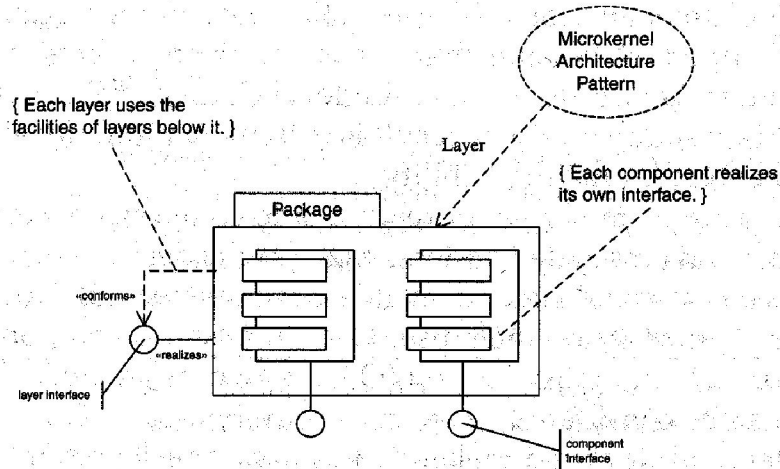


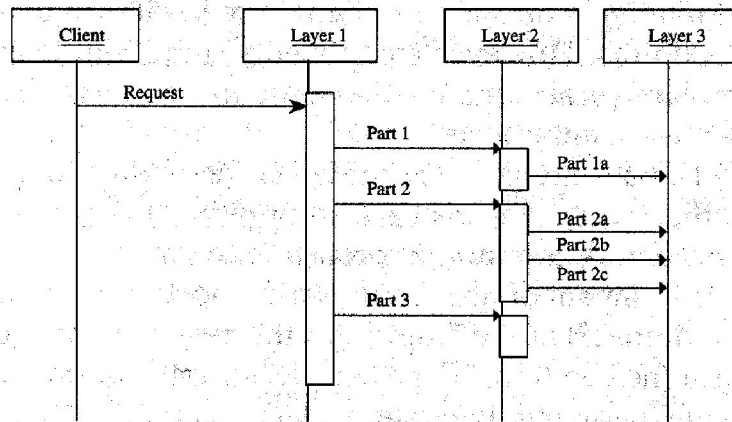
Architectural and Safety Patterns

Modeling of Real-Time Systems
4010-462/0306-672/0306-772

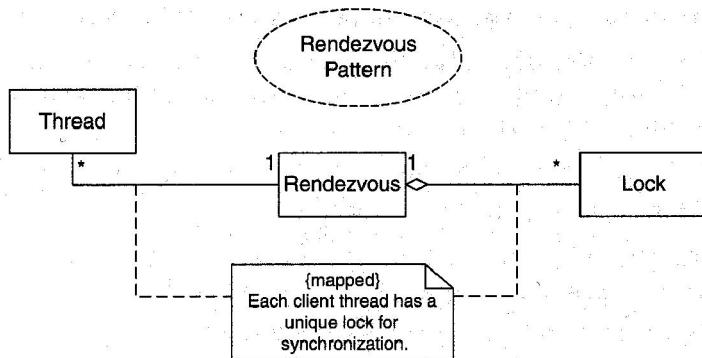
A layered architecture is quite common in either open or closed layering.



What are the advantages and disadvantages of open vs. closed layering?



The Rendezvous pattern requires all colleagues to get to the rendezvous point before any can continue.

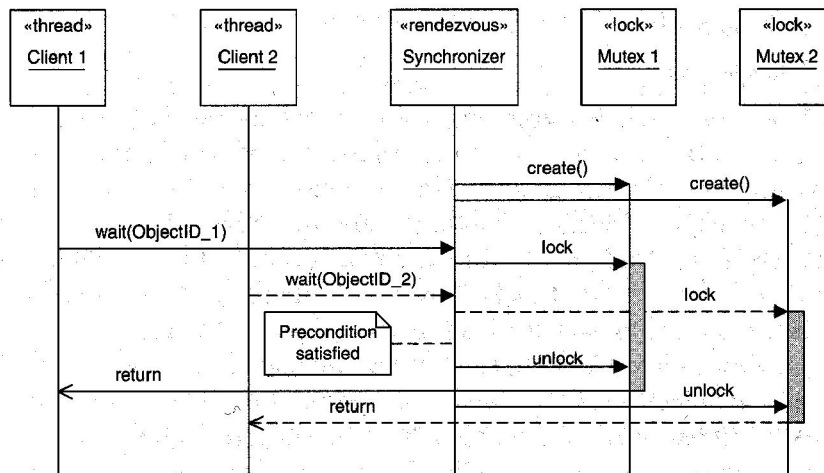


What thread executes the unlock?

