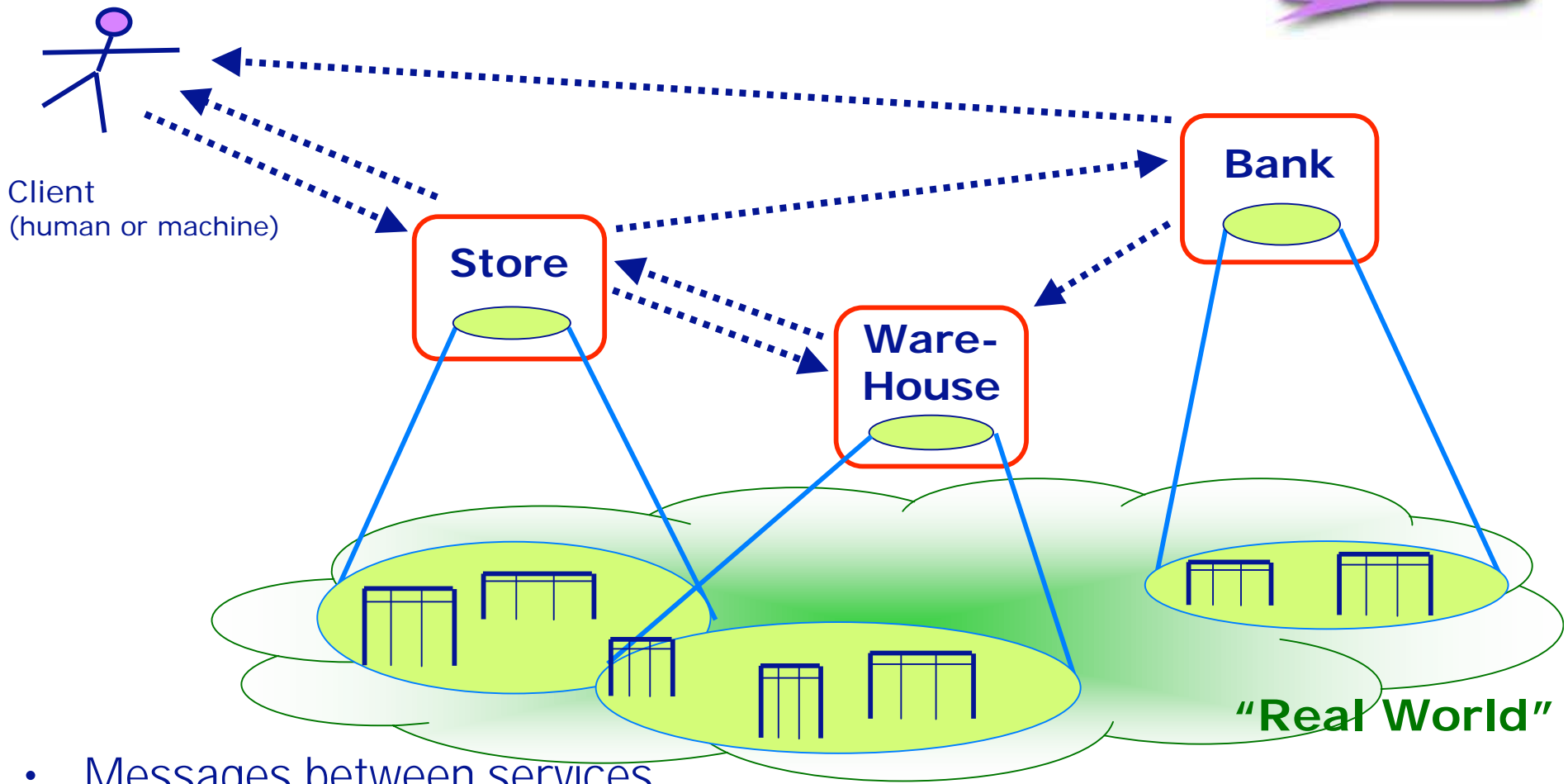


# Process Integration: Look at How You Behave!

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