DISCORD

SCALING DISTRIBUTED MONITORING

ZENMONITOR

> HOW CAN WE PROGRAM SYSTEMS WHICH BEHAVE IN A REASONABLE MANNER IN THE PRESENCE OF SOFTWARE ERRORS?

Joe Armstrong

HOW CAN WE PROGRAM SYSTEMS WHICH BEHAVE IN A REASONABLE MANNER IN THE PRESENCE OF SOFTWARE ERRORS?

ERLANG

elixir

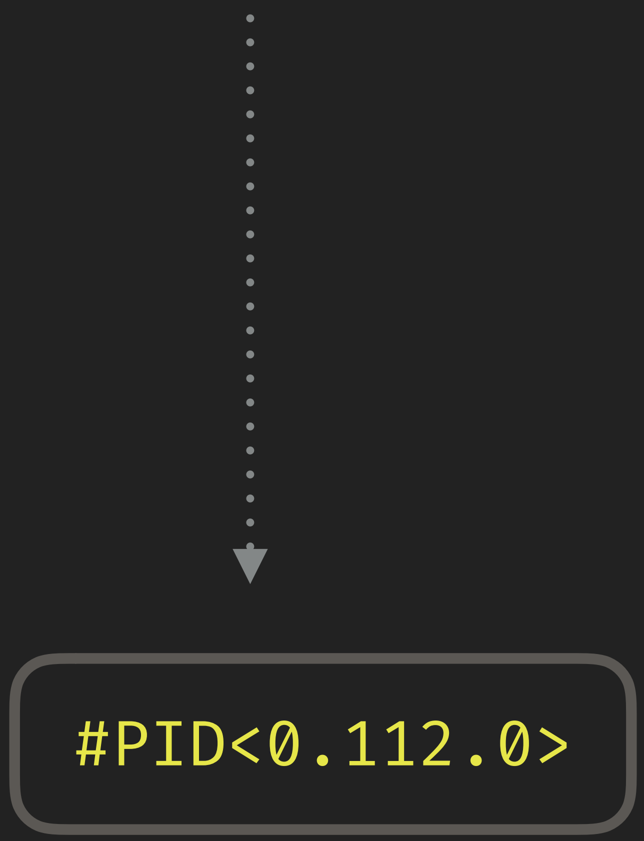
Joe Armstrong

DISCORD

BASICS

SPAWNING

```
iex(1)> pid = spawn(fn -> IO.puts("Hello World") end)
iex(1)> pid = spawn(fn -> IO.puts("Hello World") end)
```

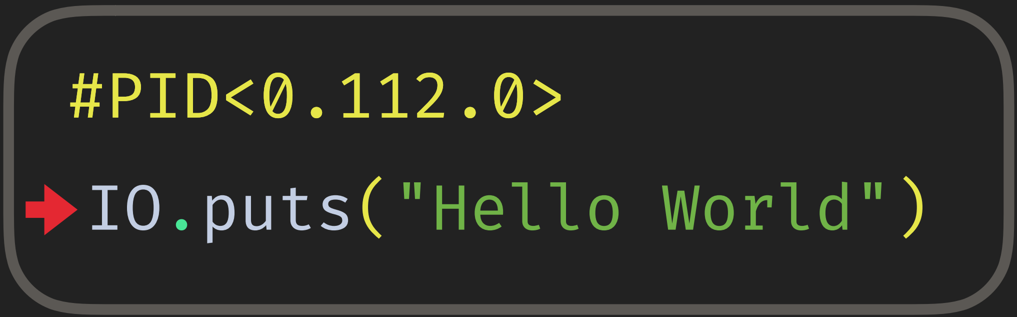


```
#PID<0.112.0>
```

```
iex(1)> pid = spawn(fn -> IO.puts("Hello World") end)
```

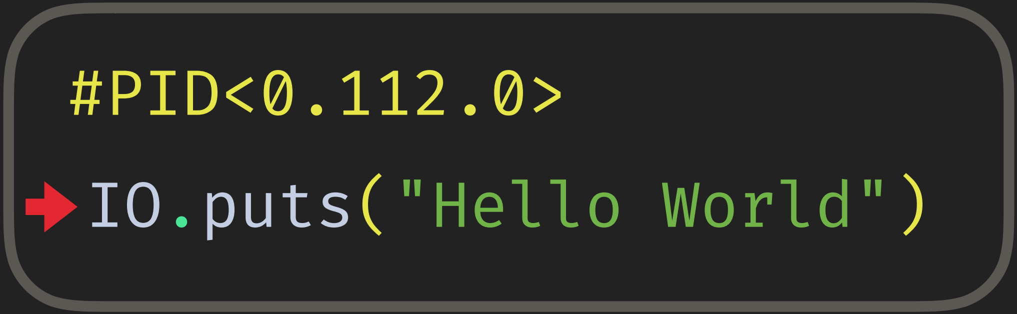
```
#PID<0.112.0>
 IO.puts("Hello World")
```

```
iex(1)> pid = spawn(fn → IO.puts("Hello World") end)
Hello World
```



```
#PID<0.112.0>
IO.puts("Hello World")
```

```
iex(1)> pid = spawn(fn -> IO.puts("Hello World") end)
Hello World
 #PID<0.112.0>
```



```
#PID<0.112.0>
IO.puts("Hello World")
```

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iex(1)> pid = spawn(fn -> IO.puts("Hello World") end)
Hello World
#PID<0.112.0>
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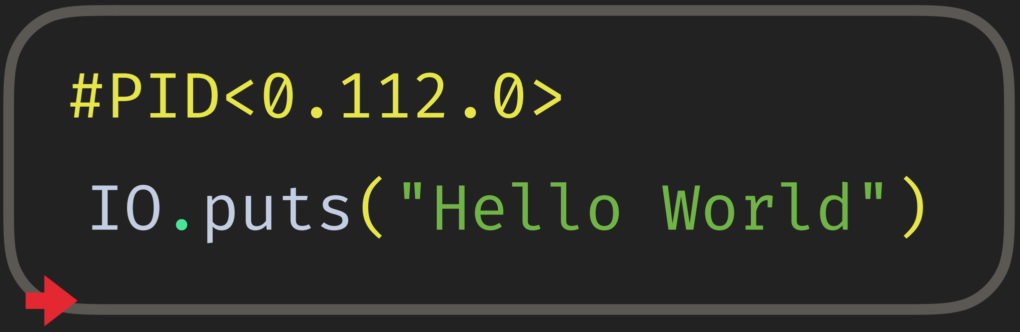


```
#PID<0.112.0>
IO.puts("Hello World")
```

```
iex(1)> pid = spawn(fn -> IO.puts("Hello World") end)
Hello World
 #PID<0.112.0>

iex(2)> Process.alive?(pid)
false
```