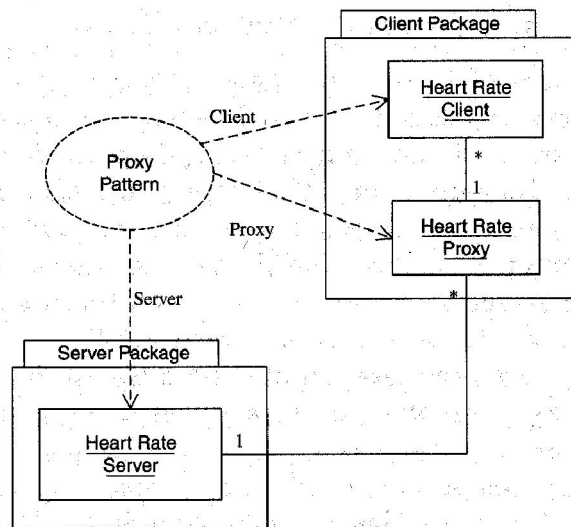
Can this be done with only one mutex?

How can this be done with a semaphore?

What is the best synchronization primitive to use?

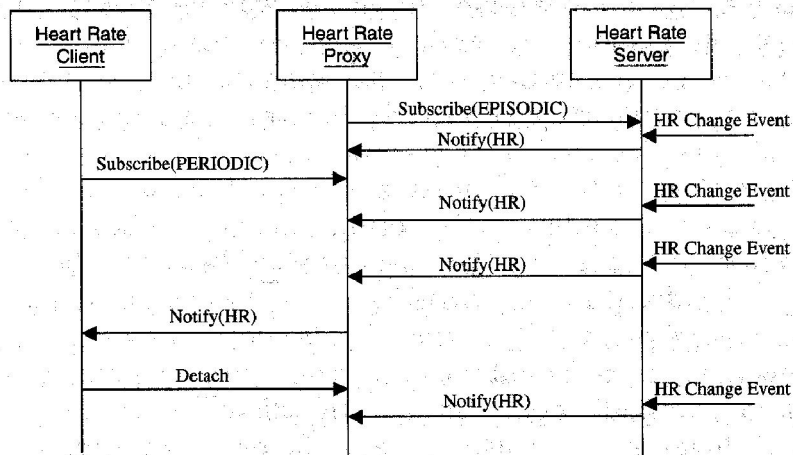


The Proxy pattern hides the details of location and connection mechanism.

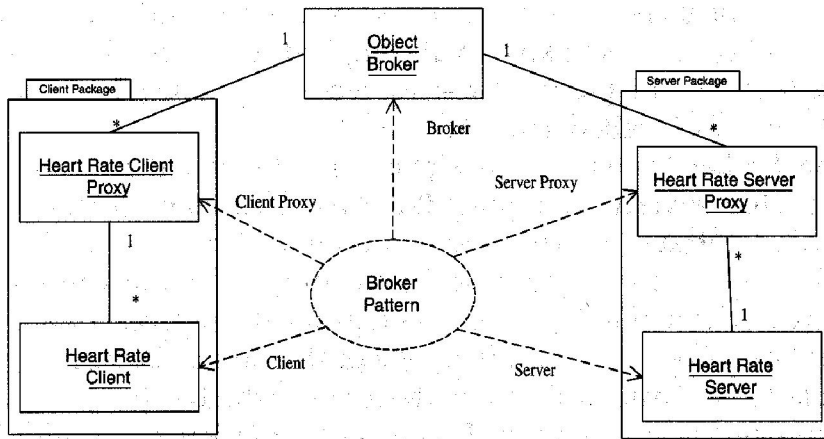


What design pattern does this really look like?

What is the difference between periodic and episodic subscriptions?

