#lang minimart

Actors for Racket

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Actors

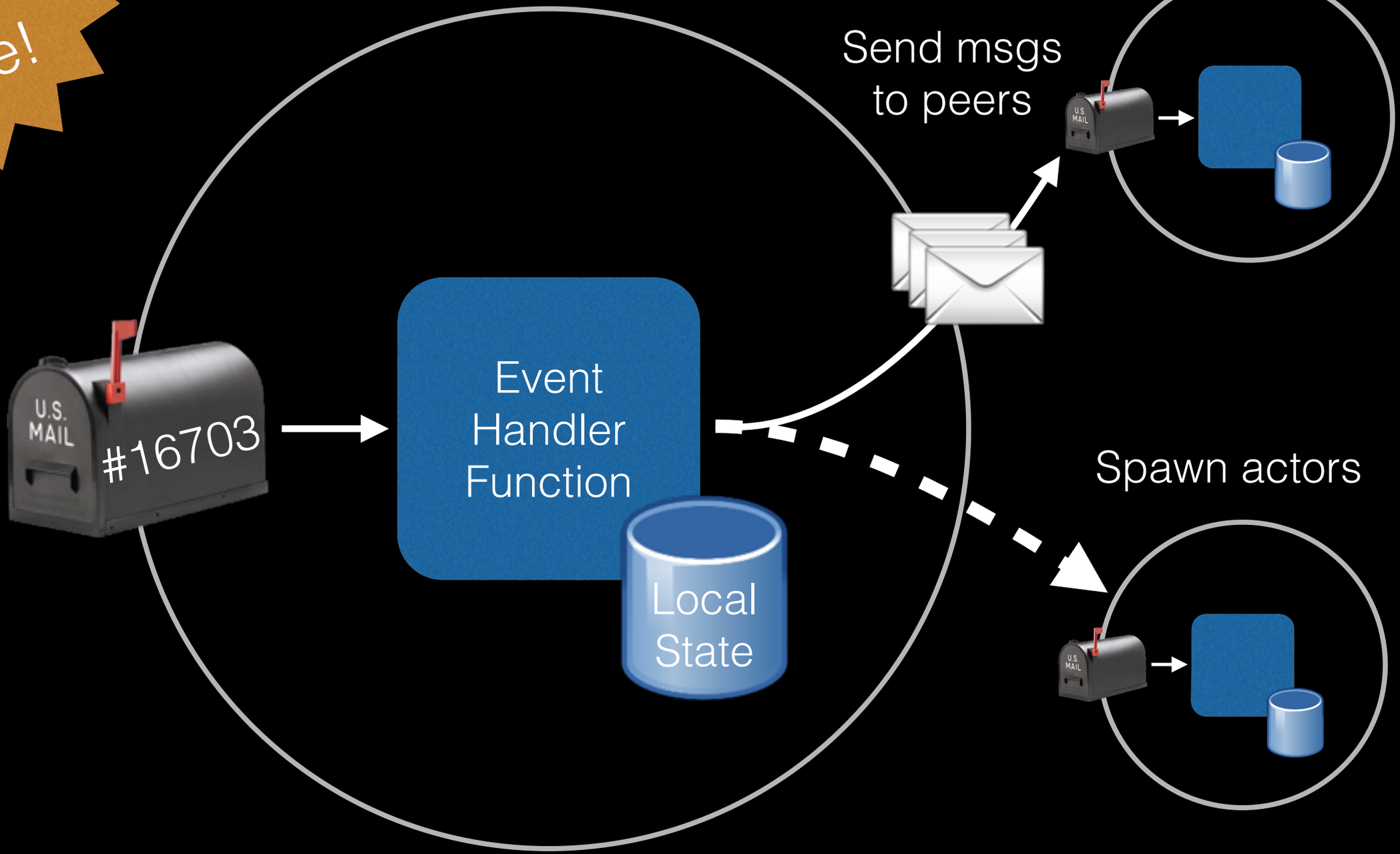
Languages

Influenced

Libraries

Networks

Basic Actor Model



Too Simple

Ubiquitous Problems…

Event broadcasting
Crash/exit signaling
Readiness notification

Composition
Distribution

… many more

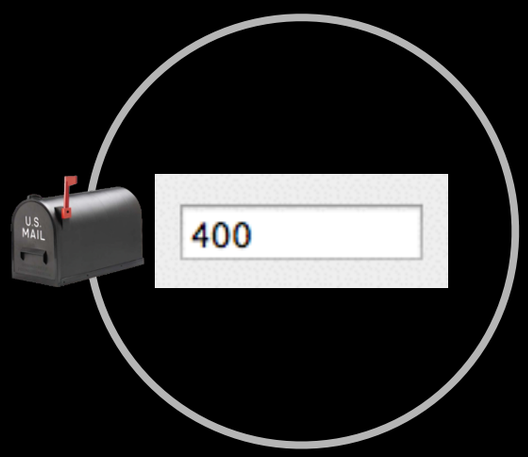
…Uniform Solution

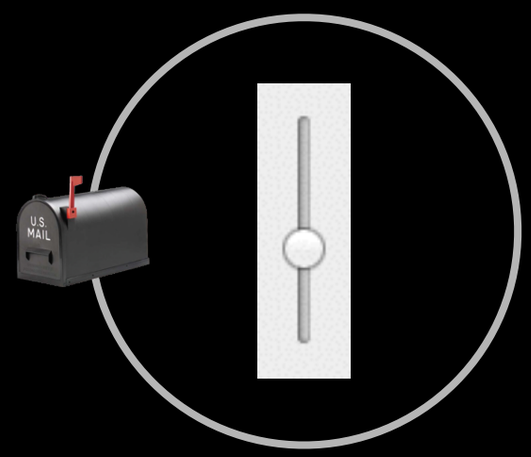
Event broadcasting → Publish / Subscribe (Multicast)

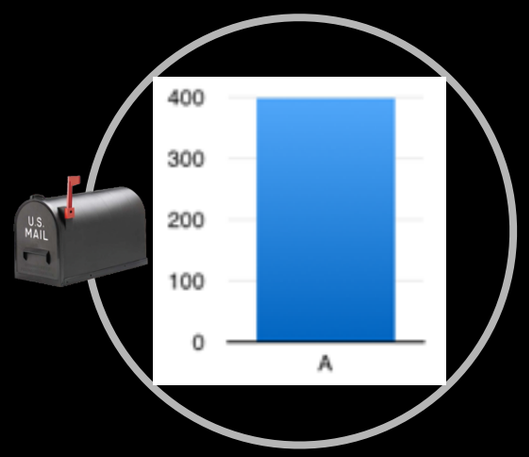
Crash/exit signaling
Readiness notification → Routing Events

Composition
Distribution → Layered groups of *functional* actors

Event Broadcast







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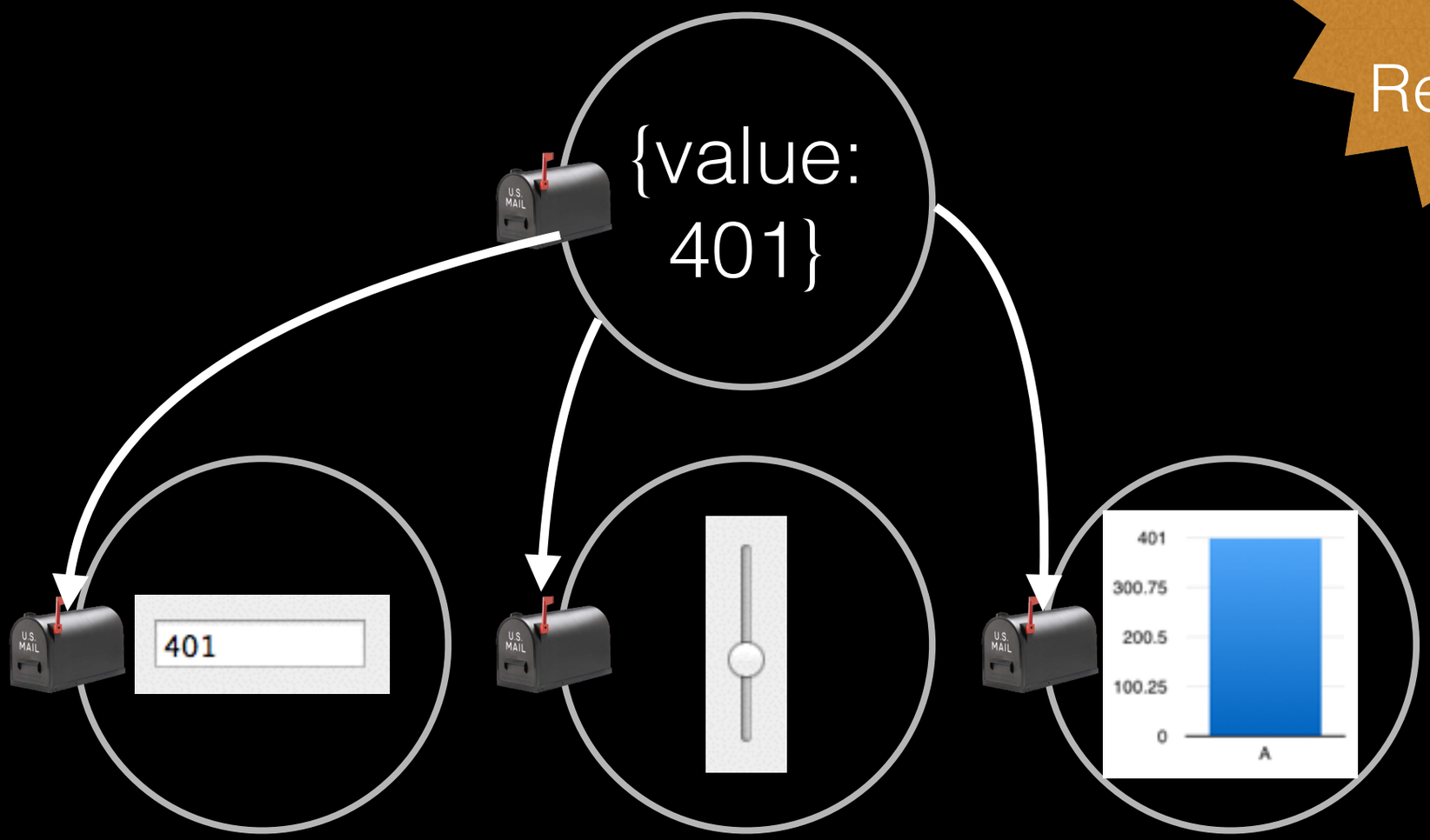
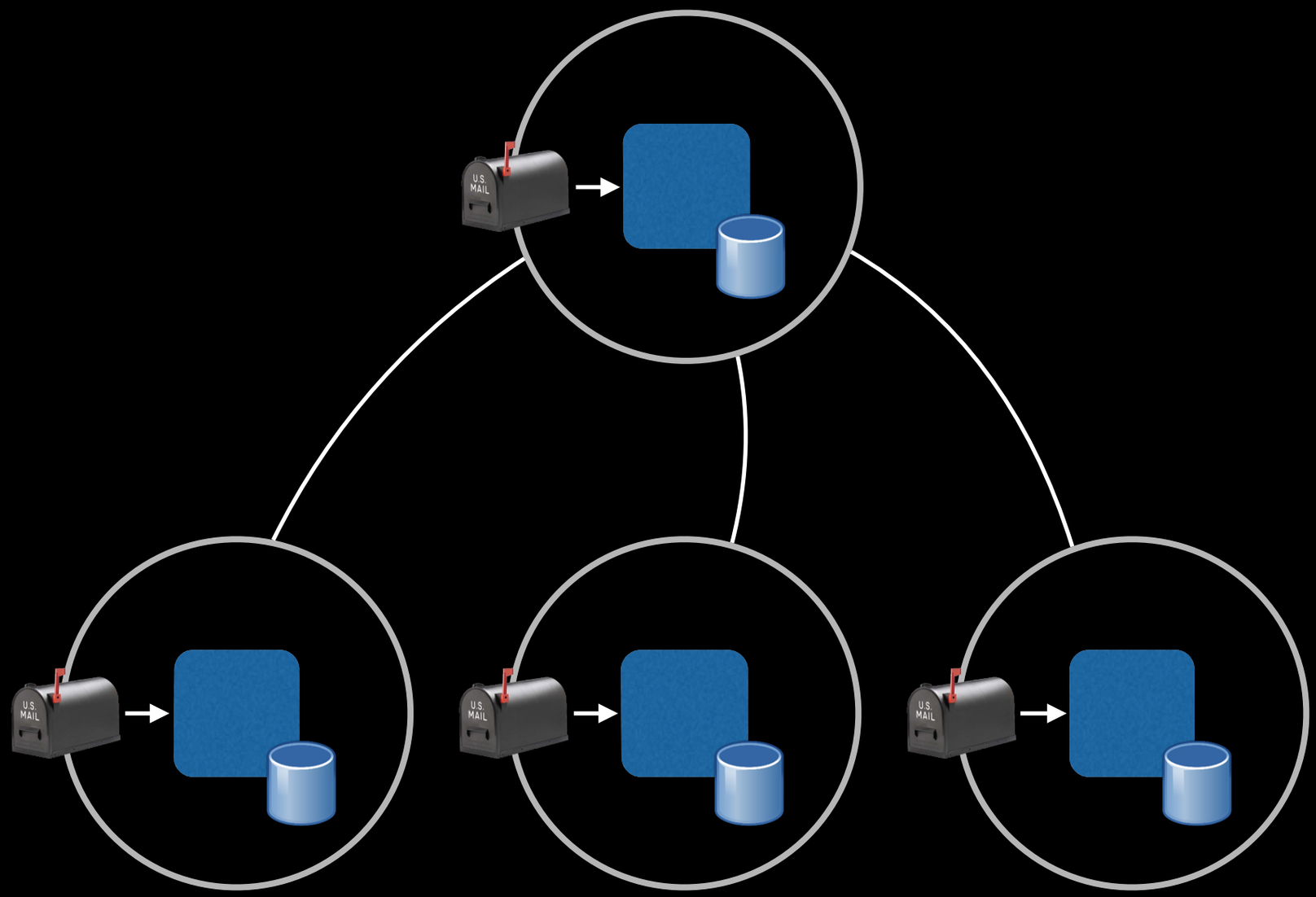


Subscriber List Required!

