

plumber + future: Async Web APIs


```
function(id) {  
    fast_calc(id)  
}
```

```
function(id) {  
    slow_calc(id)  
}
```

```
# ./plumber.R
```

```
## @get /fast/<id>  
function(id) {  
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}
```

```
## @get /slow/<id>  
function(id) {  
  slow_calc(id)  
}
```





Receive



Process



Respond





Receive



Process



Respond





Receive



Process



Respond





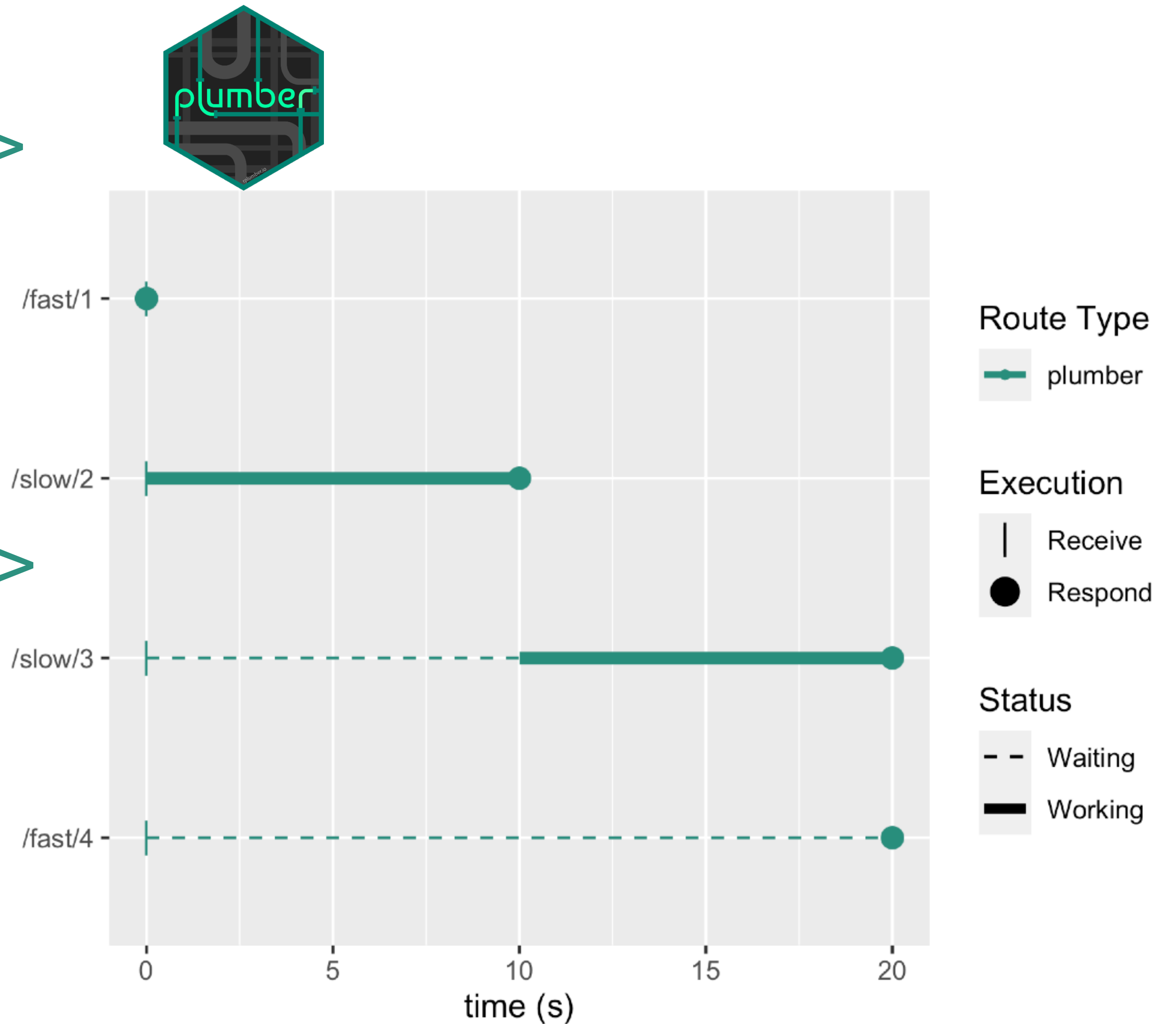
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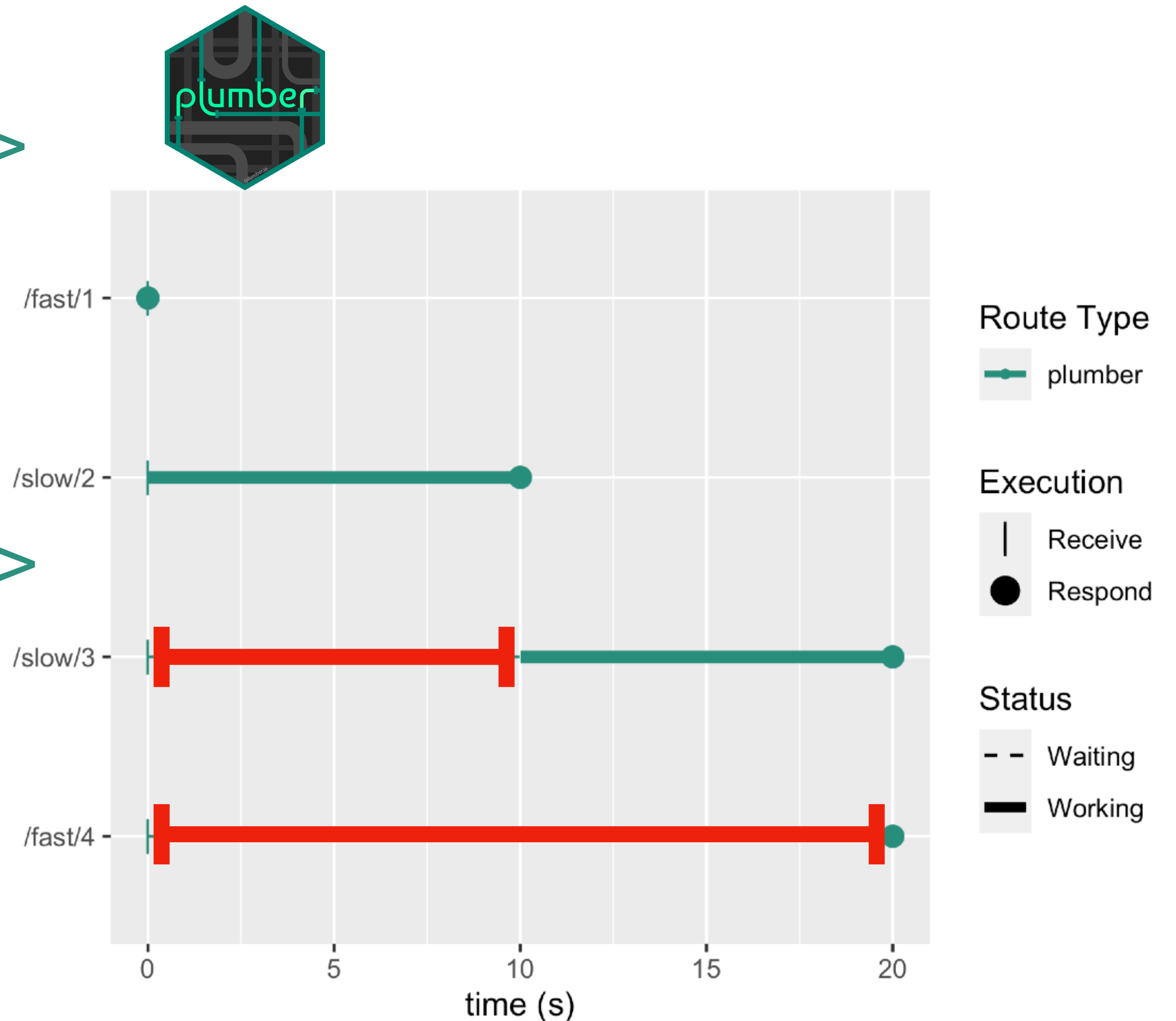
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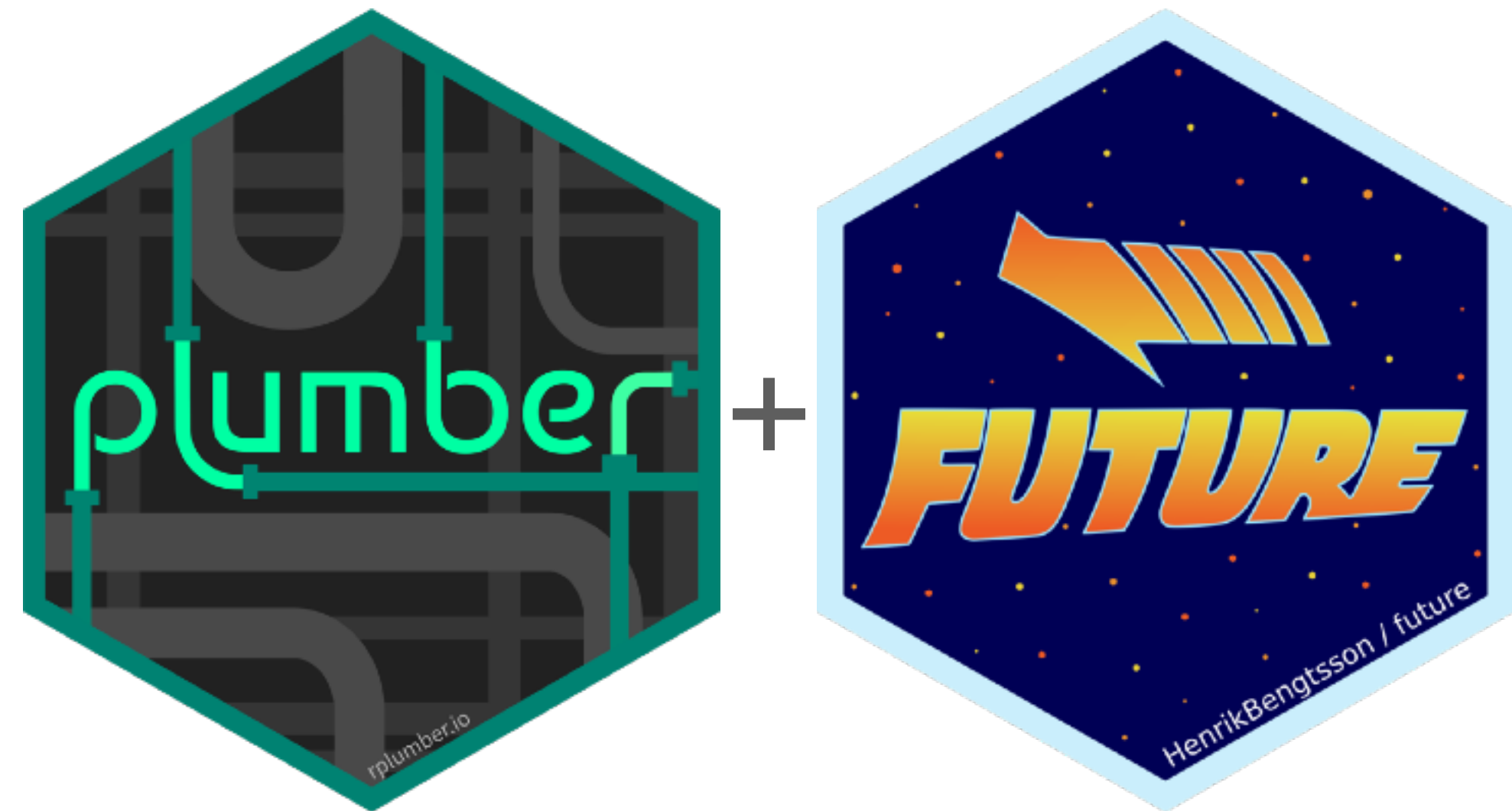
```
## @get /slow/<id>  
function(id) {  
  slow_calc(id)  
}
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```
future::plan("multisession")
```