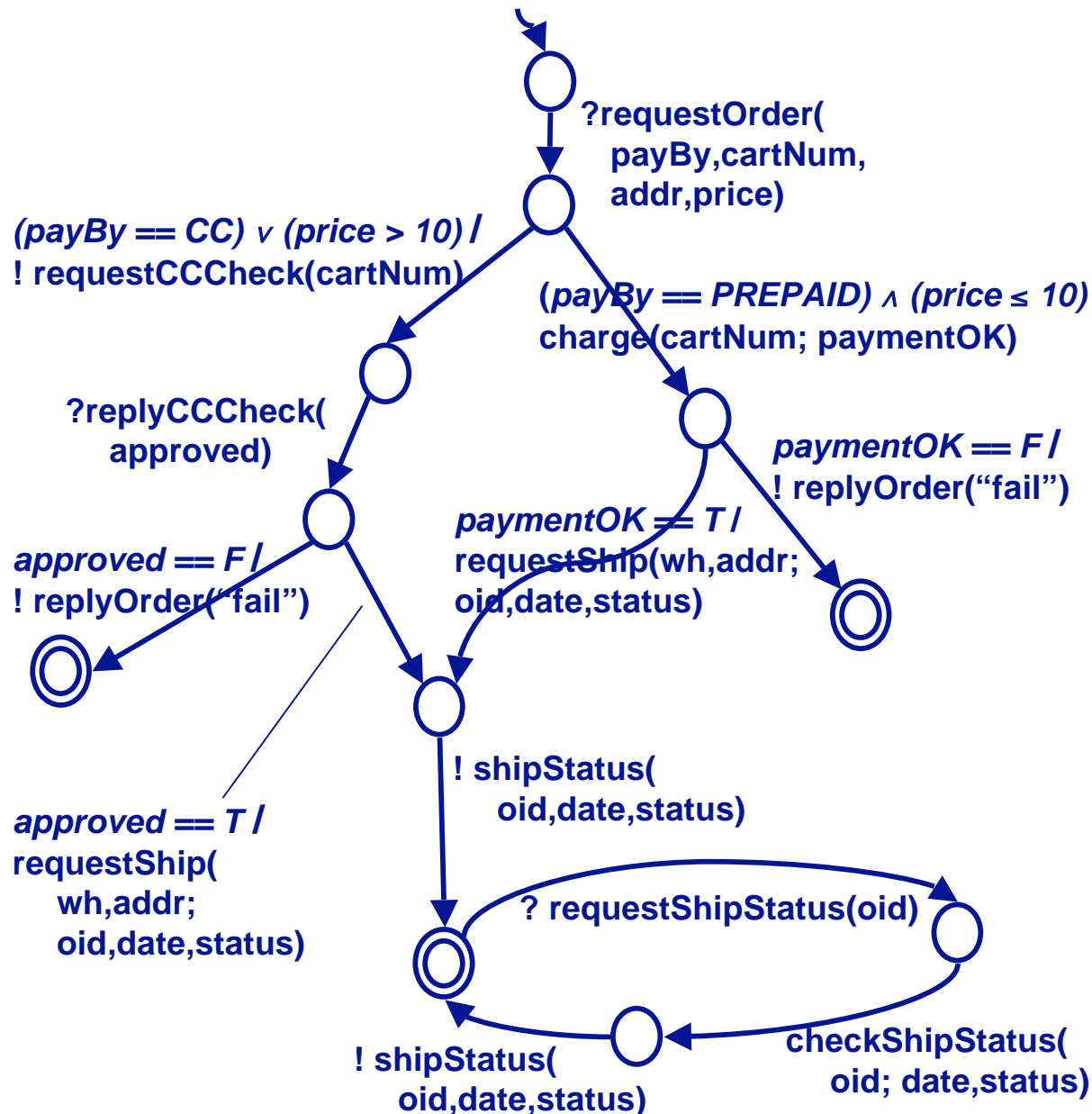
Suppose processes/services act on an integrated view of the world ...

