



# Actor-based Runtime Model of Adaptable Feedback Control Loops

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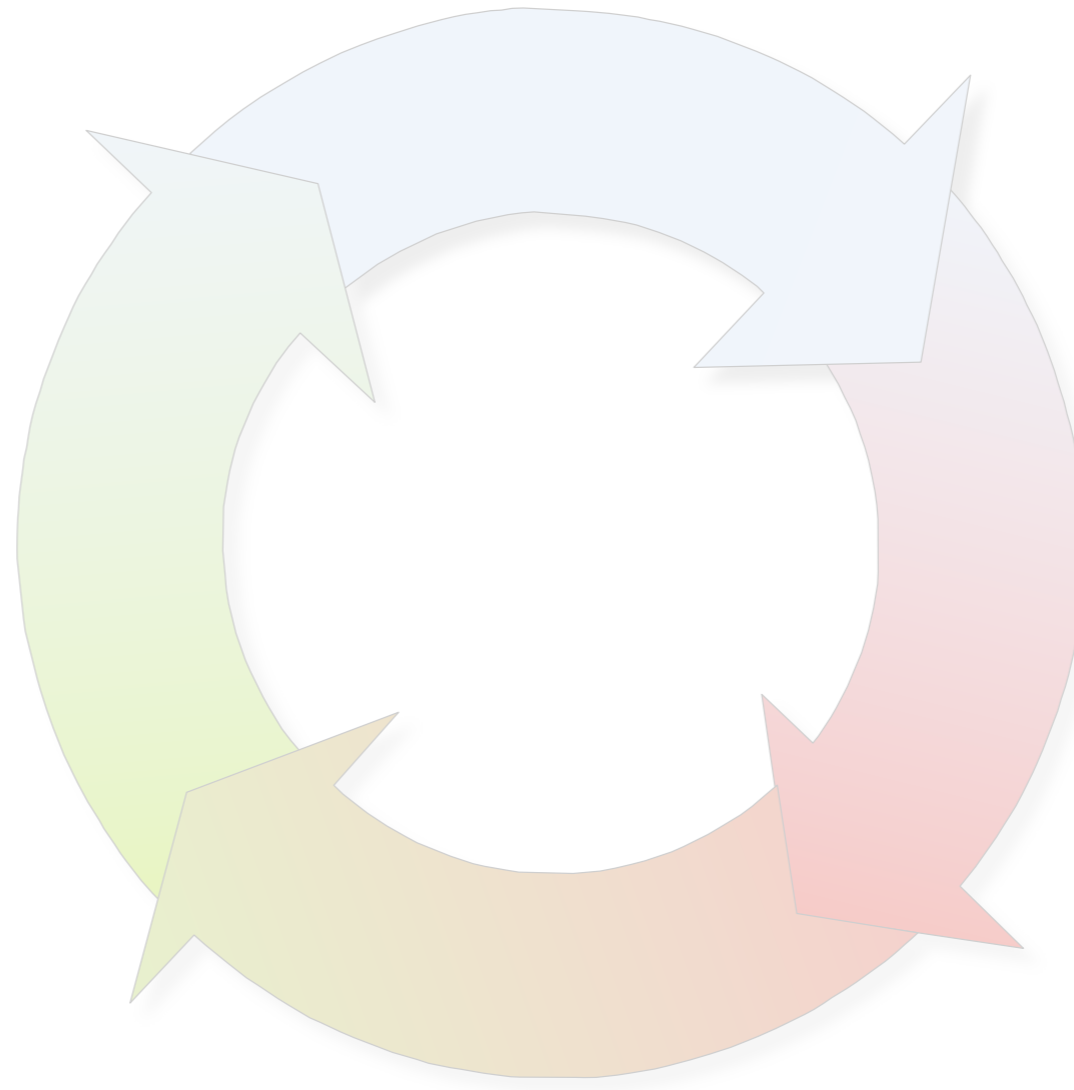
Colorado State University  
Computer Science Department  
USA