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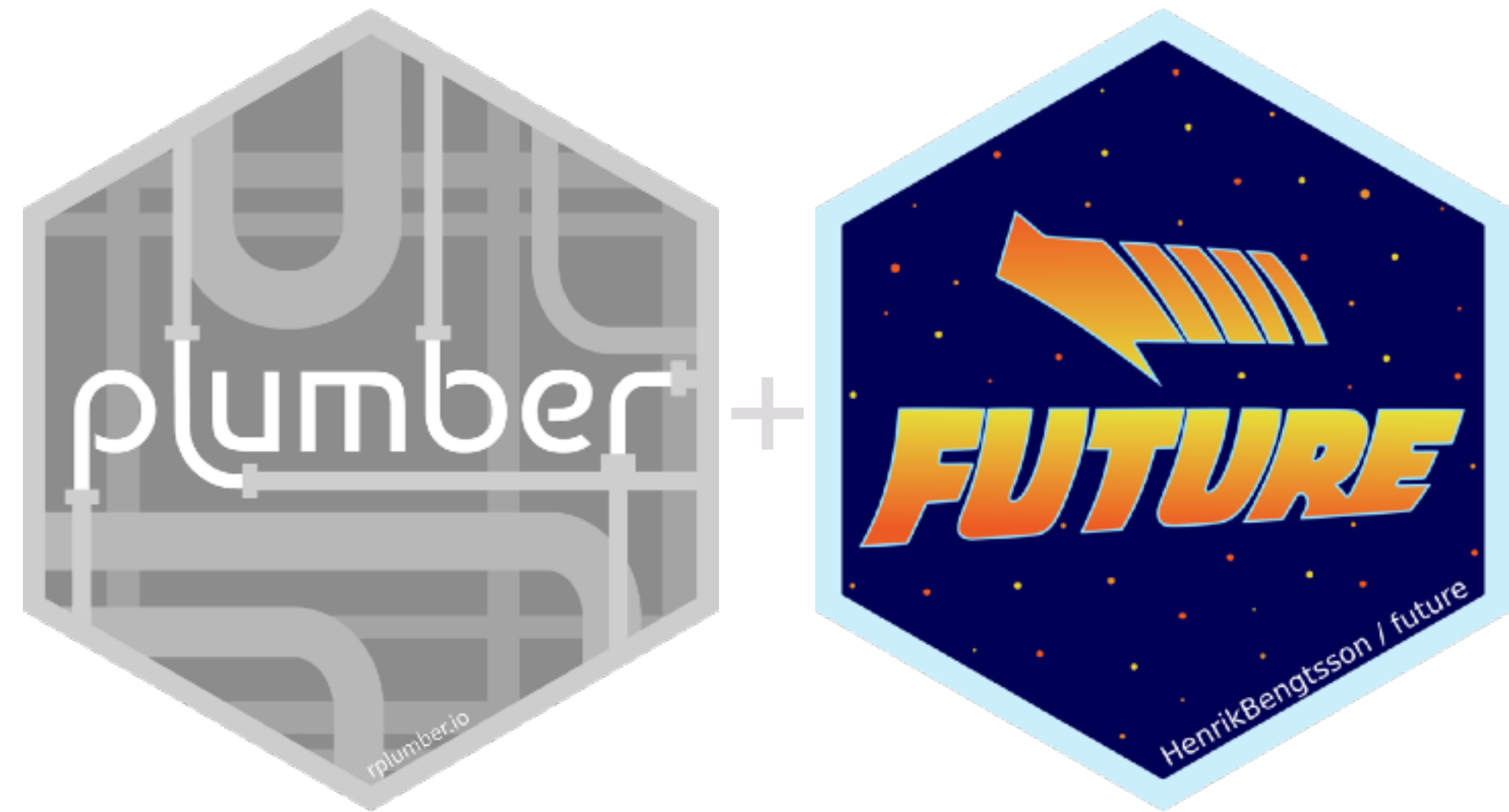
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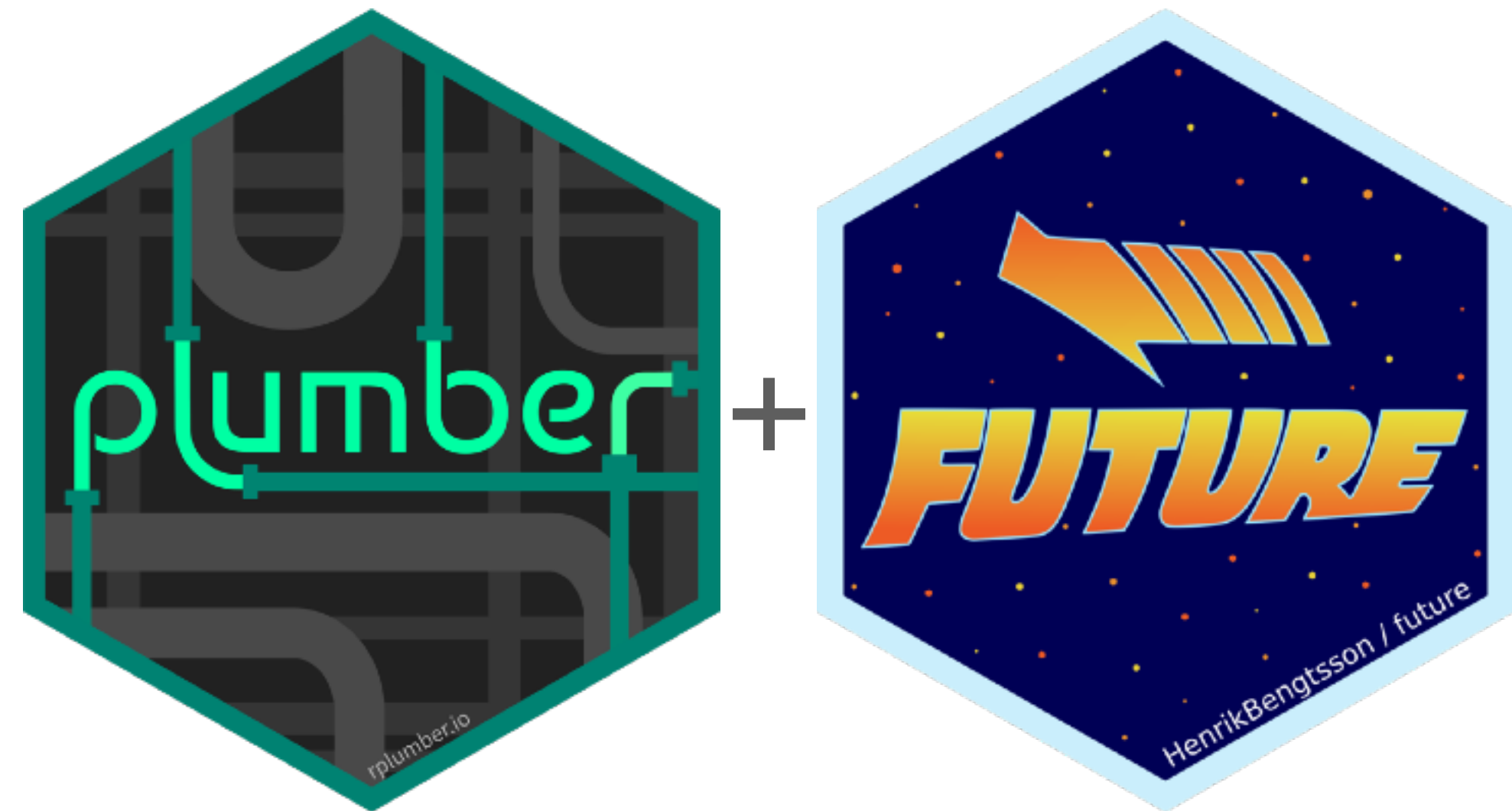
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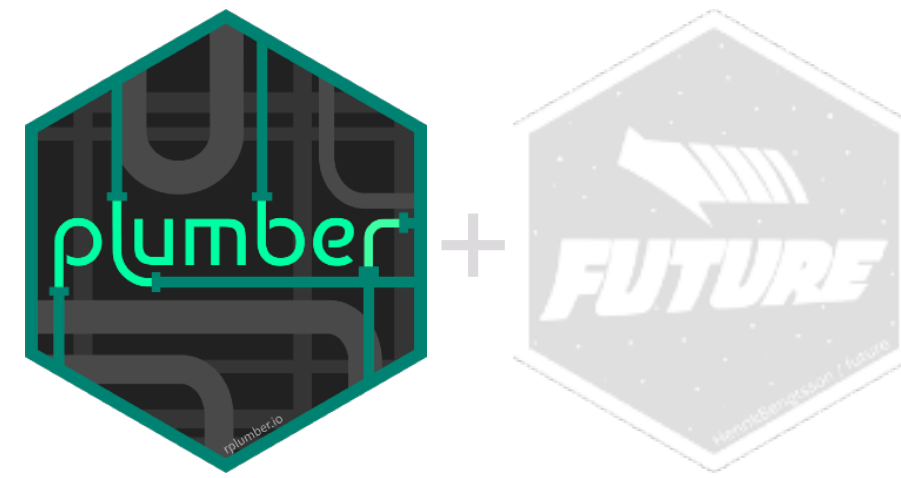
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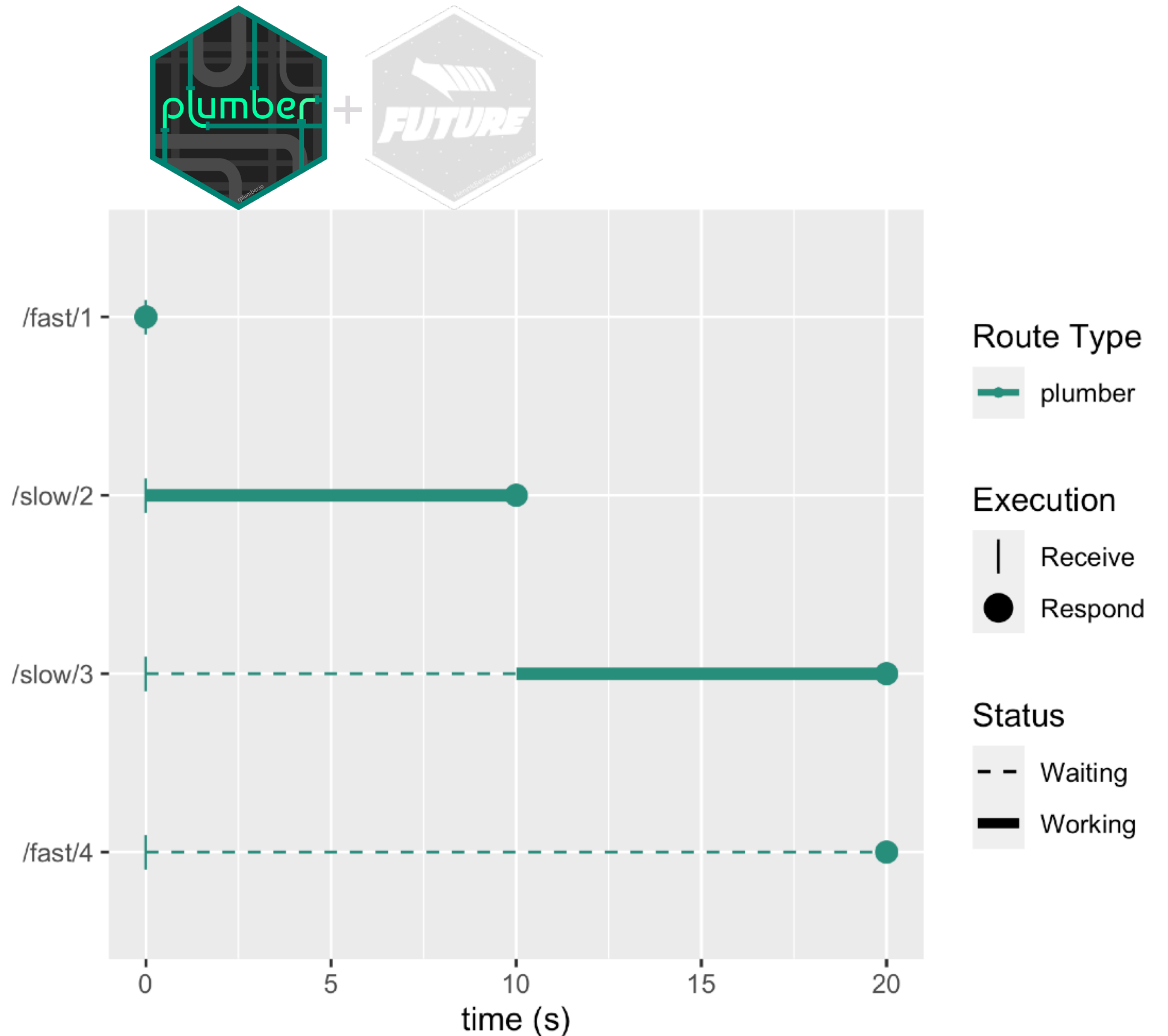