Crash Signalling



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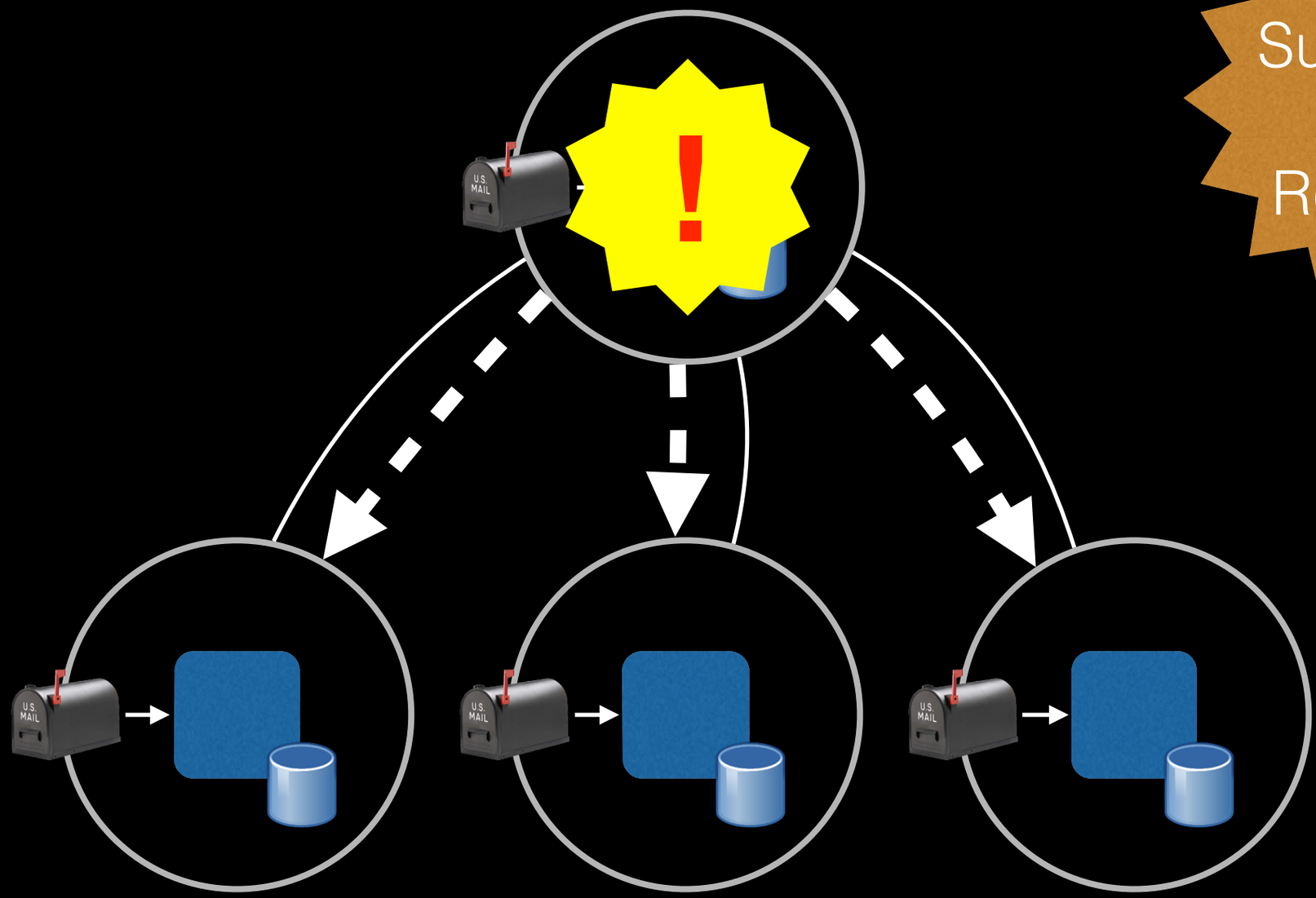
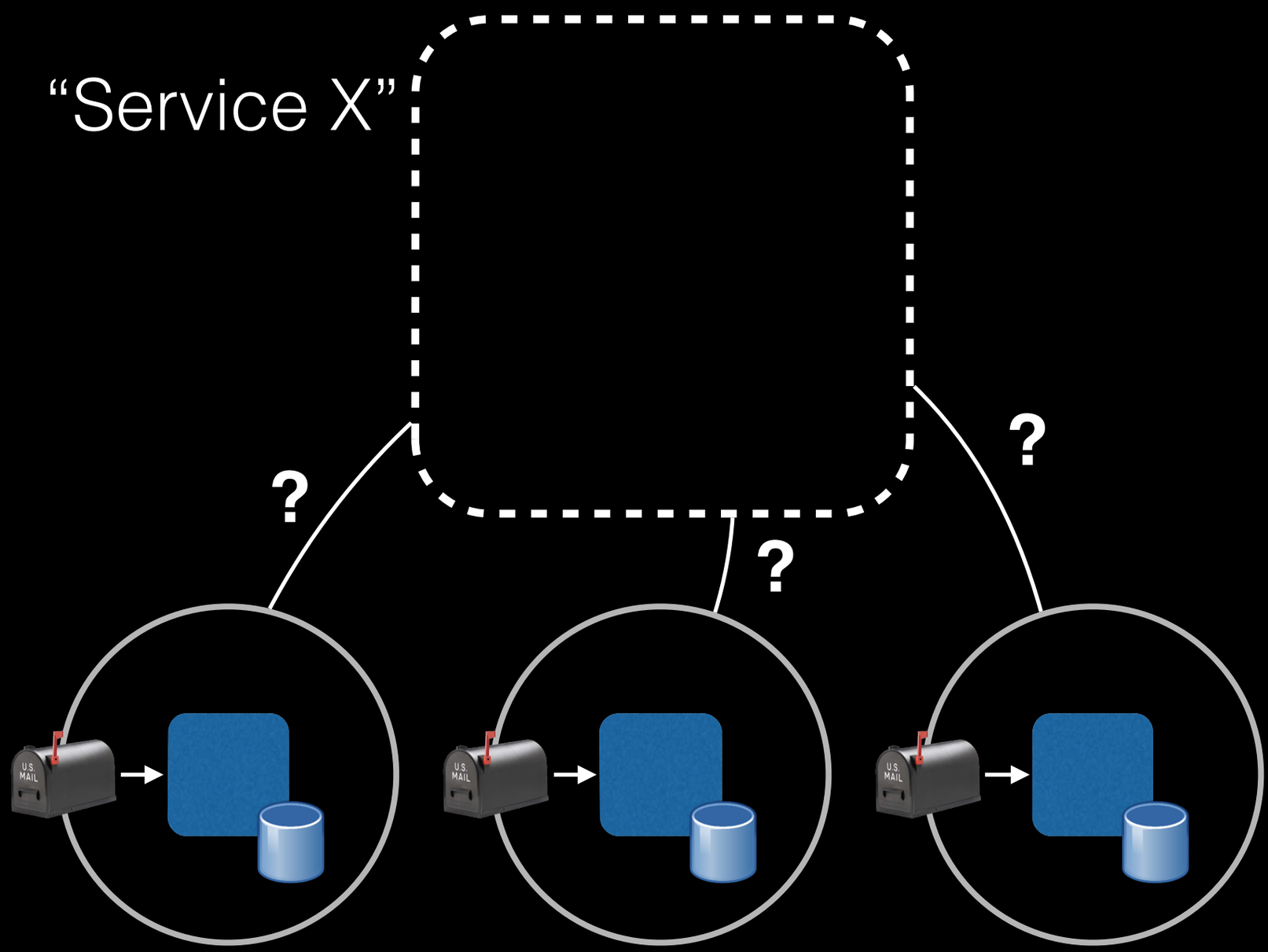


Subscriber List Required!

Readiness Notification



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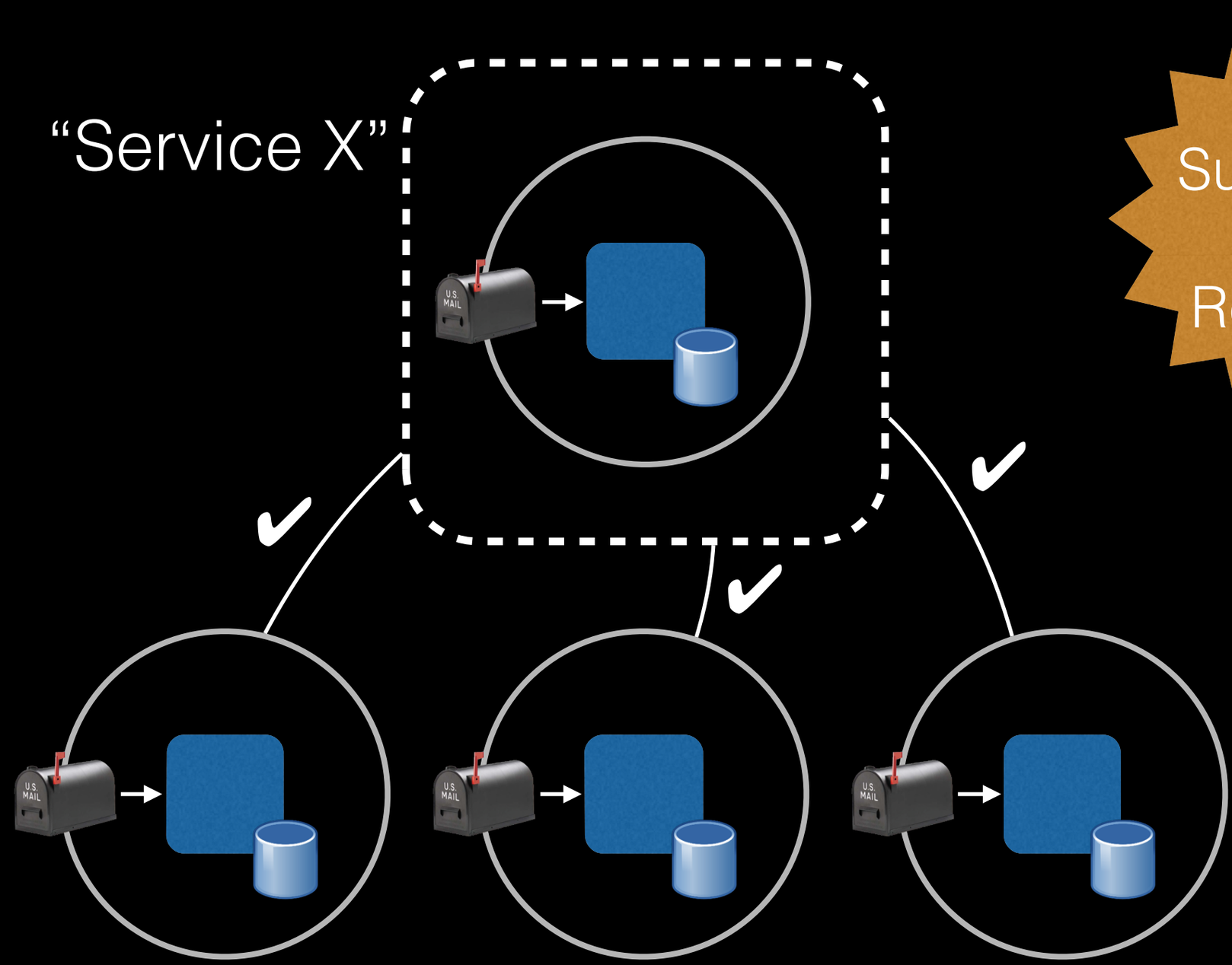

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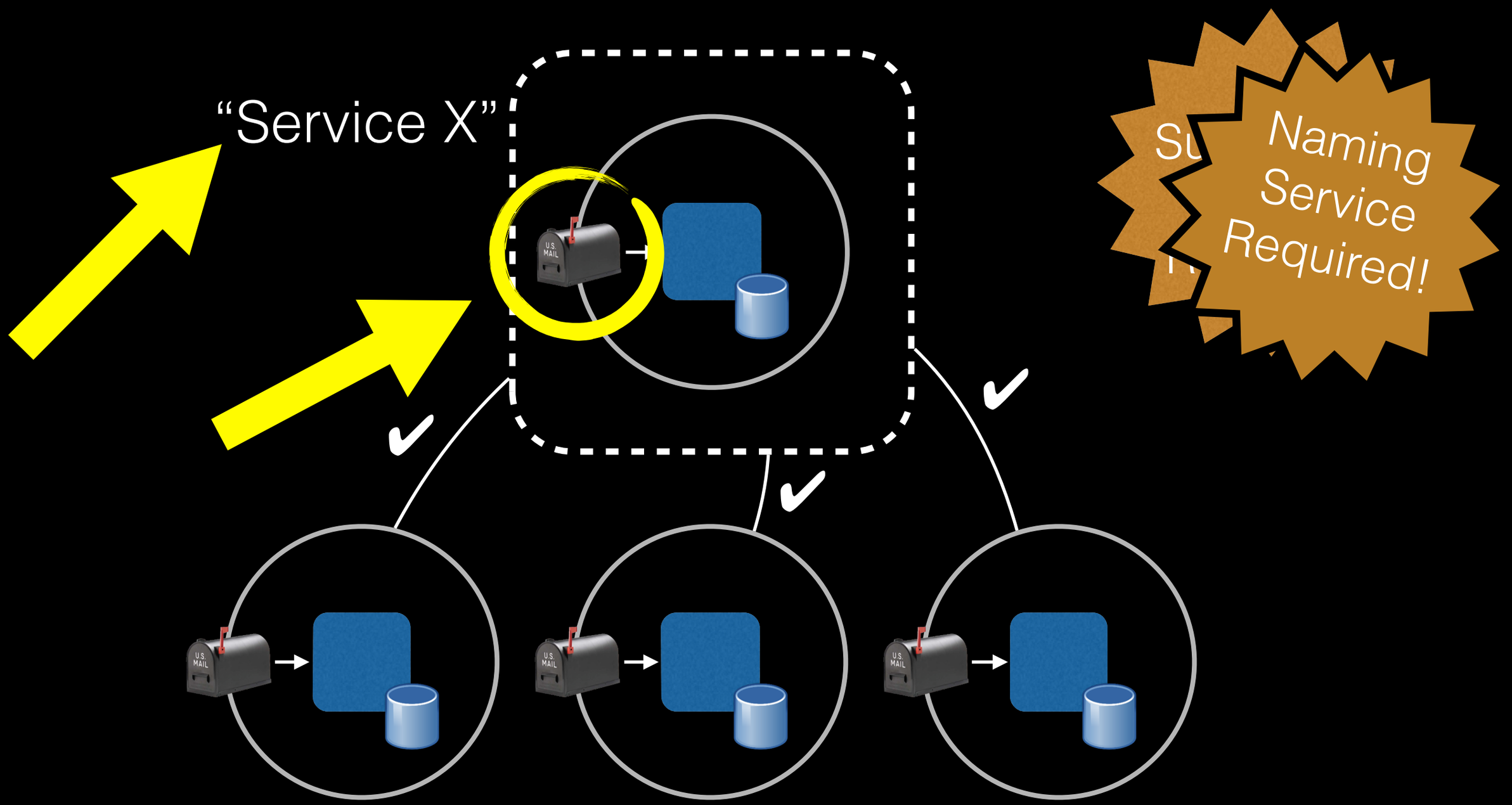
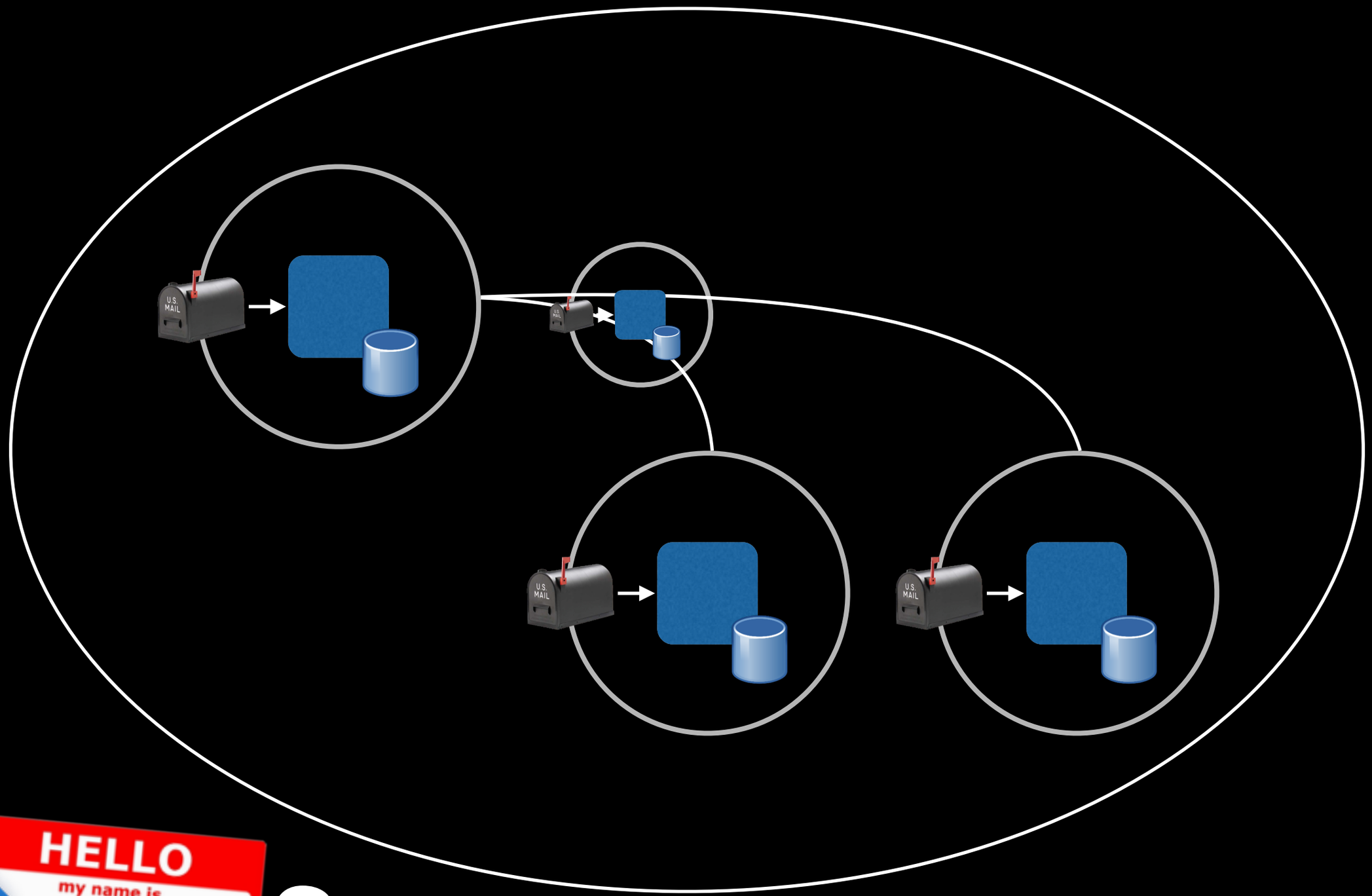
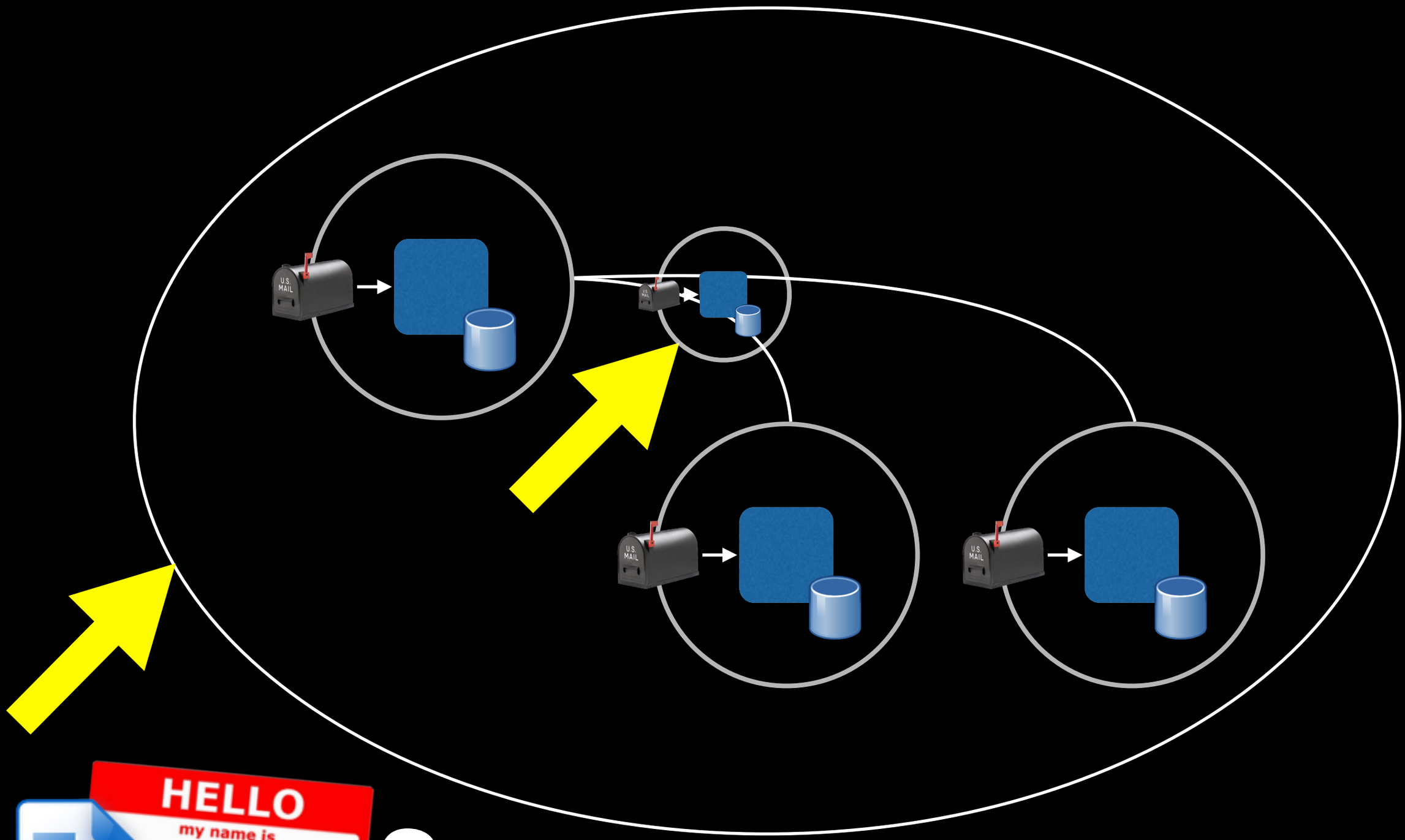



