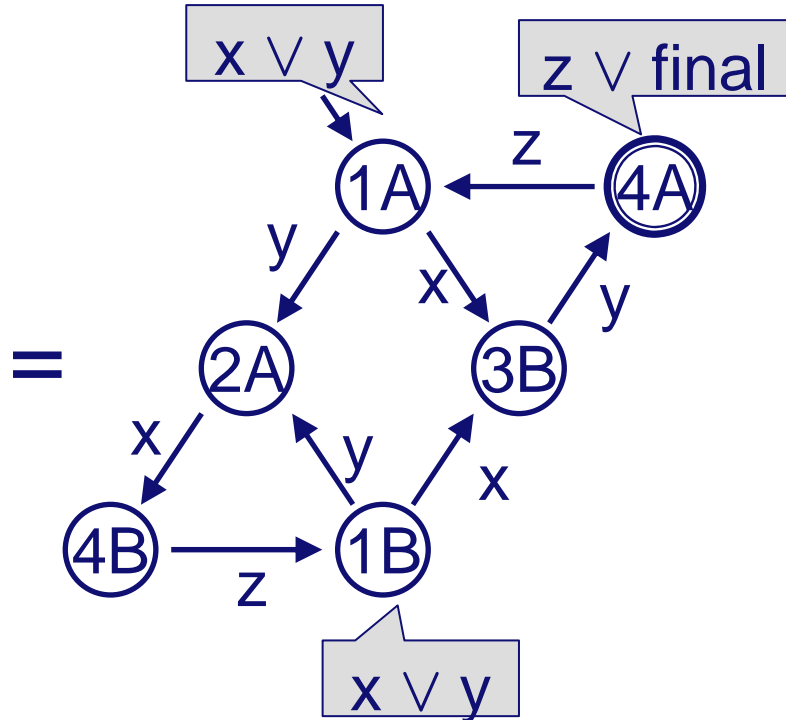
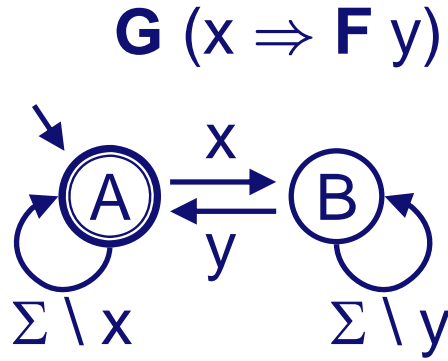
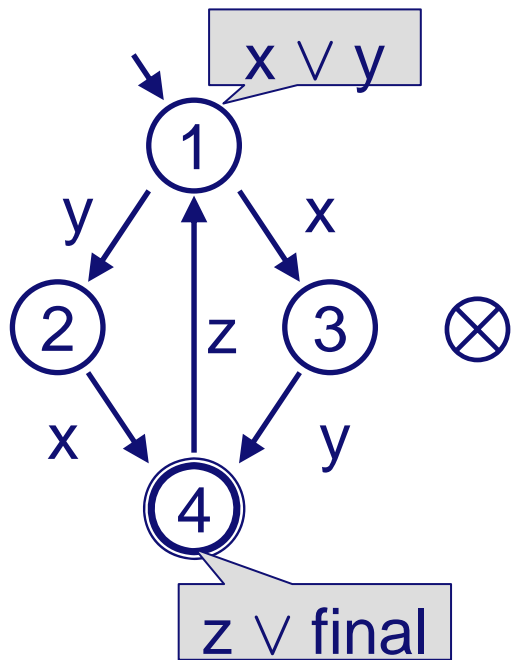
Temporal logic constraints

- Restrict strategies to those that preserve temp. log. property (LTL, CTL*, etc.)
- E.g. LTL formula \rightarrow Büchi automaton