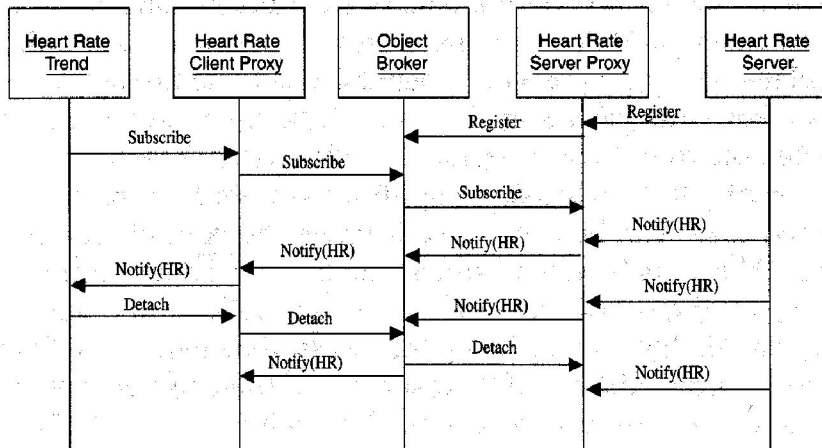


The Broker pattern adds an additional layer of abstraction when connecting to a server.

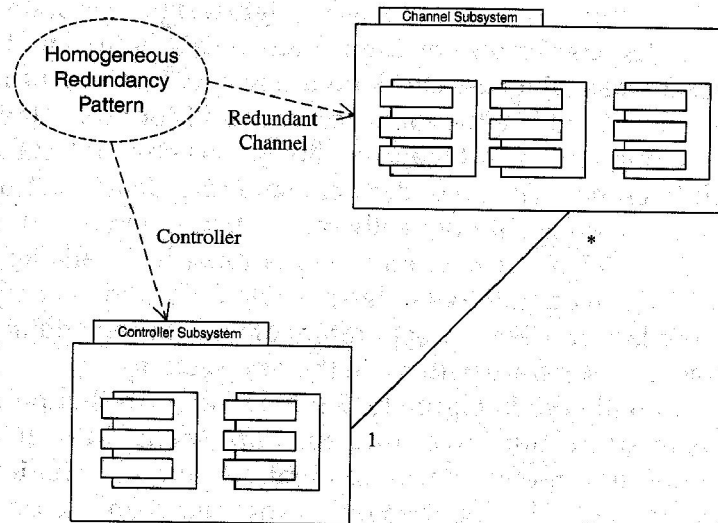


What is the additional layer of abstraction?

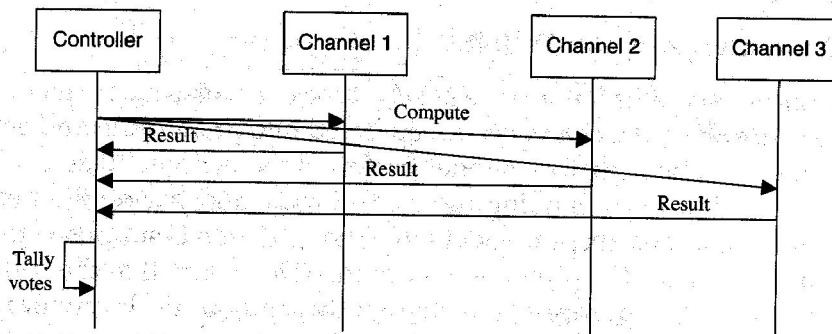
What may be a potential problem for this pattern? How could you get around that? What are the positive and negatives of that "fix"?



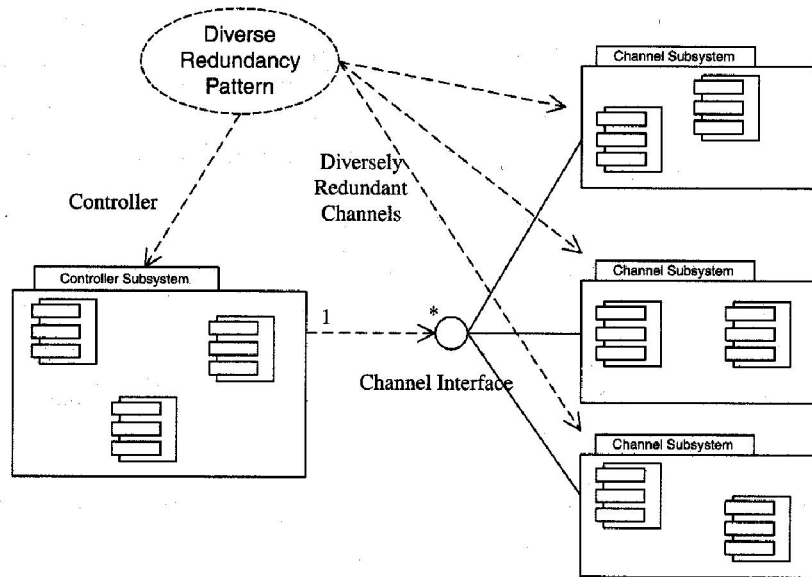
The Homogeneous Redundancy uses multiple identical systems.