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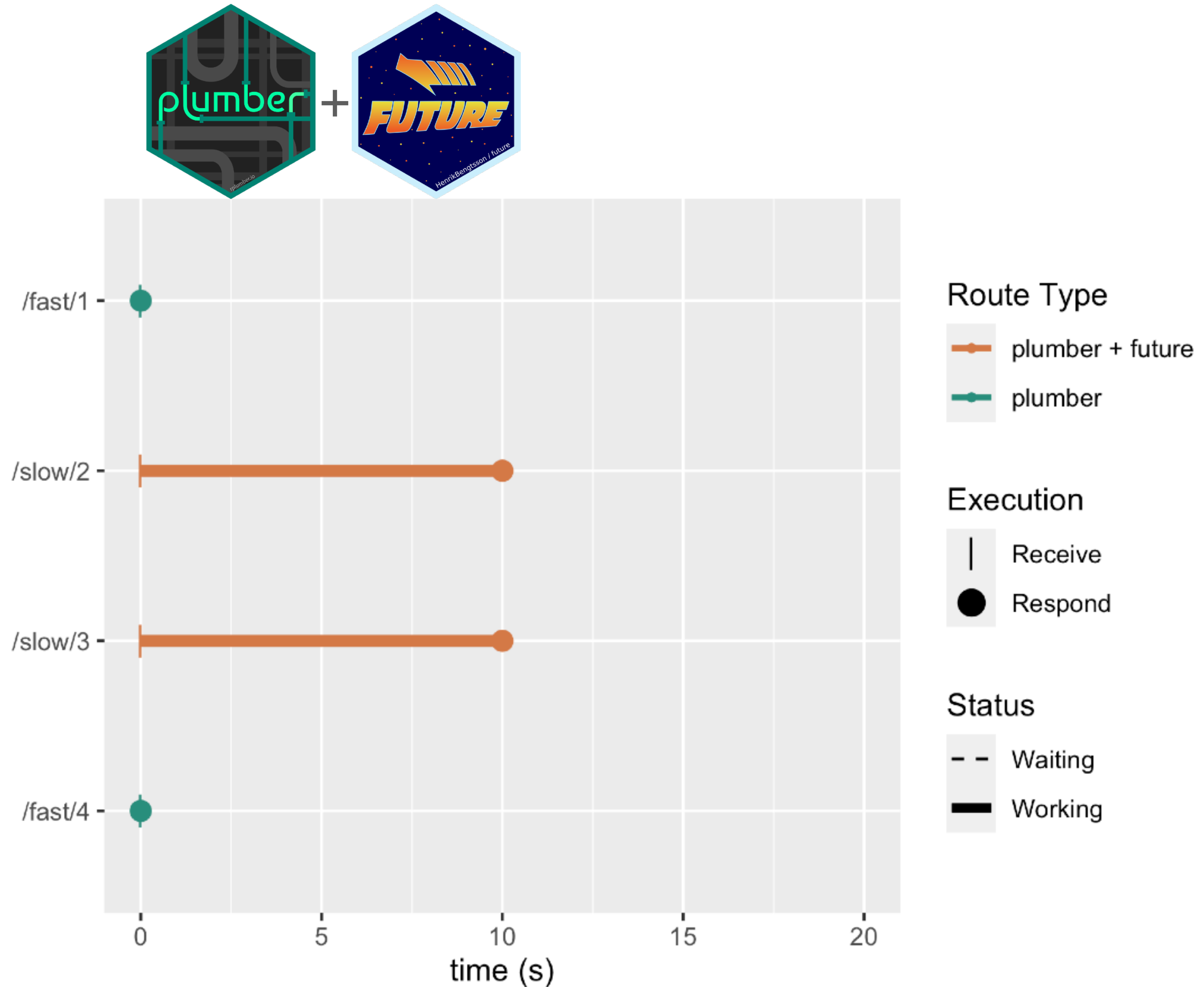
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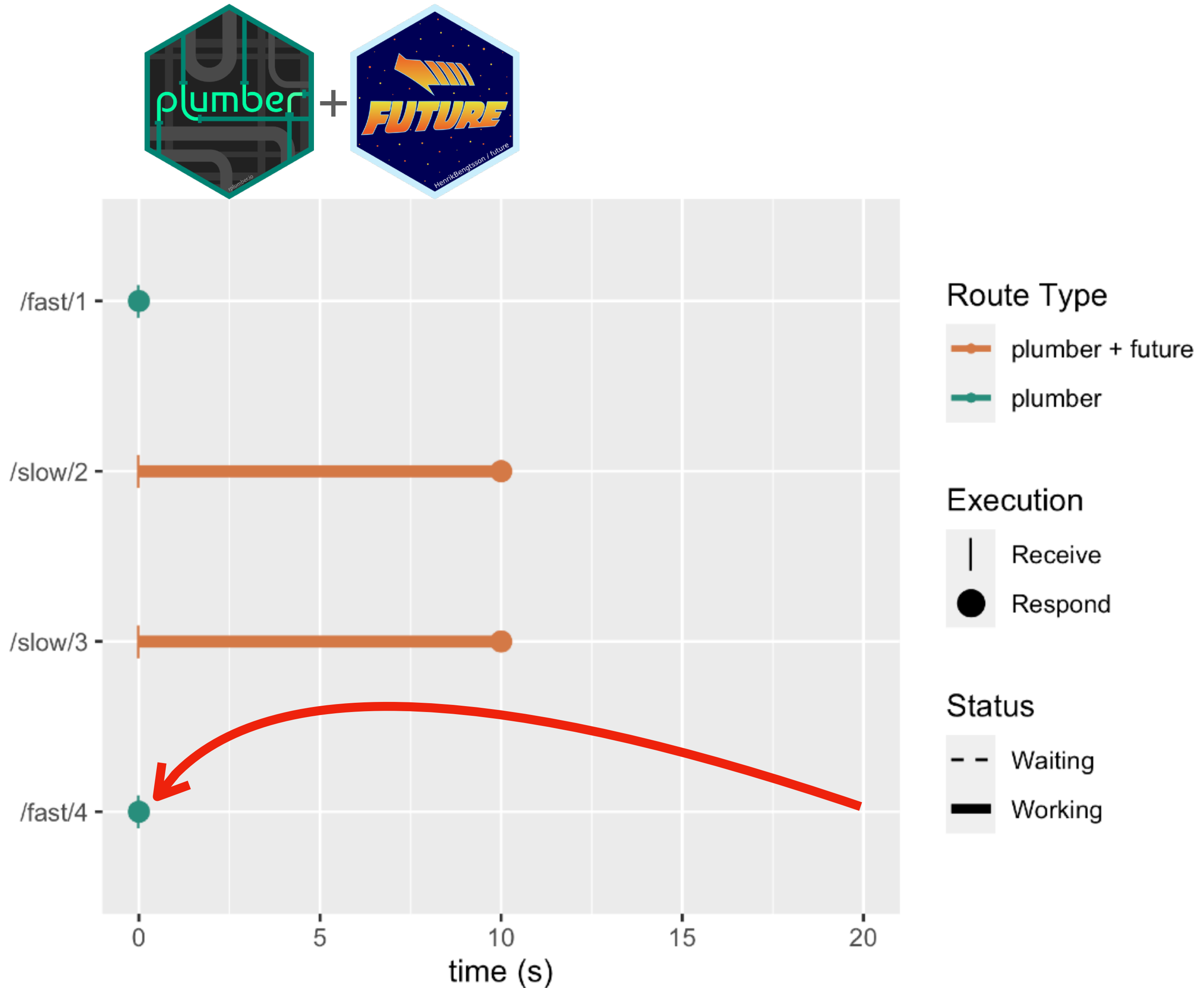
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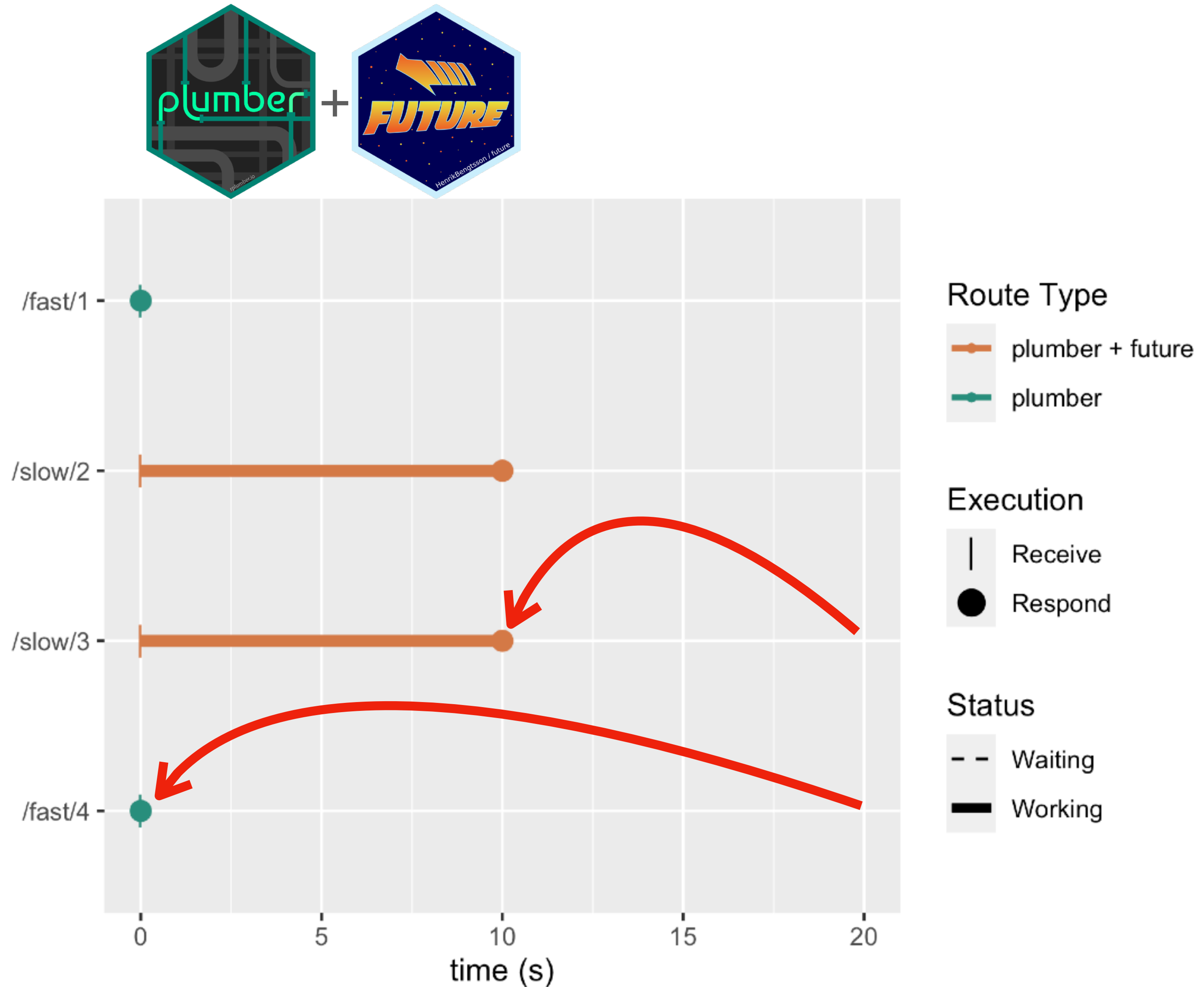
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Receive