LINKING

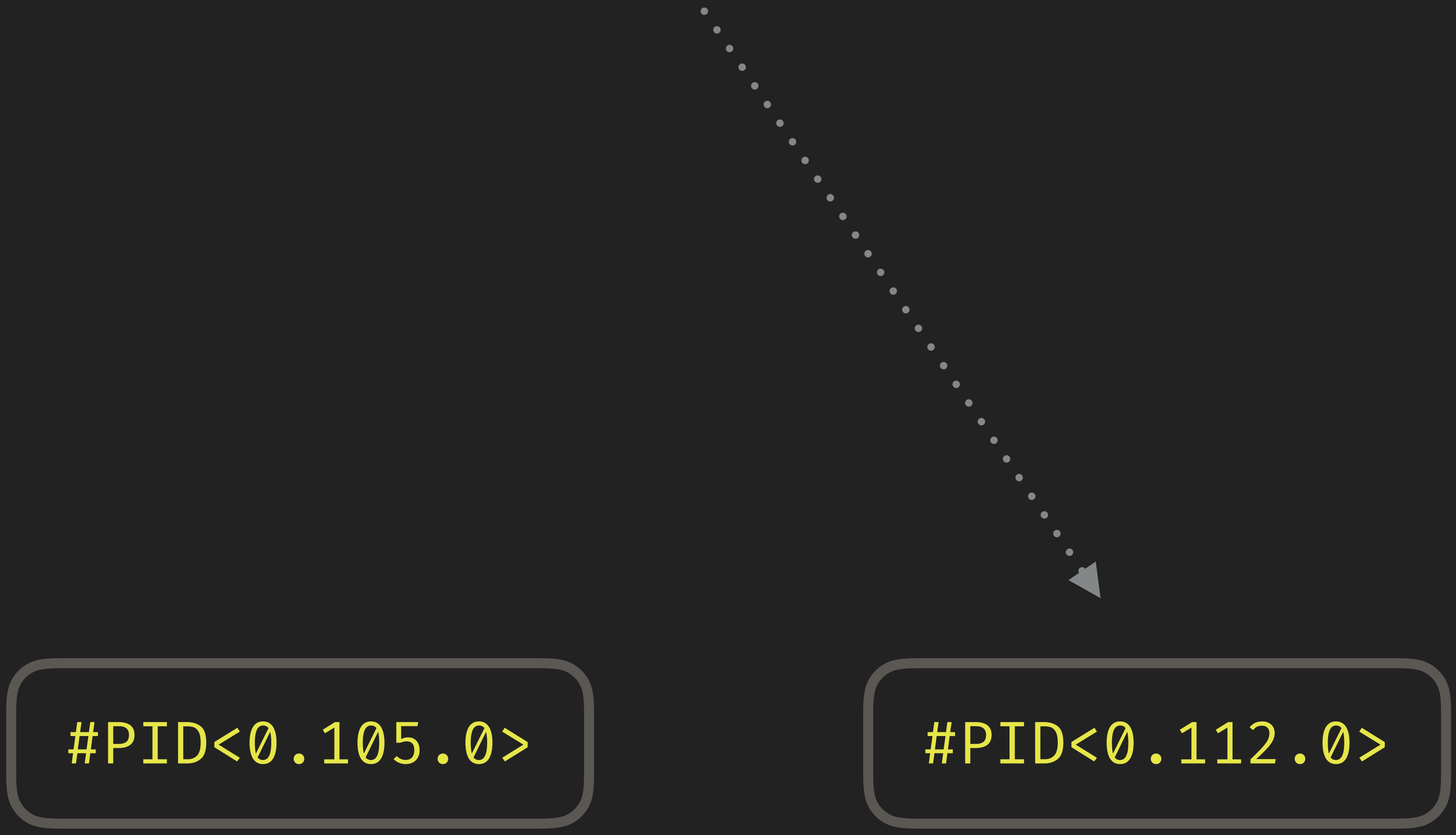
```
iex(1)> self()
iex(1)> self()
#PID<0.105.0>
```

```
#PID<0.105.0>
```

```
iex(1)> self()
#PID<0.105.0>
iex(2)> pid =  spawn_link(fn -> exit(:abnormal) end)
```

```
#PID<0.105.0>
```

```
iex(1)> self()
#PID<0.105.0>
iex(2)> pid =  spawn_link(fn -> exit(:abnormal) end)
```



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iex(1)> self()
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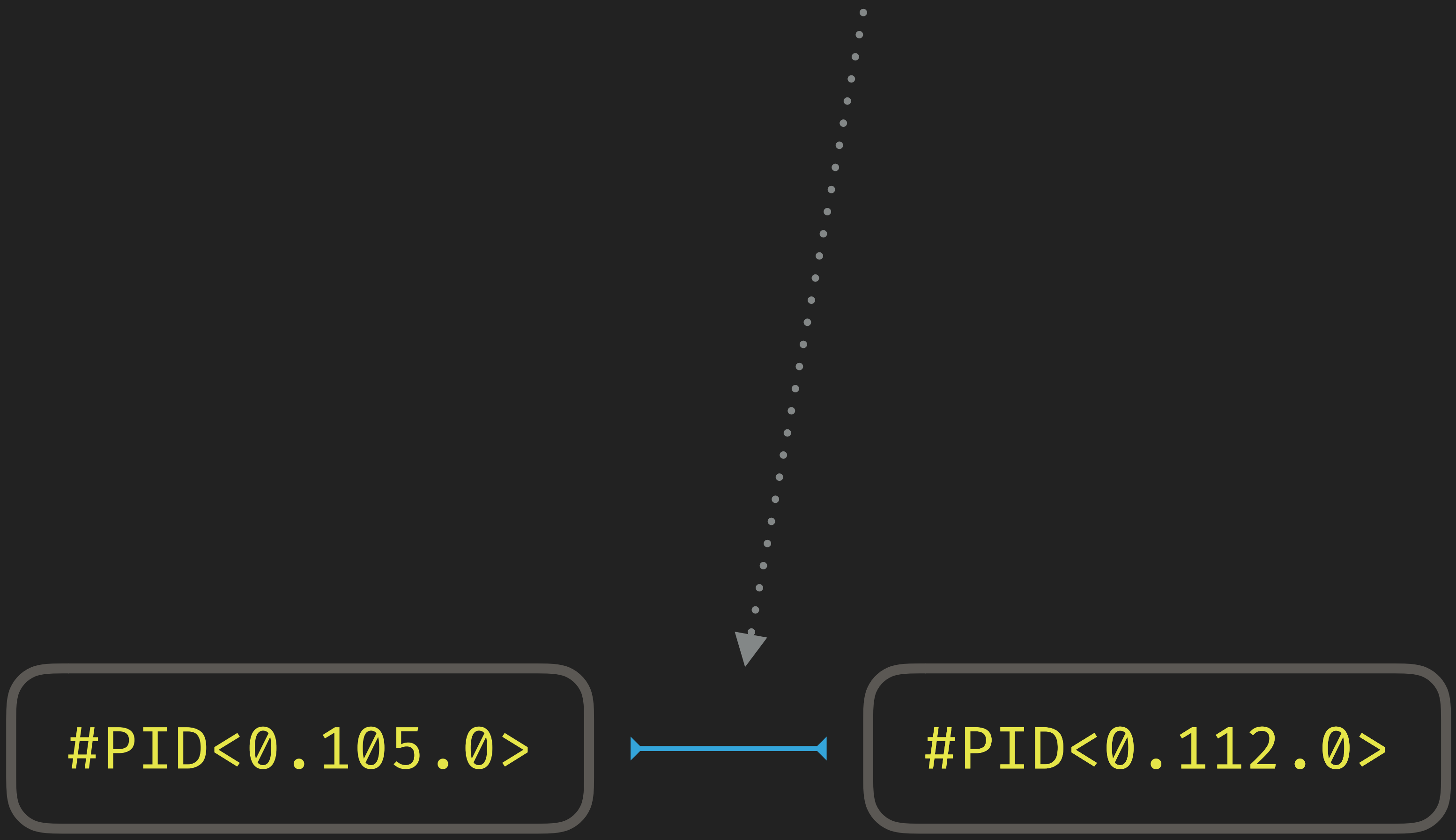
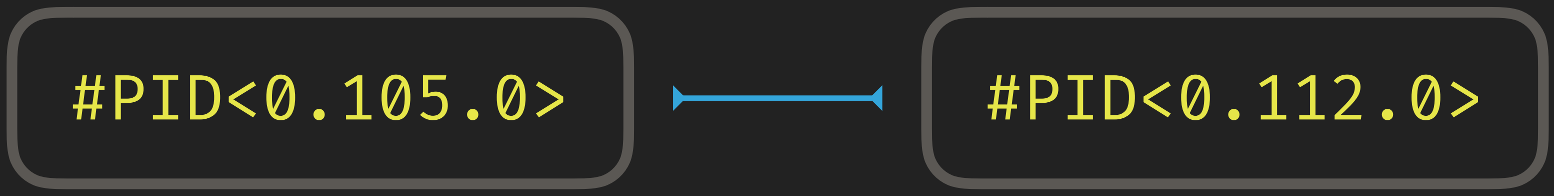


```
iex(1)> self()
#PID<0.105.0>
iex(2)> pid =  spawn_link(fn -> exit(:abnormal) end)

#PID<0.112.0>
```