**7th International Workshop on Models@run.time (MRT 2012)**

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# The Big Picture

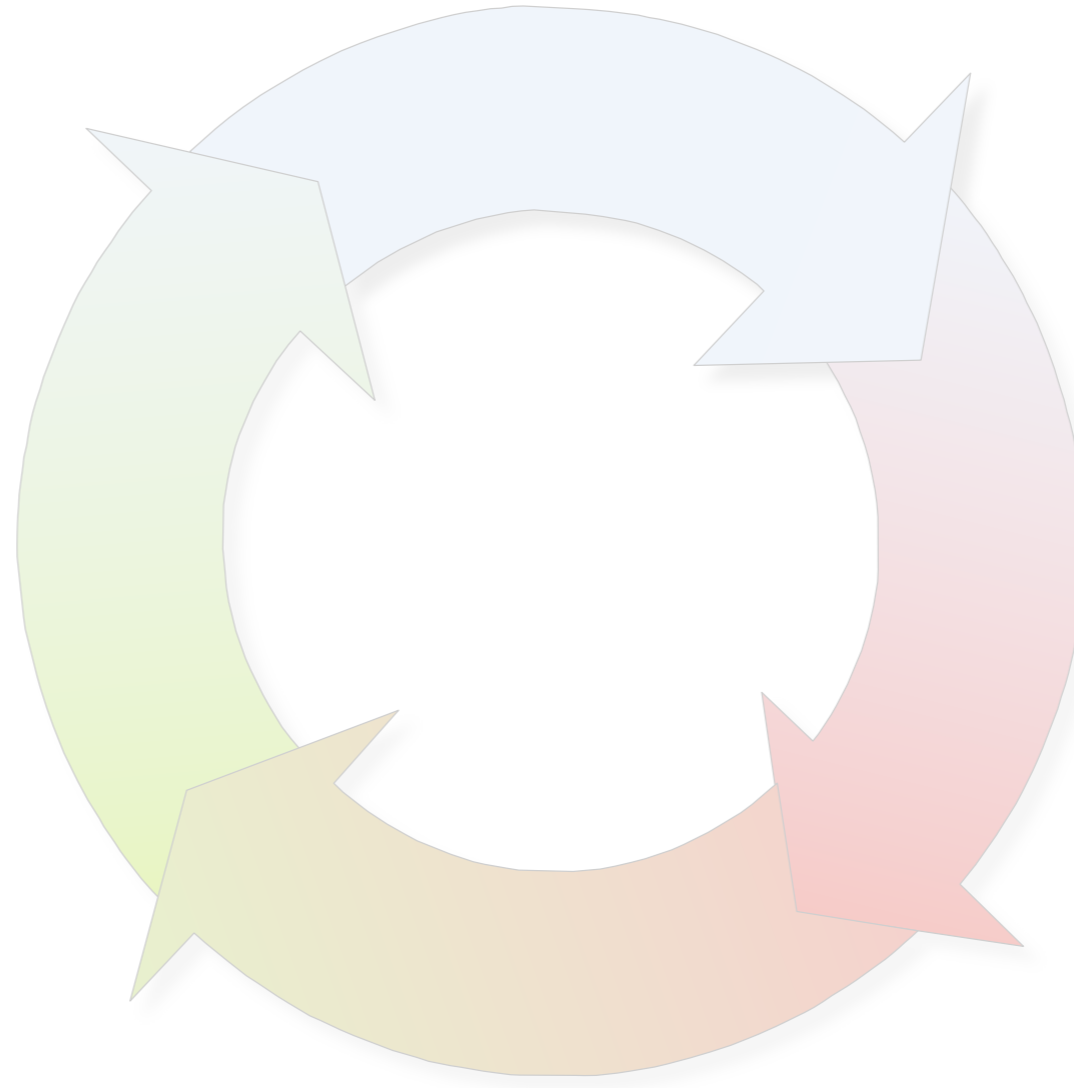
**Capture Feedback Control Loops in networks of reflective actors**



# The Big Picture

## Capture Feedback Control Loops in networks of reflective actors

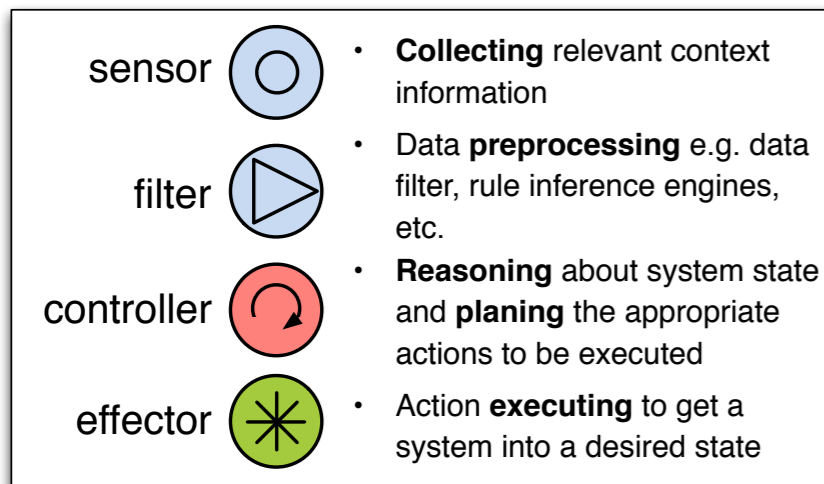
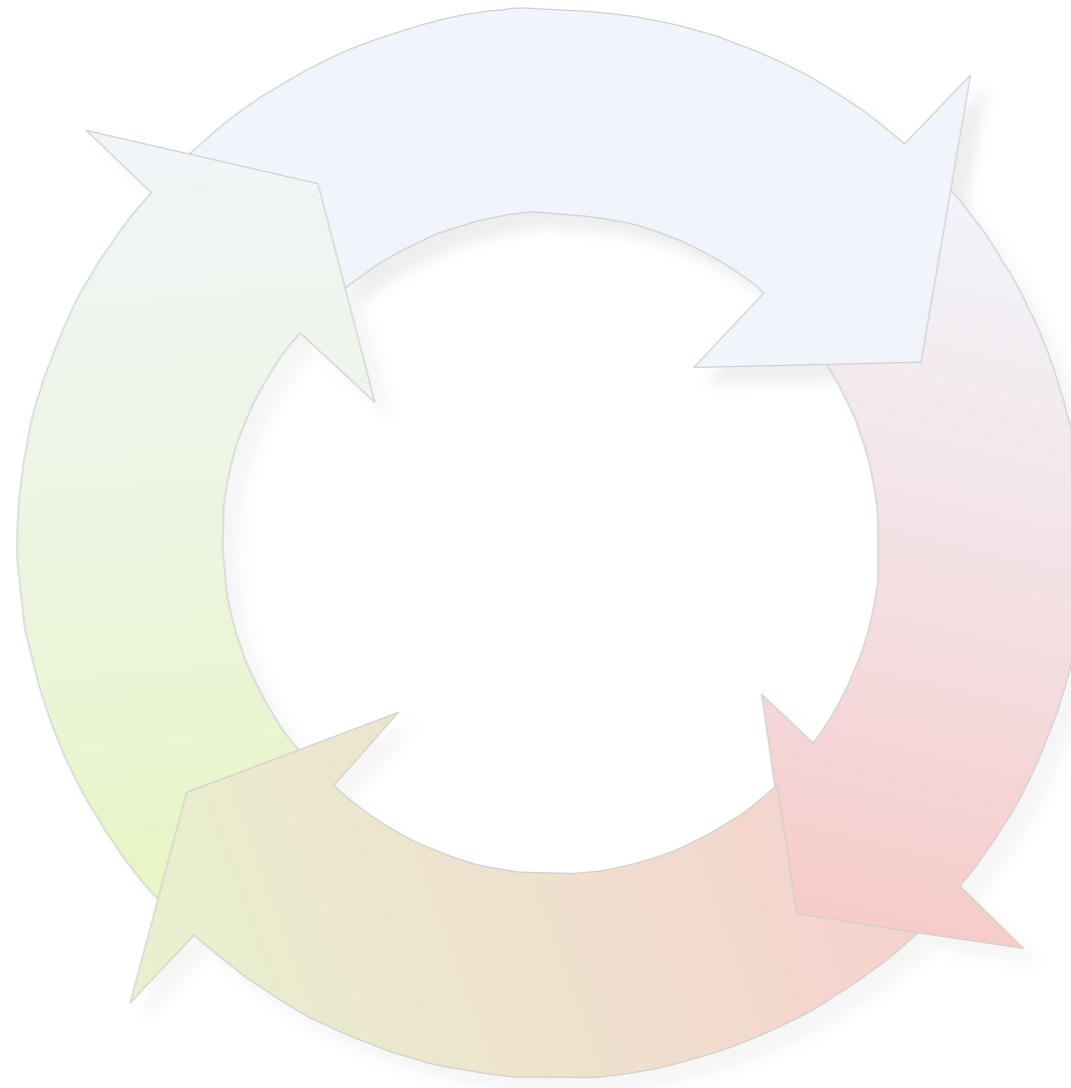
Example: Restart Apache server every time its memory usage exceeds 1GB