Process



Respond





Main



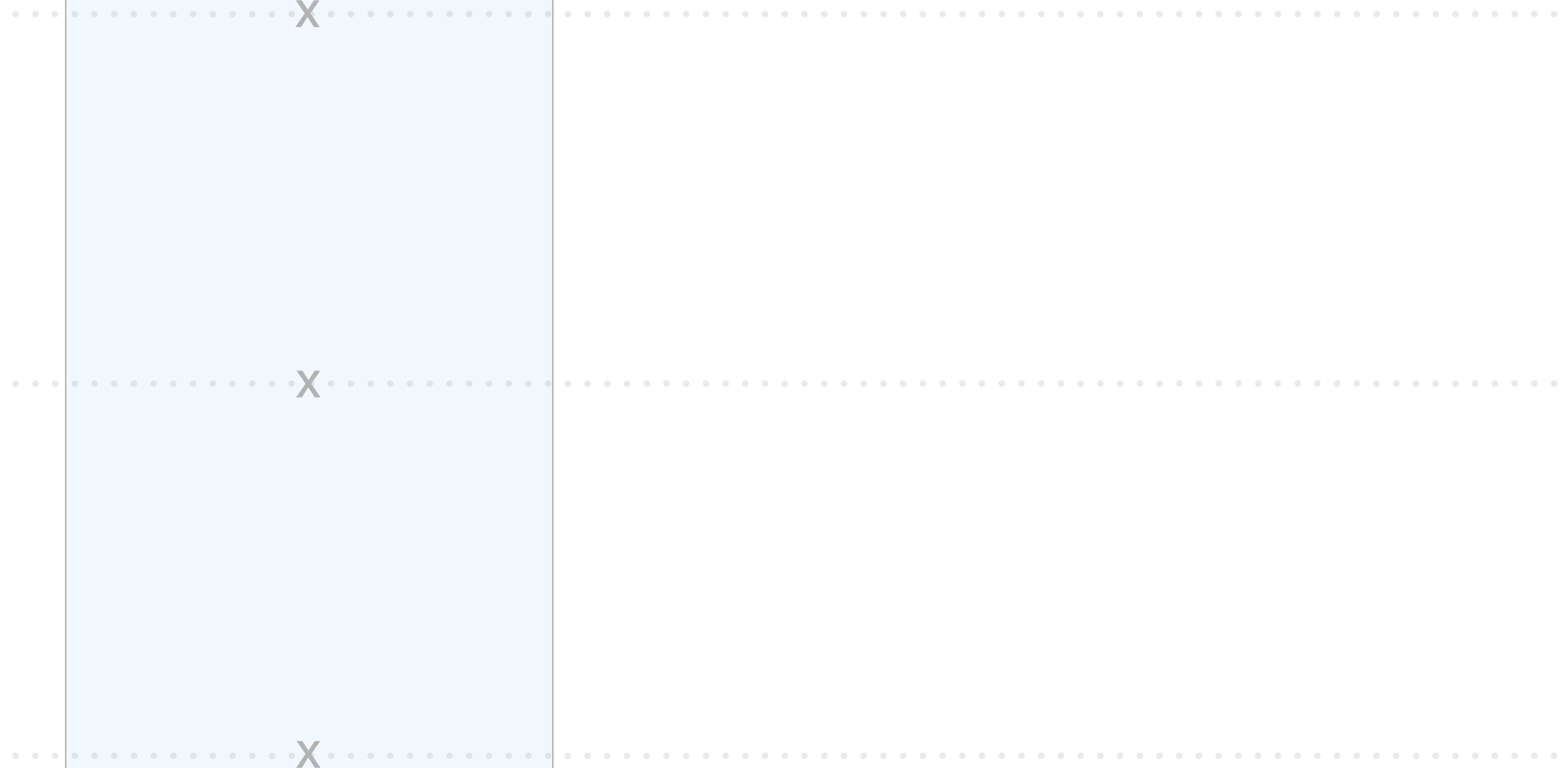
Receive



Process

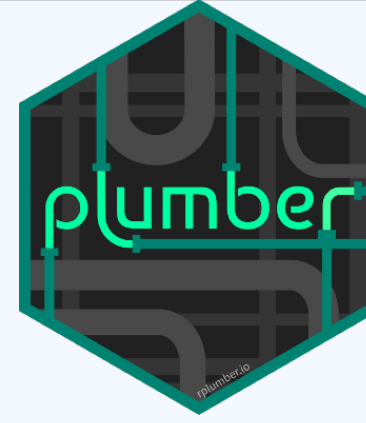


Respond





Main



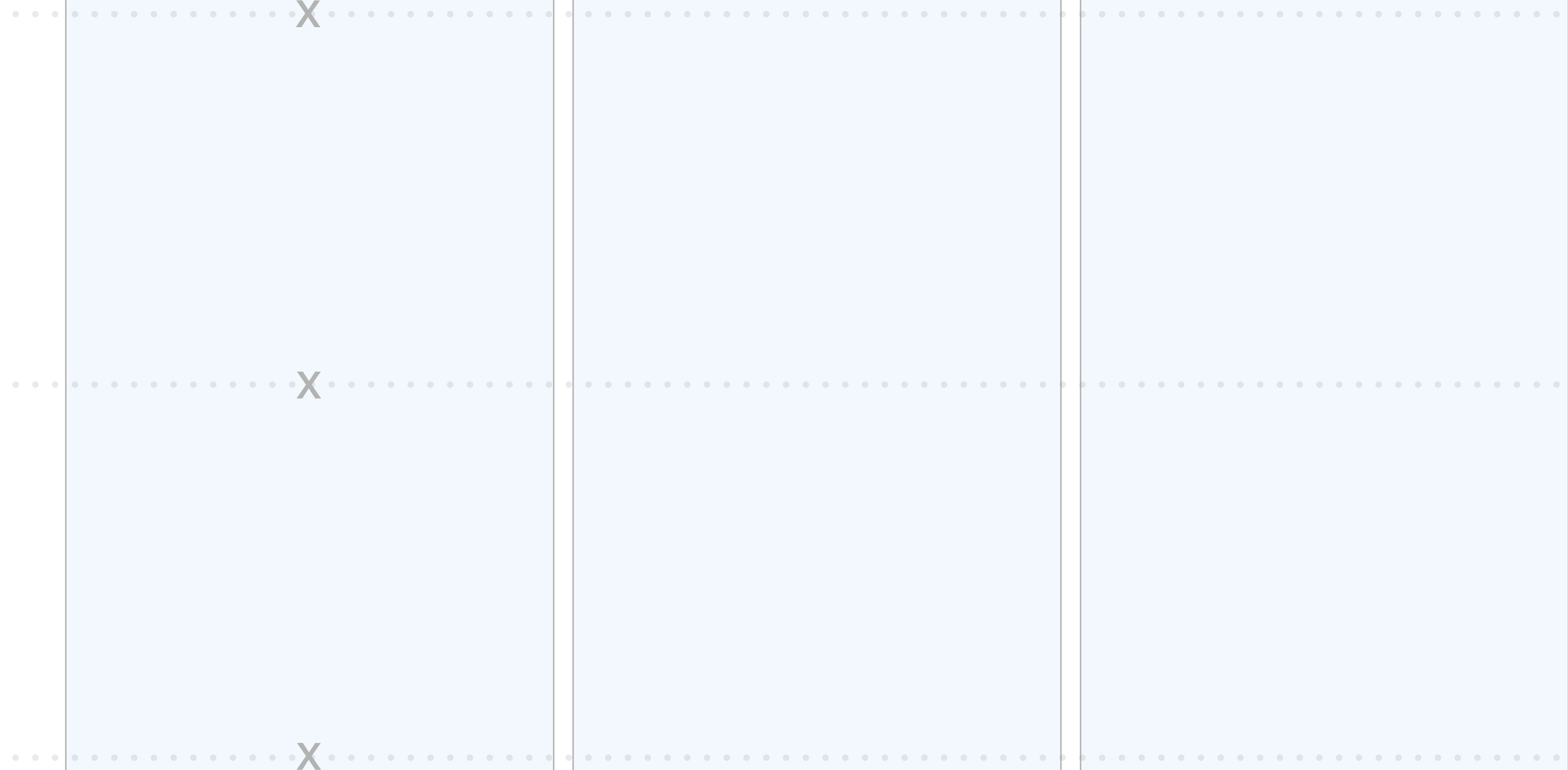
Receive



Process

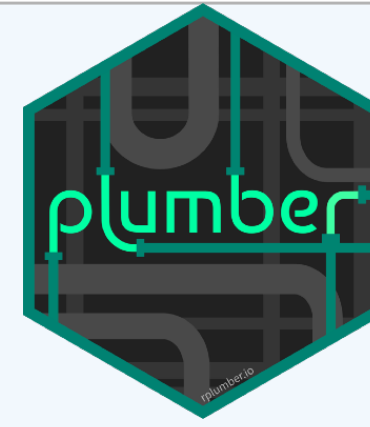


Respond





Main



Worker
#1



Worker
#2



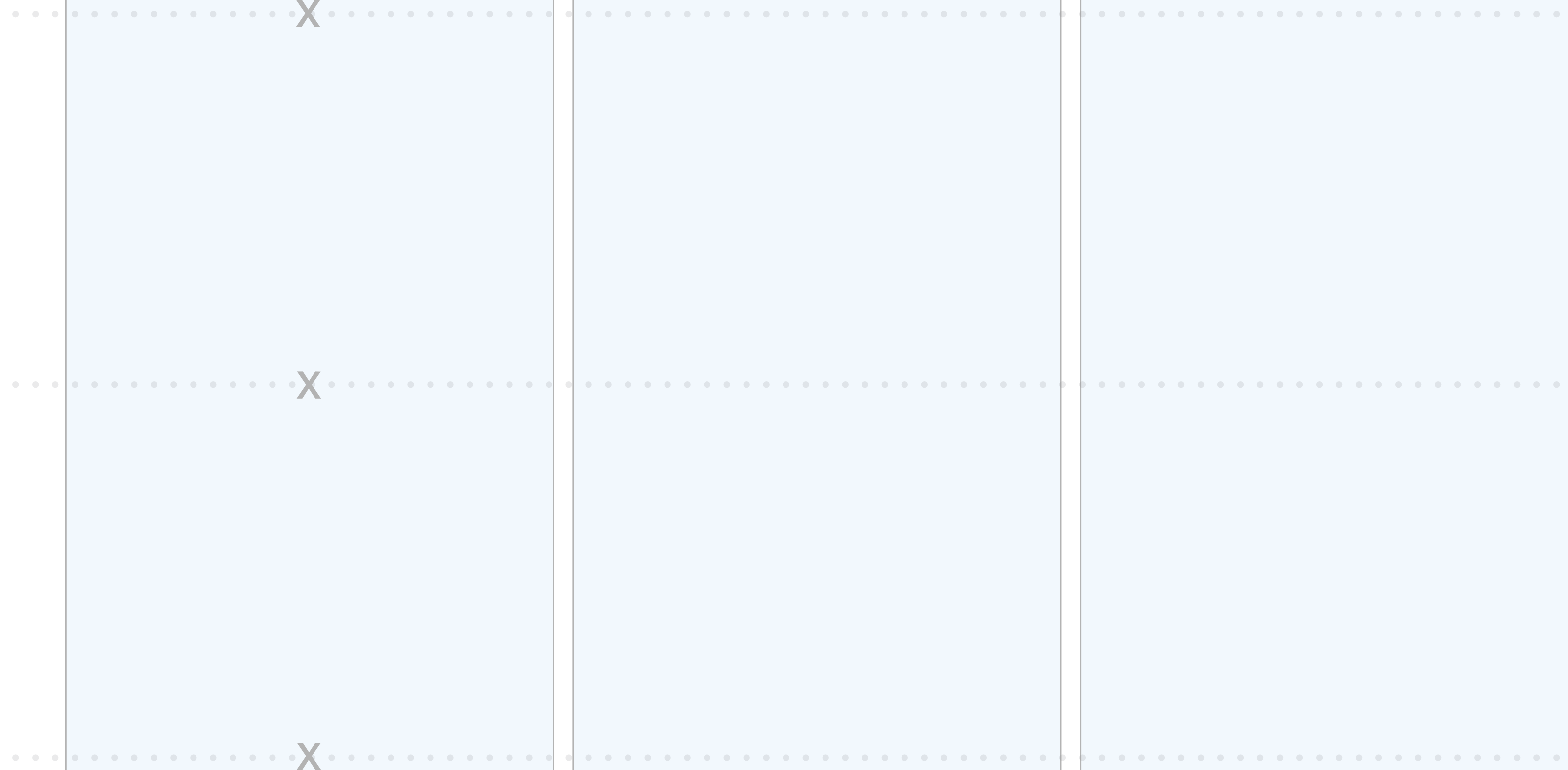