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#PID<0.112.0>

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iex(1)> self()
#PID<0.105.0>
iex(2)> pid =  spawn_link(fn -> exit(:abnormal) end)

#PID<0.112.0>
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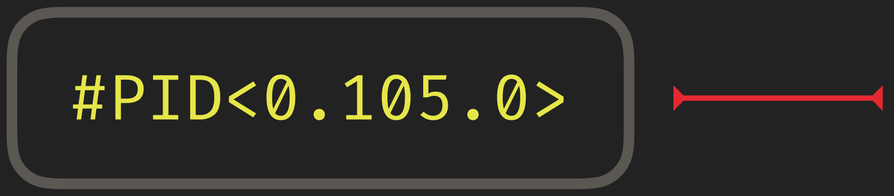


#PID<0.105.0>

```
iex(1)> self()
#PID<0.105.0>
iex(2)> pid =  spawn_link(fn -> exit(:abnormal) end)

#PID<0.112.0>

** (EXIT from #PID<0.105.0>) shell process exited with
reason: :abnormal
```

MONITORING

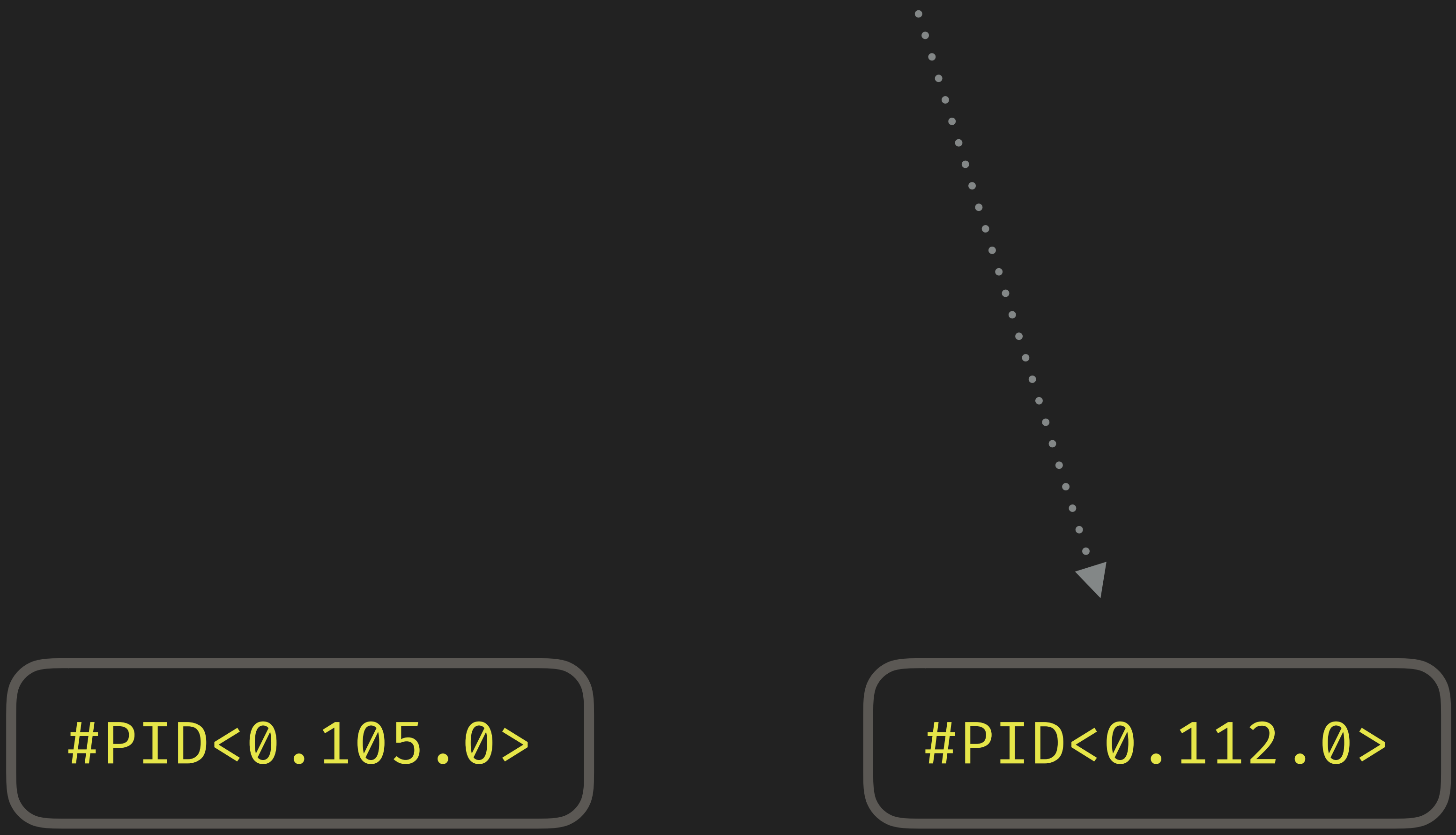
```
iex(1)> self()
iex(1)> self()
#PID<0.105.0>
```

```
#PID<0.105.0>
```

```
iex(1)> self()
#PID<0.105.0>
iex(2)> {pid, ref} =  spawn_monitor(fn -> IO.puts("Hi") end)
```

```
#PID<0.105.0>
```

```
iex(1)> self()
#PID<0.105.0>
iex(2)> {pid, ref} =  spawn_monitor(fn -> IO.puts("Hi") end)
```