[BCDHM-VLDB05]



- Messages between services
- Impact on "real world" — modeled as relations or FOL
- "View" of internal process model — automata based

# Process/service behavior of as abstract machine querying and acting on the world ...

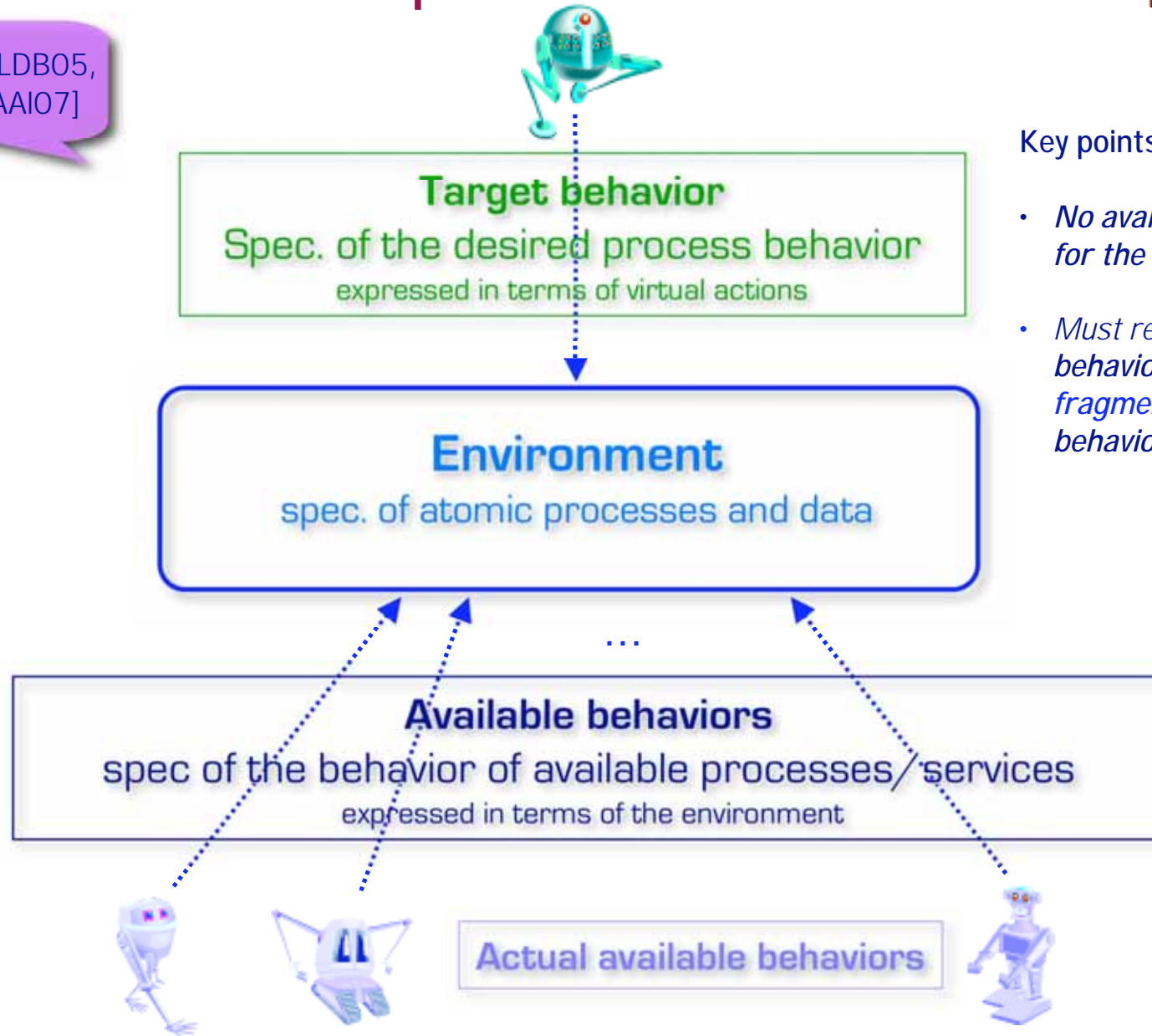


- Local store
- Edge conditions based on local store (and incoming message)
- Edge actions
  - Atomic Process
    - acting on the world
    - set the local store
  - Create/send message
  - Read message

[BCDHM-VLDB05]