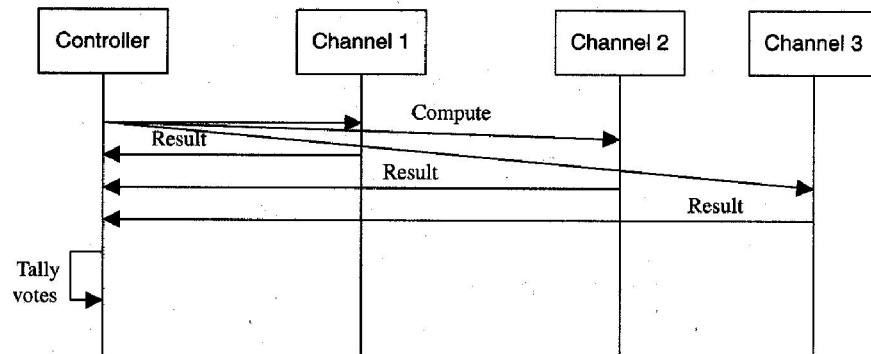
What are the advantages and disadvantages of this safety architecture?



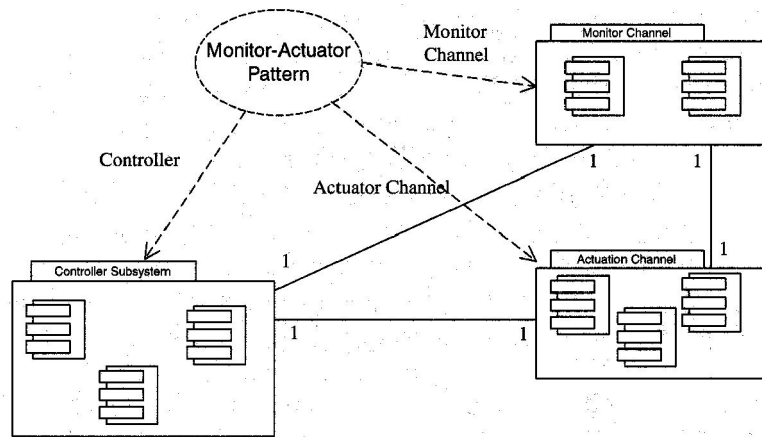
The Diverse Redundancy uses multiple systems that are all different.



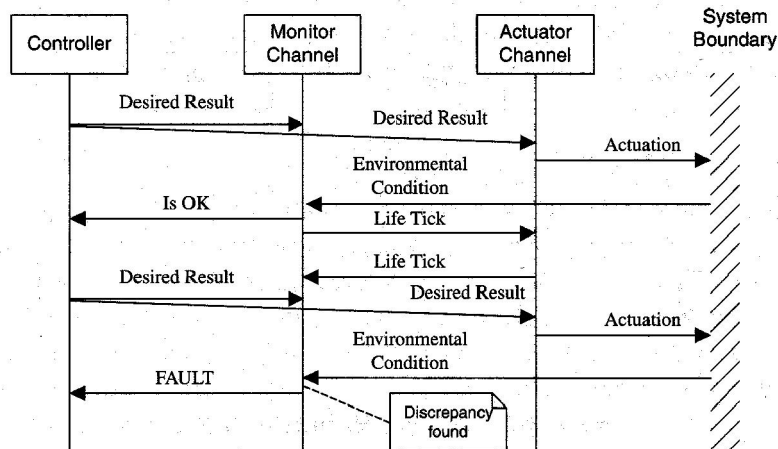
What are the advantages and disadvantages of this safety architecture?



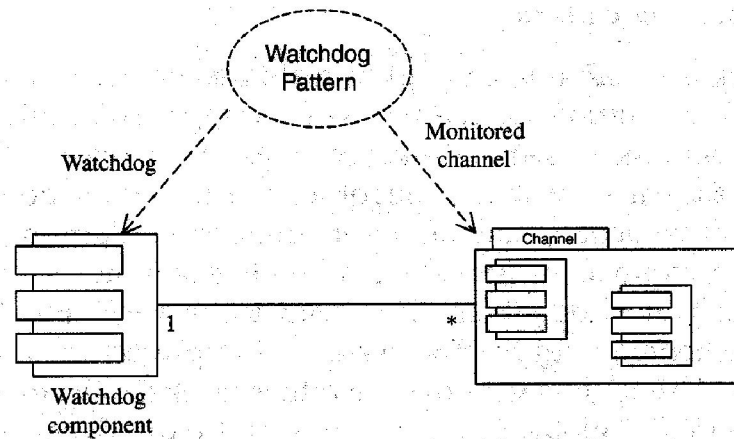
The Monitor-Actuator pattern has a monitor safety component keeping tabs on the actuator.