Receive



Process



Respond





Main



Worker
#1



Worker
#2



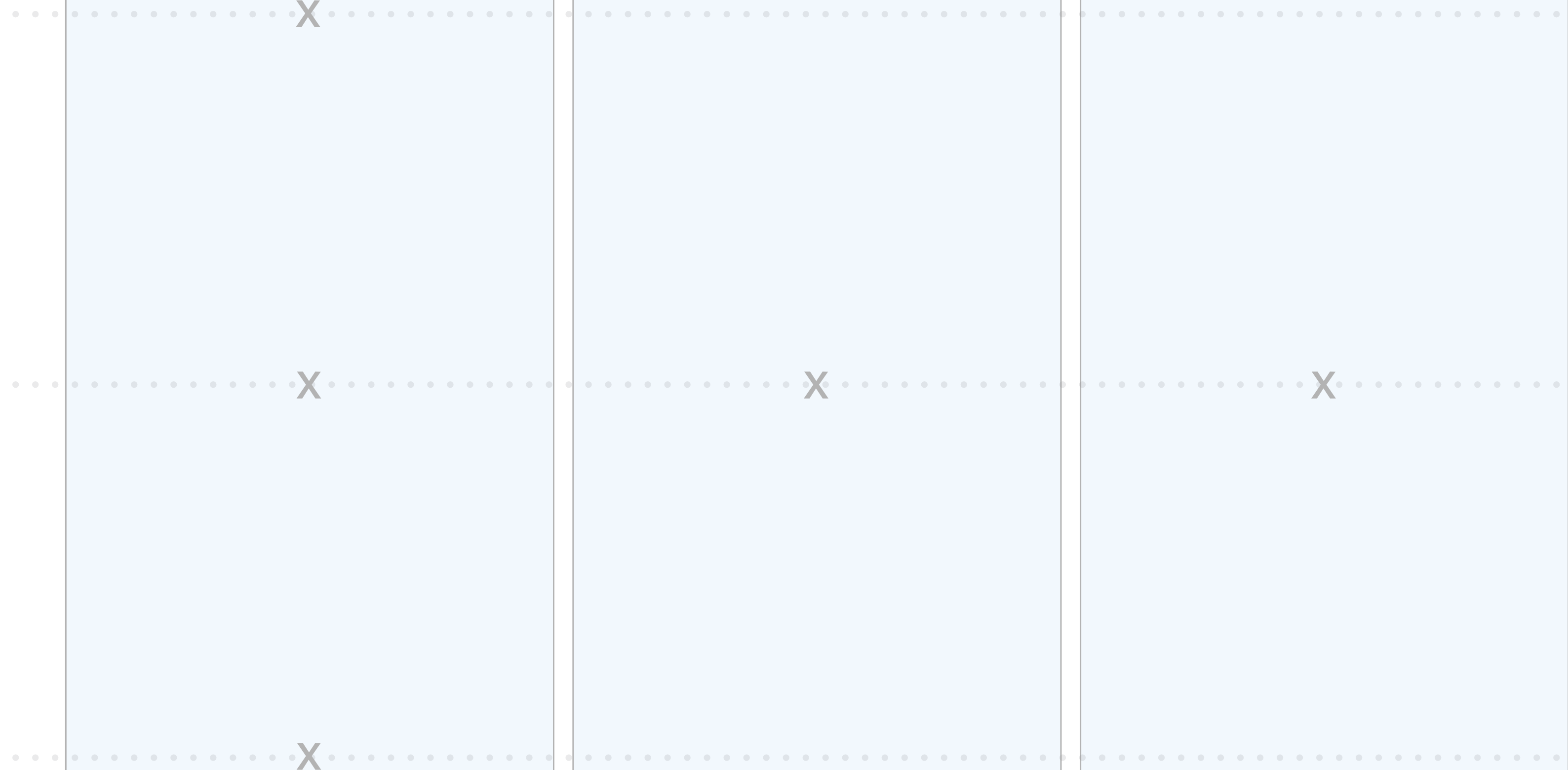
Receive



Process



Respond



Receive



Process



Respond

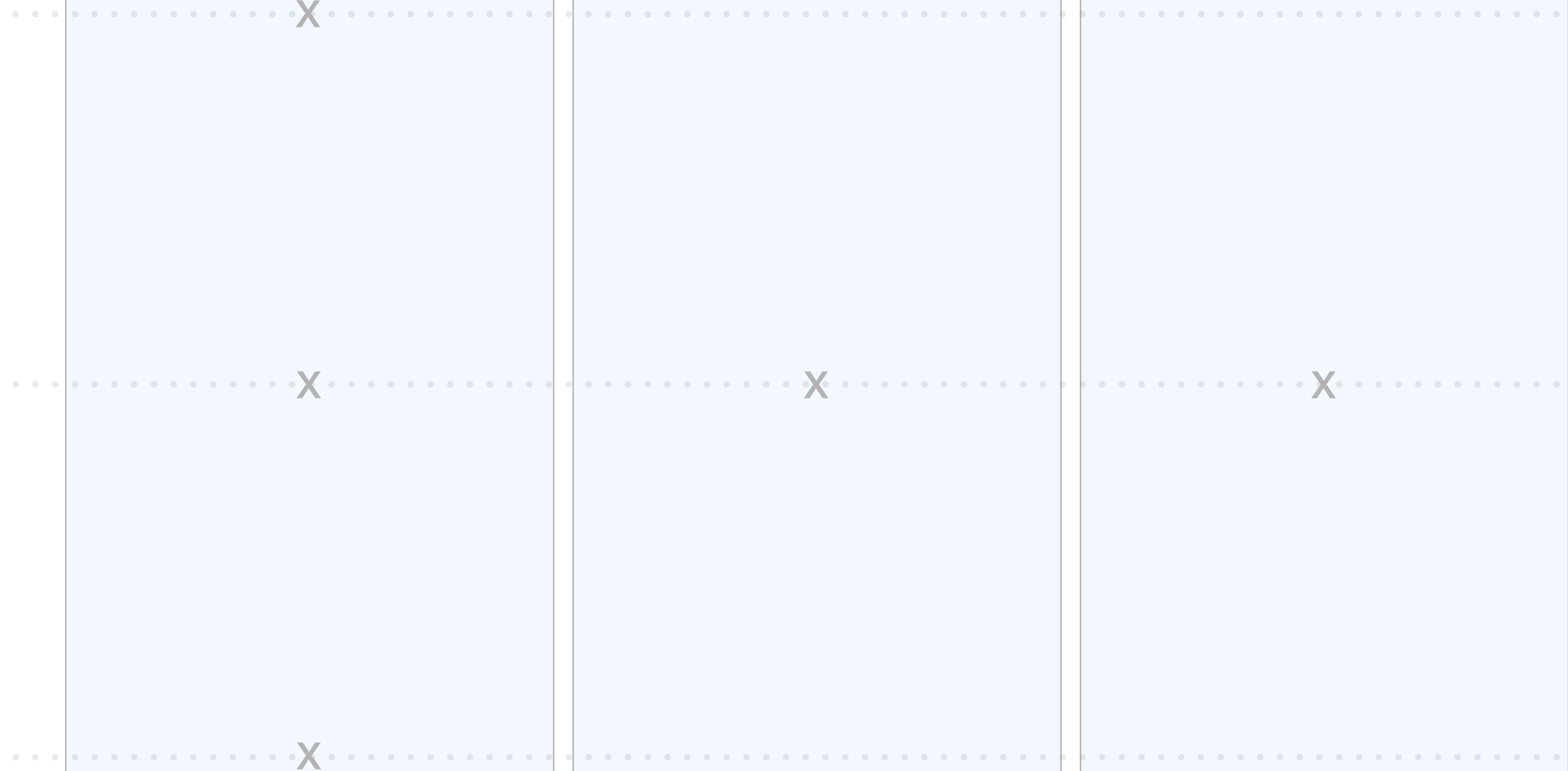
Main



Worker
#1



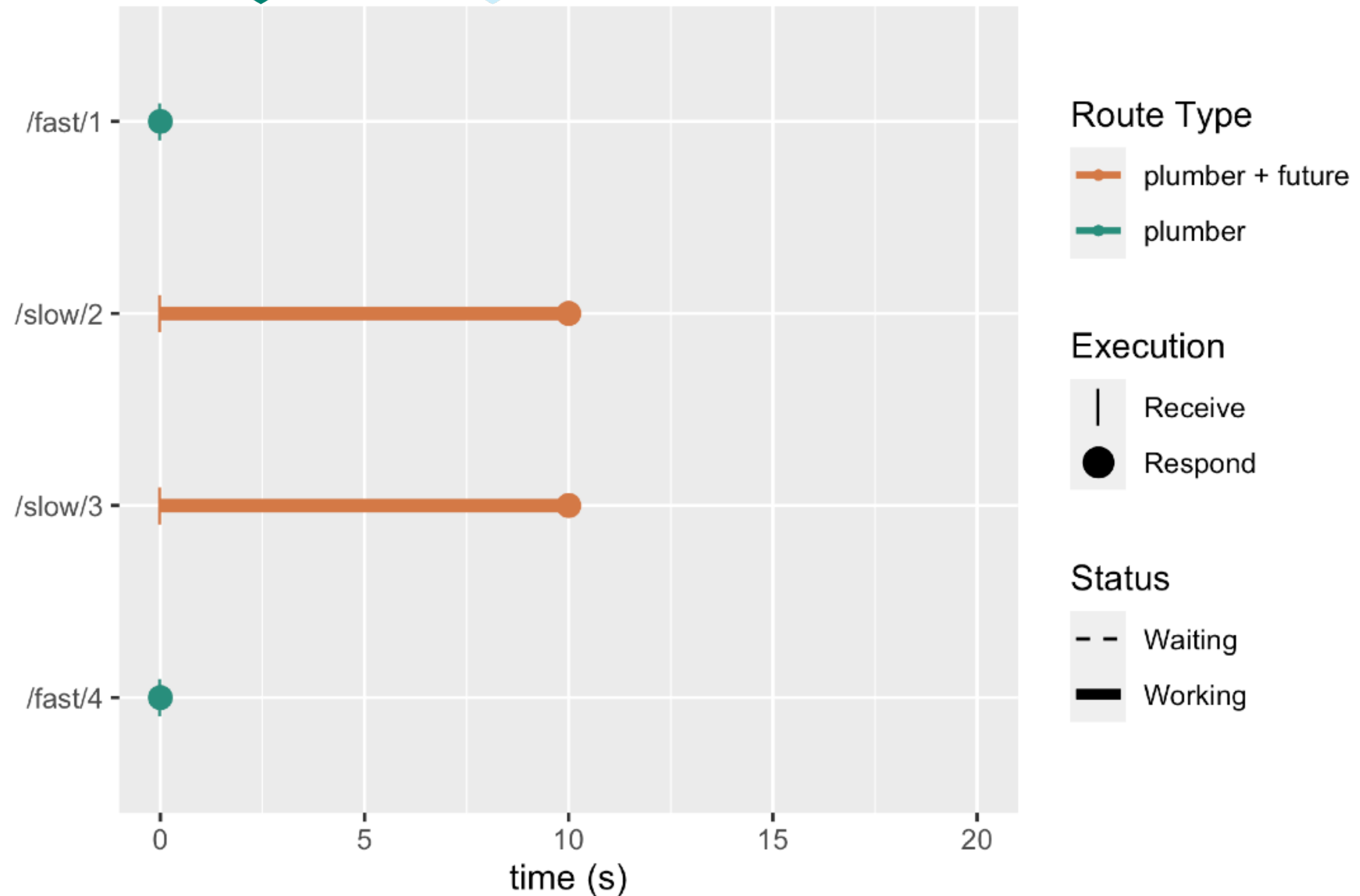
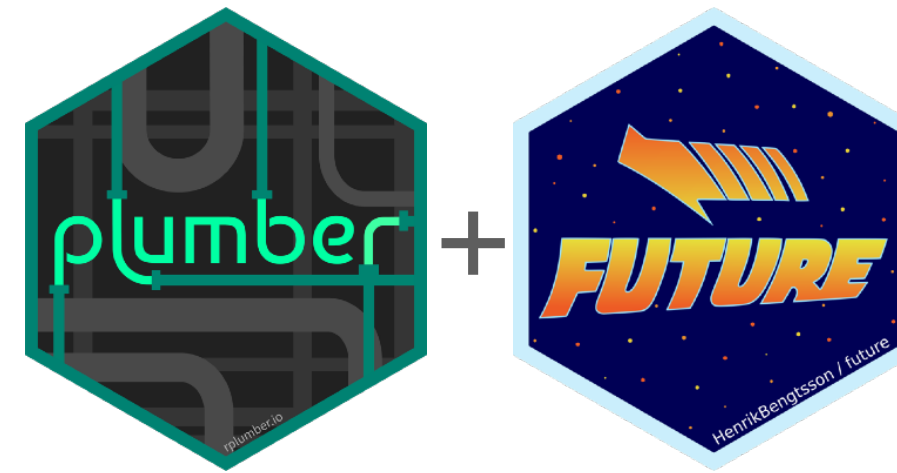
Worker
#2