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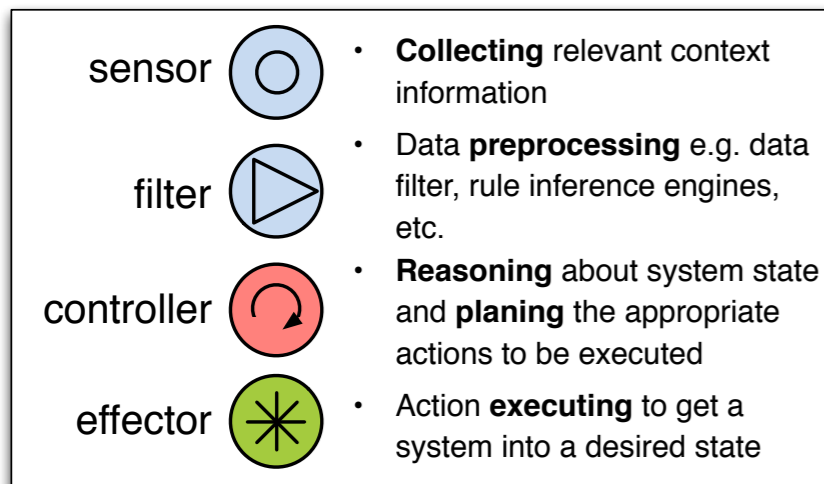
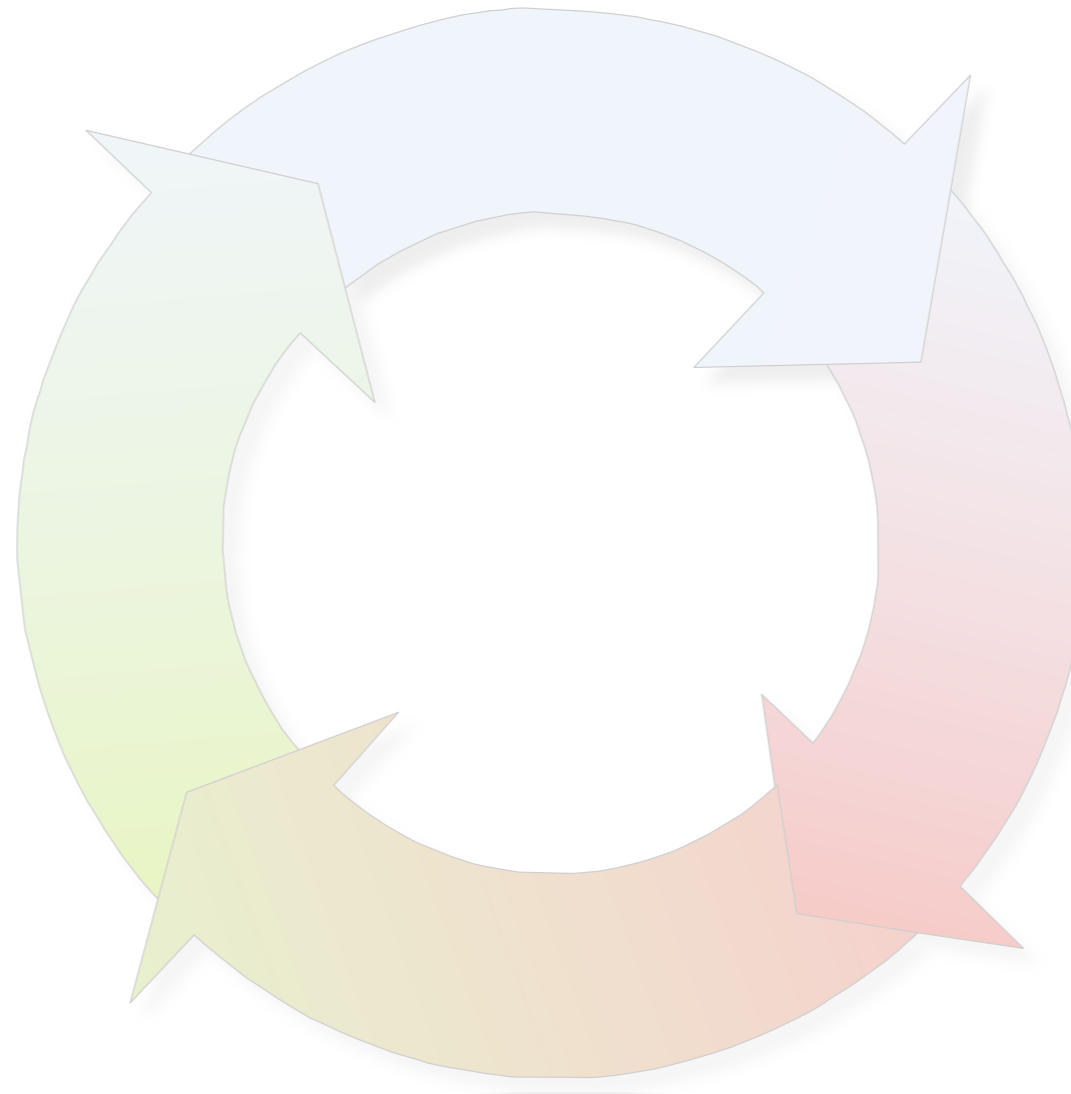
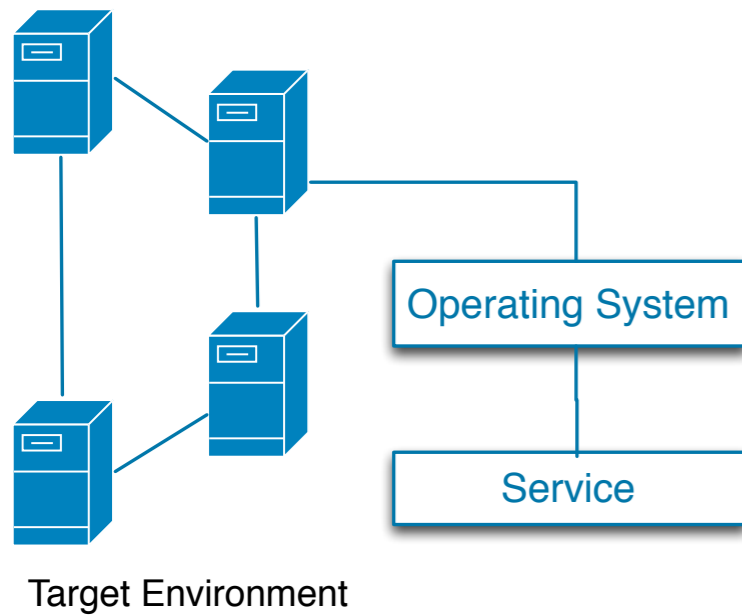