U.S. MAIL
U.S. MAIL
U.S. MAIL
U.S. MAIL


HELLO
my name is

?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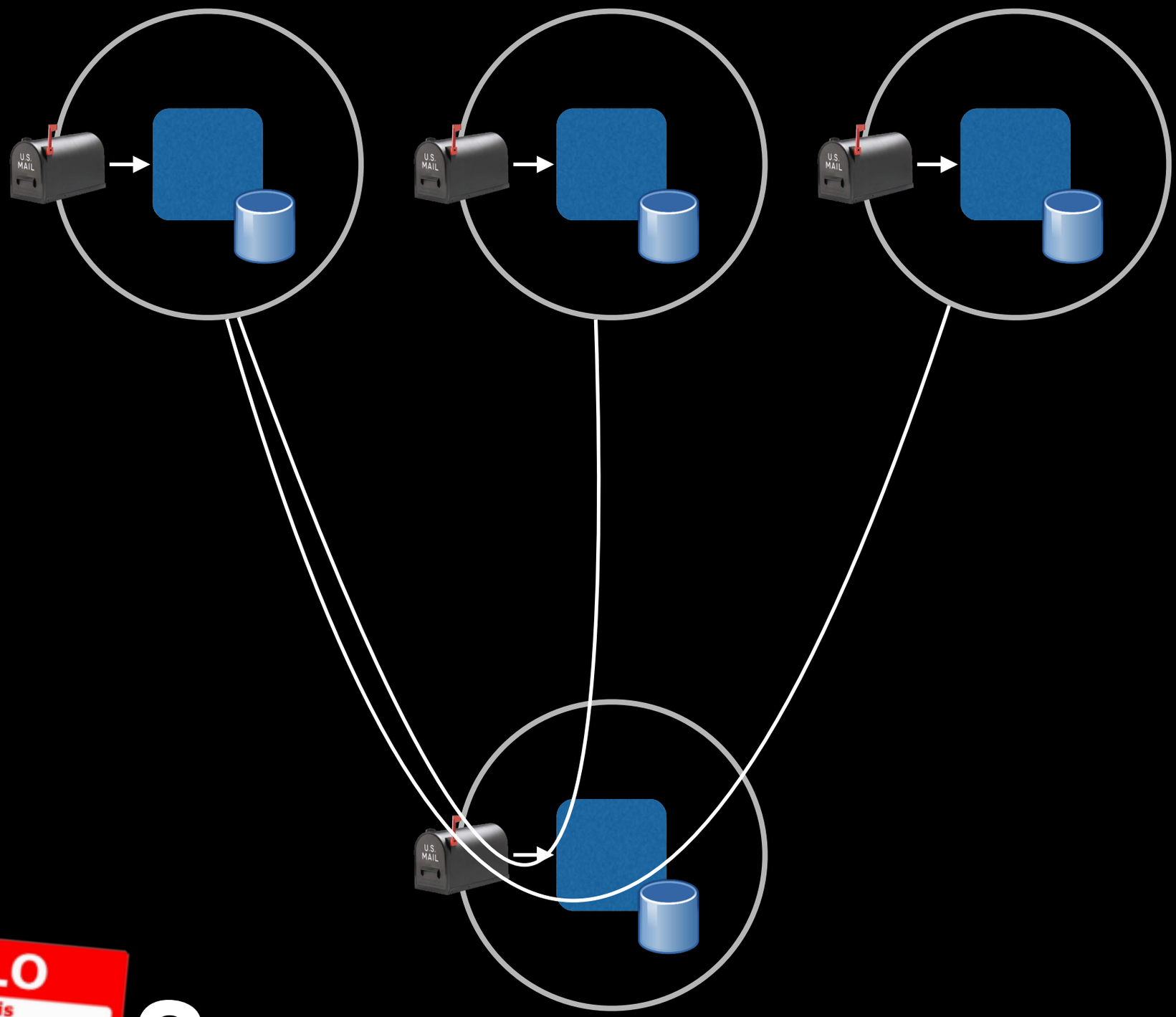
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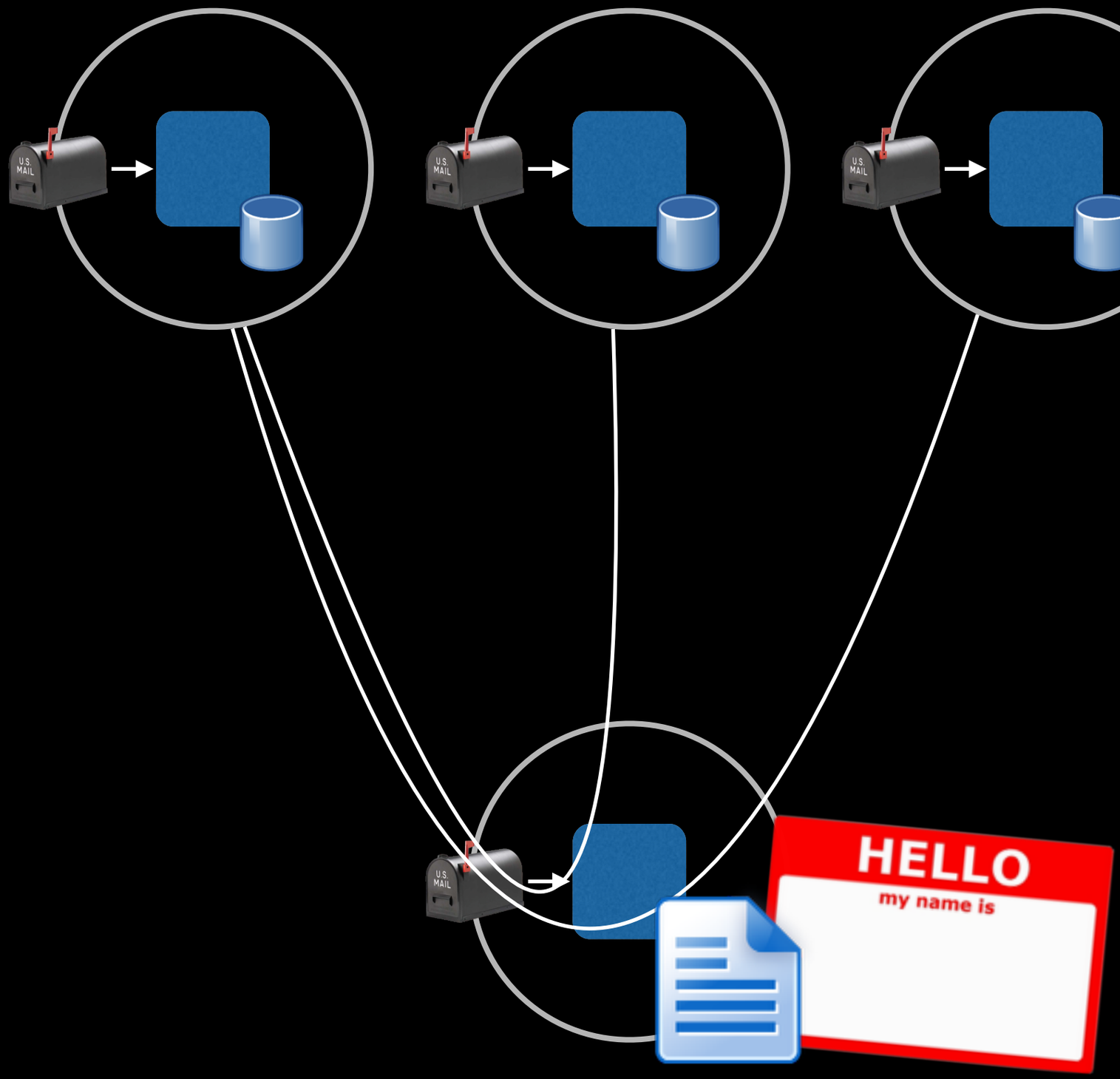
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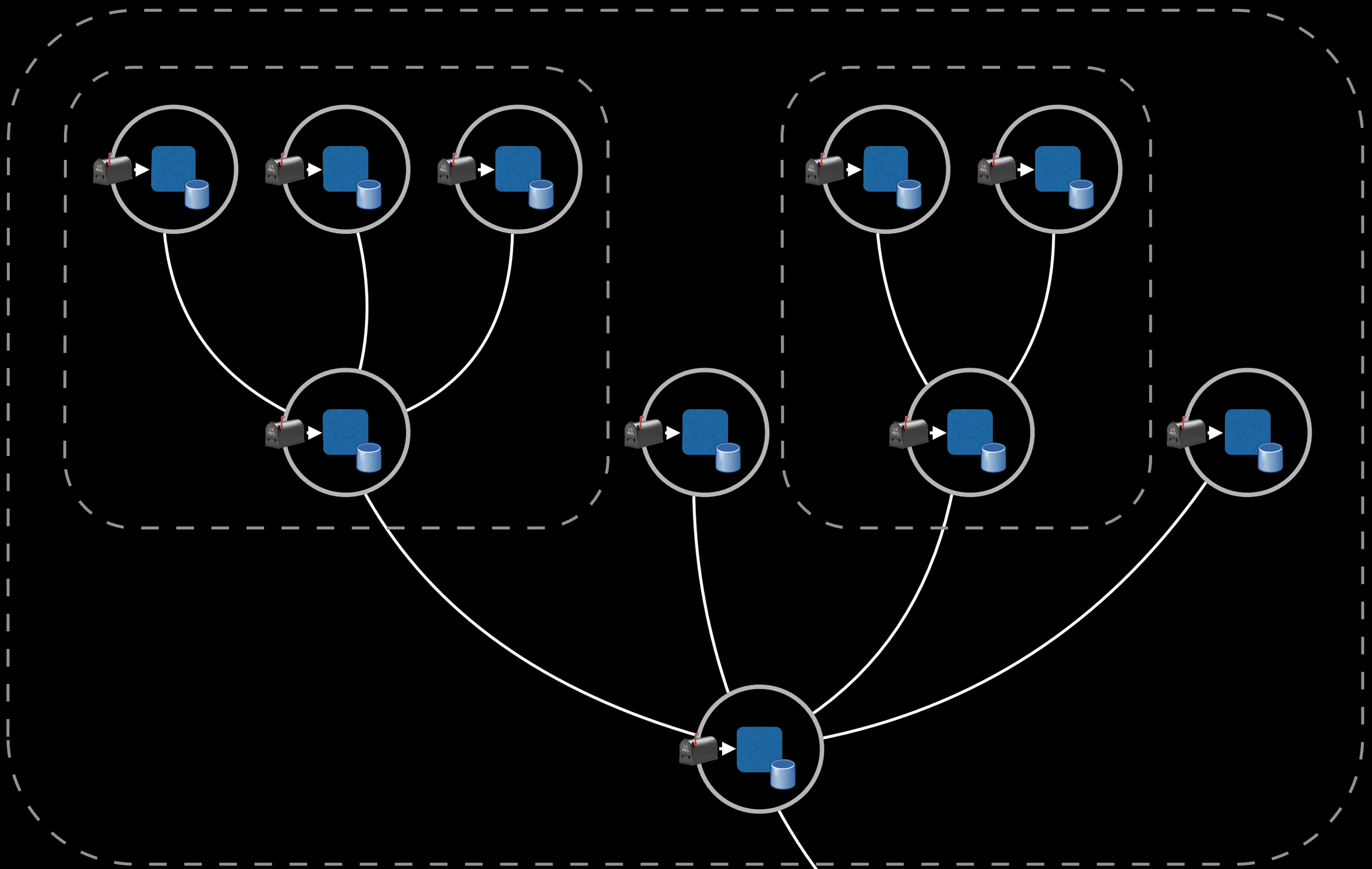