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future::plan("multisession")
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## @get /fast/<id>  
function(id) {  
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}
```

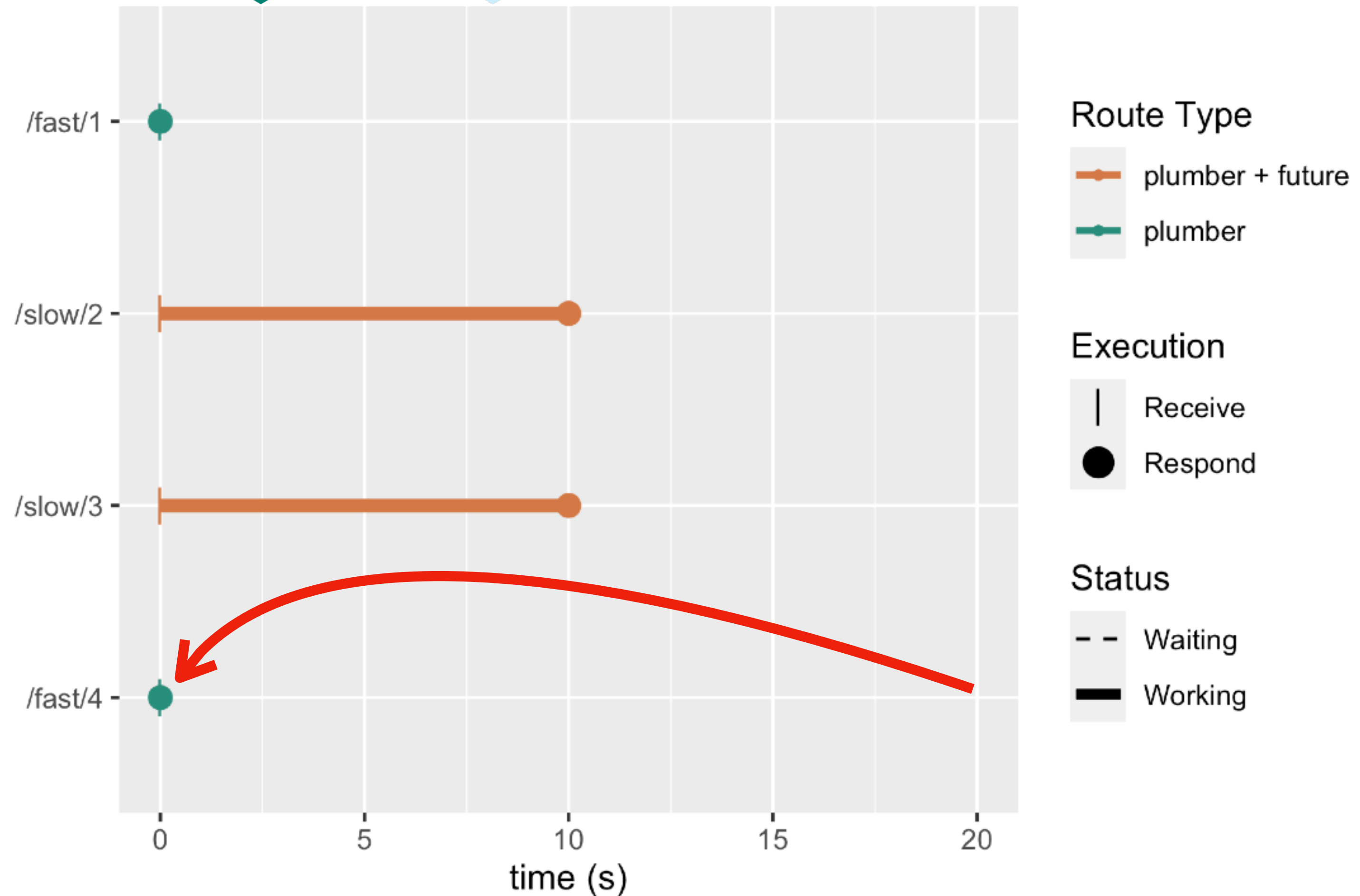
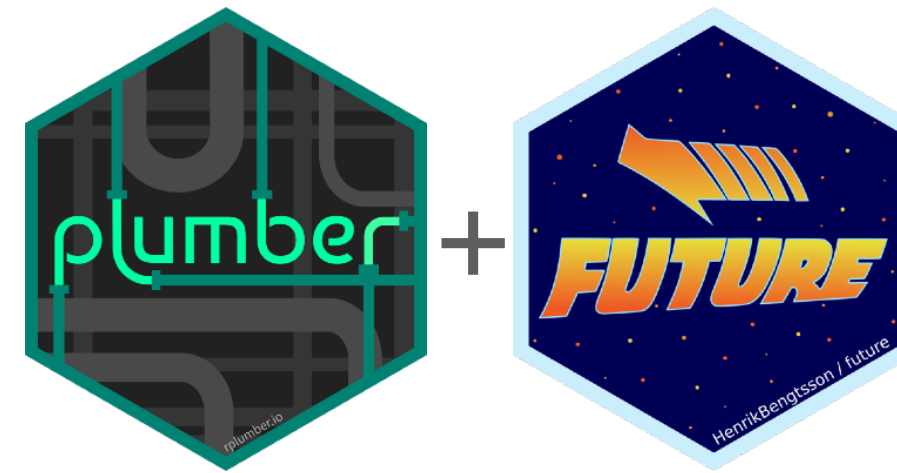
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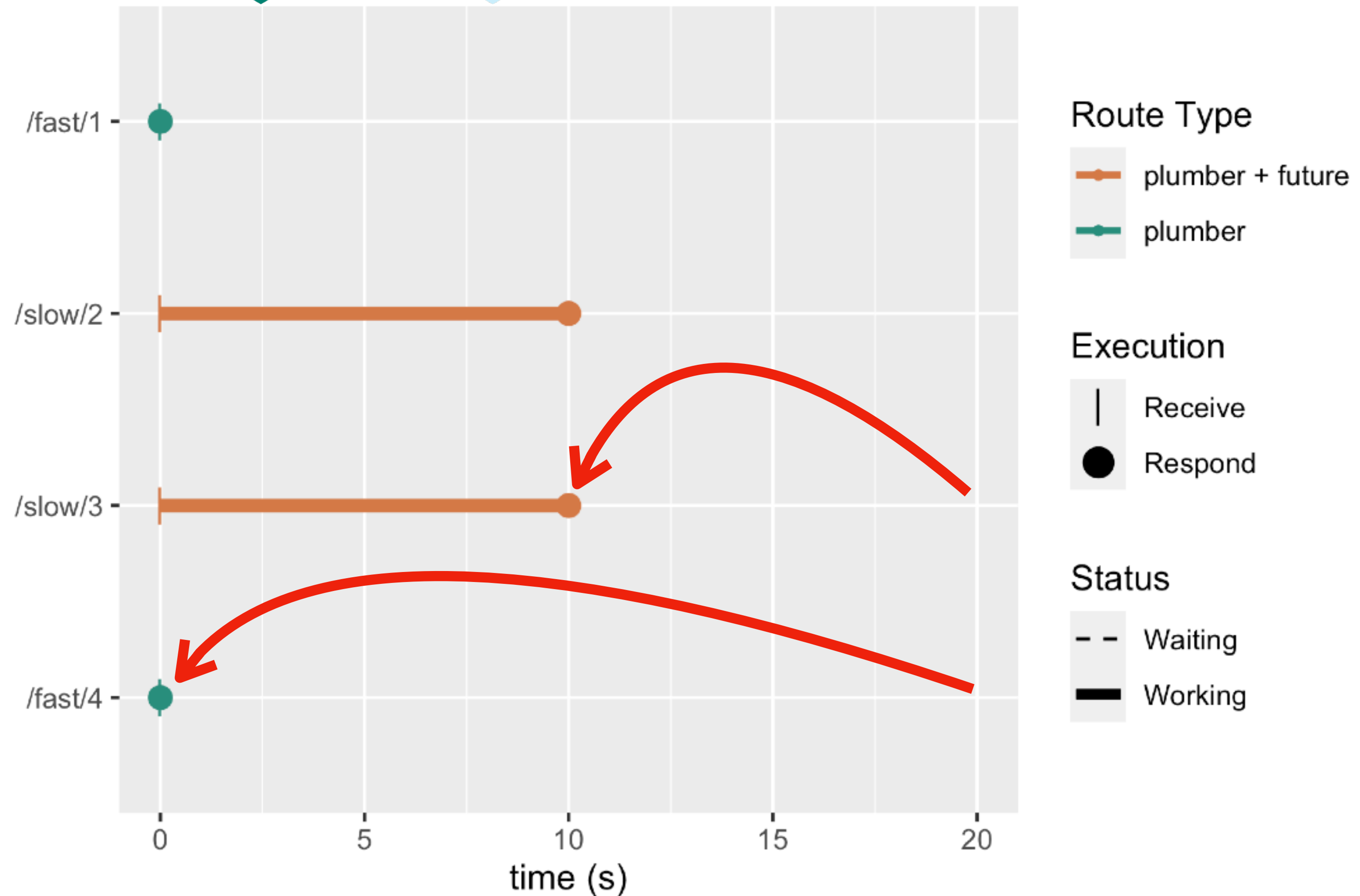
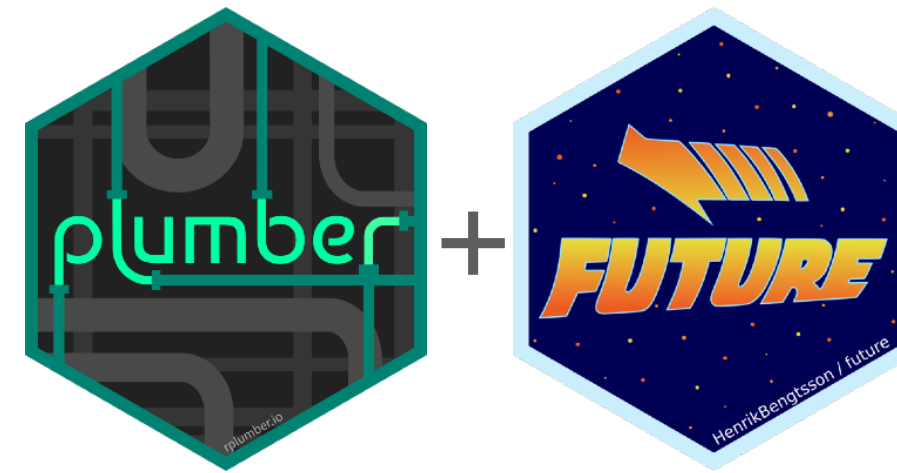
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```



Limitations...

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- Manually add `future(expr)`

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- Manually add `future(expr)`
- `future(expr)` is not instant



Limitations...

- Manually add `future(expr)`
- `future(expr)` is not instant
- Processing power is finite
Memory size is finite



+



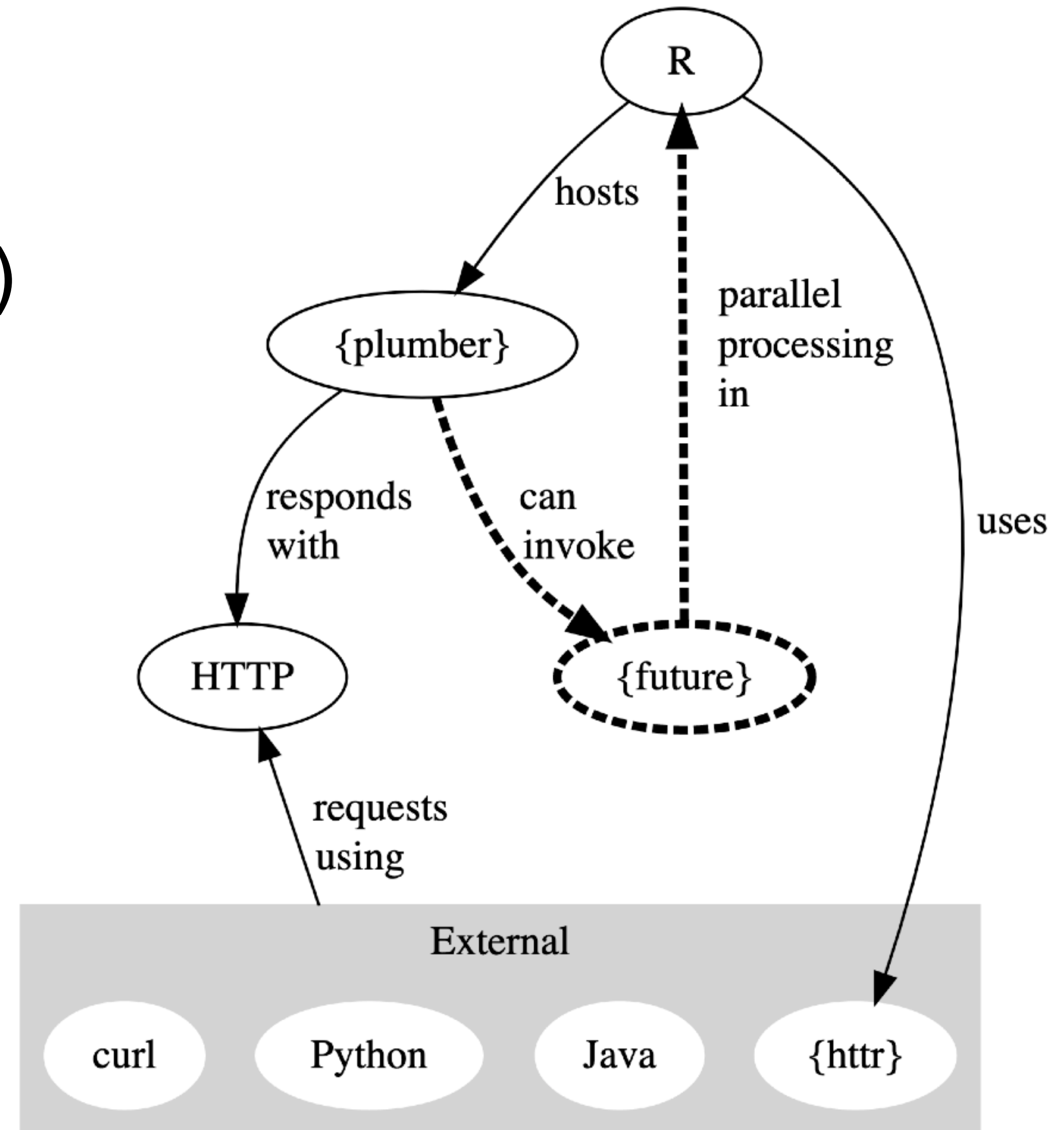
Barret Schloerke
RStudio / Shiny Team
  @schloerke

- Offload *slow* routes using `future(expr)`
- **Slides and material:**
rstudio.io/global2021/barretschloerke

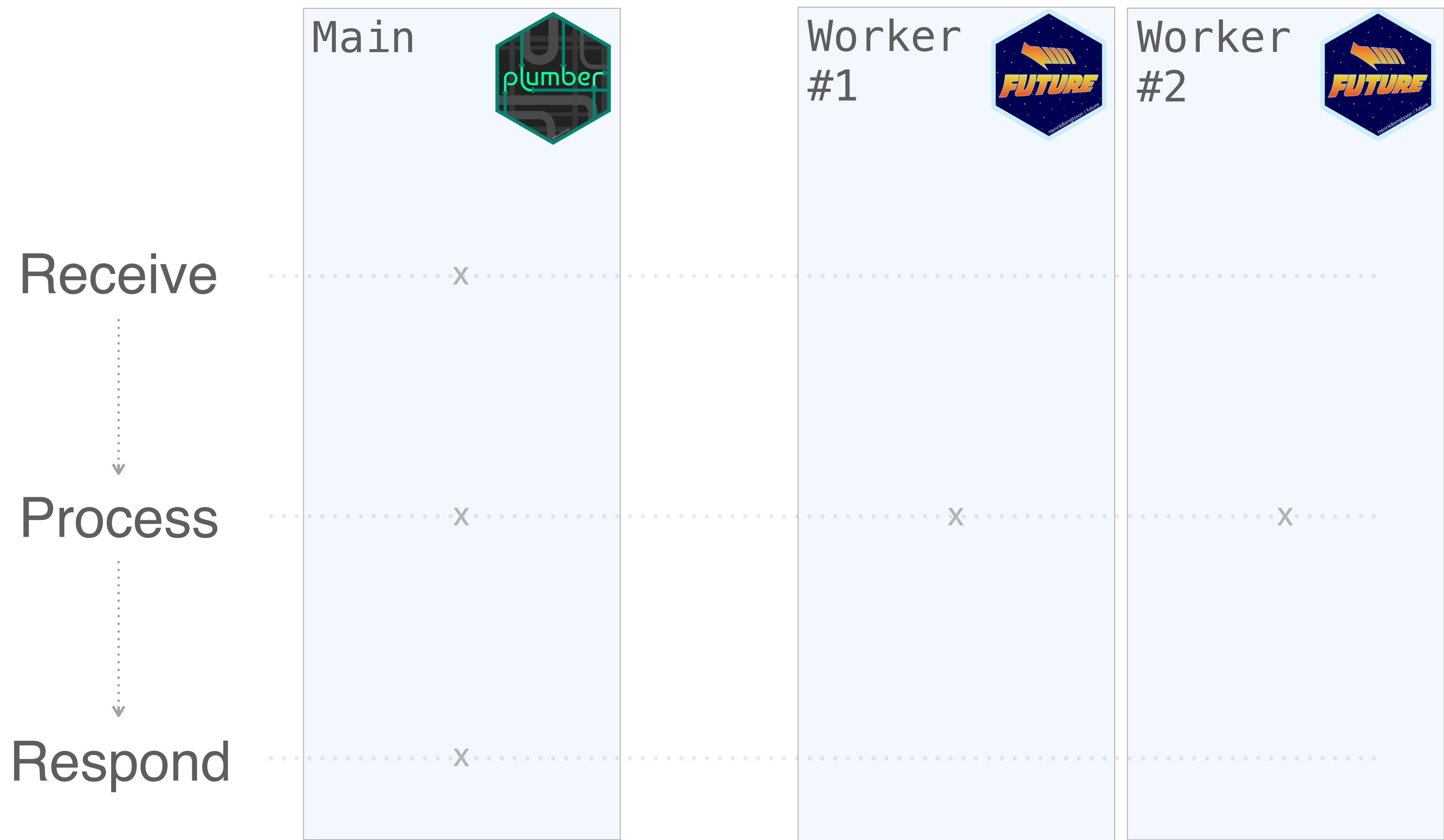
```