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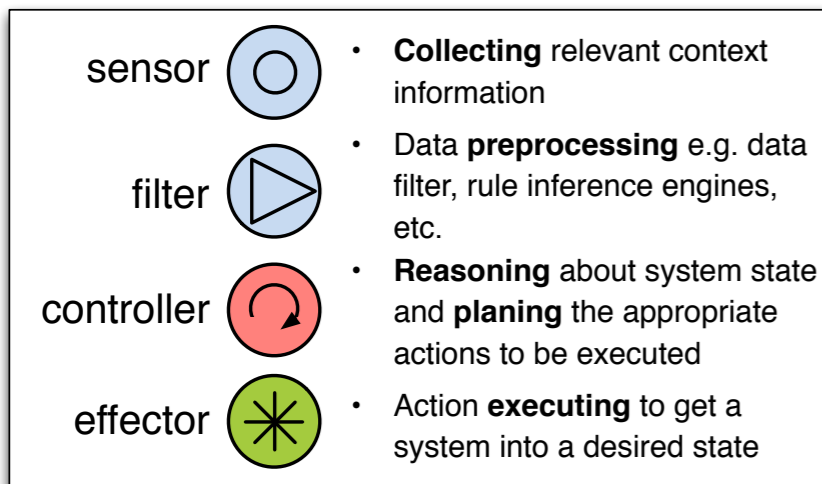
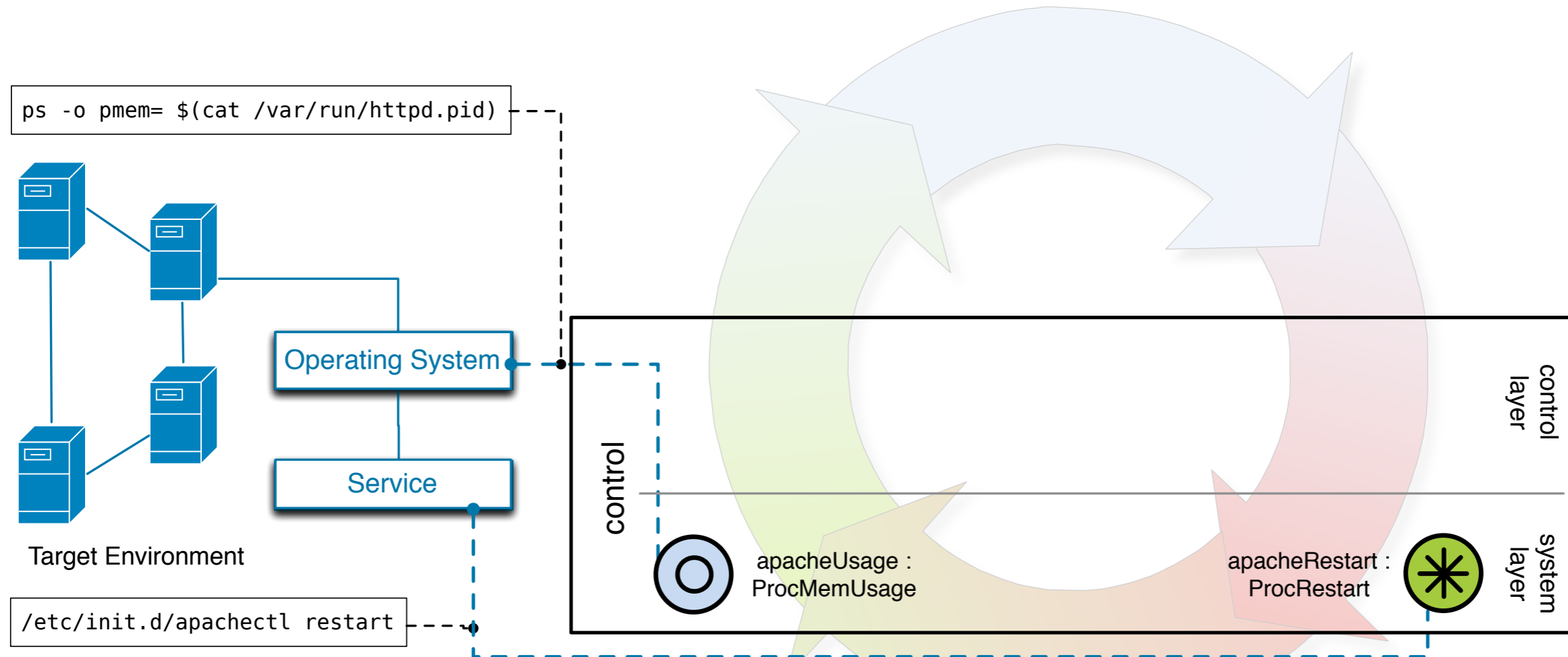
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