Code!

```
#lang minimart

(struct my-message (topic body) #:prefab)

(actor #:name symbolic-name

       #:state [current-topic "apples"]
       #:state [foo (+ 1 (* 2 3))]
       #:state [bar? #f]

       ;; Might produce messages on the current topic
       (advertise (my-message current-topic ?))

       ;; Want to hear messages on the current topic
       (subscribe (my-message current-topic ($ msg-body))
         (printf "Got message ~a\n" msg-body)
         #:update [foo (+ foo 1)]
         ...)

       (observe-advertisers (my-message ($ topic) ?)
         #:name all-topics
         #:set topic
         (printf "All available topics: ~a\n" all-topics))

       (observe-subscribers ...))
```

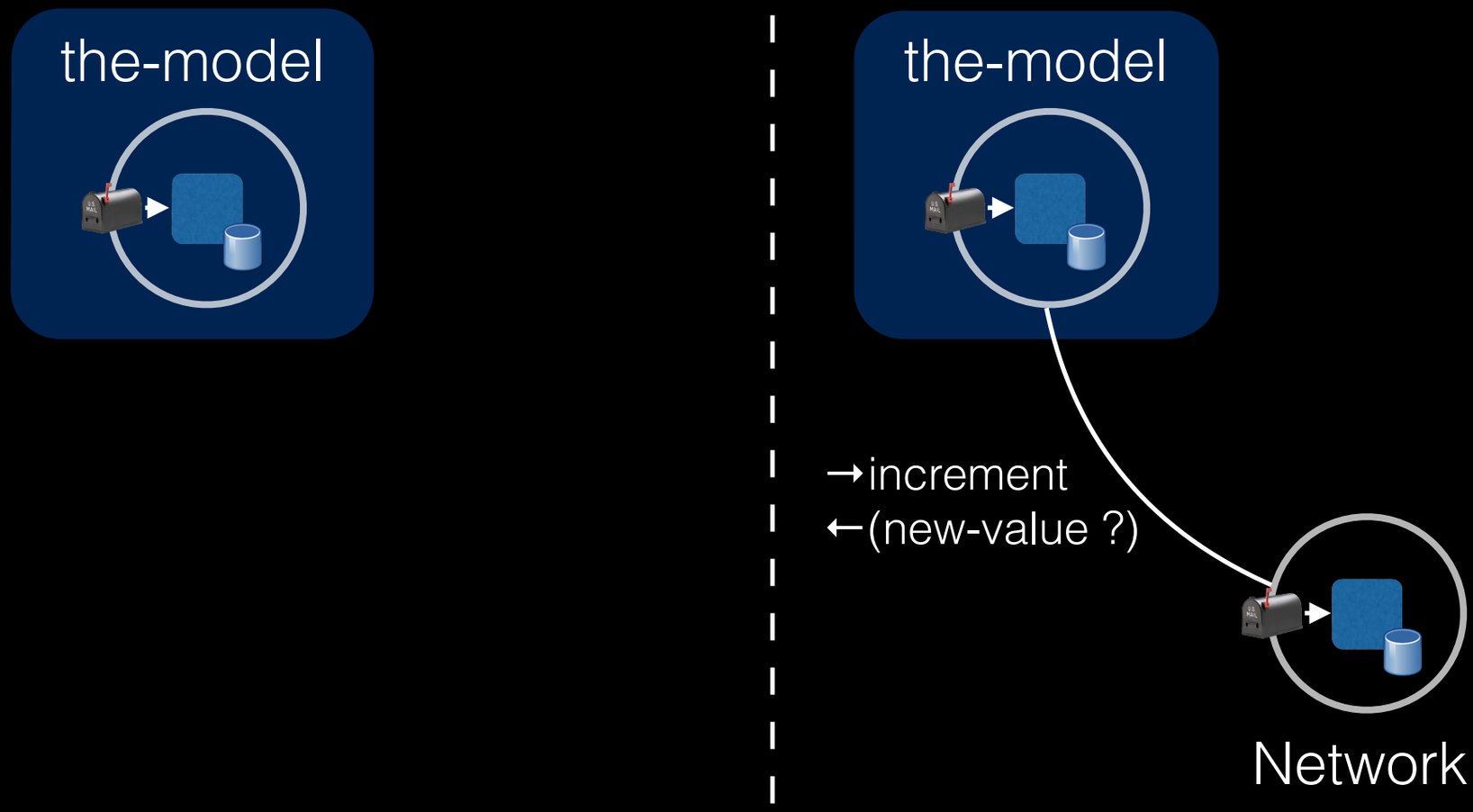
Model/View

Event Broadcasting,
Observable/Observer

```
(actor #:name the-model
       #:state [value 400]

       (advertise (list 'new-value ?))

       (subscribe 'increment
         #:update [value (+ value 1)]
         (send (list 'new-value value))))
```



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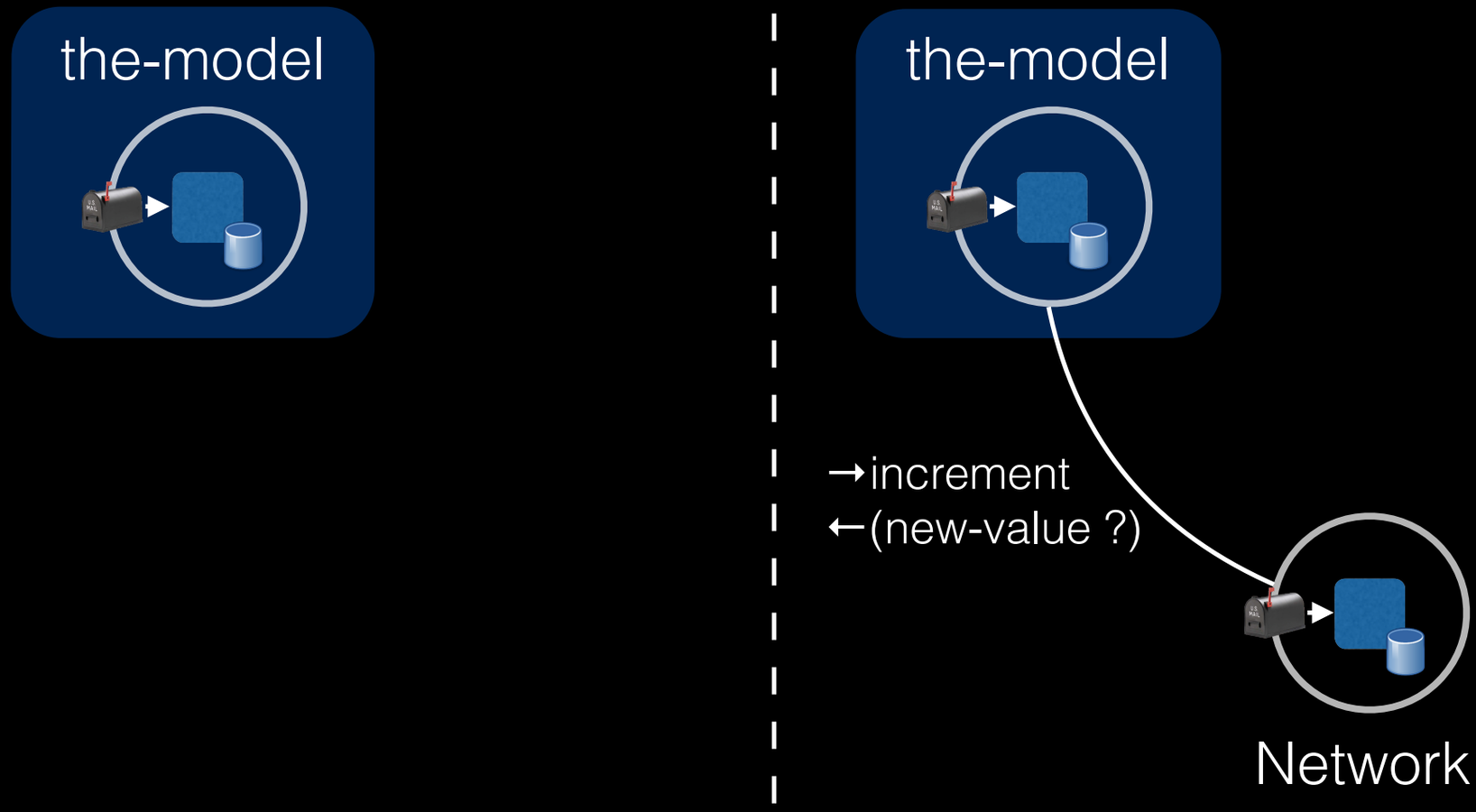

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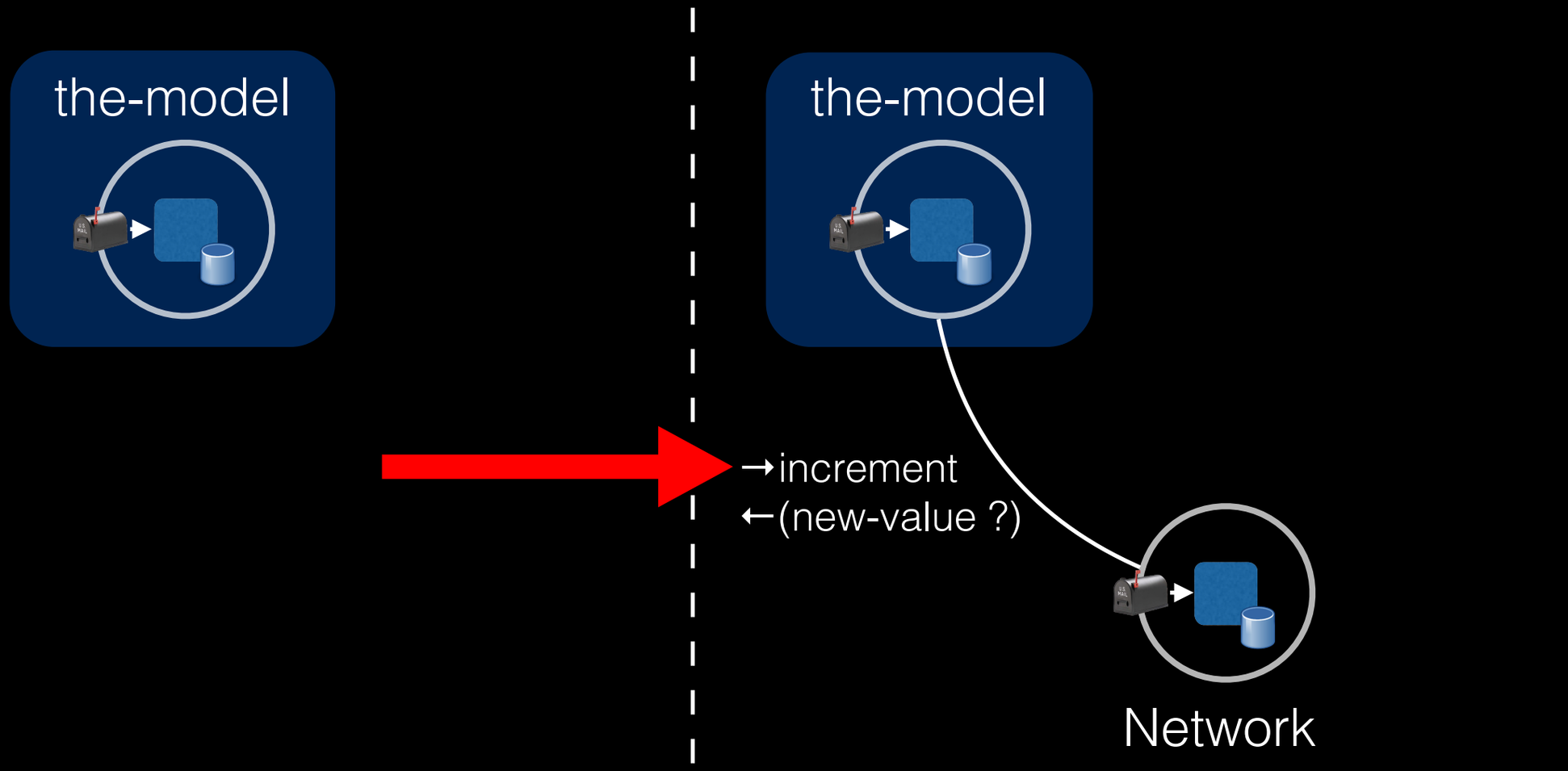