# Behavior-based composition

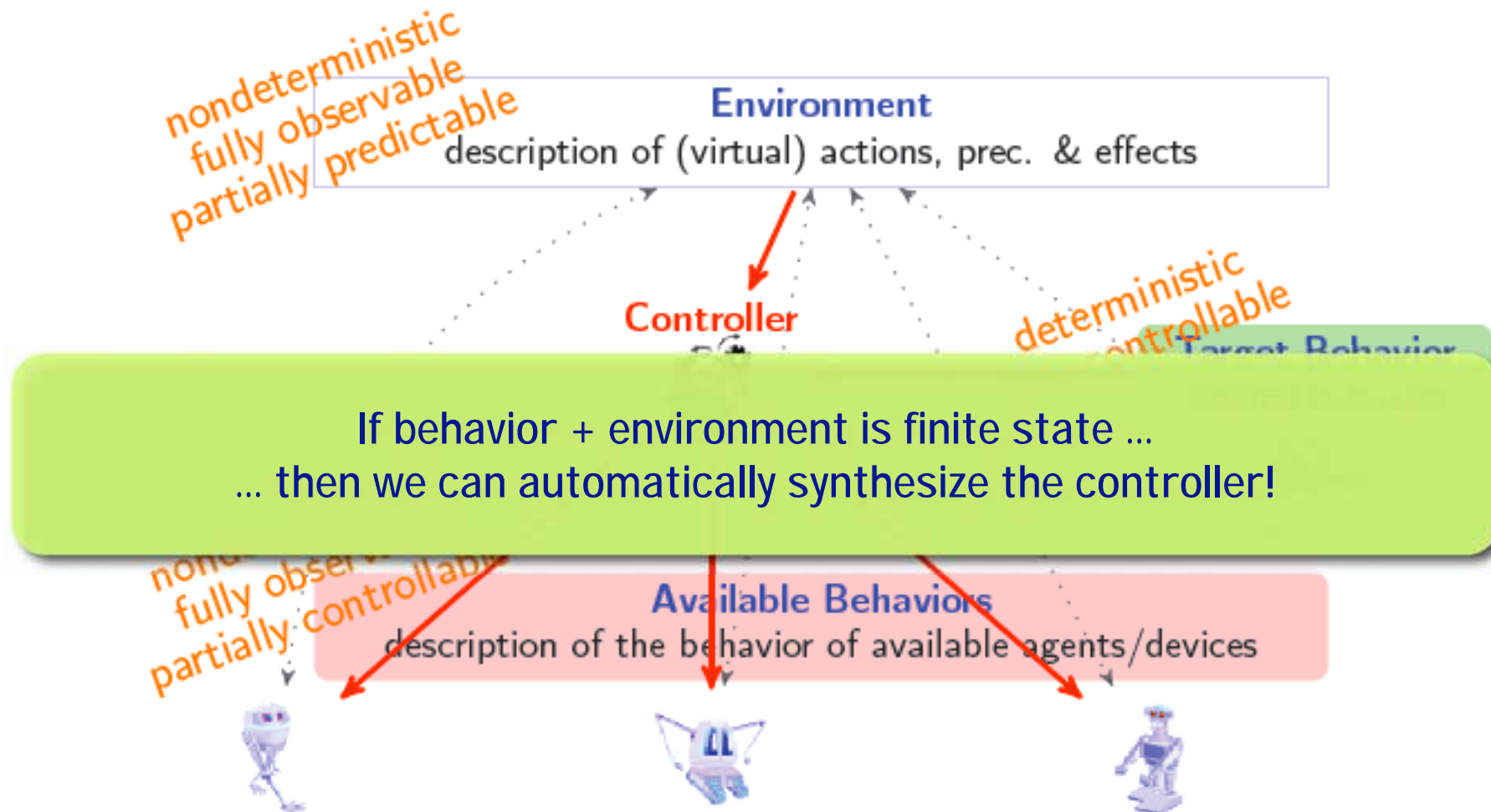
[ICSOC03, VLDB05,  
IJCAI07, AAAI07]



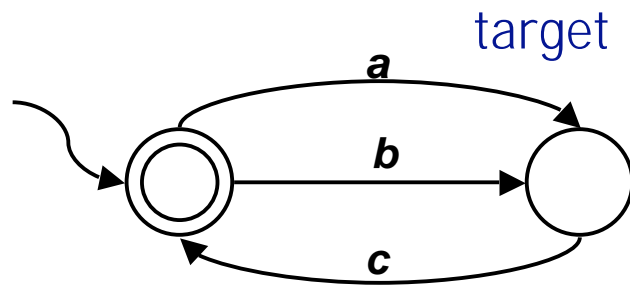
## Key points

- *No available process for the target behavior*
- *Must realize target behavior using fragments of available behaviors*