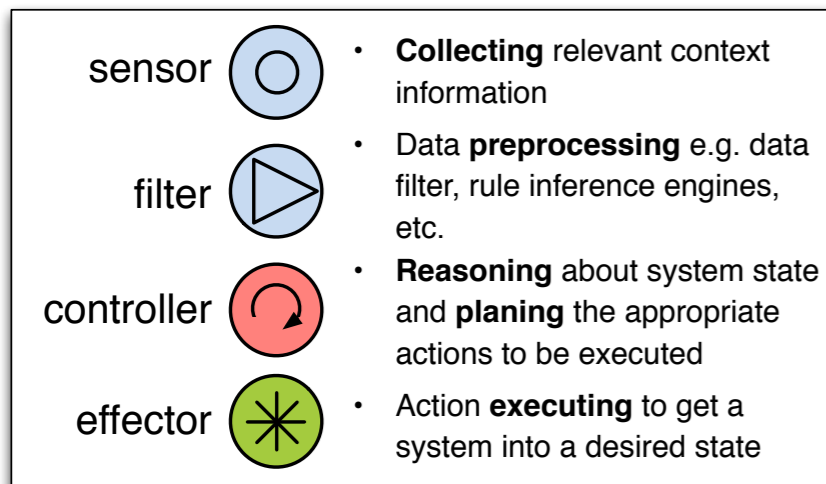
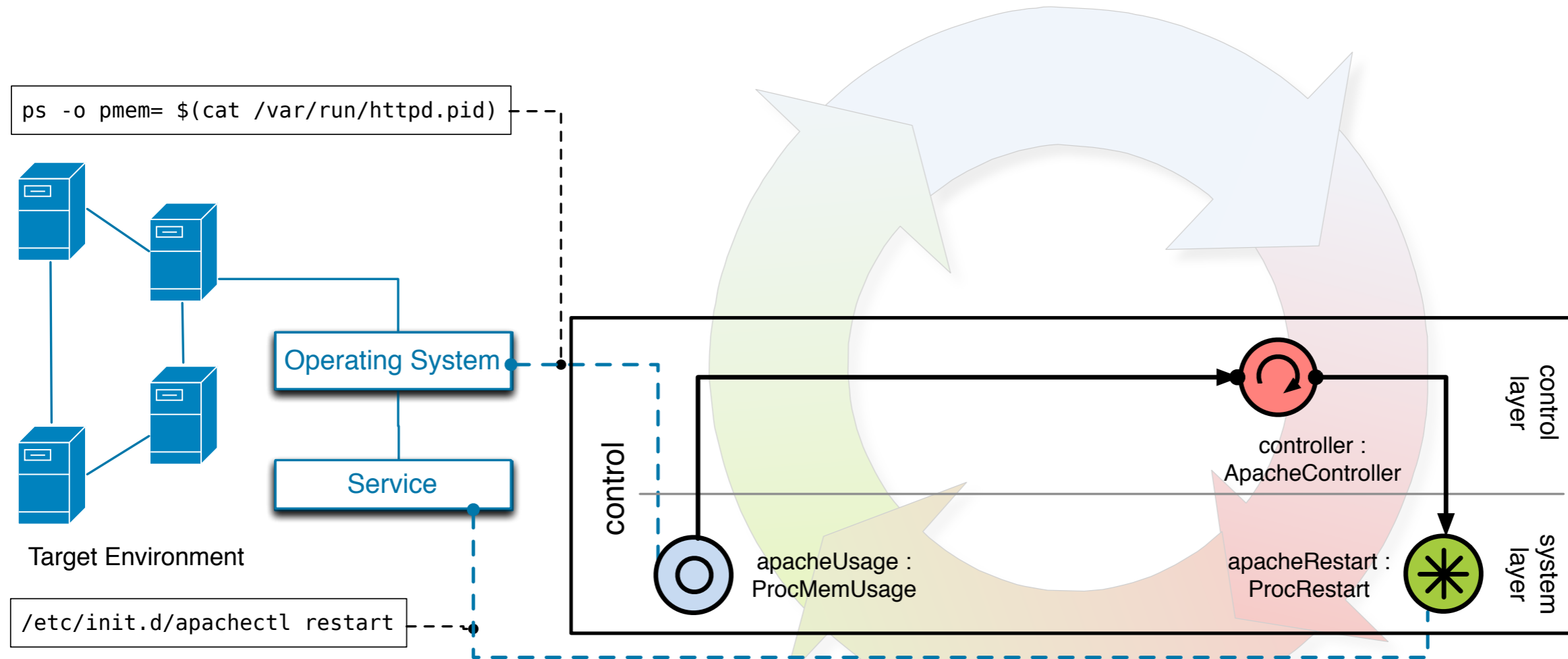
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