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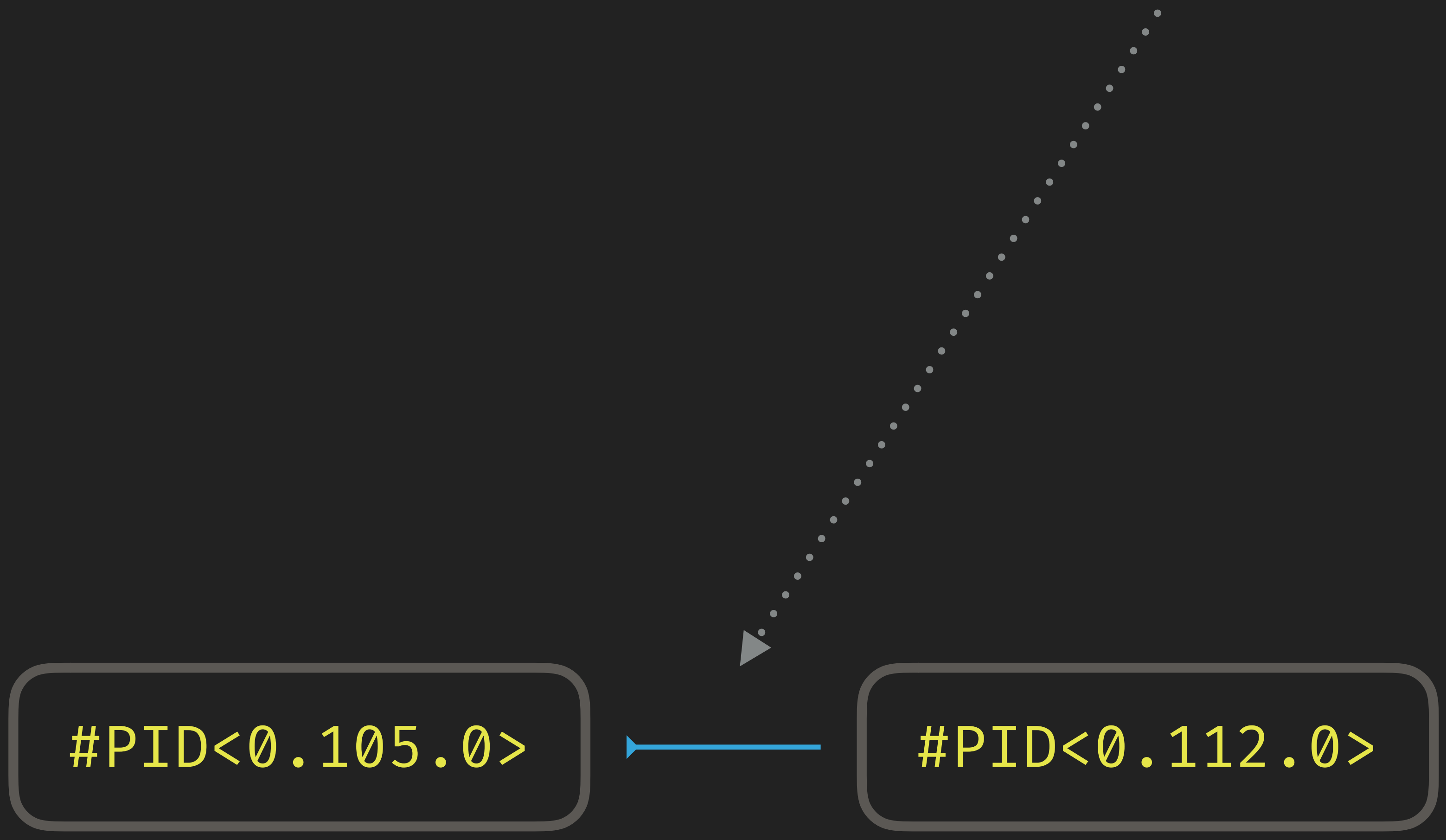
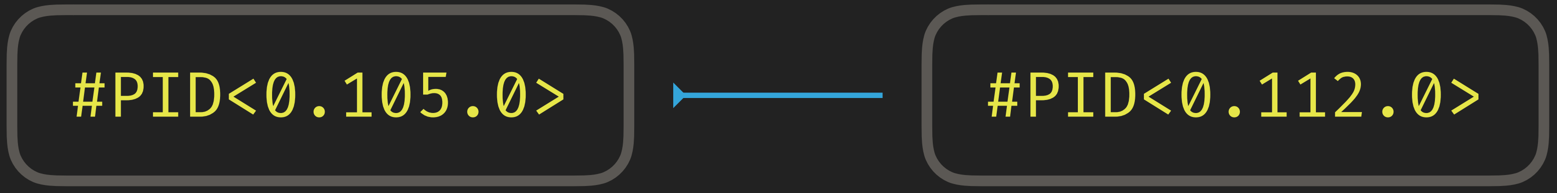


```
iex(1)> self()
#PID<0.105.0>
iex(2)> {pid, ref} =  spawn_monitor(fn -> IO.puts("Hi") end)
{#PID<0.112.0>, #Reference<0.2953221187.3884449794.58577>}
```



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iex(1)> self()
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```

#PID<0.105.0>

```
iex(1)> self()
#PID<0.105.0>
iex(2)> {pid, ref} =  spawn_monitor(fn -> IO.puts("Hi") end)
{#PID<0.112.0>, #Reference<0.2953221187.3884449794.58577>}
iex(3)> flush()
```

#PID<0.105.0>

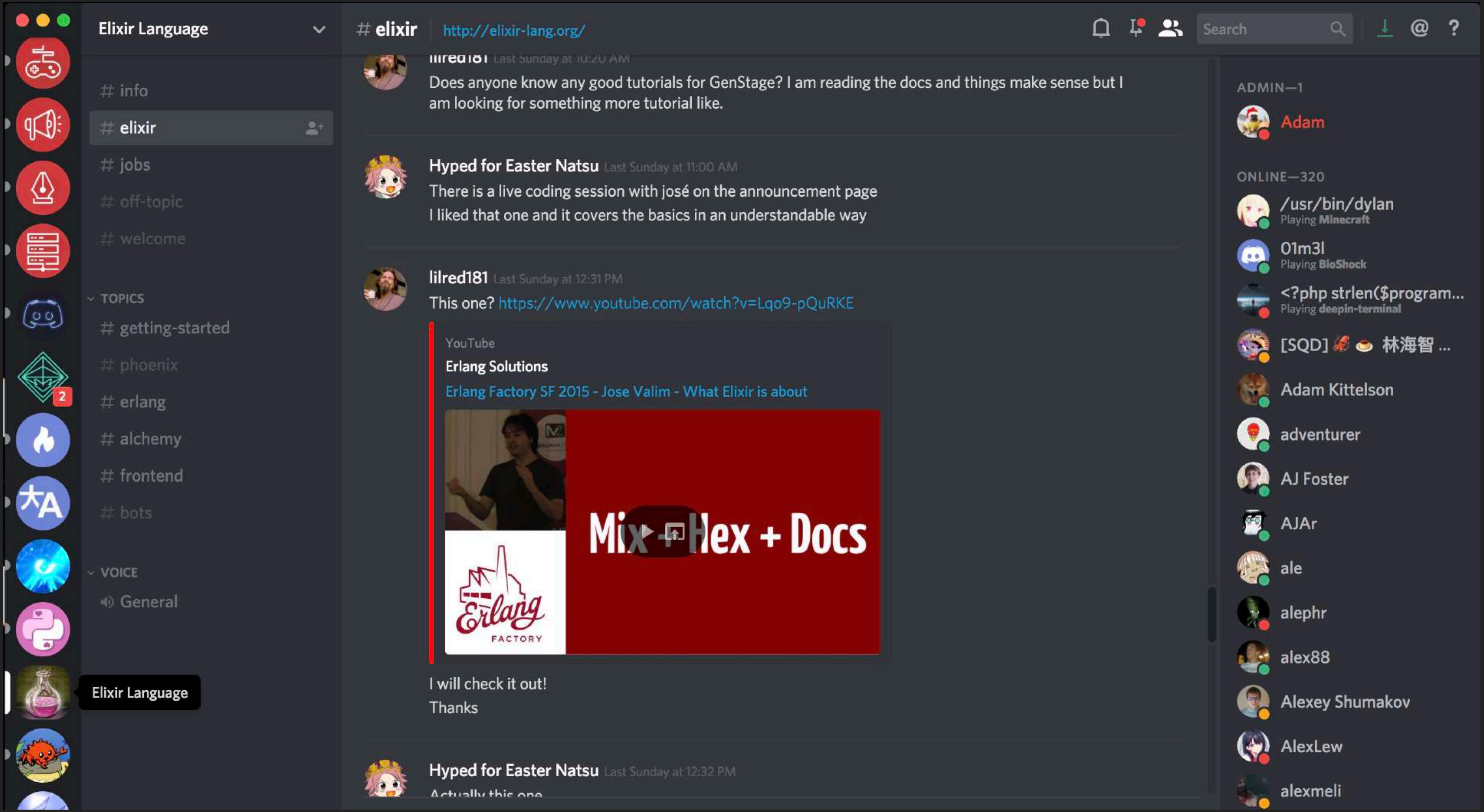
```
iex(1)> self()
#PID<0.105.0>
iex(2)> {pid, ref} =  spawn_monitor(fn -> IO.puts("Hi") end)
{#PID<0.112.0>, #Reference<0.2953221187.3884449794.58577>}
iex(3)> flush()
{
  :DOWN,
  #Reference<0.2953221187.3884449794.58577>,
  :process,
  #PID<0.112.0>,
  :normal
}
```

```
#PID<0.105.0>
```