# Realizing target behavior via a composition



# Example




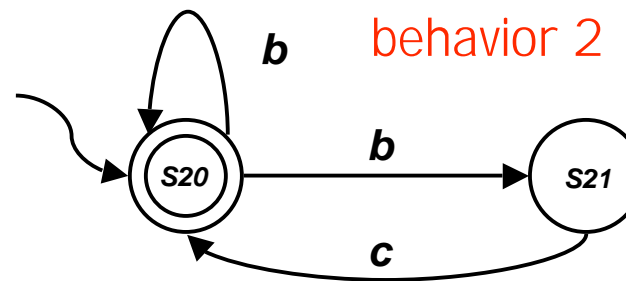
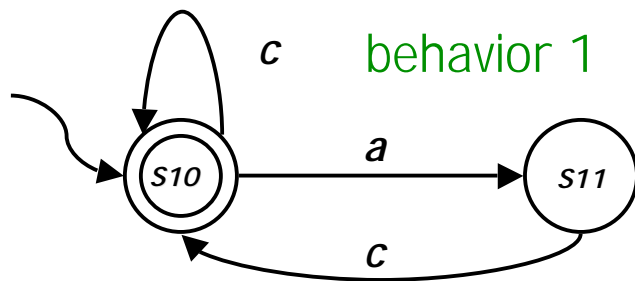
controller

```

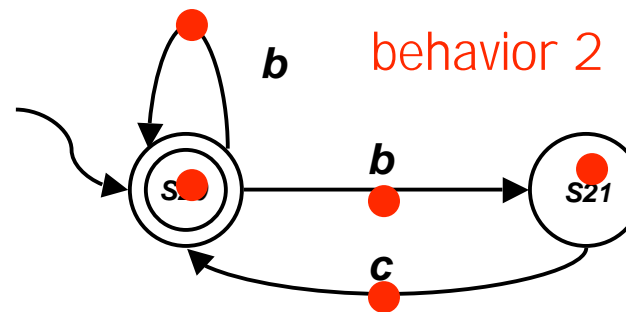
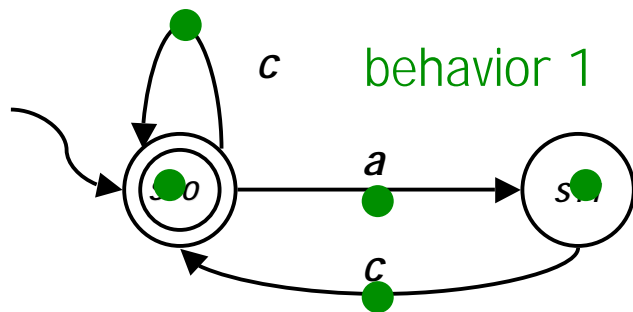
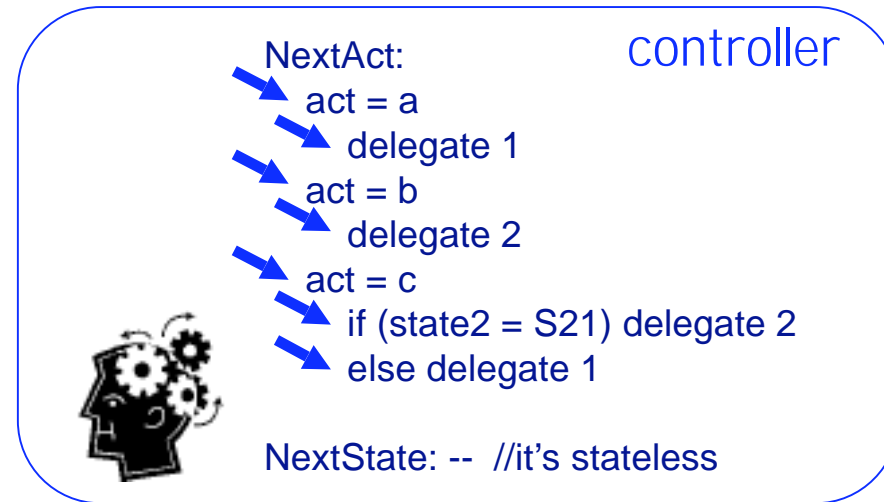
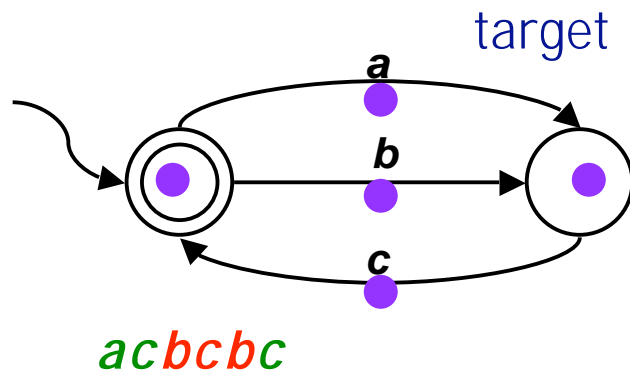
NextAct:
  act = a
    delegate 1
  act = b
    delegate 2
  act = c
    if (state2 = S21) delegate 2
    else delegate 1
        
```