What is the Life Tick?
What should happen if Life Ticks stop?

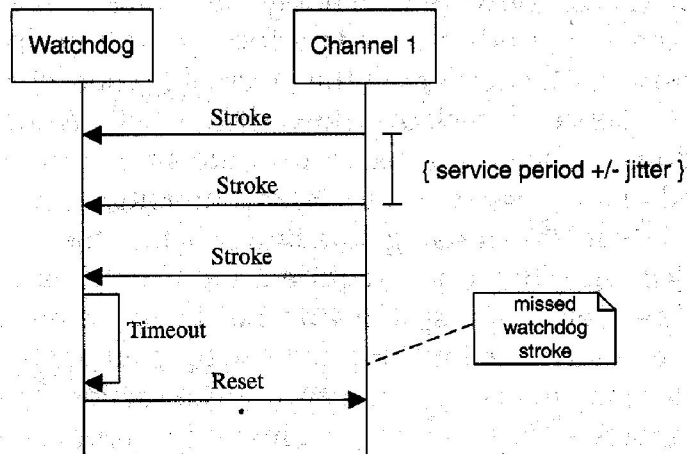


The Watchdog pattern is a basic safety pattern telling little more than something is running.

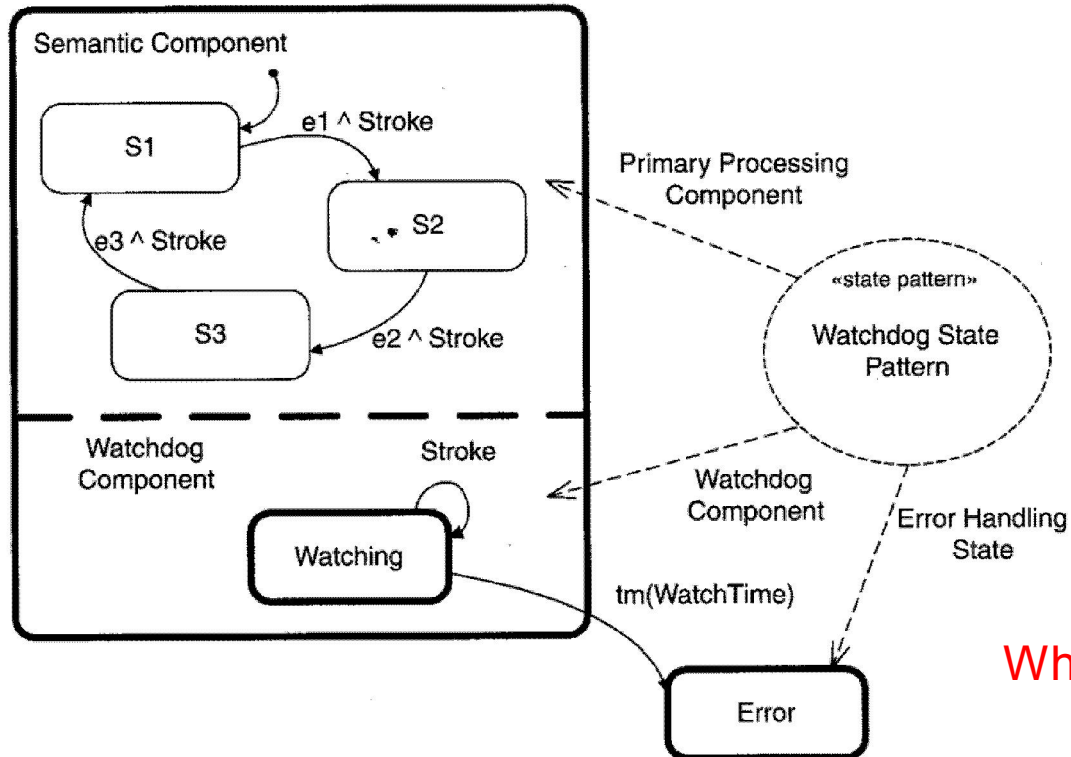


How do you determine the timeout period?

What is the optimal stroke interval?