CONTEXT

REAL TIME CHAT

DISCORD



lilred181 Last Sunday at 10:20 AM

Does anyone know any good tutorials for GenStage? I am reading the docs and things make sense but I am looking for something more tutorial like.

Hyped for Easter Natsu Last Sunday at 11:00 AM

There is a live coding session with josé on the announcement page

I liked that one and it covers the basics in an understandable way

lilred181 Last Sunday at 12:31 PM

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YouTube

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I will check it out!

Thanks

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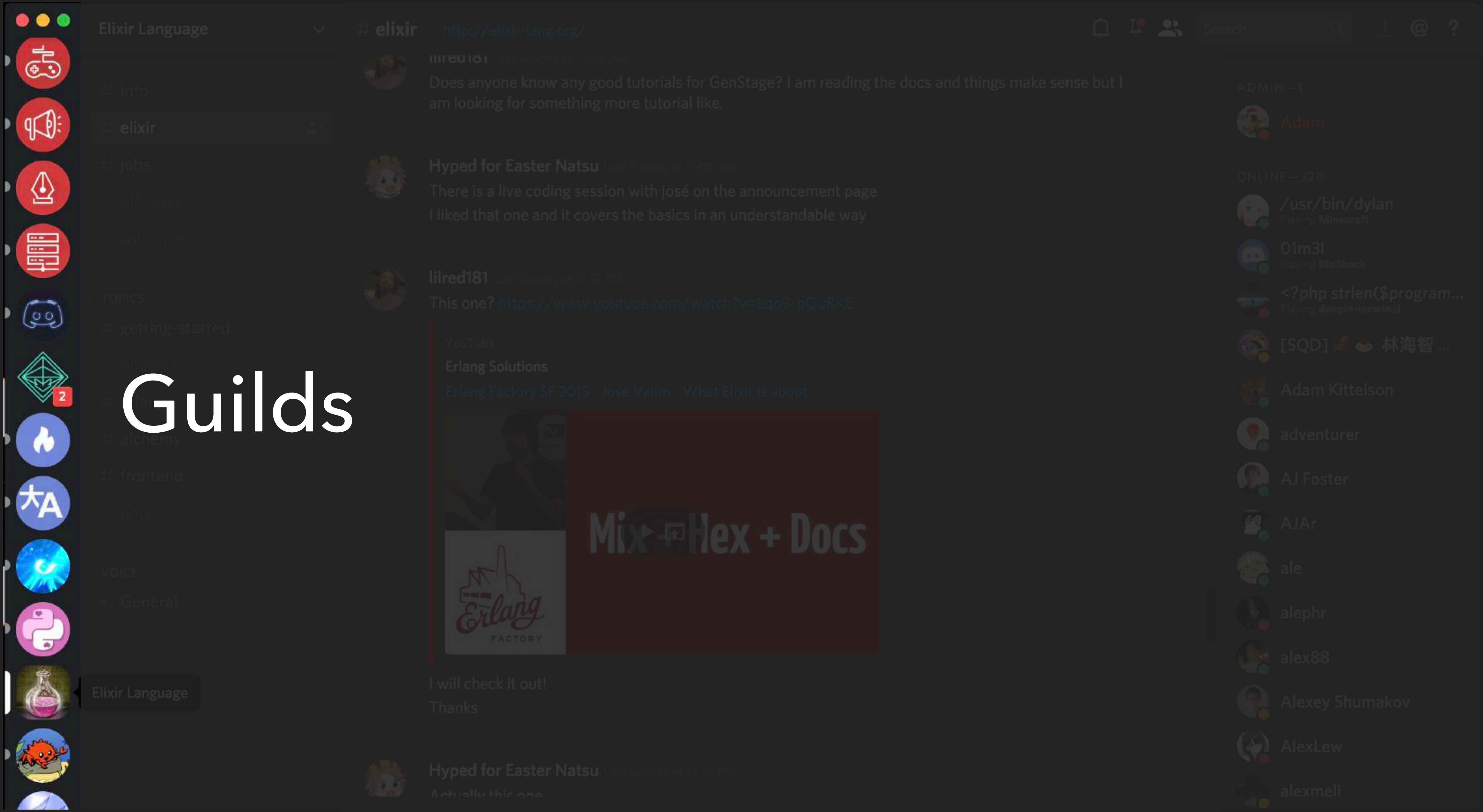
Guilds