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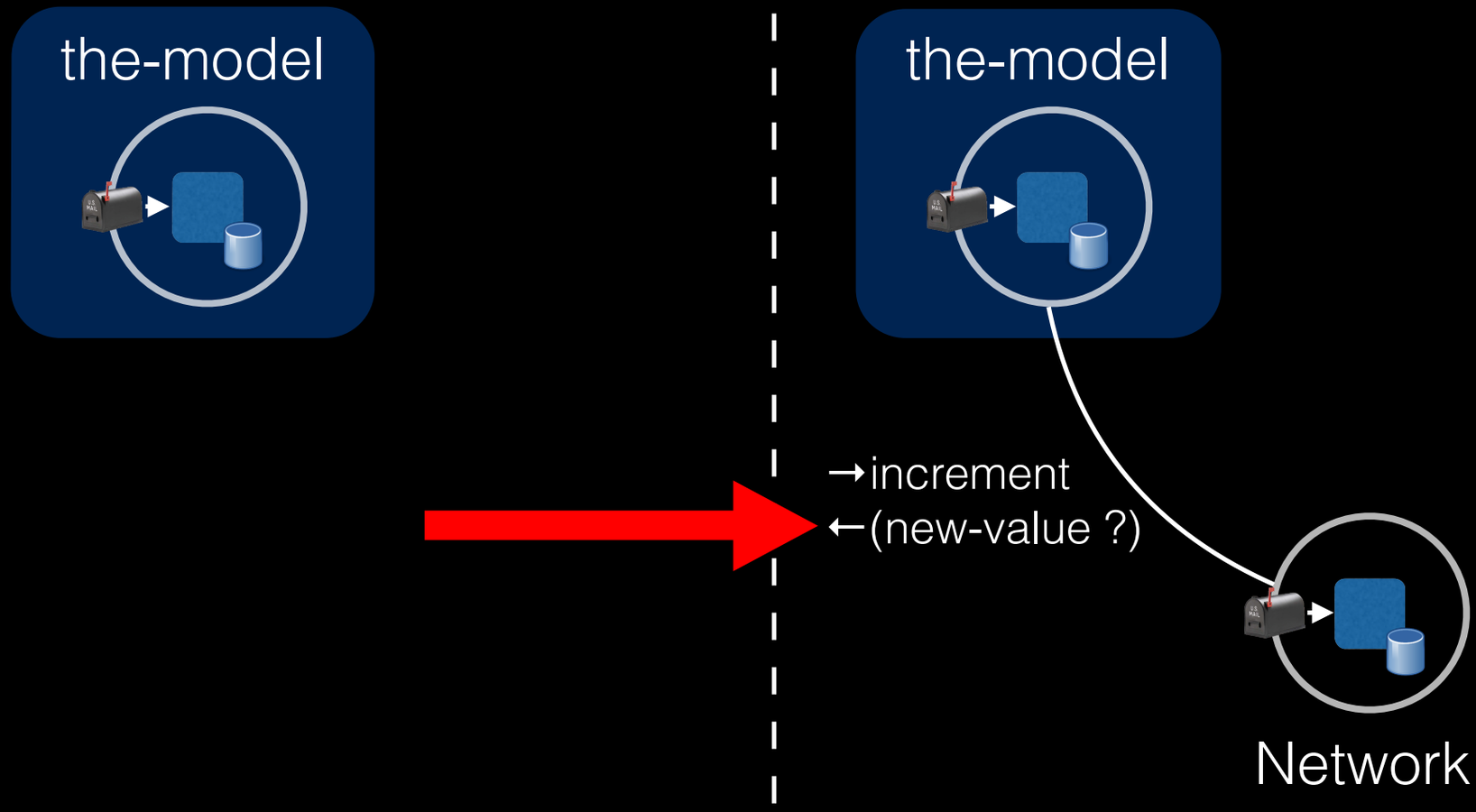
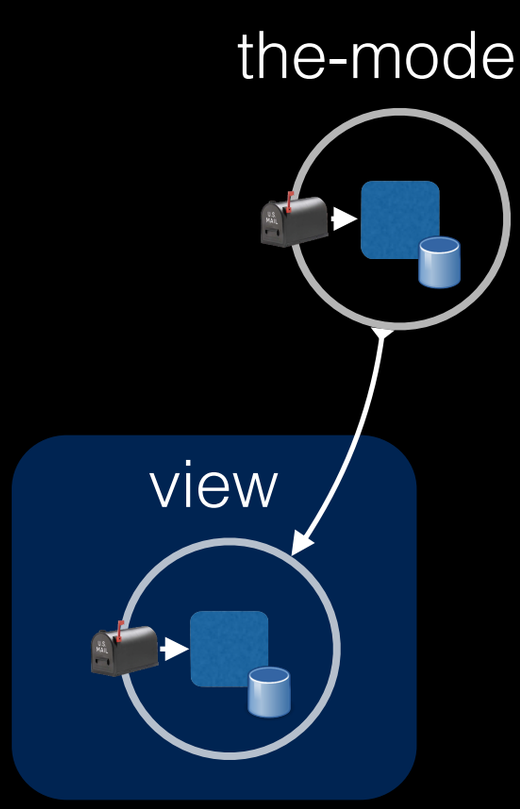
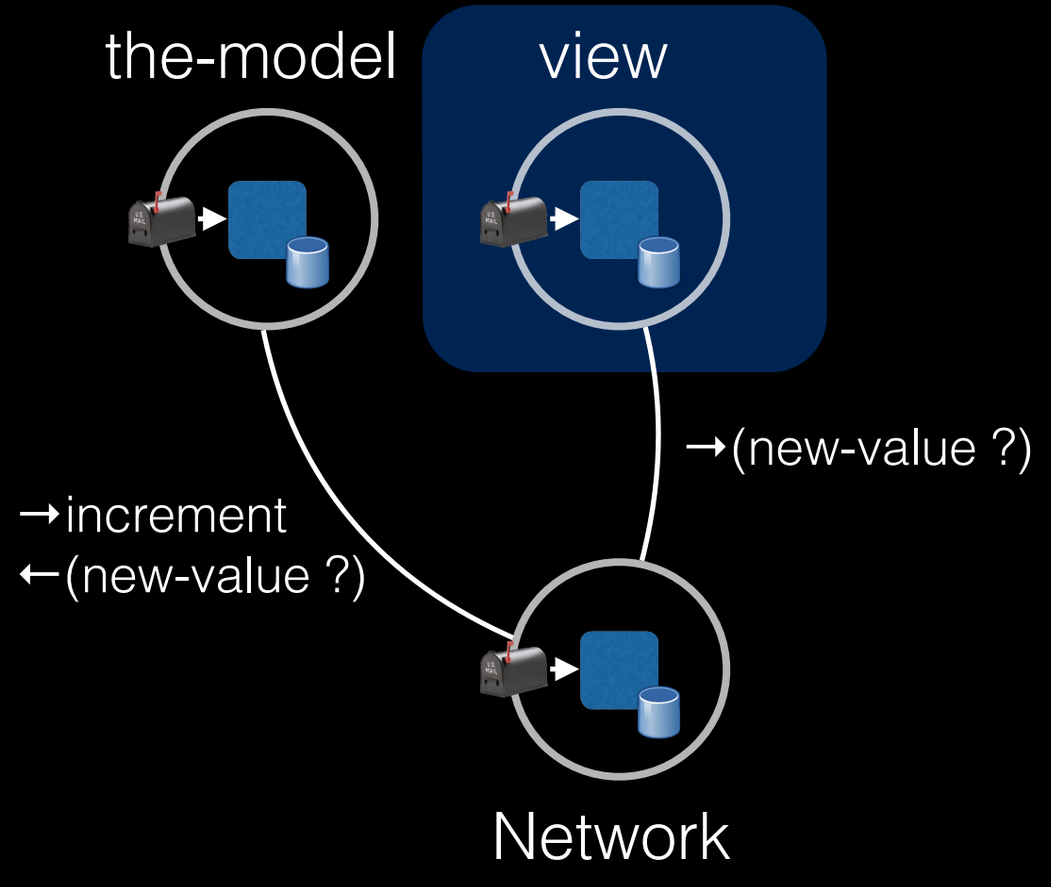


```
(actor #:name view

       (subscribe (list 'new-value ($ the-value))
         (printf "View saw a new value: ~a\n" the-value)))
```





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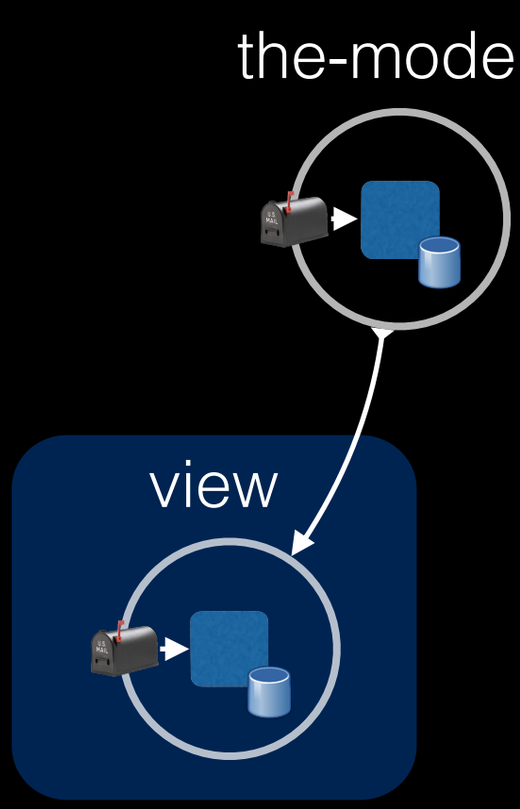

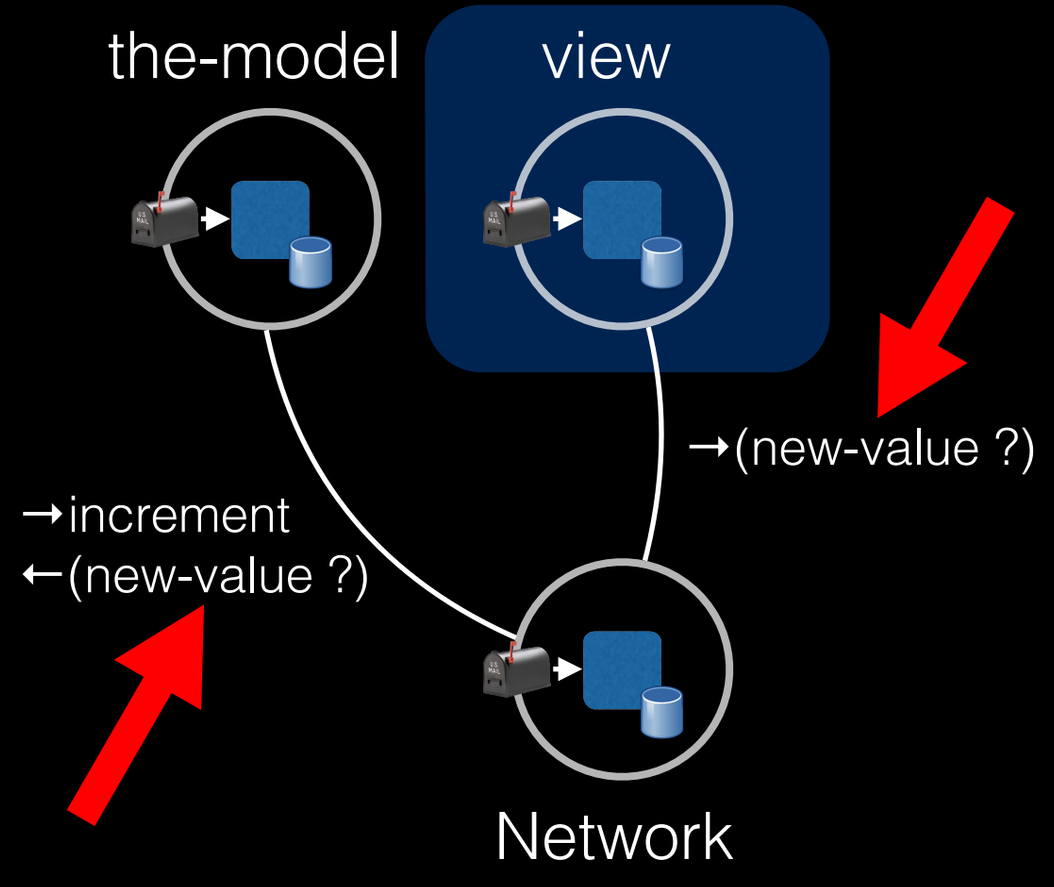

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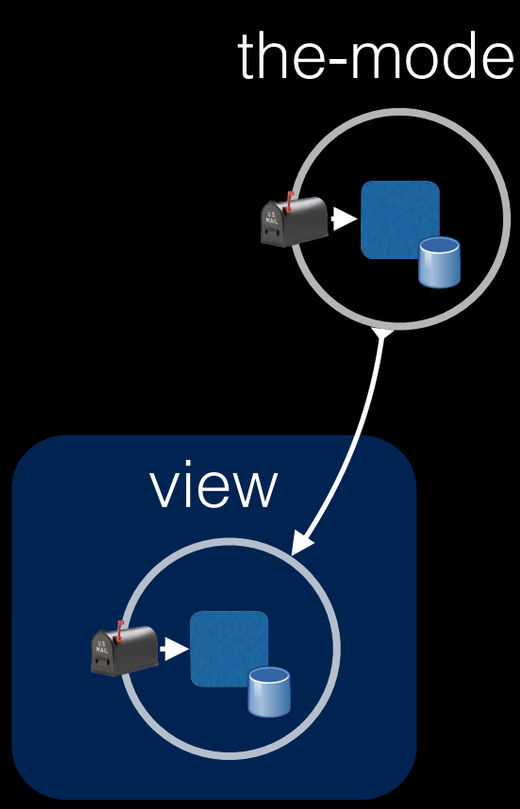