#* @get /ask
function(question) {
  if (is_quick(question))
    barret::answer(
      question)
  else
    future({
      barret::answer(
        question)
    })
}

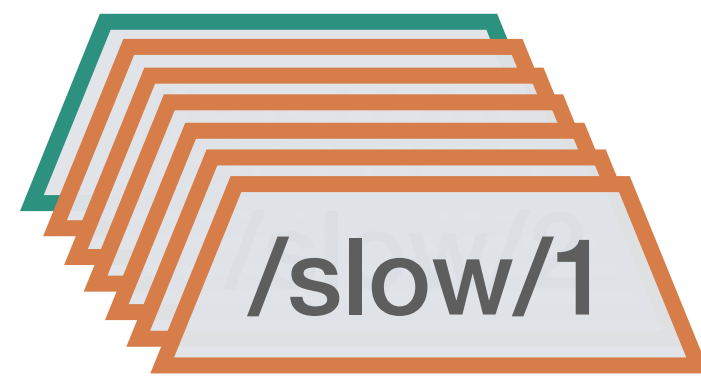
```



Question:
What happens
when I run out of
future workers?



workers = 2



Main



Worker
#1



Worker
#2



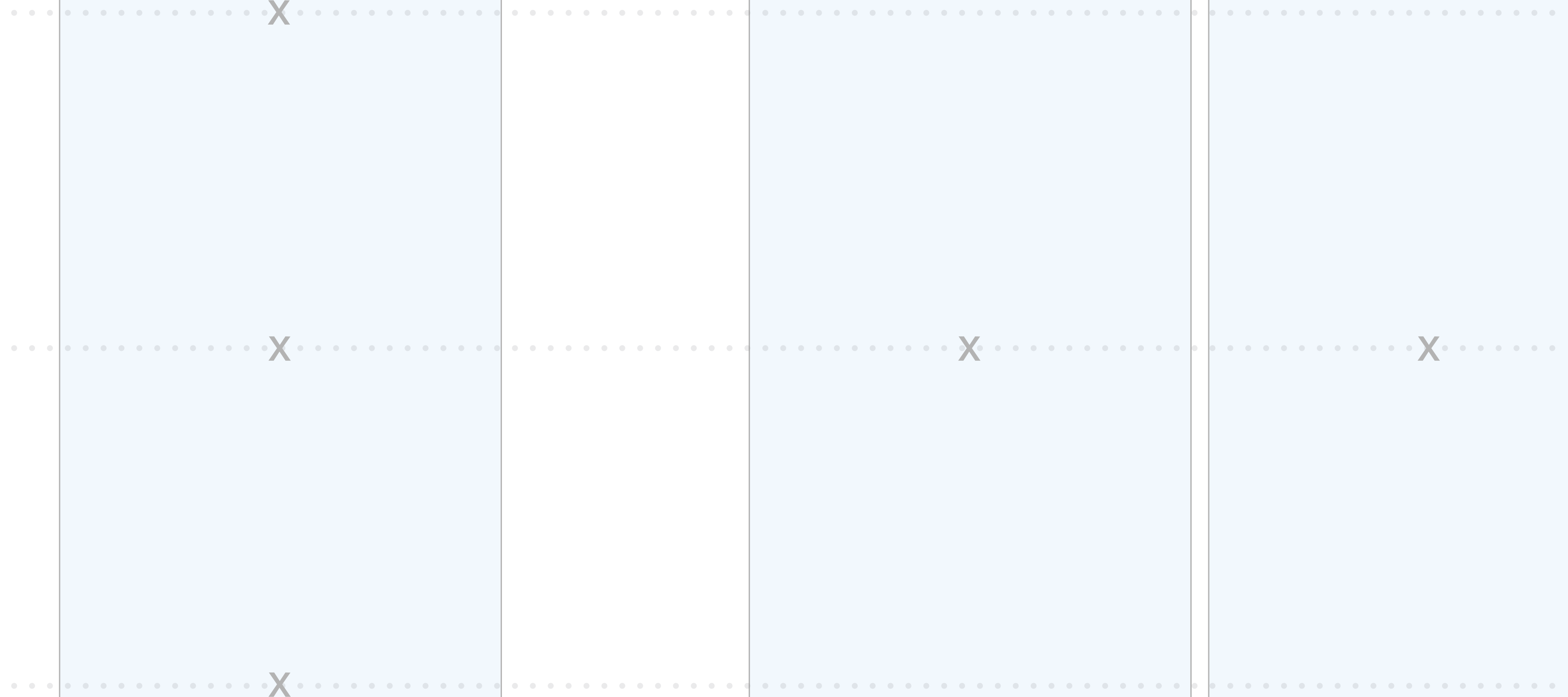
Receive



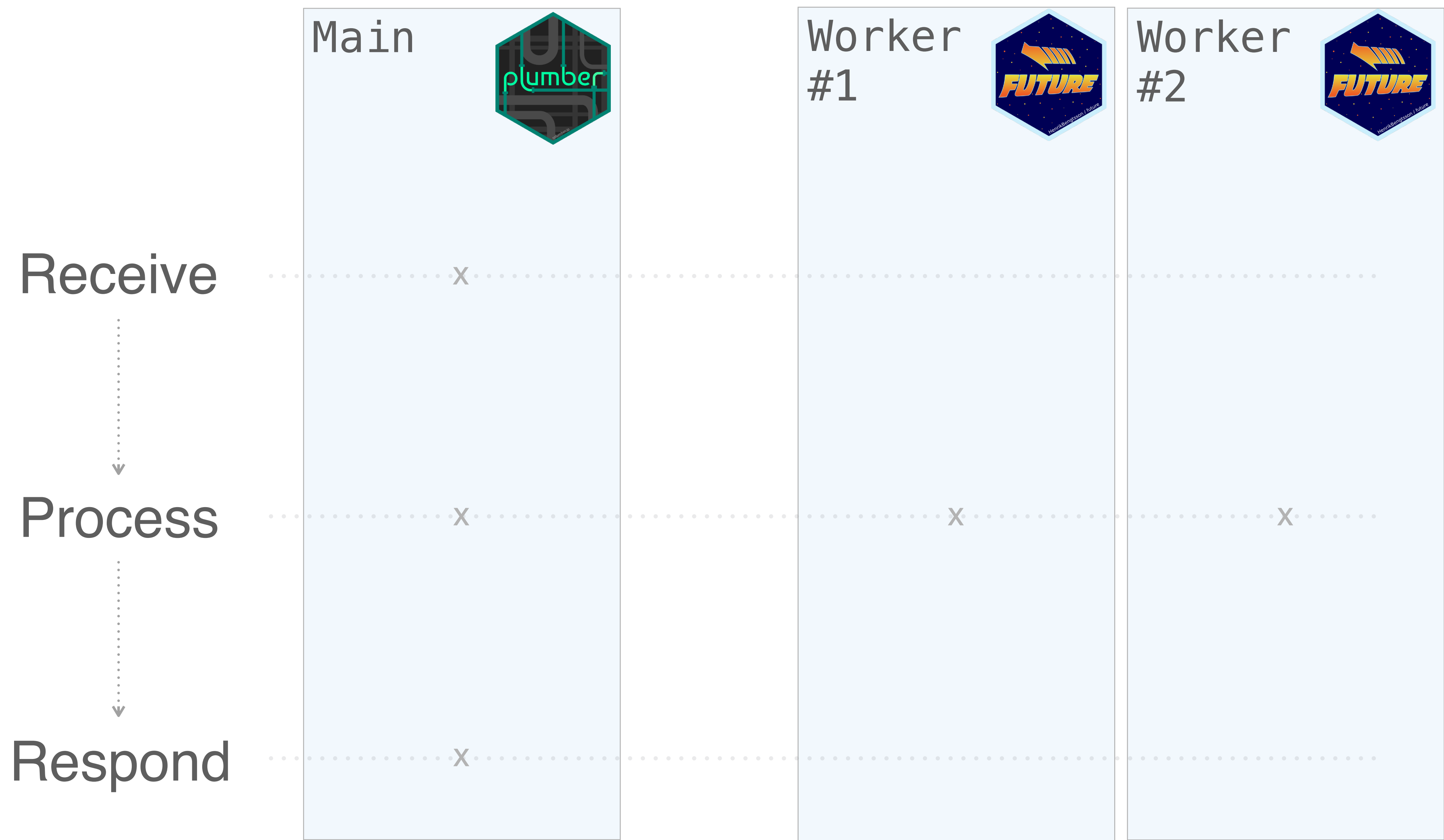
Process

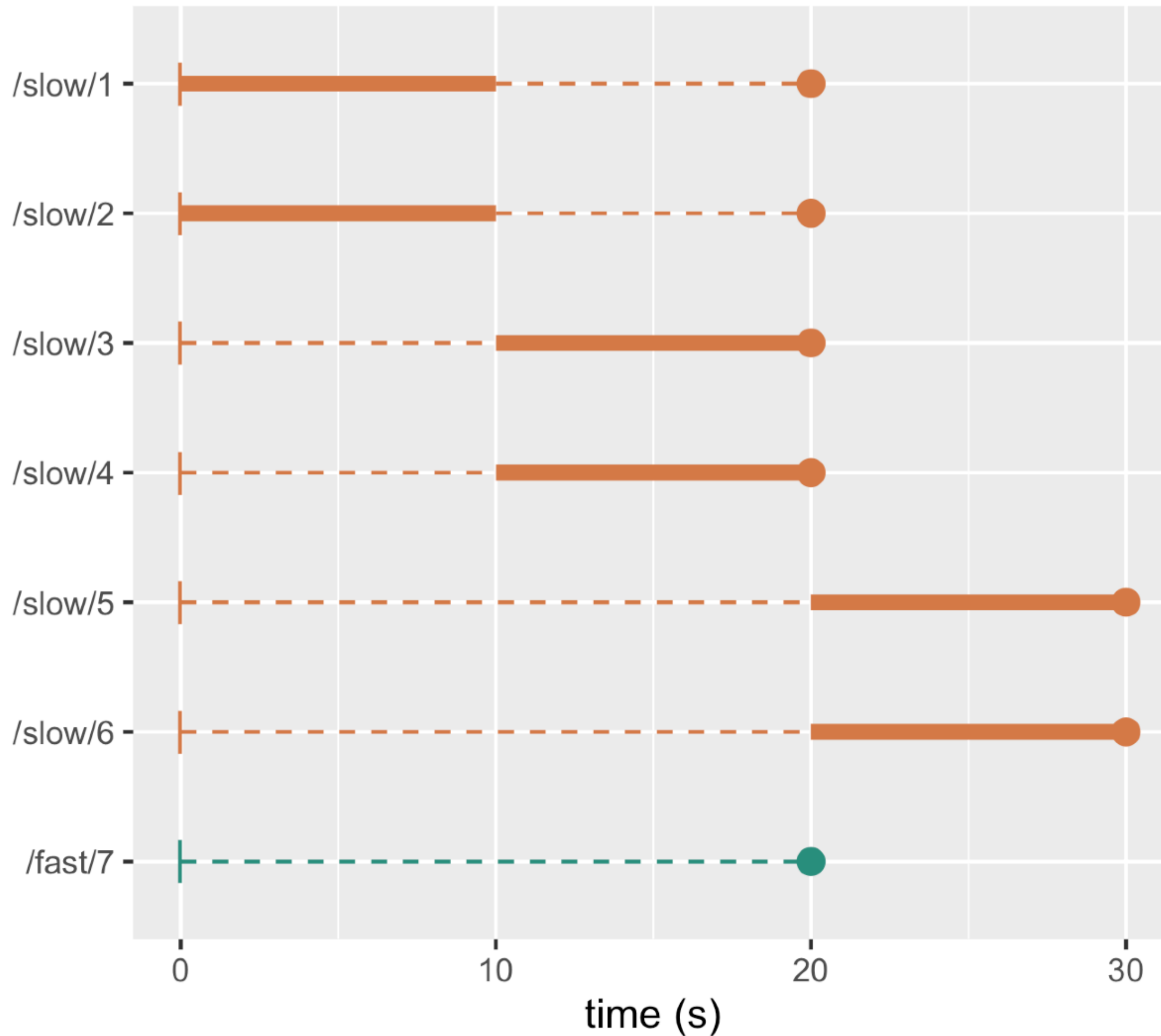


Respond

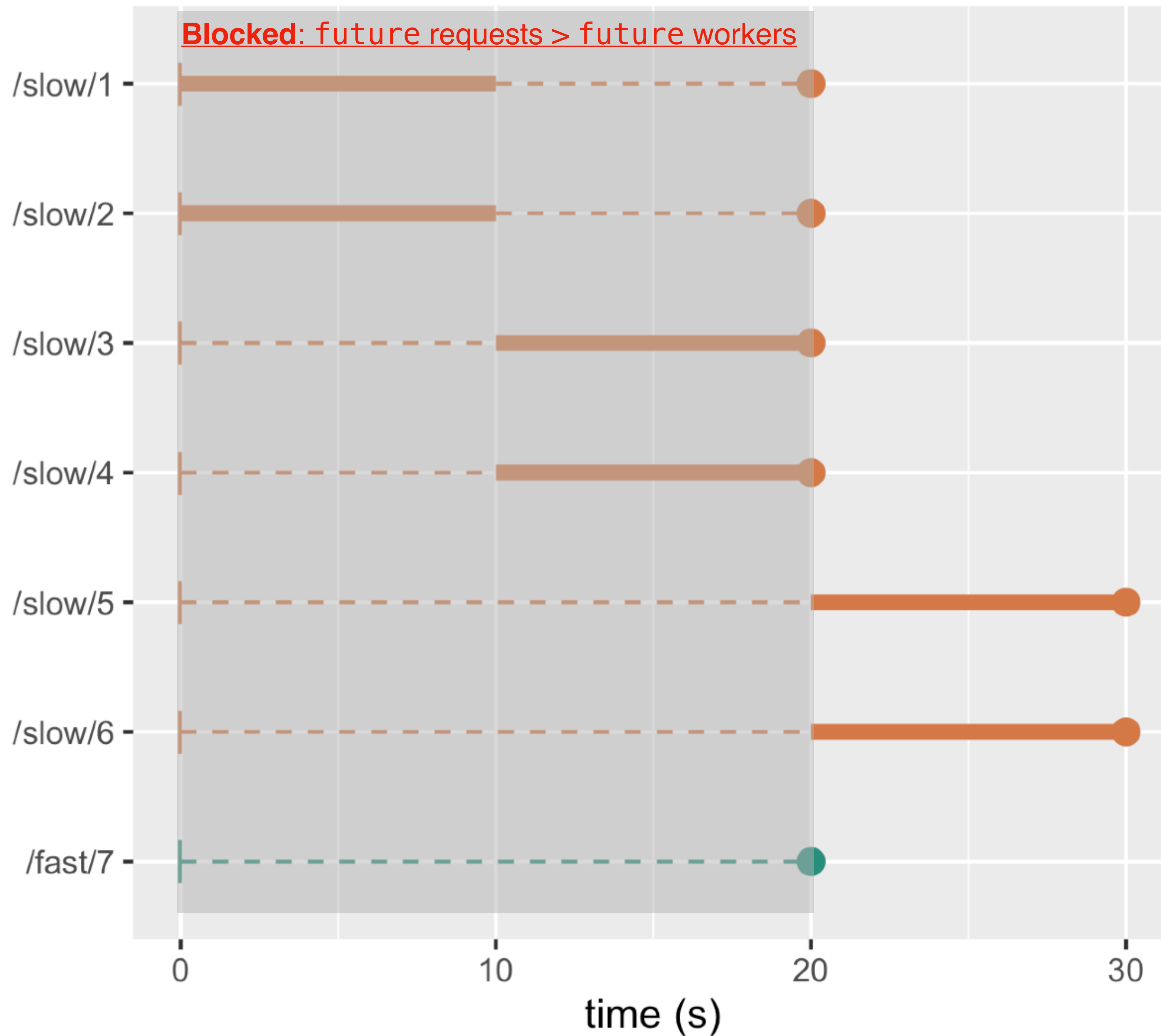


workers = 2





workers = 2



Route Type

- plumber + future
- plumber

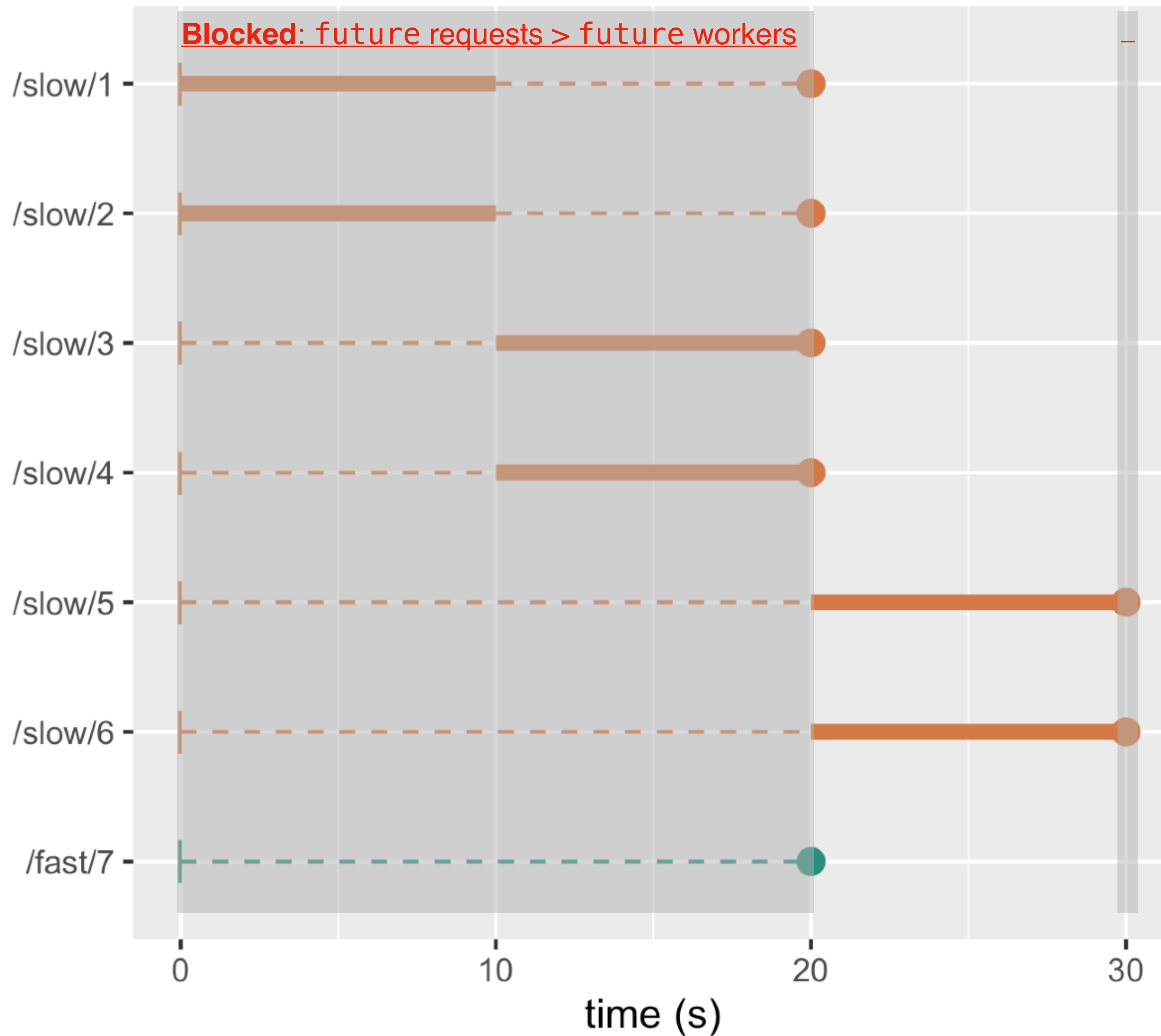
Execution

- Receive
- Respond

Status

- Waiting
- Working

workers = 2



Route Type

- plumber + future
- plumber

Execution

- Receive
- Respond

Status

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- Working

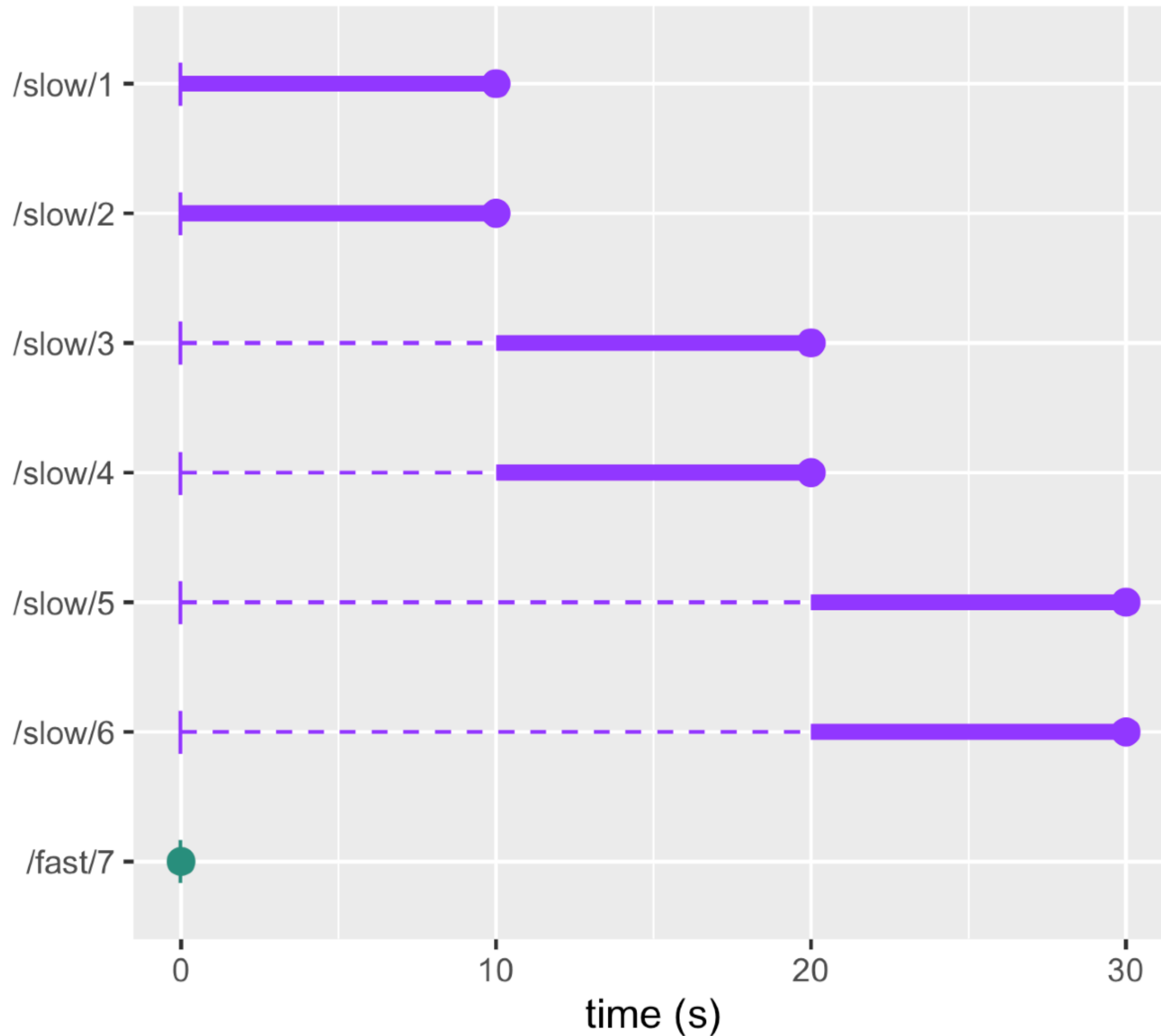
workers = 2