Elixir Language

info
elixir
jobs
off-topic
welcome

TOPICS
# getting-started
# phoenix
# erlang
# alchemy
# frontend
# bots

VOICE
General

Elixir Language

elixir http://elixir-lang.org/

Search

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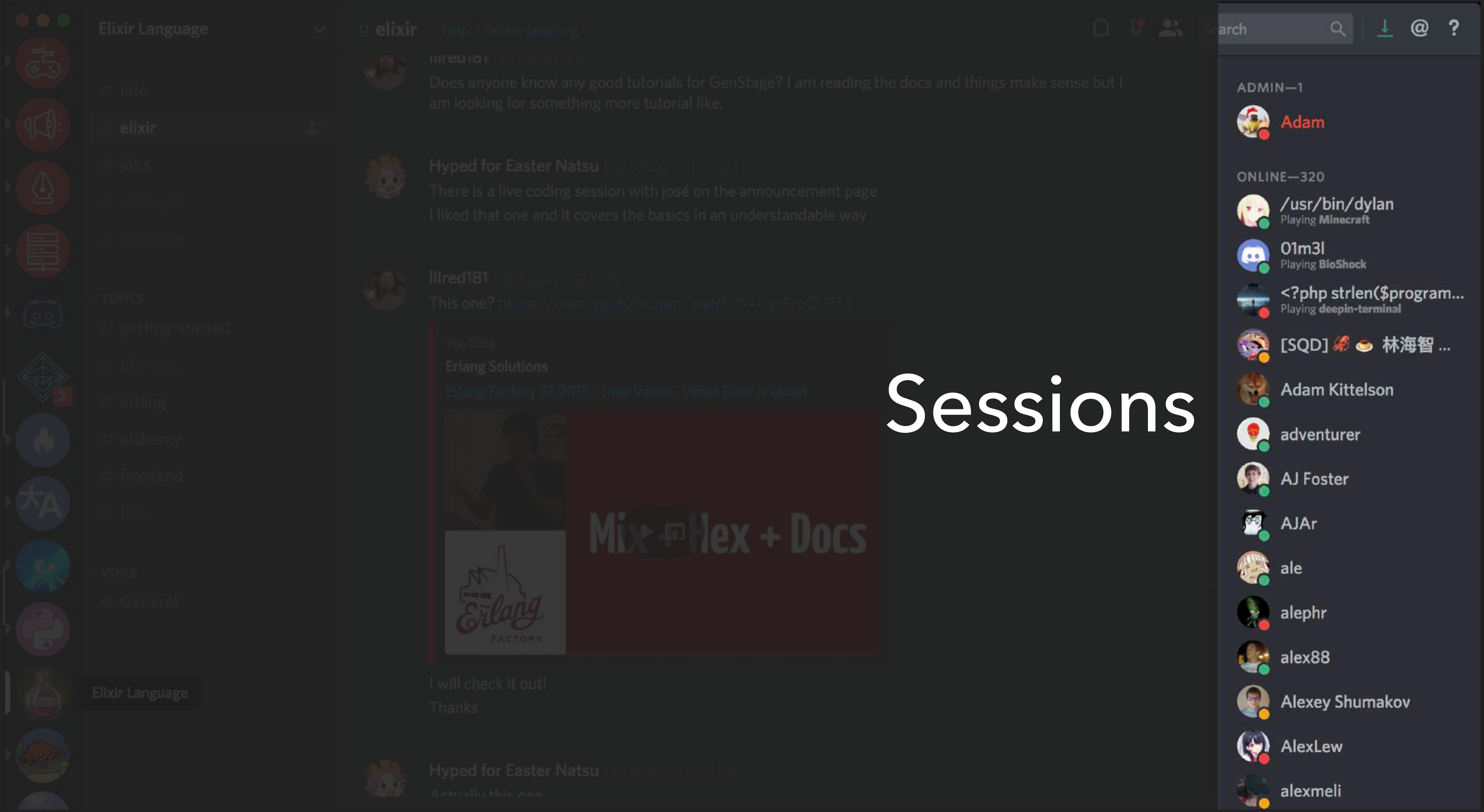
Actually this one

ADMIN—1
Adam

ONLINE—320
/usr/bin/dylan
Playing Minecraft
01m3l
Playing BioShock
<?php strlen($program...
Playing deepin-terminal
[SQD] 🥓 🍮 林海智 ...
Adam Kittelson
adventurer
AJ Foster
AJAr
ale
alephr
alex88
Alexey Shumakov
AlexLew
alexmeli

Sessions



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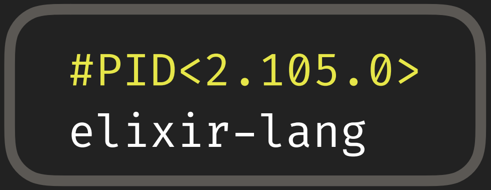
Guilds

Sessions

Guilds

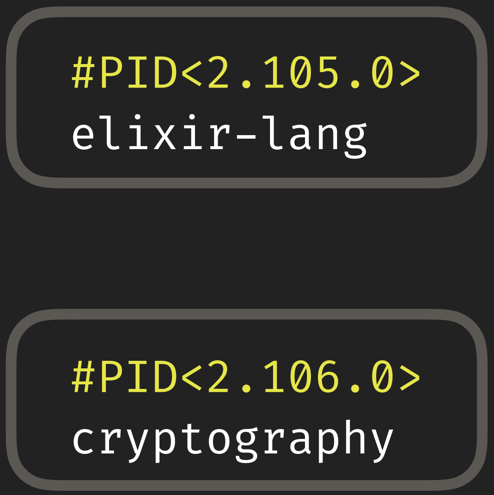
Sessions



```
#PID<2.105.0>
elixir-lang
```

Guilds

Sessions



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Guilds

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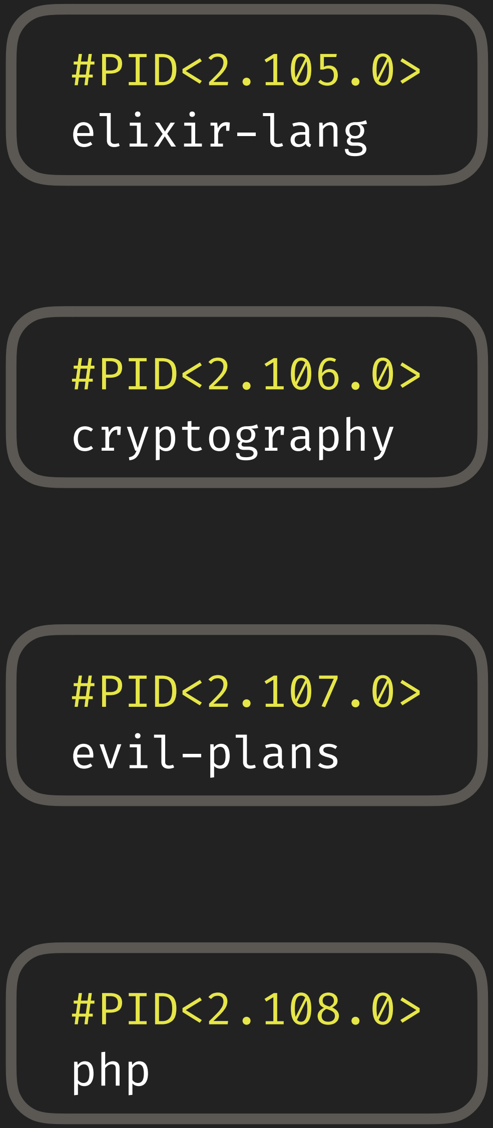