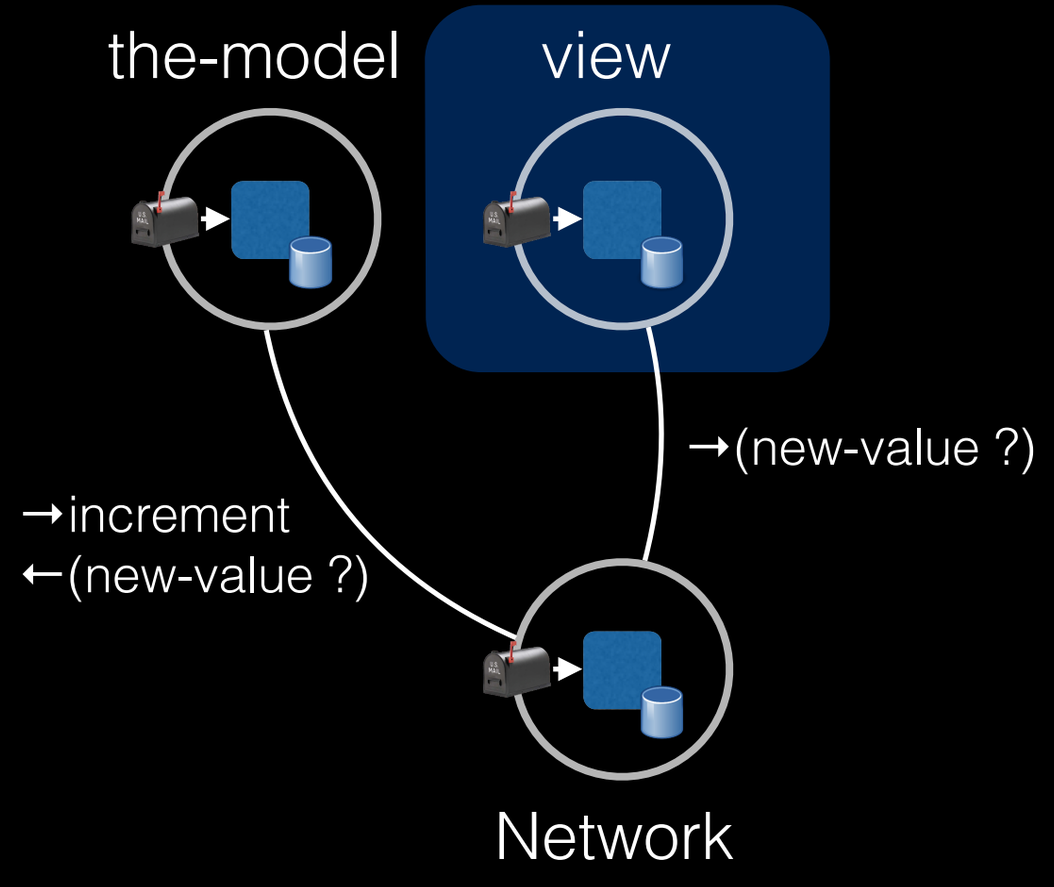

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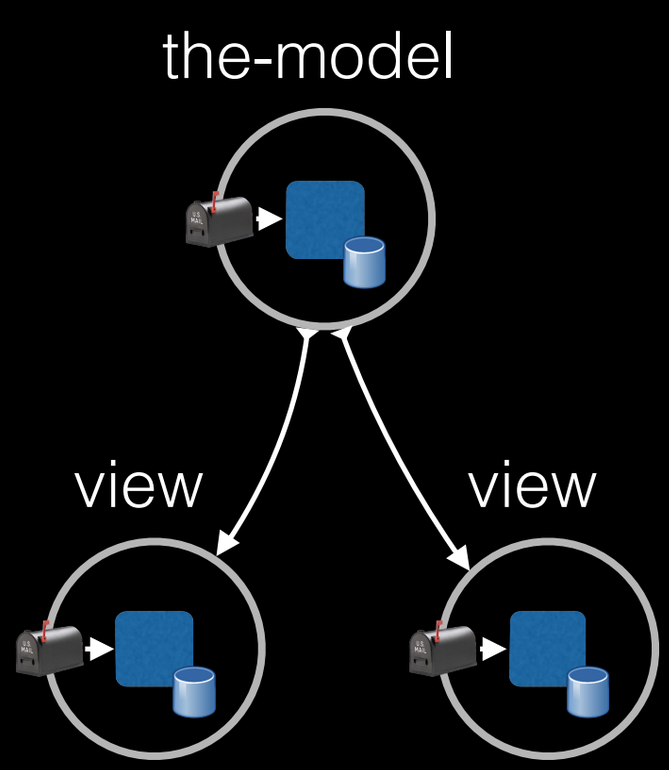
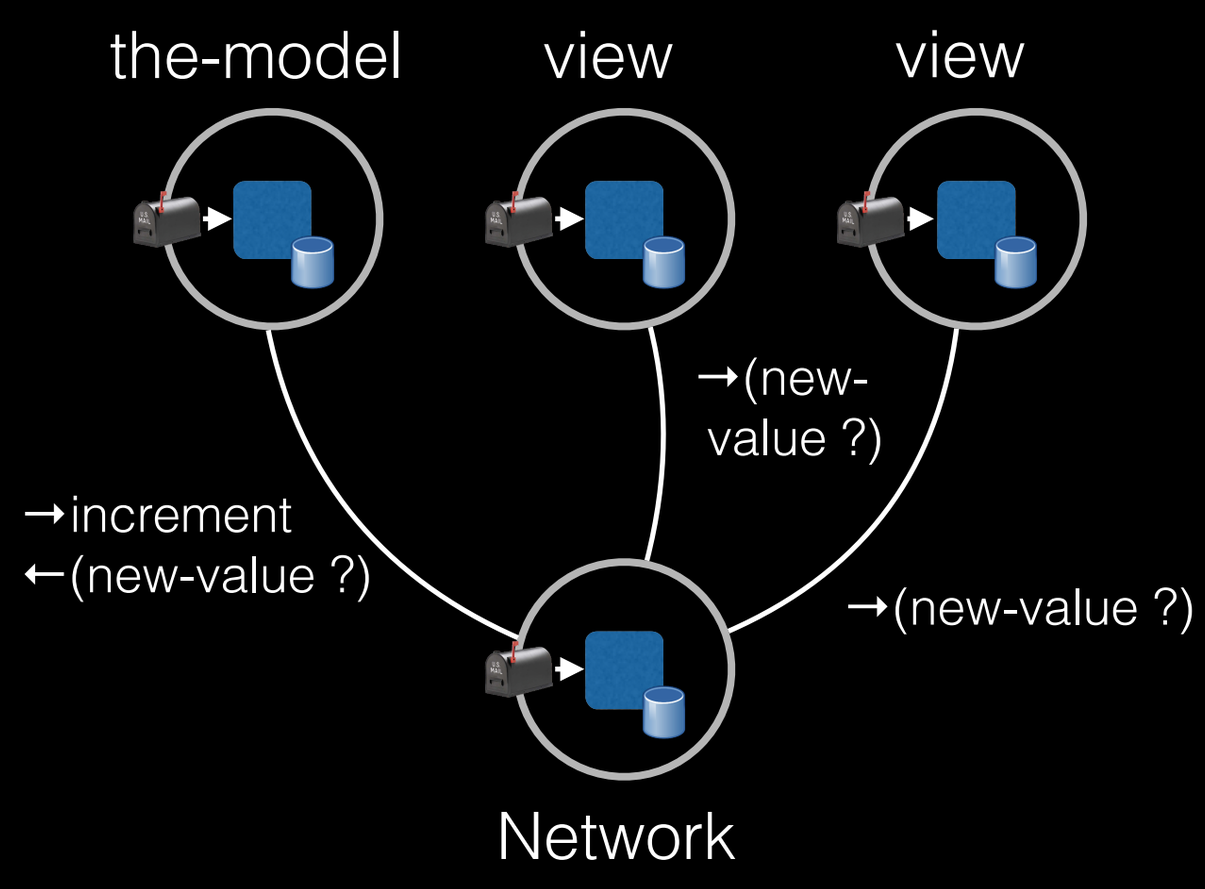
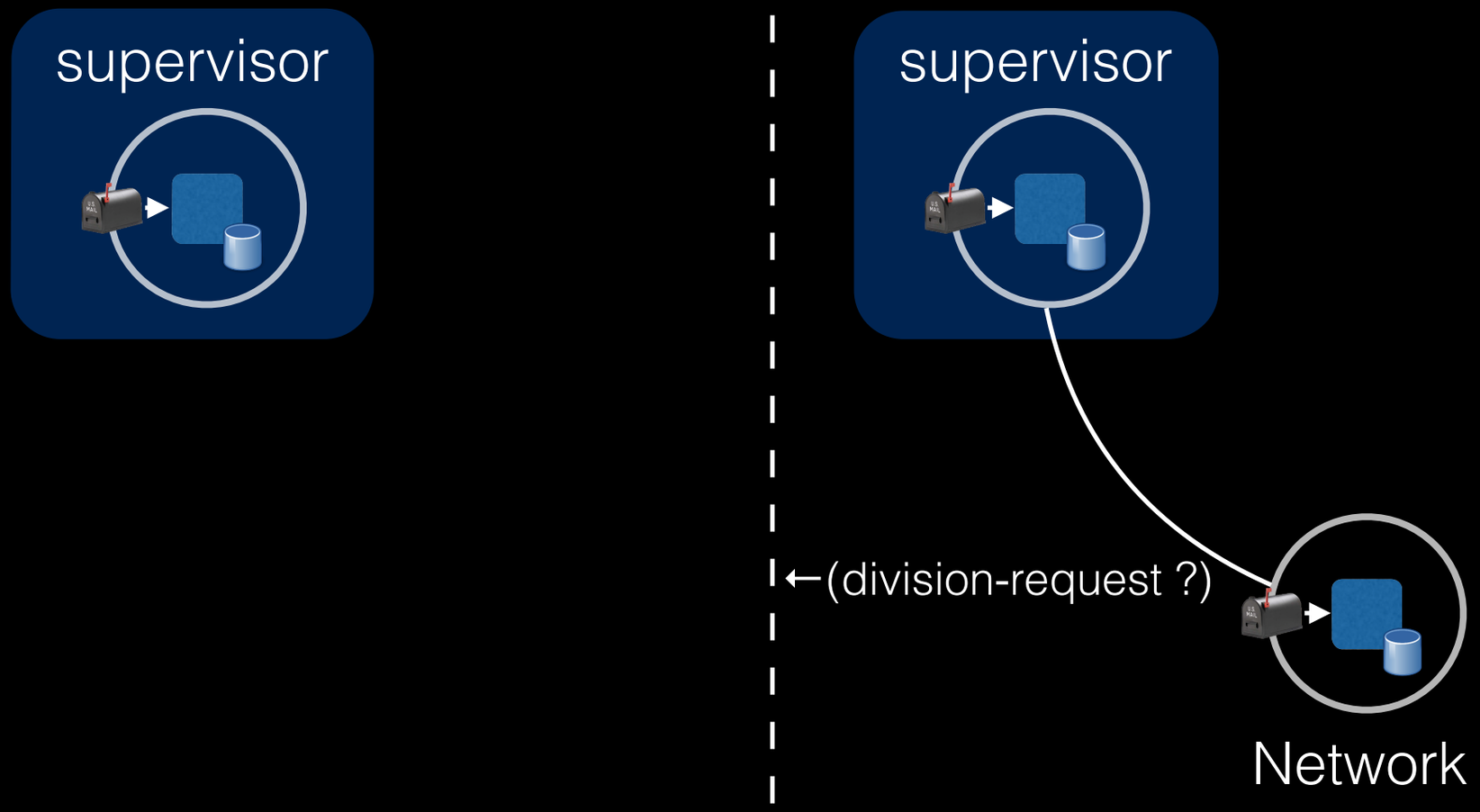




Supervisors

Crash/exit signaling
Readiness notification

```
(actor #:name supervisor
       (observe-subscribers (list 'division-request ?)
         #:presence server-running?
         (when (not server-running?)
           (printf "SUPERVISOR: Starting server!\n")
           (spawn-server))))
```



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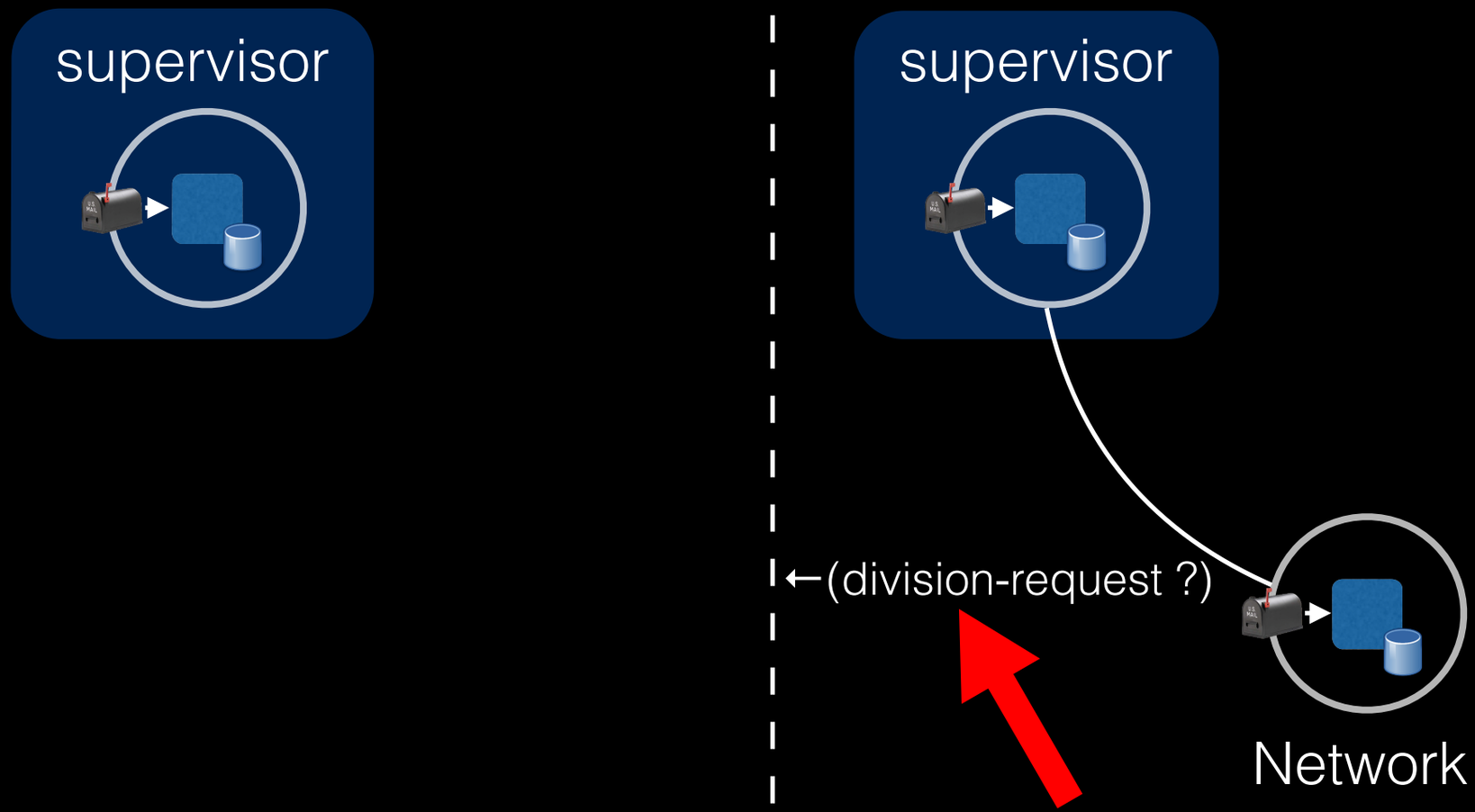

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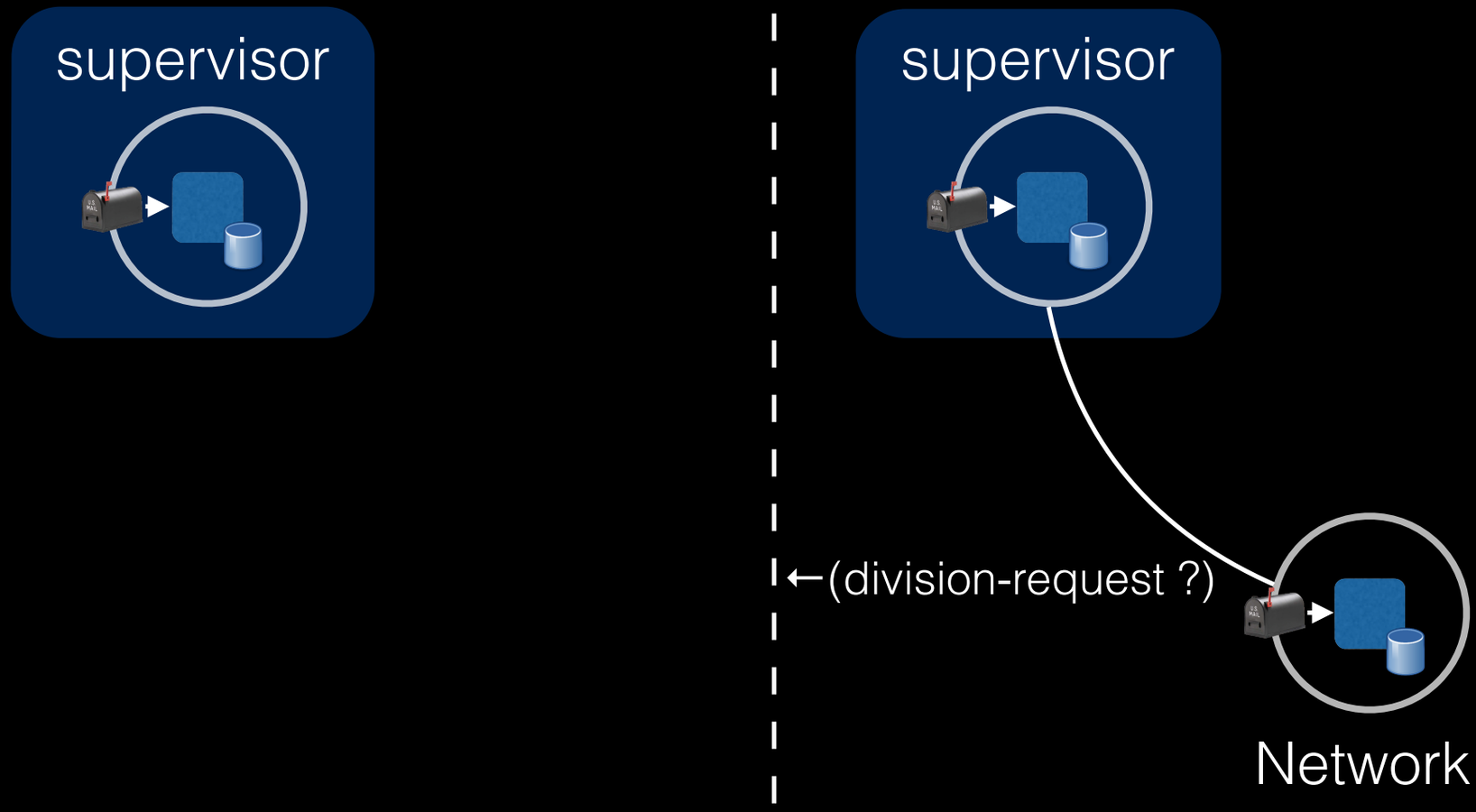