```
promises::future_promise(expr)
```

`promises::future_promise(expr)`

A promise that executes using future

(In final development of
promises v1.2.0)



Route Type

- plumber + future_promise
- plumber

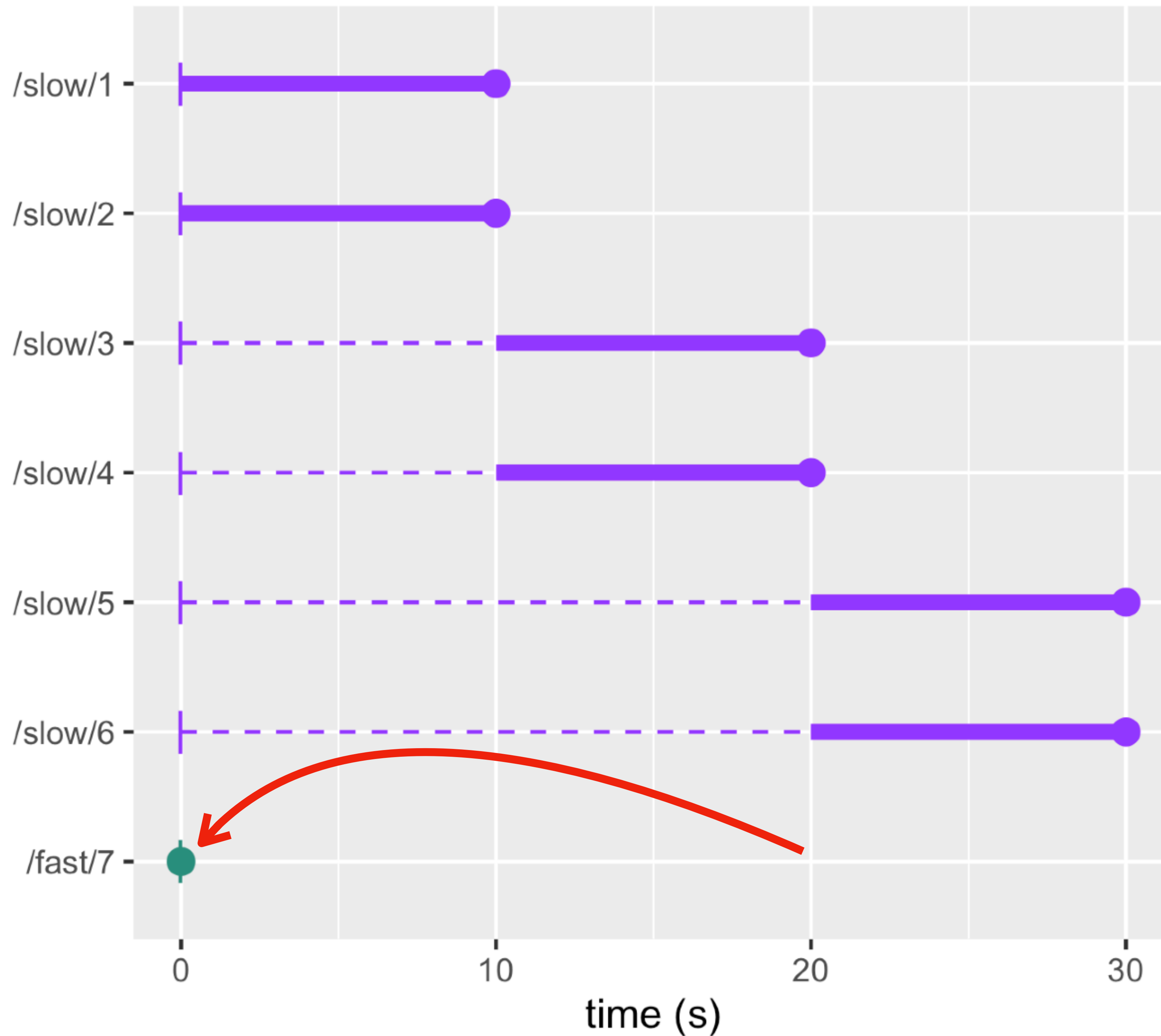
Execution

- Receive
- Respond

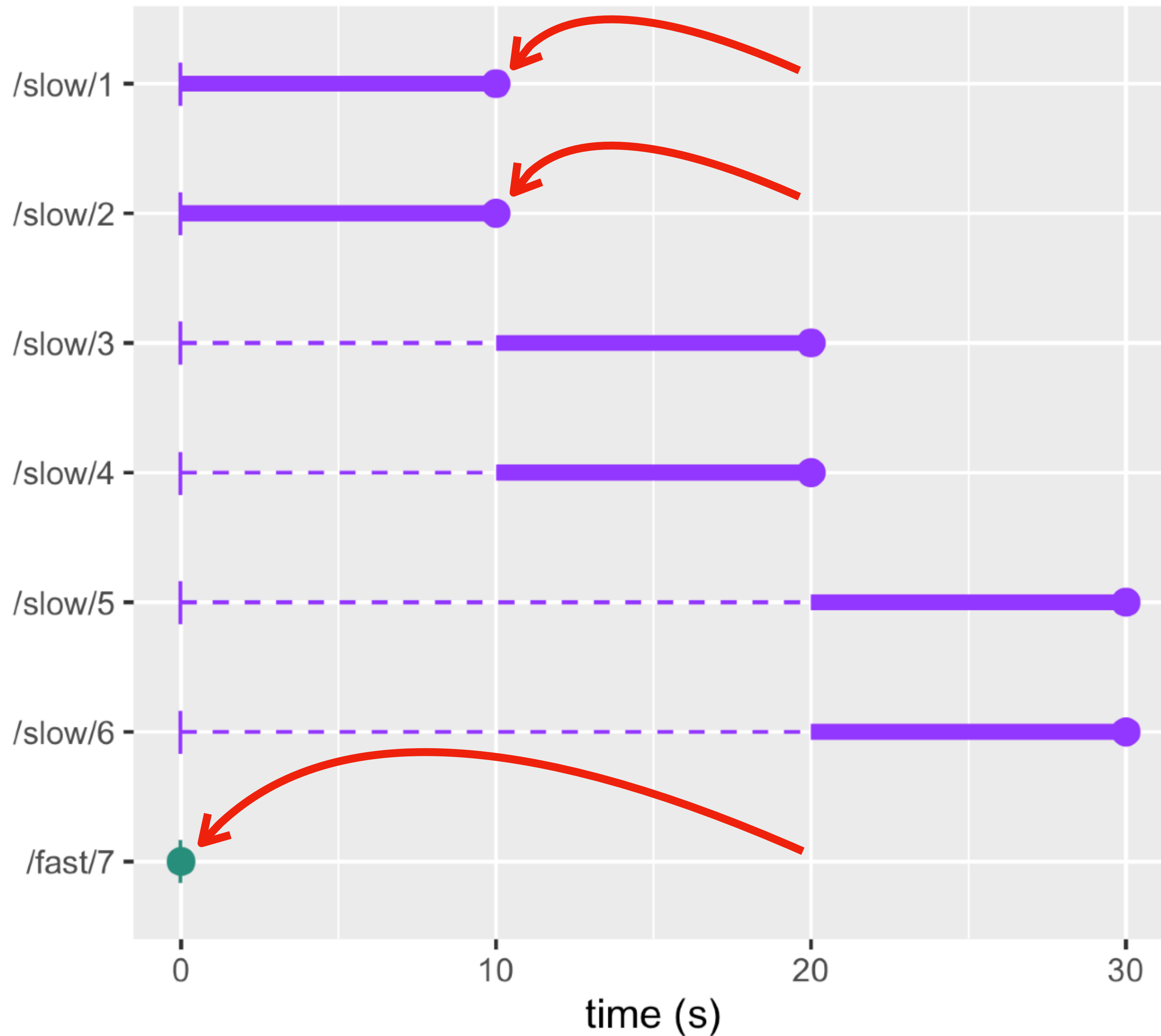
Status

- Waiting in promise
- Working in future

workers = 2



workers = 2



Route Type

- plumber + future_promise
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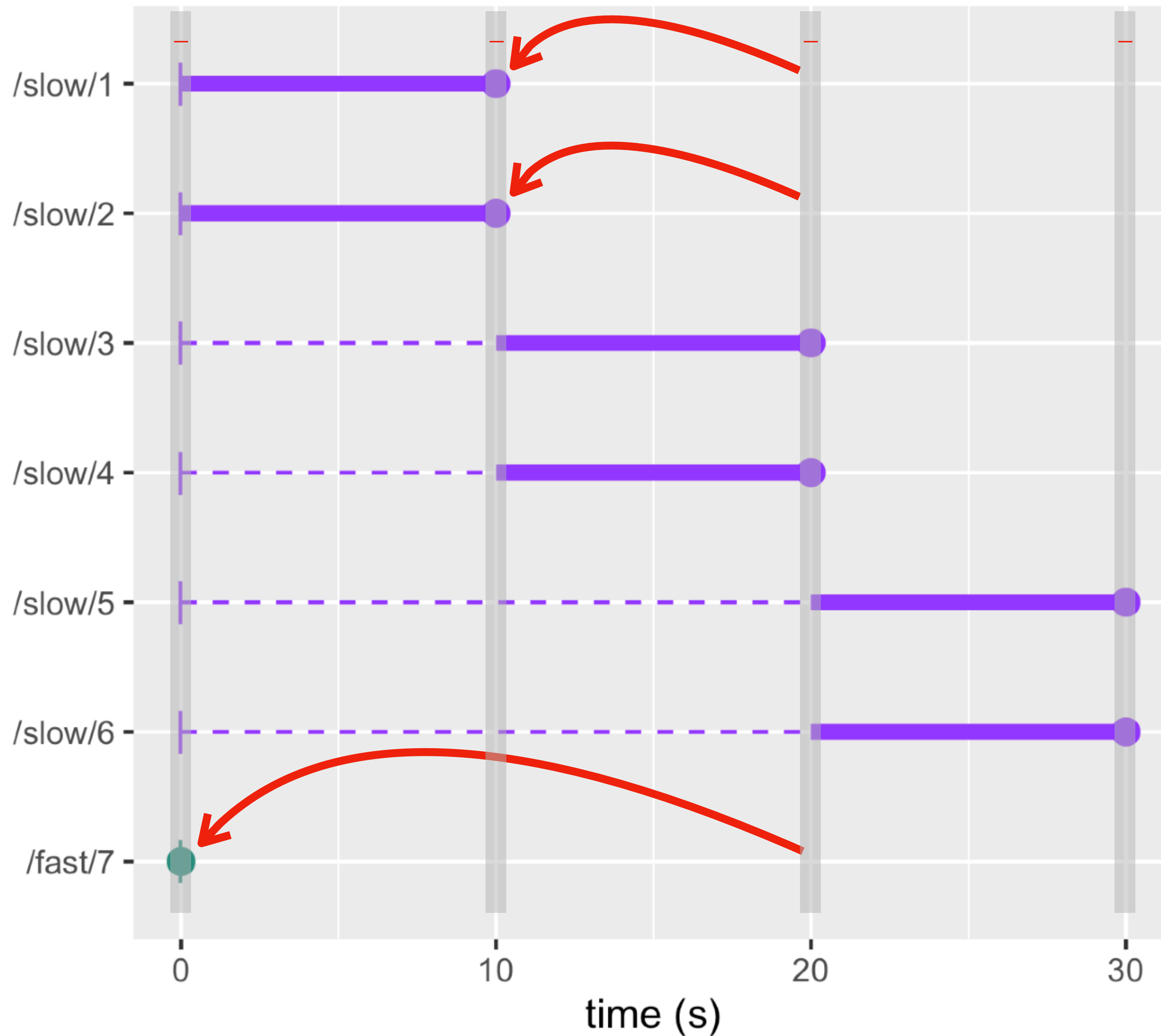
Execution

- Receive
- Respond

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Route Type

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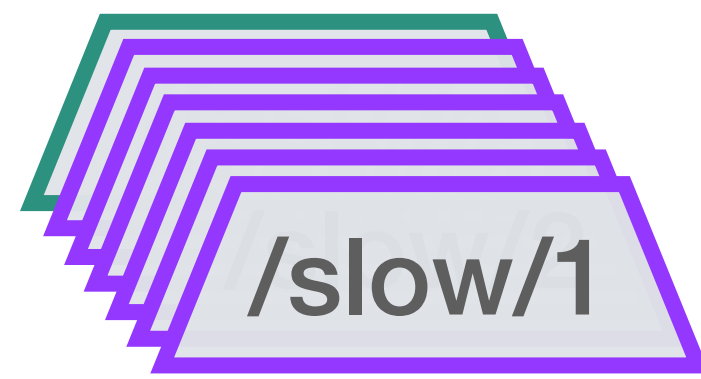
- Receive
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Main



Worker
#1

Worker
#2



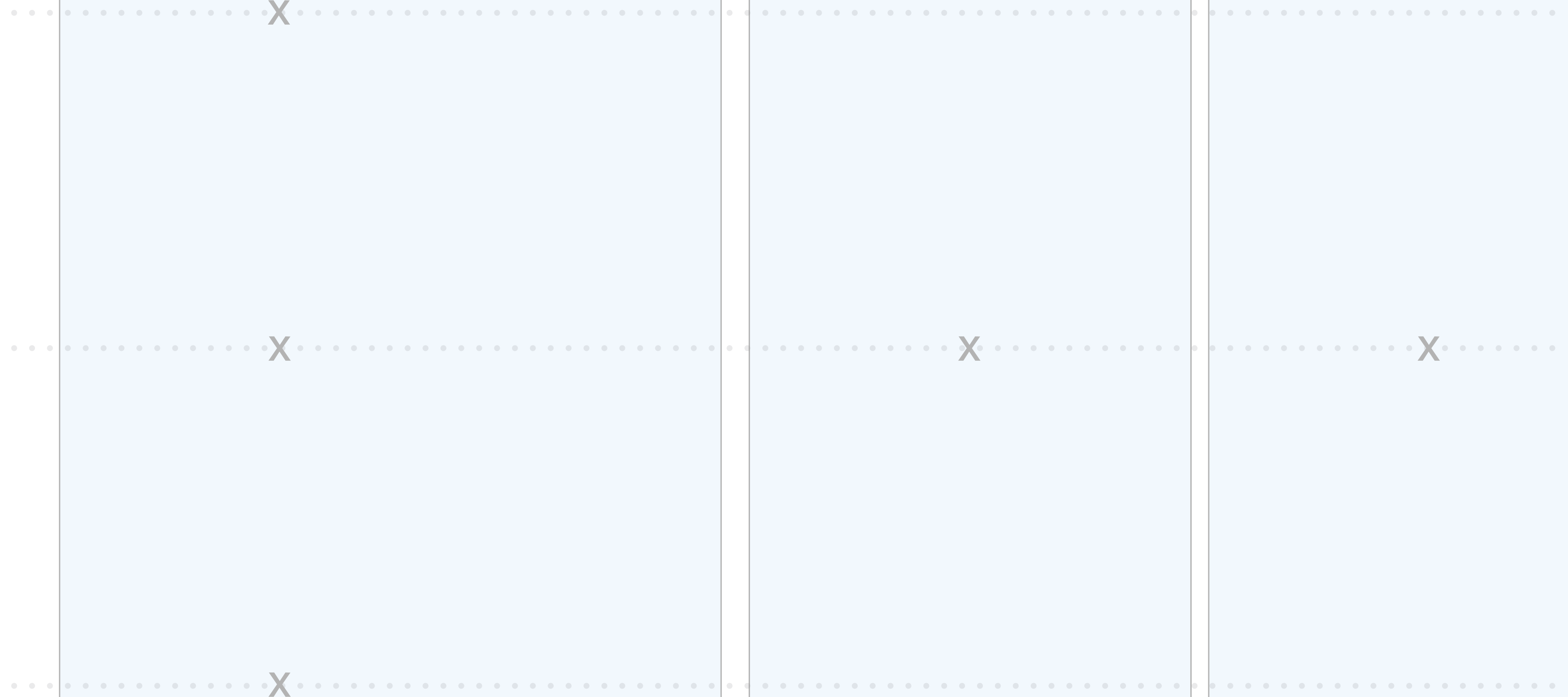
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