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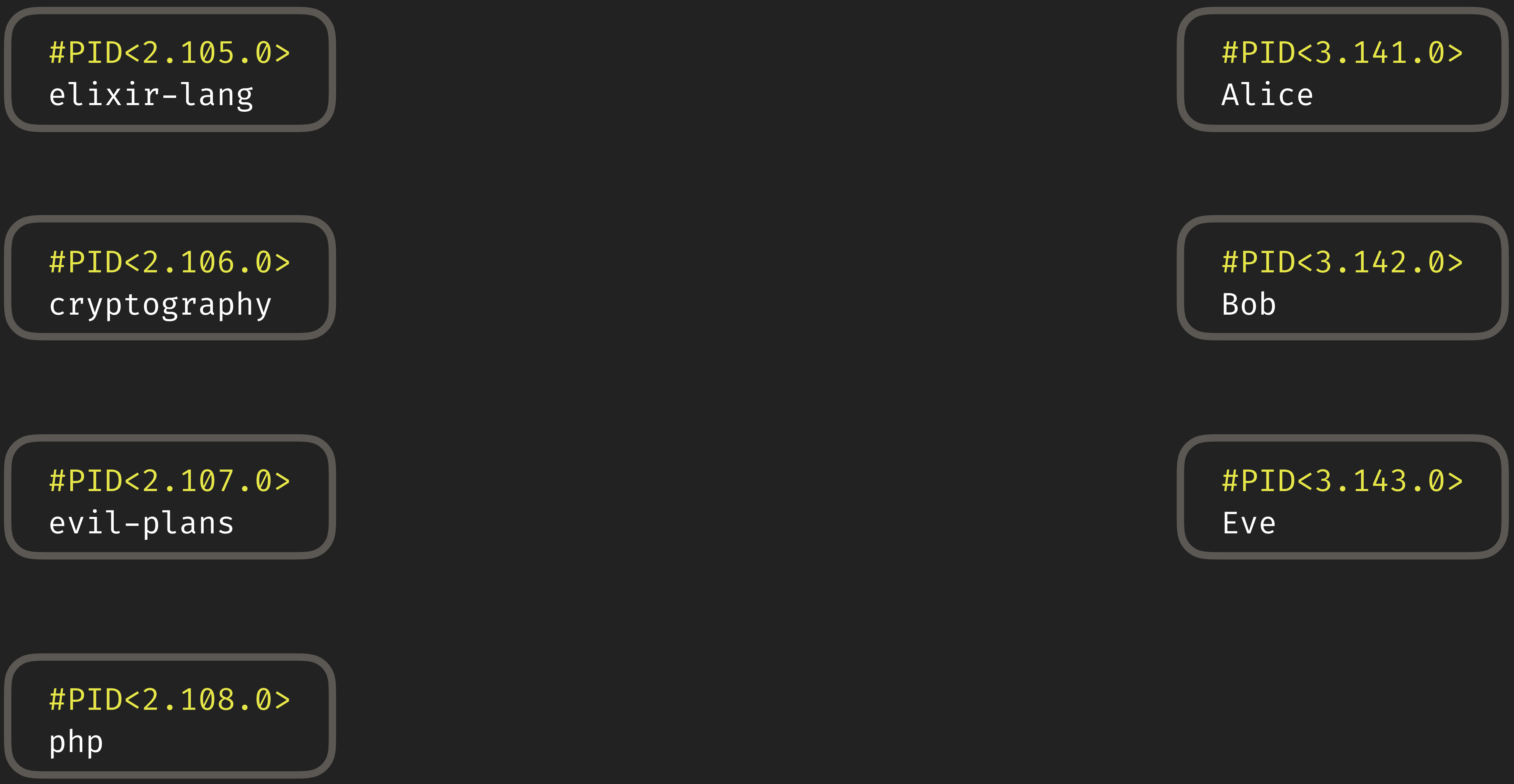

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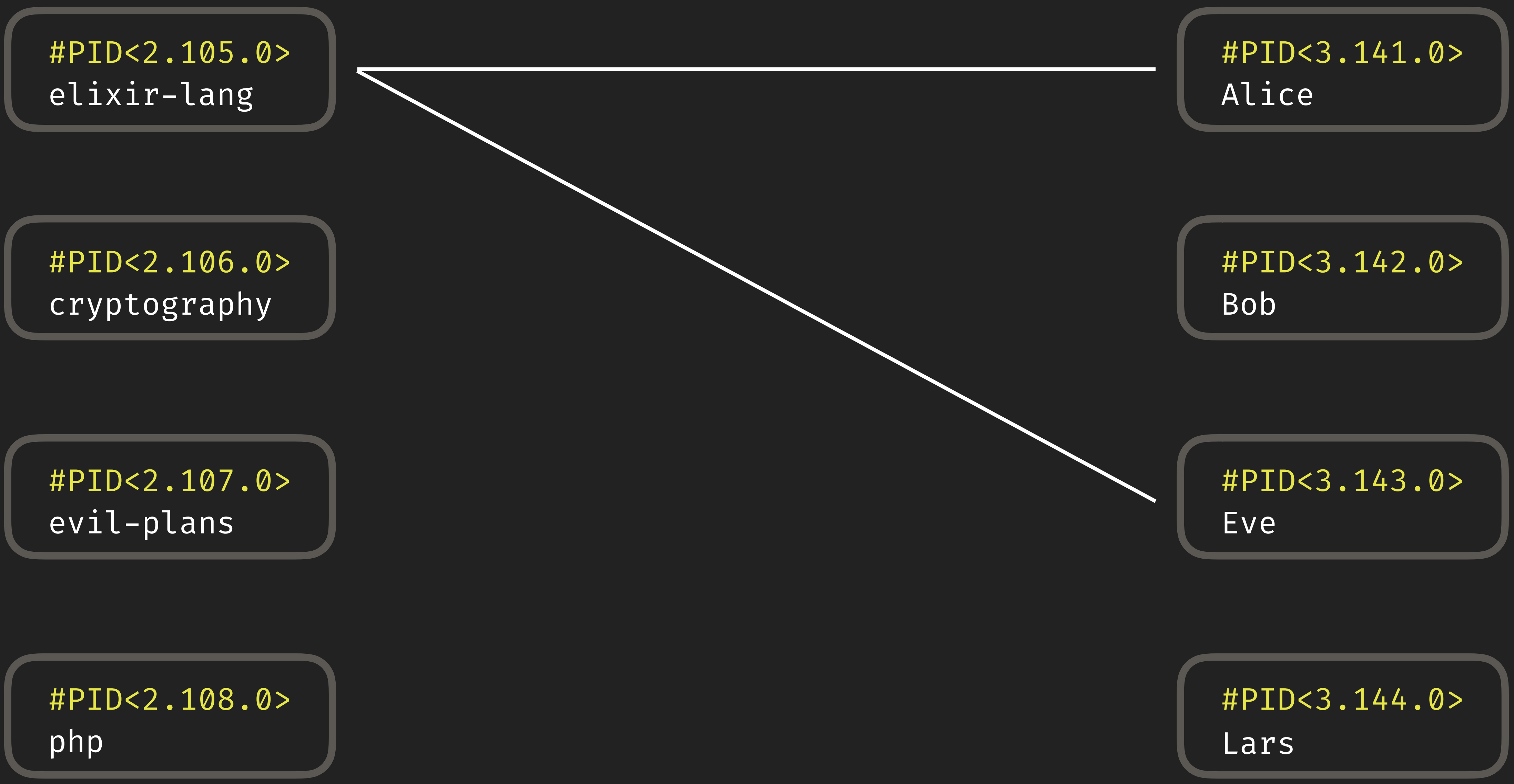
Eve