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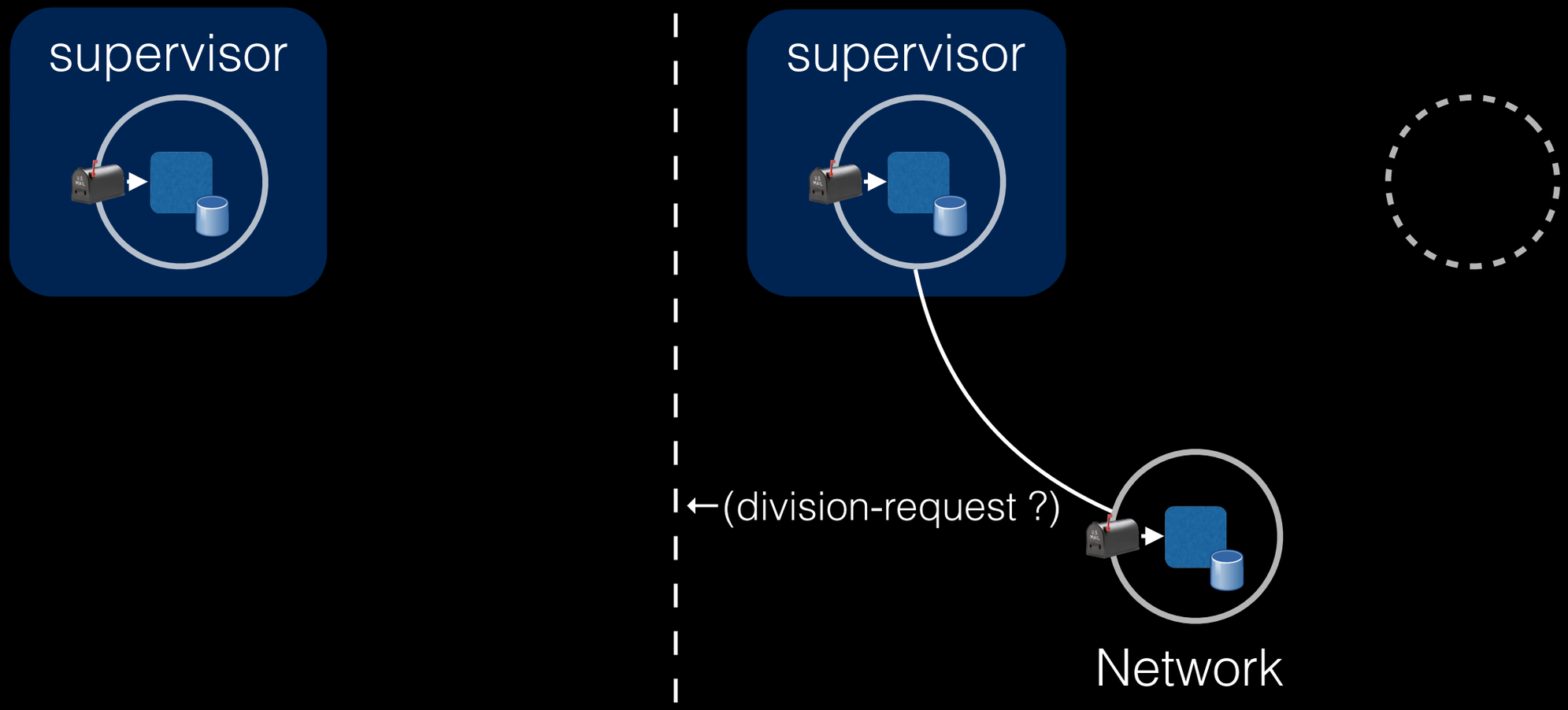
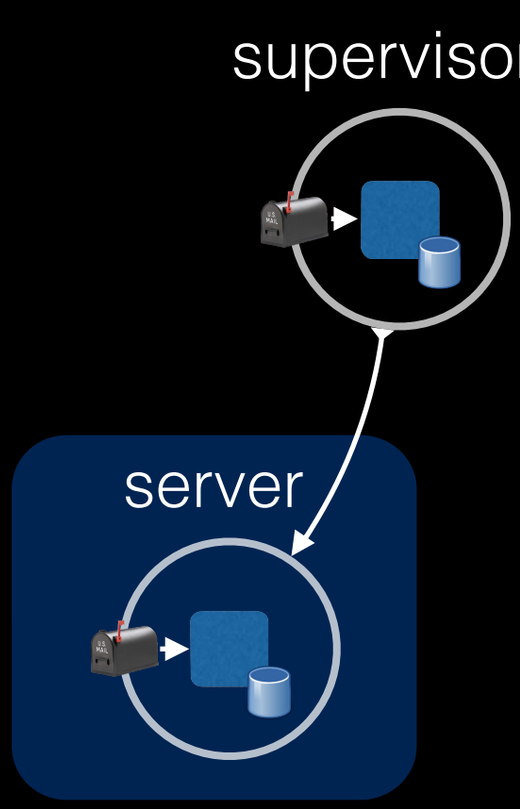
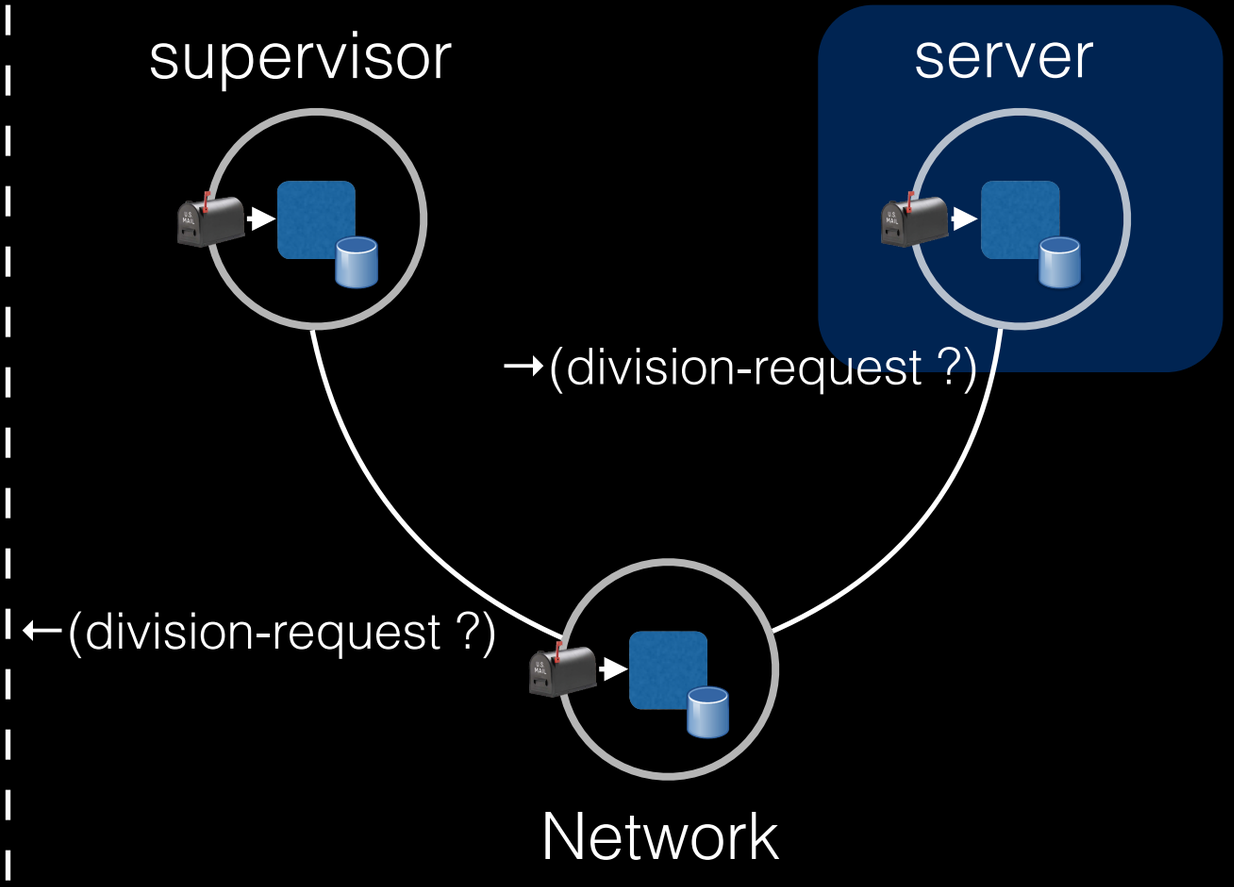


```
(define (spawn-server)
  (actor #:name server
         (subscribe (list 'division-request ($ denominator))
           (printf "SERVER: got request\n")
           ...)))
```





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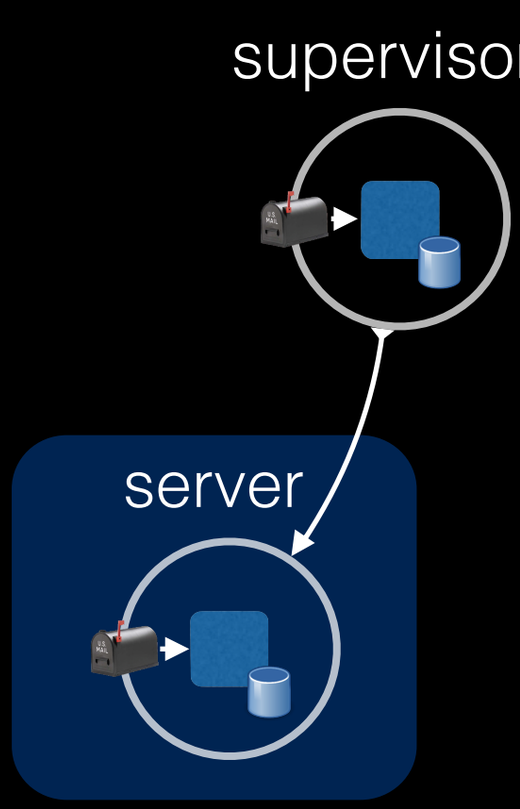

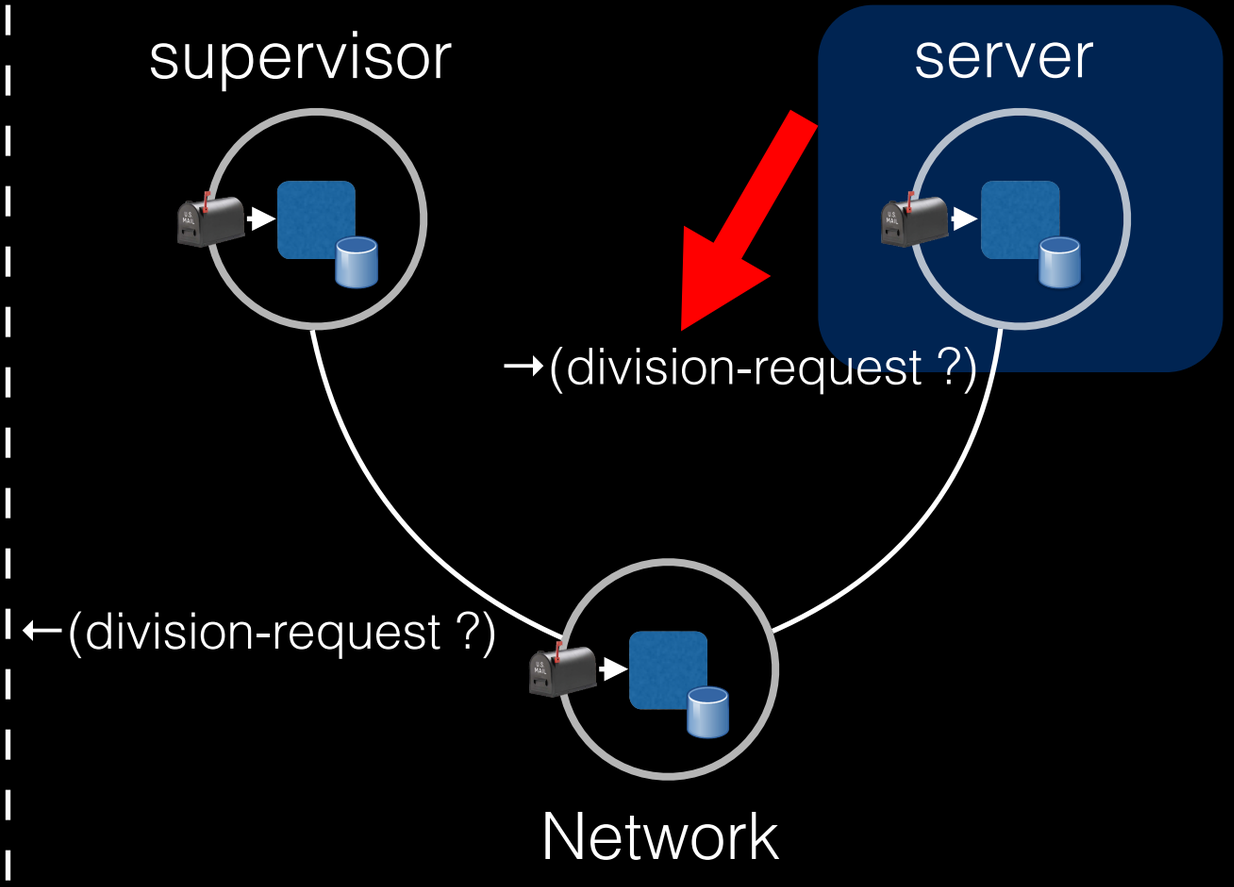

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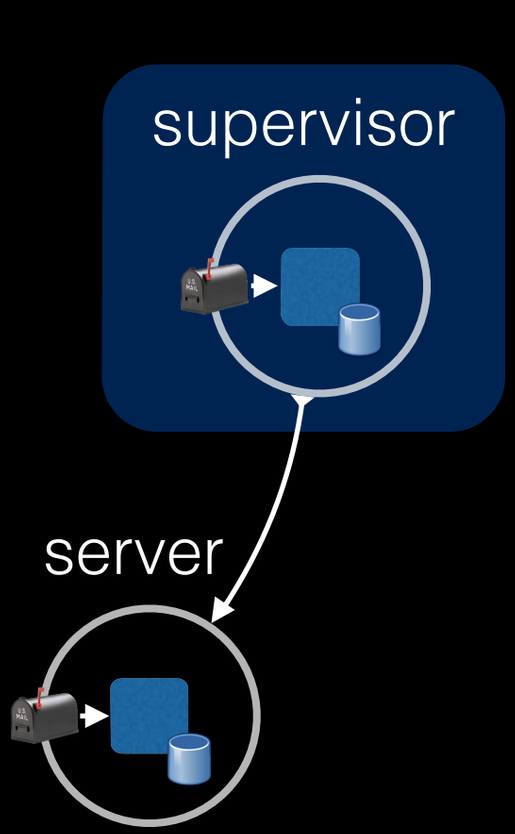