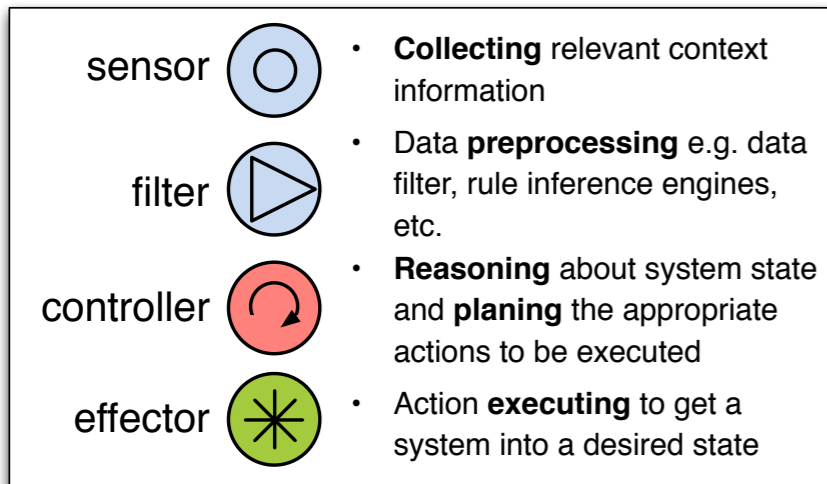
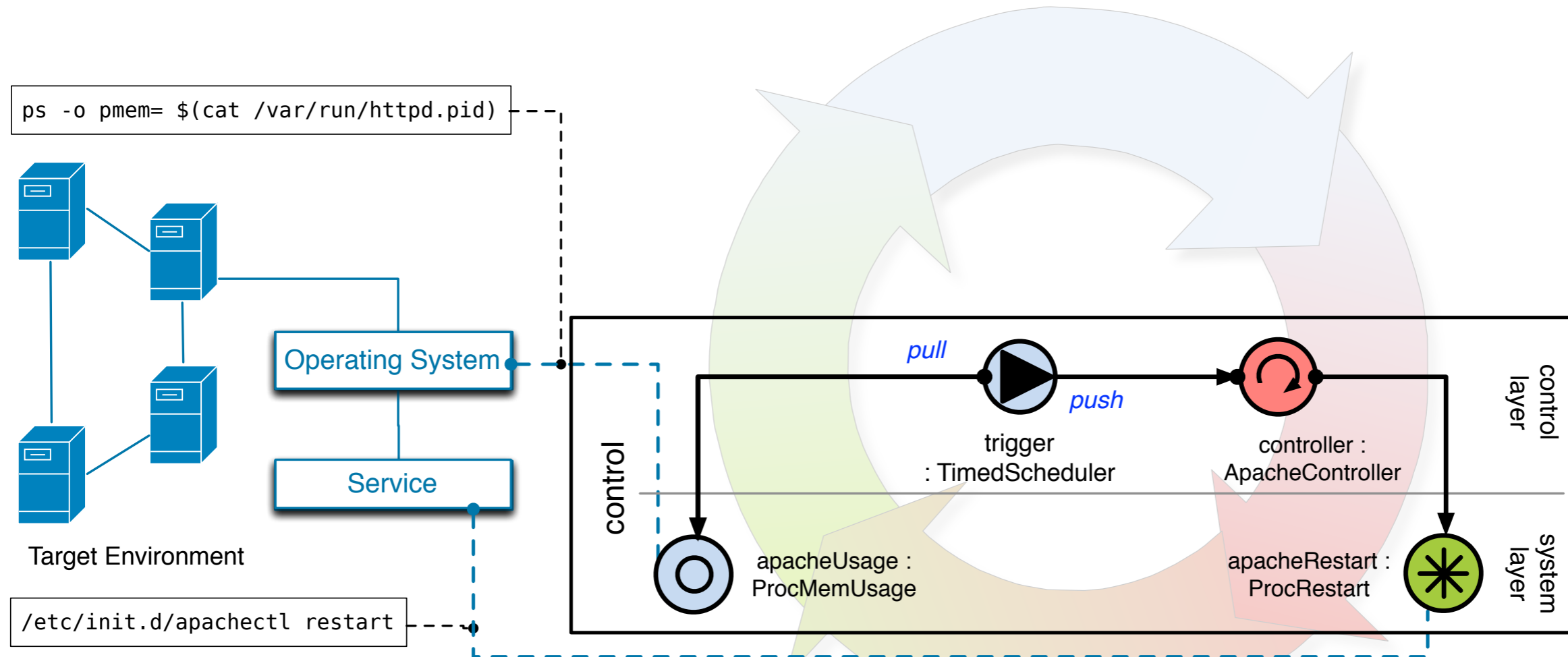
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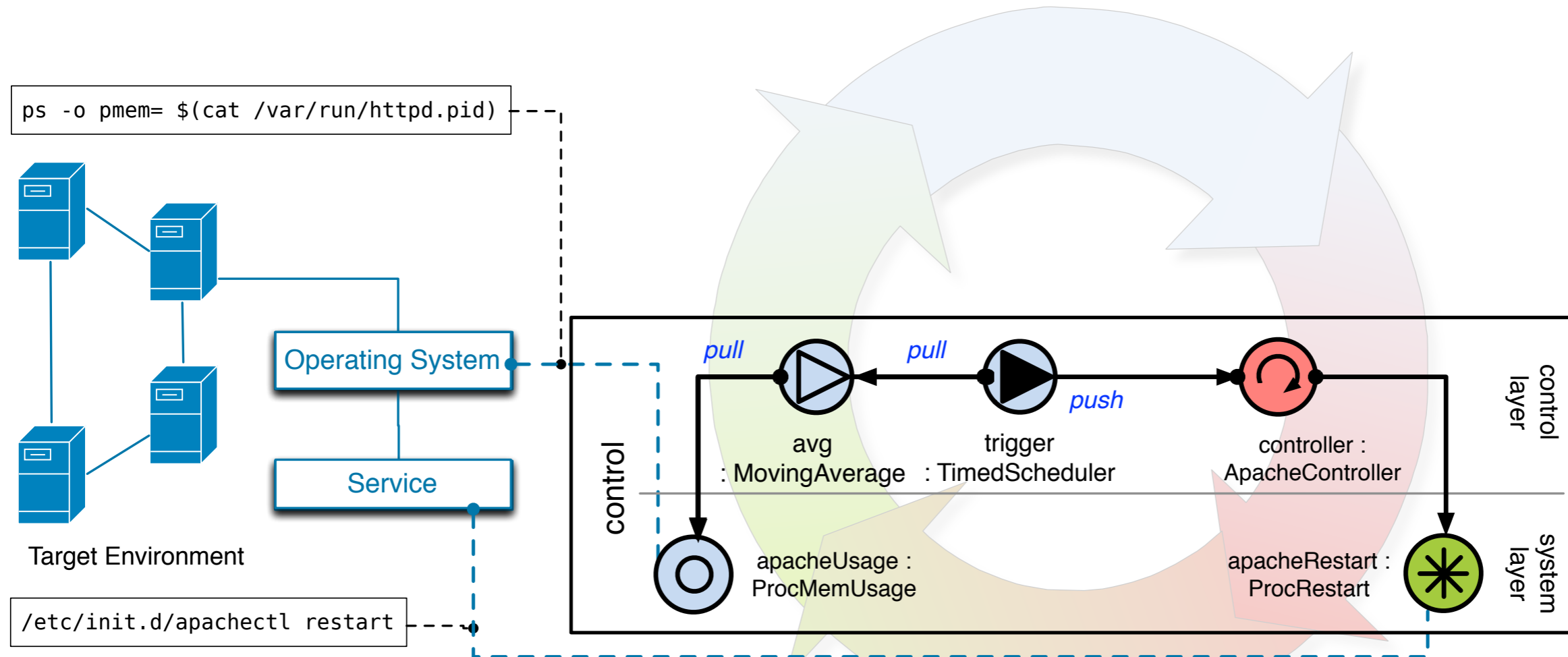