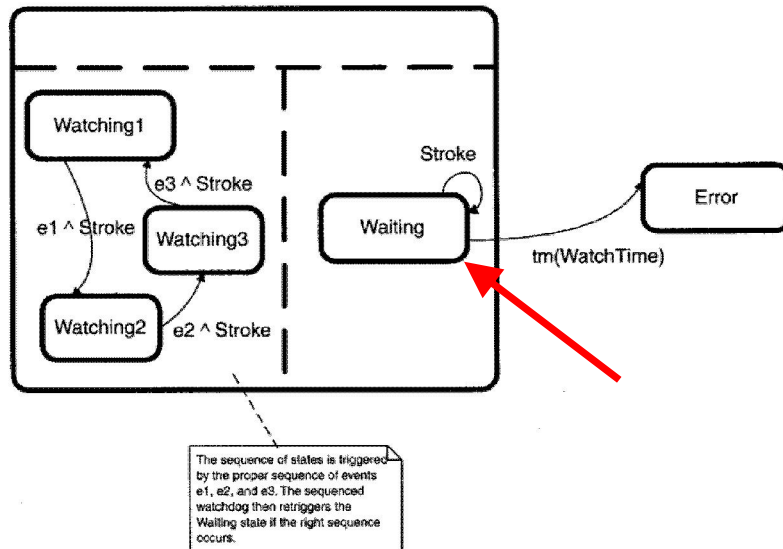
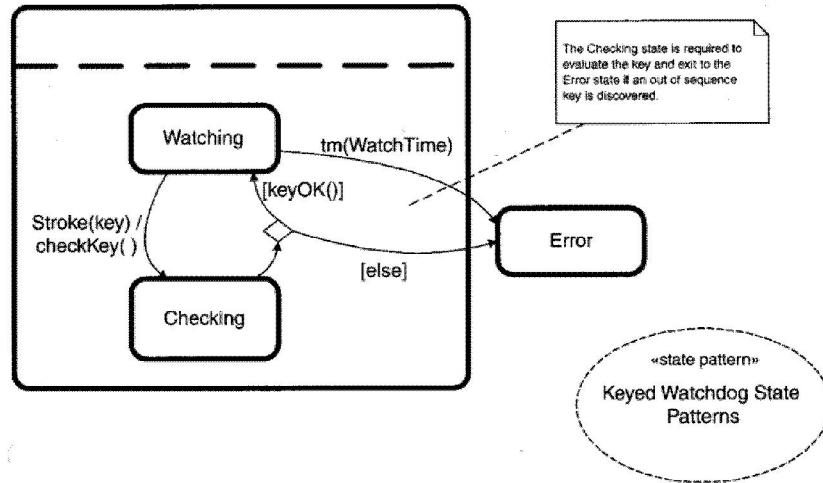


The Watchdog pattern's behavior is not difficult to define in a statechart.



What are the advantages of stroking after each processing step?

The Keyed Watchdog pattern adds an identifier to each stroke of the watchdog.

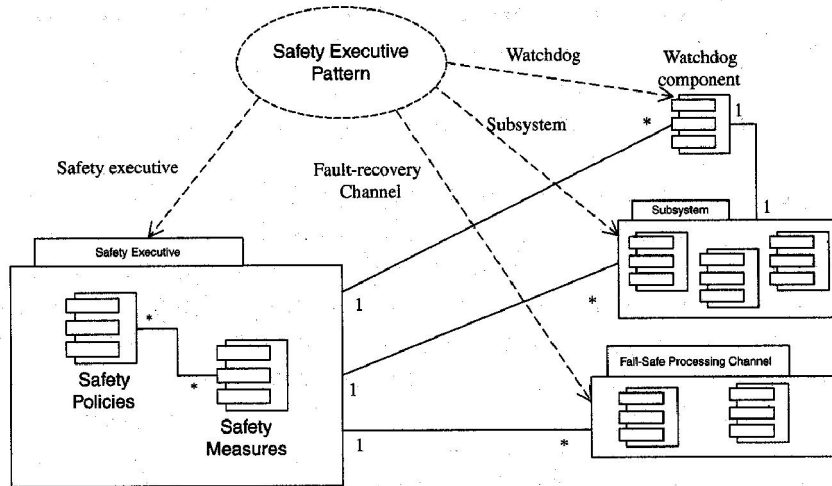


What does the checkKey() function look for?

Do we need the simple watchdog also?

What feature of SE441 FSPs can this pattern implement?

Safety Executive monitors safe operation and coordinates the response to failures.



If the failure response requires coordinated action by several components, which design pattern does this look like?