NextState: -- //it's stateless

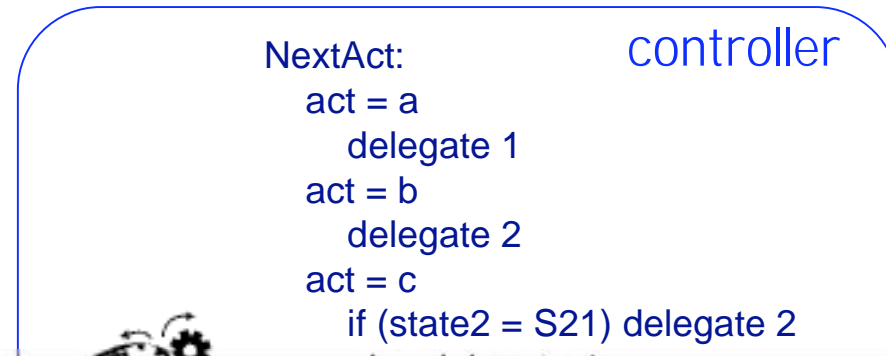
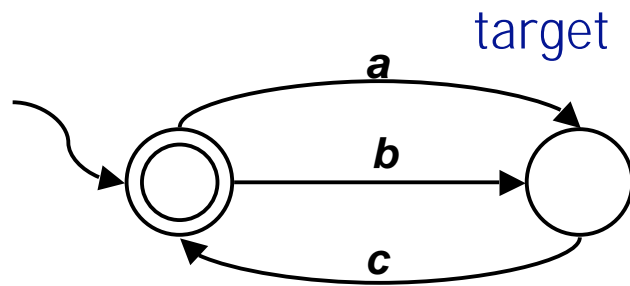




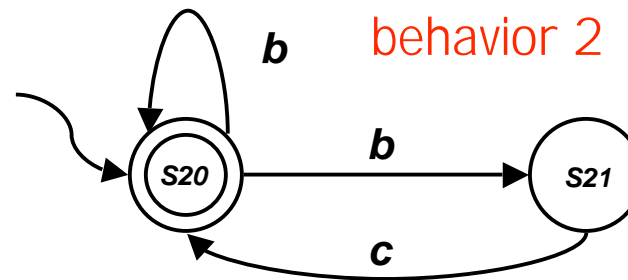
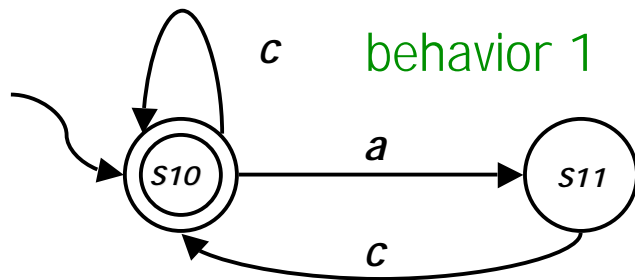
# Example



# Example



controller automatically synthesized!





# Basic issues

We have all the issues of data integration but in addition ...

- Behavior: description of the **dynamics** of the process!
- Behavior should be formally and **abstractly** described: conceptual modeling of dynamics (not a la OWL-S). *Which?*
  - Workflows community may help
  - Business process community may help
  - Services community may help
  - Process algebras community may help
  - Reasoning about actions community may help
  - DB community may help
  - ... may help
- Behavior + environment should be *even more abstractly* described for **analysis/synthesis**: must be finite state.
  - CAV (Computer Aid Verification) community can help!
- How do we **map behaviors** one into the other?
  - ??? may help
- ...