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## Capture Feedback Control Loops in networks of reflective actors

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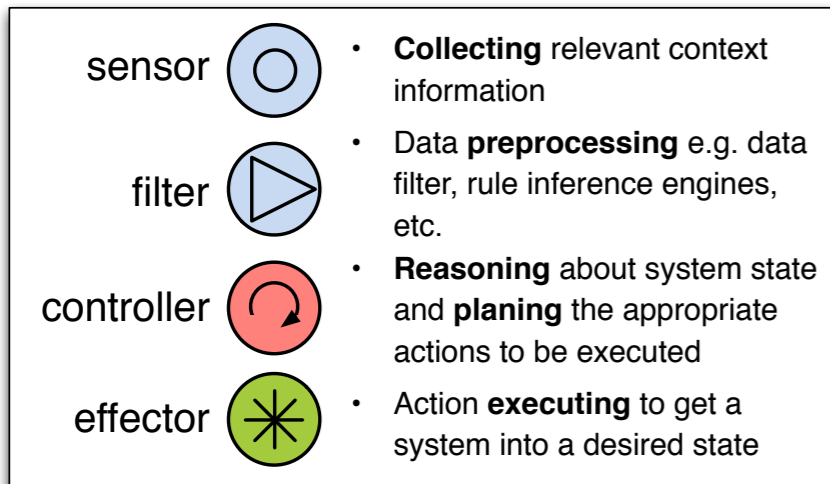
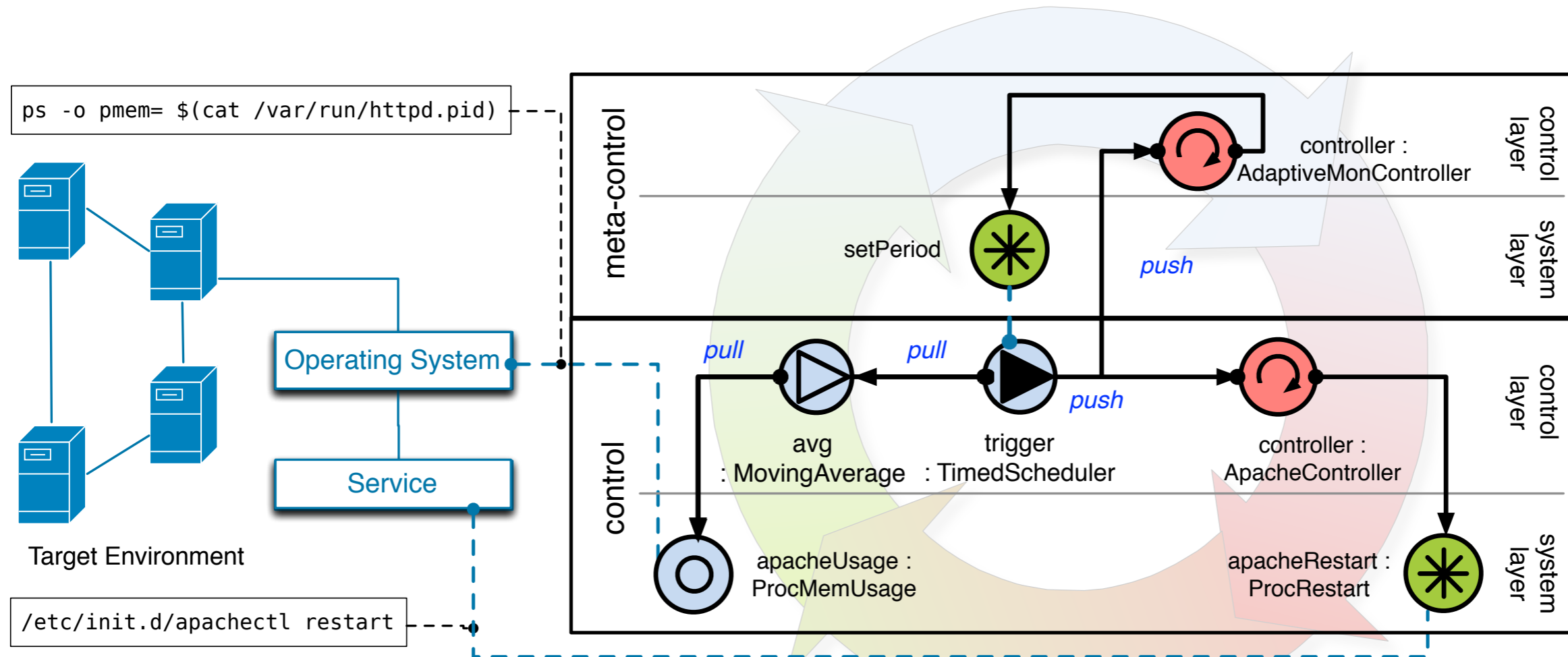