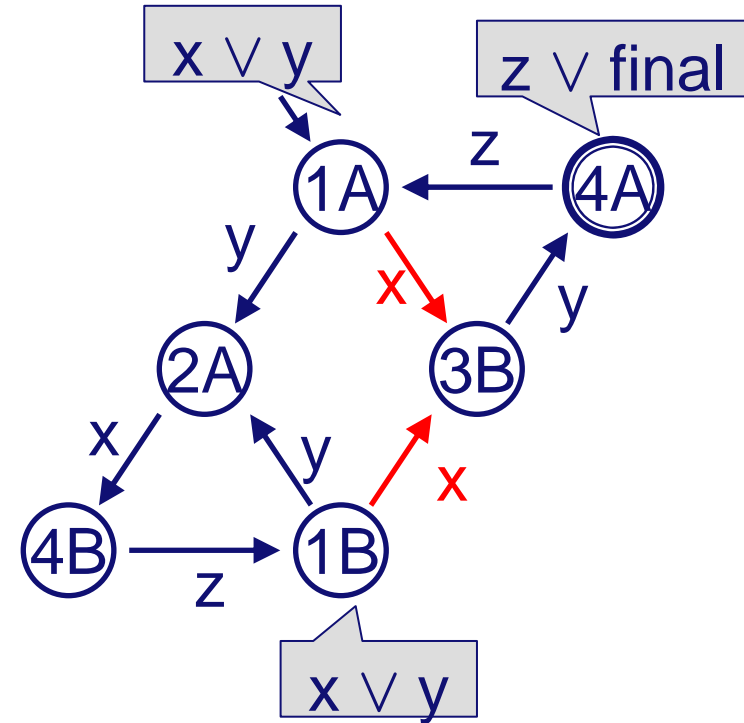
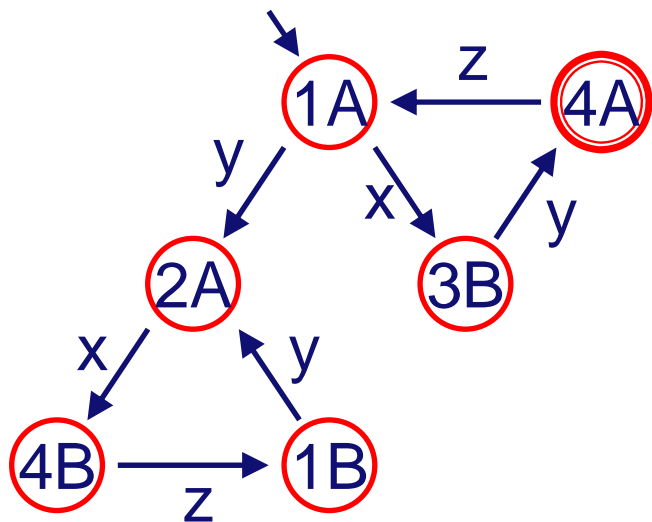
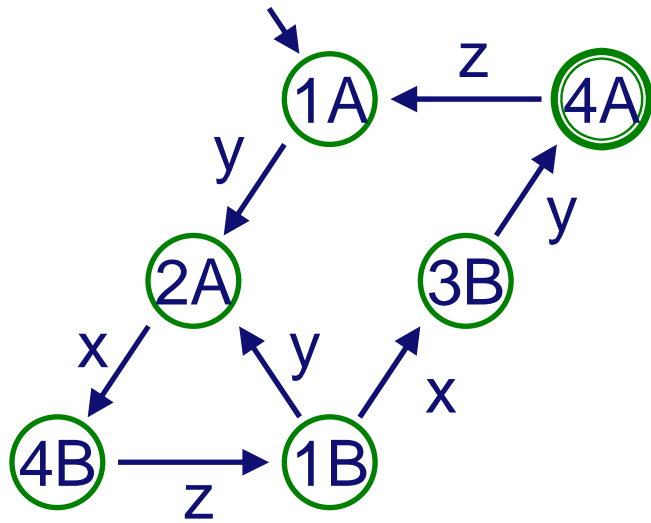
Open Problem

- Try to find a compact representation

A naive approach



A naive approach



... does not work!!

Constructing substitutable services

- **Given:** Service S
- **Wanted:** representation of all services T with
 - $\text{Strat}(S) = \text{Strat}(T)$
 - $\text{Strat}(S) \subseteq \text{Strat}(T)$
- $=$: restricted approach for DF-strategies
- \subseteq : solution for DF-strategies

Other aspects

- Migration
 - solution only for DF-strategies
- Decentralized setting
- Strong termination

Many Thanks!