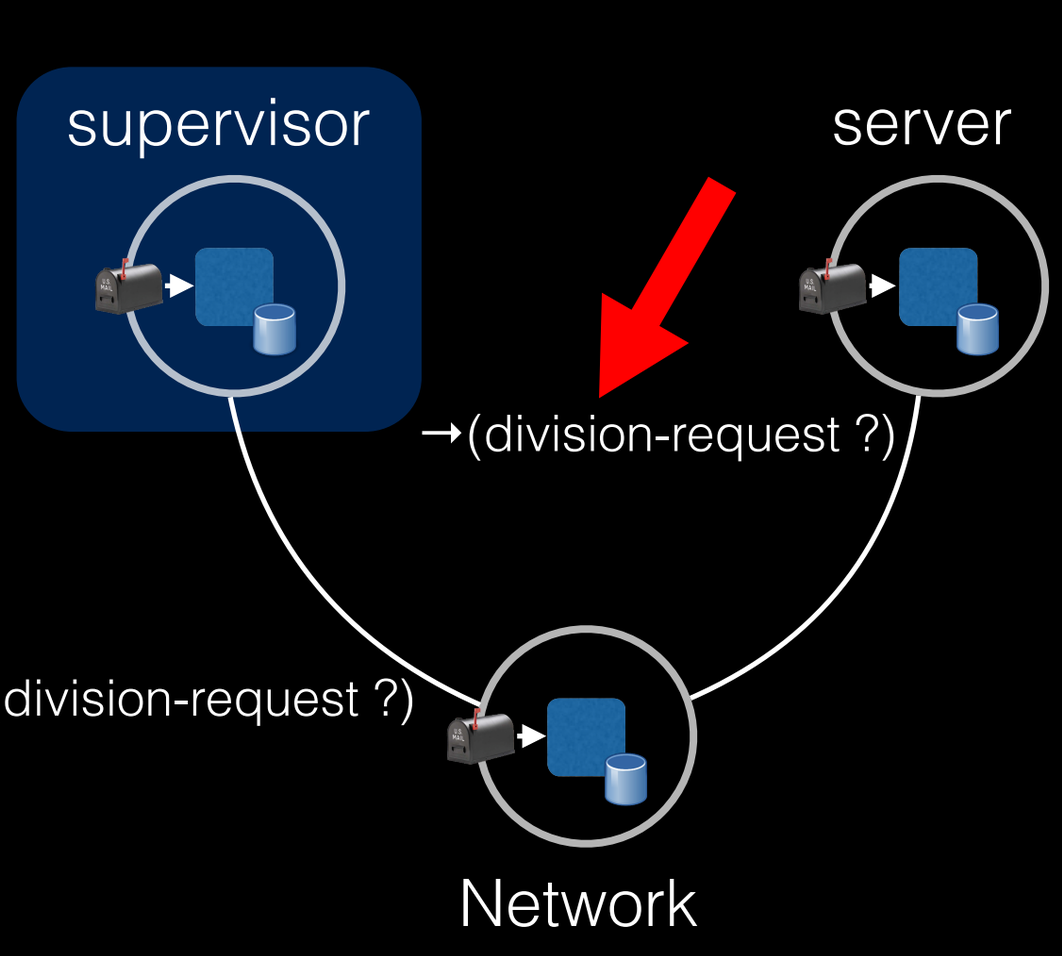

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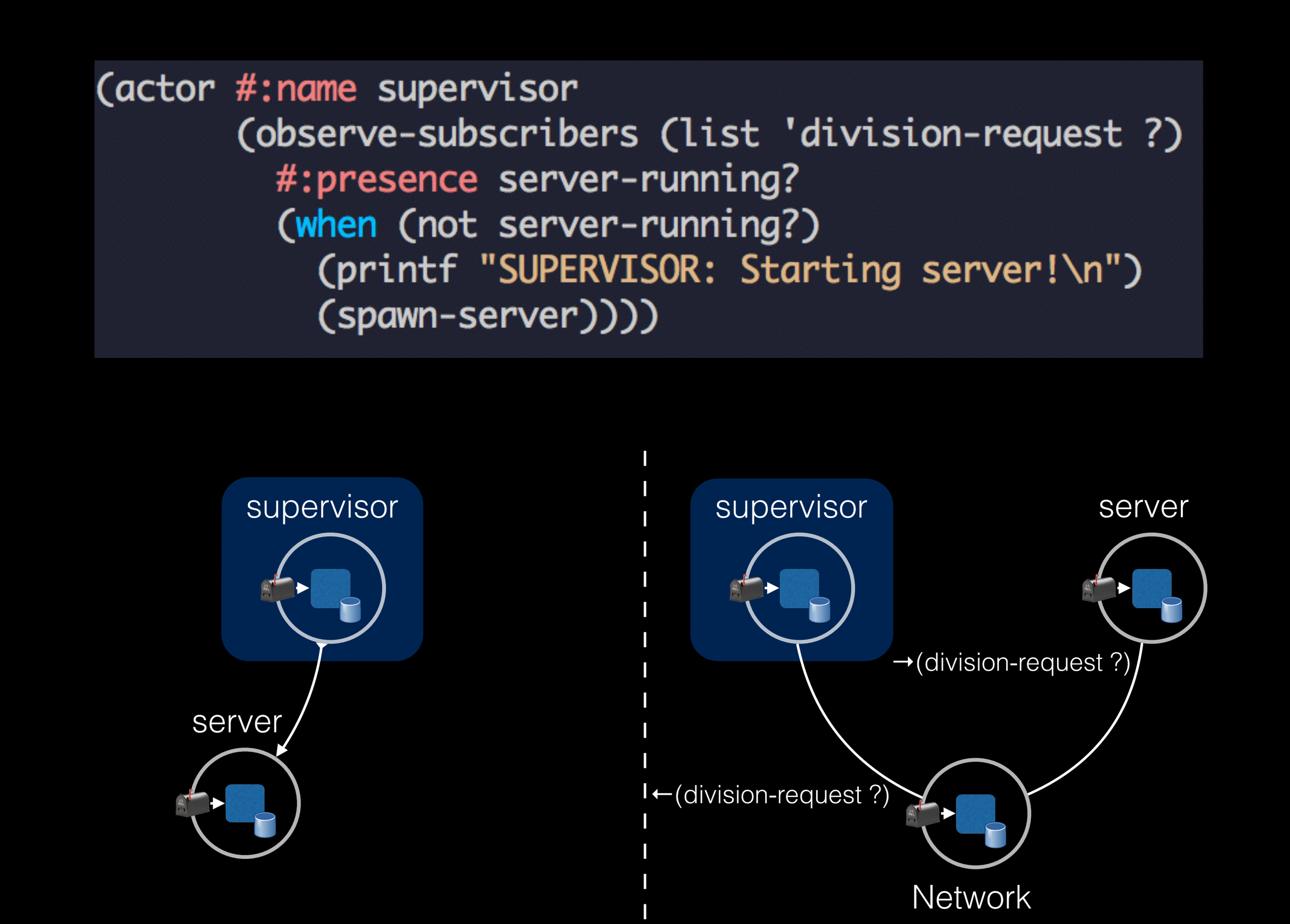

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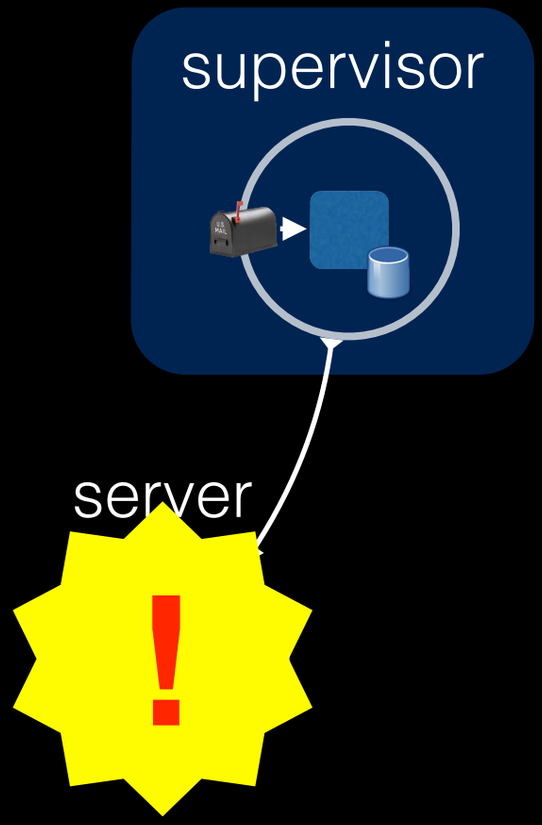
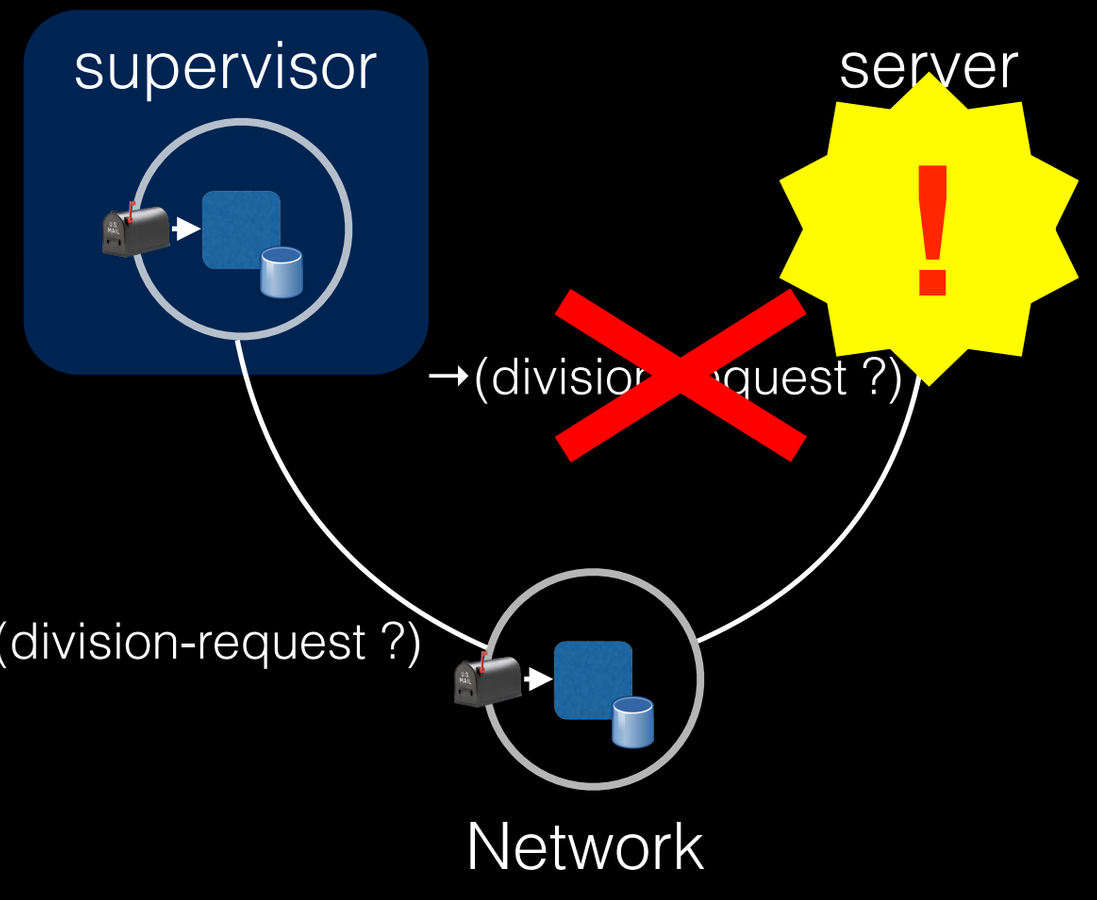
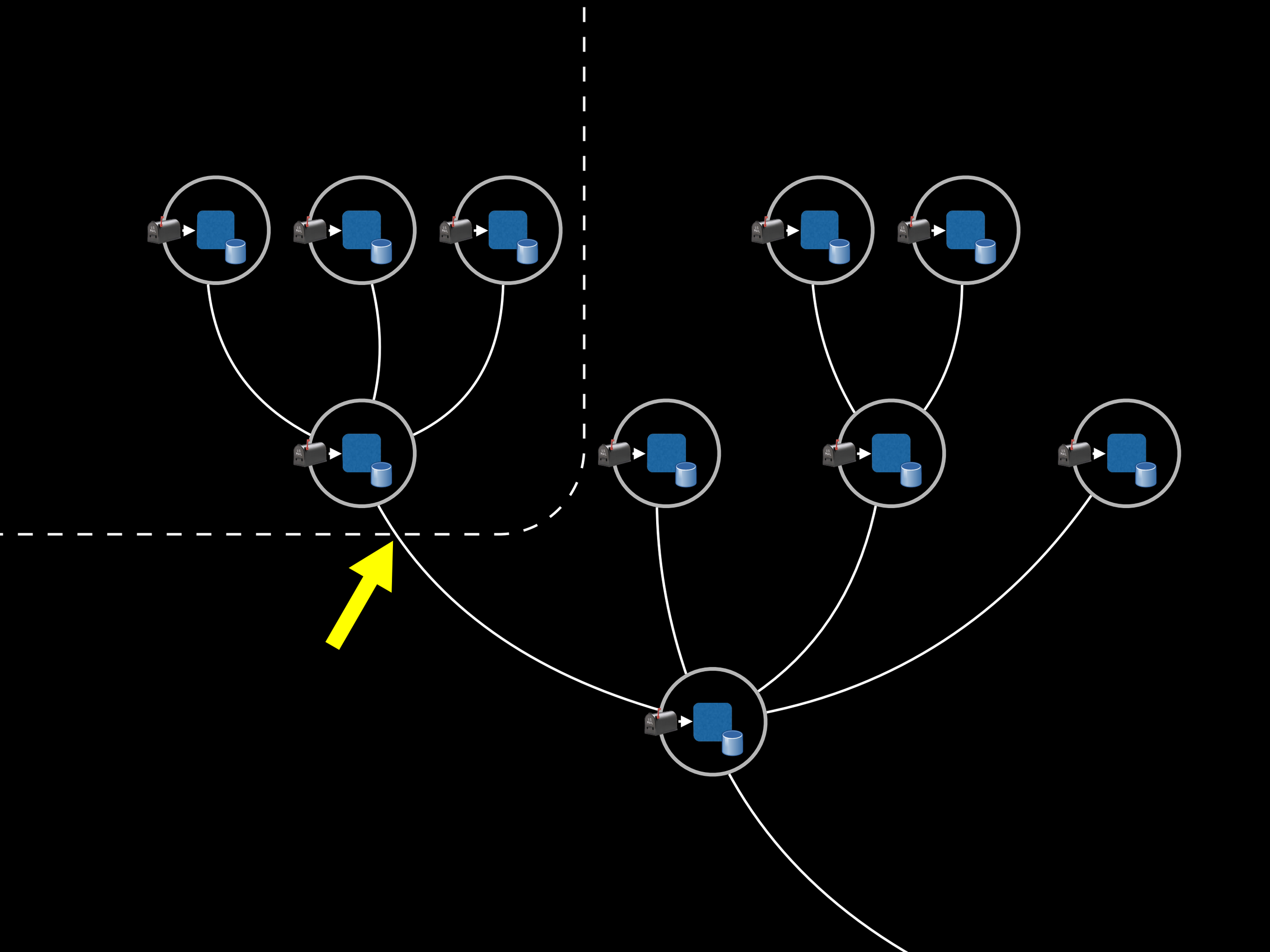




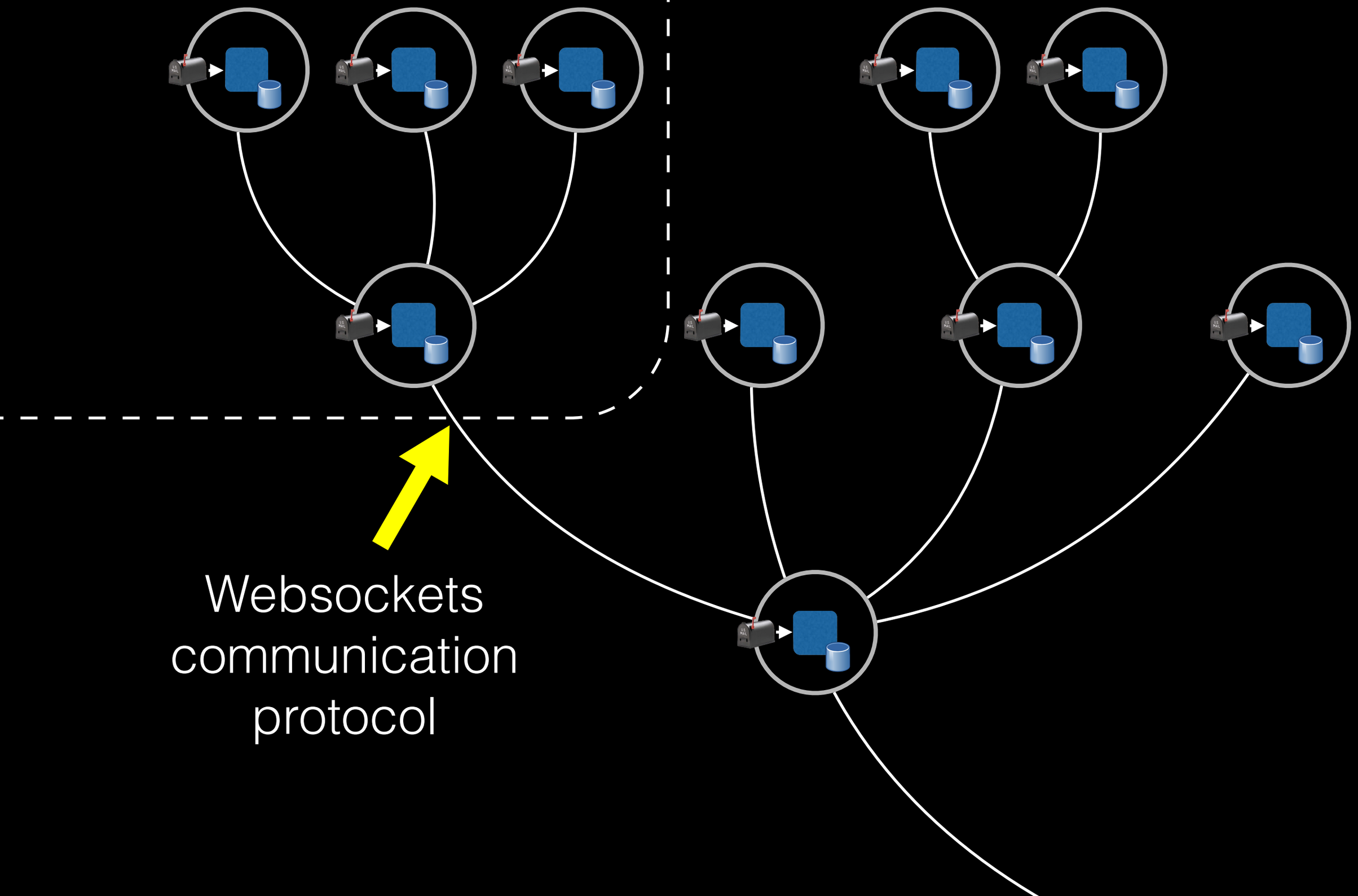
Distribution

Minimart in the Browser



JS-marketplace

Minimart



Websockets
communication
protocol

#lang minimart

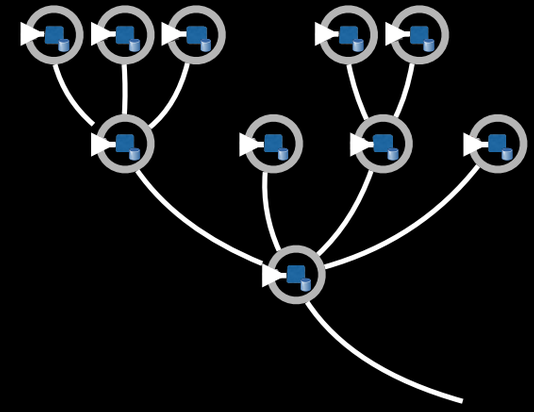
Publish / Subscribe conversations

```
(actor #:name A
  (subscribe (pat ...)
      ... handler ...))
```

Observe others' subscriptions

```
(actor #:name B
  (observe-subscribers
      (pat ...)
    #:presence v
     ... handler ...))
```

Grouping & layering



raco pkg install minimart

https://github.com/tonyg/minimart

https://github.com/tonyg/js-marketplace