- sensor  • **Collecting** relevant context information
- filter  • Data **preprocessing** e.g. data filter, rule inference engines, etc.
- controller  • **Reasoning** about system state and **planning** the appropriate actions to be executed
- effector  • Action **executing** to get a system into a desired state

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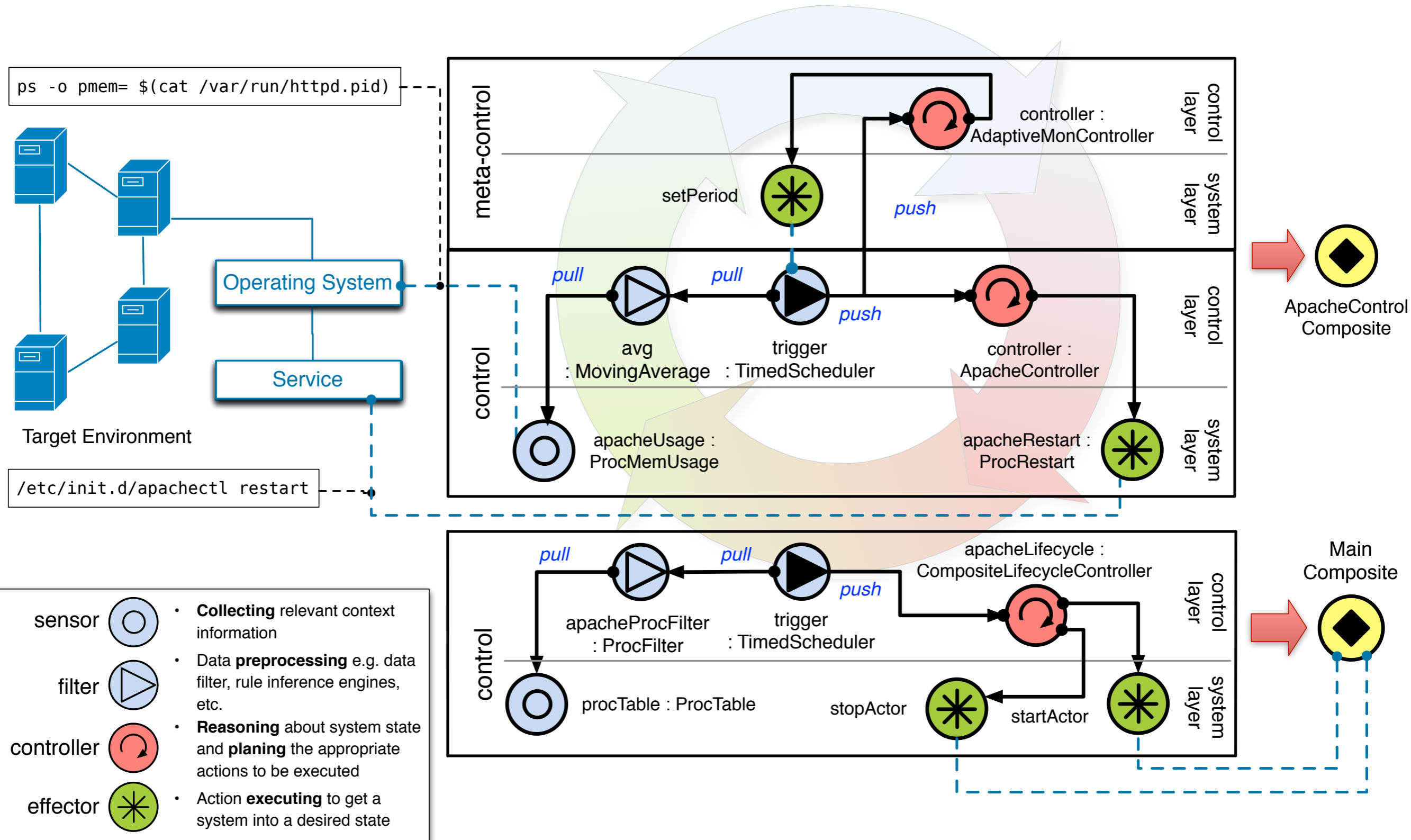
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- **Towards Models@run.time**
  - Alternative form of Models@run.time
  - Explicit and concrete FCLs using reflective actor model
  - Higher-level of abstraction
  - Actors potentially reusable in different scenarios
  - Multiple coordinated and hierarchically layered FCLs
  - Support some non-functional requirements of Models@run.time
    - thread-safety
    - distribution
    - scalability
- **Towards Rapid Prototyping using an MDE toolchain**
  - *Provide researchers and engineers with a tooled approach to experiment with self-adaptive systems*

# Thank you!

<http://nyx.unice.fr/projects/actress>

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