#PID<3.144.0>
Lars

DISCORD

Guilds

Sessions



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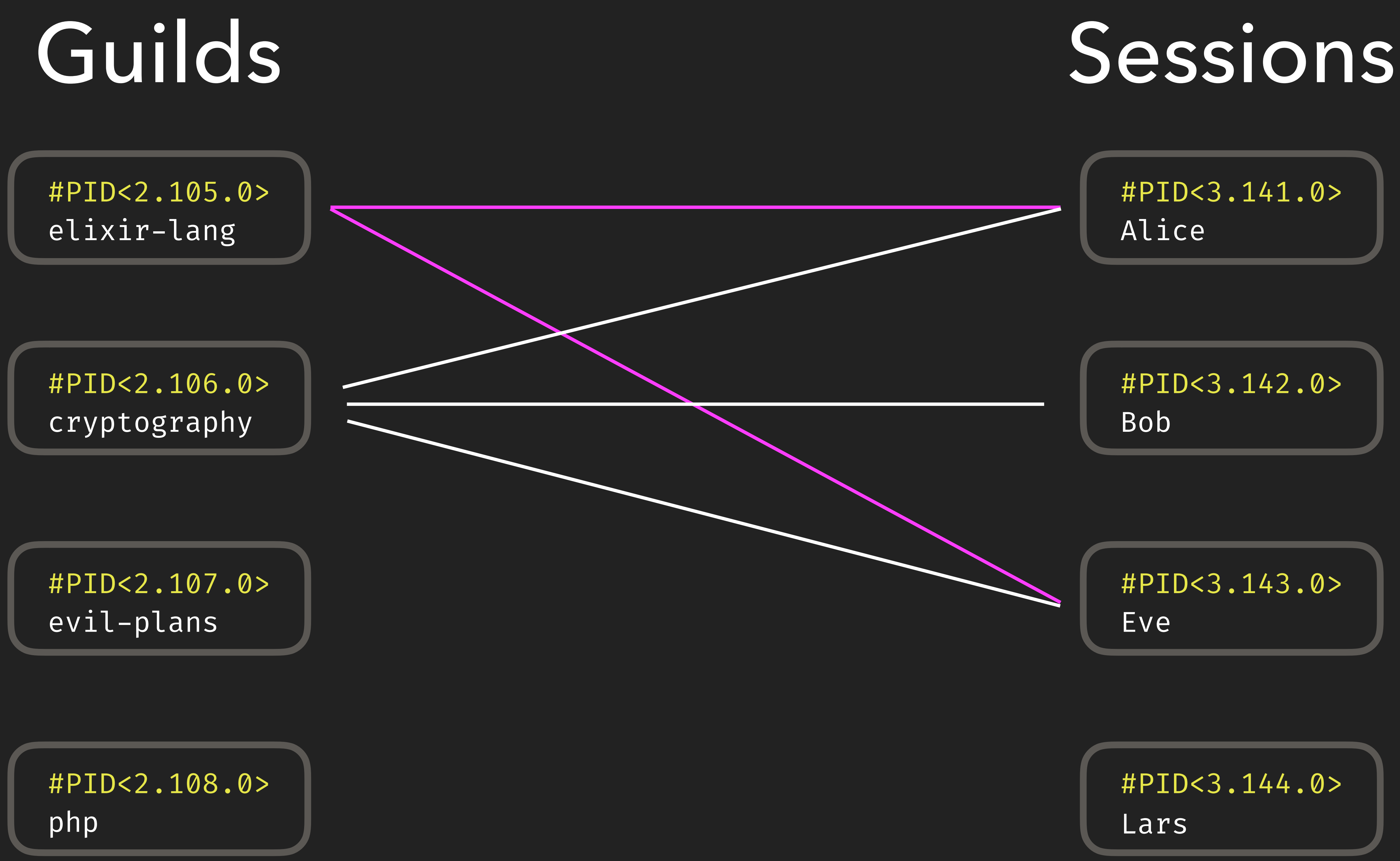

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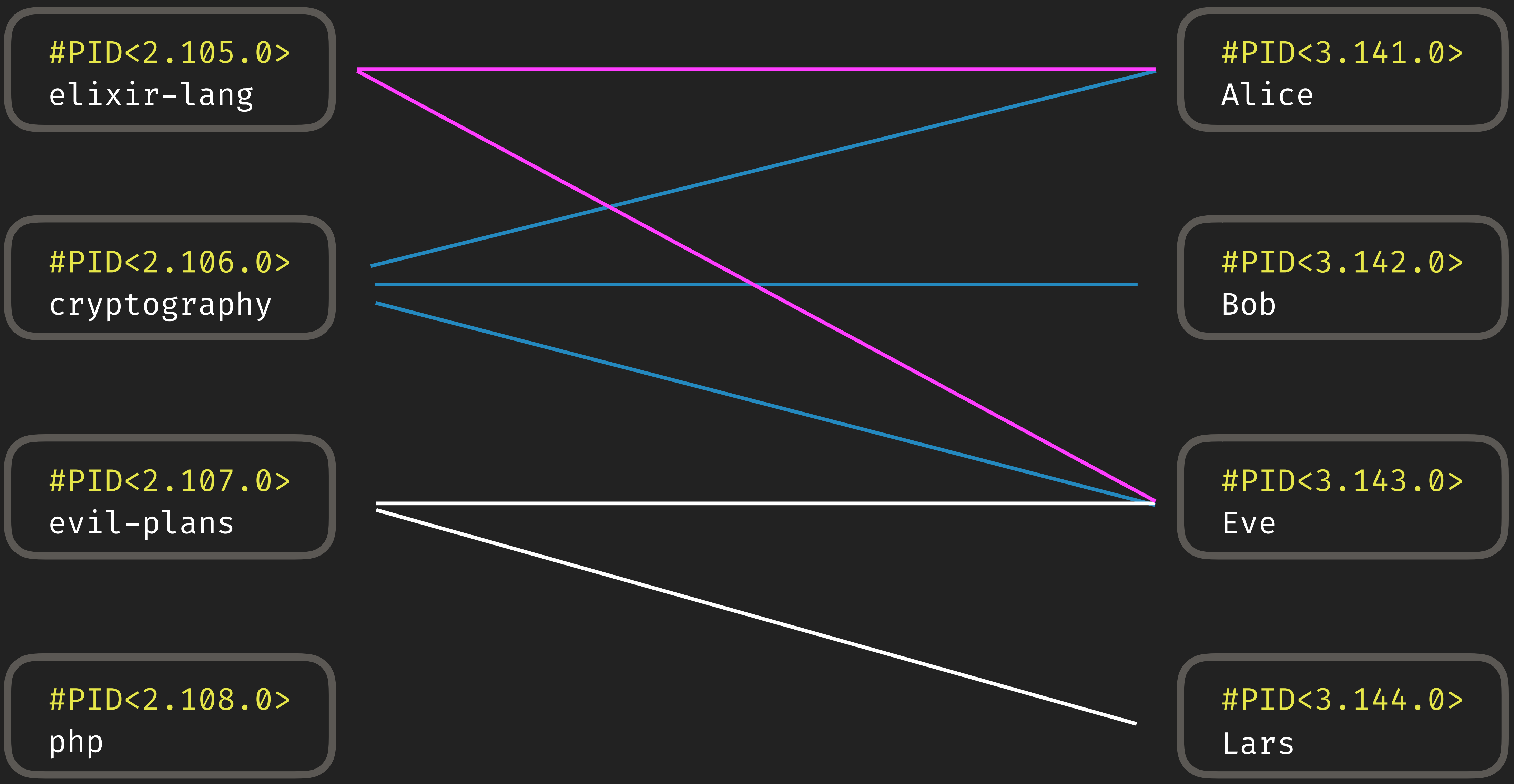

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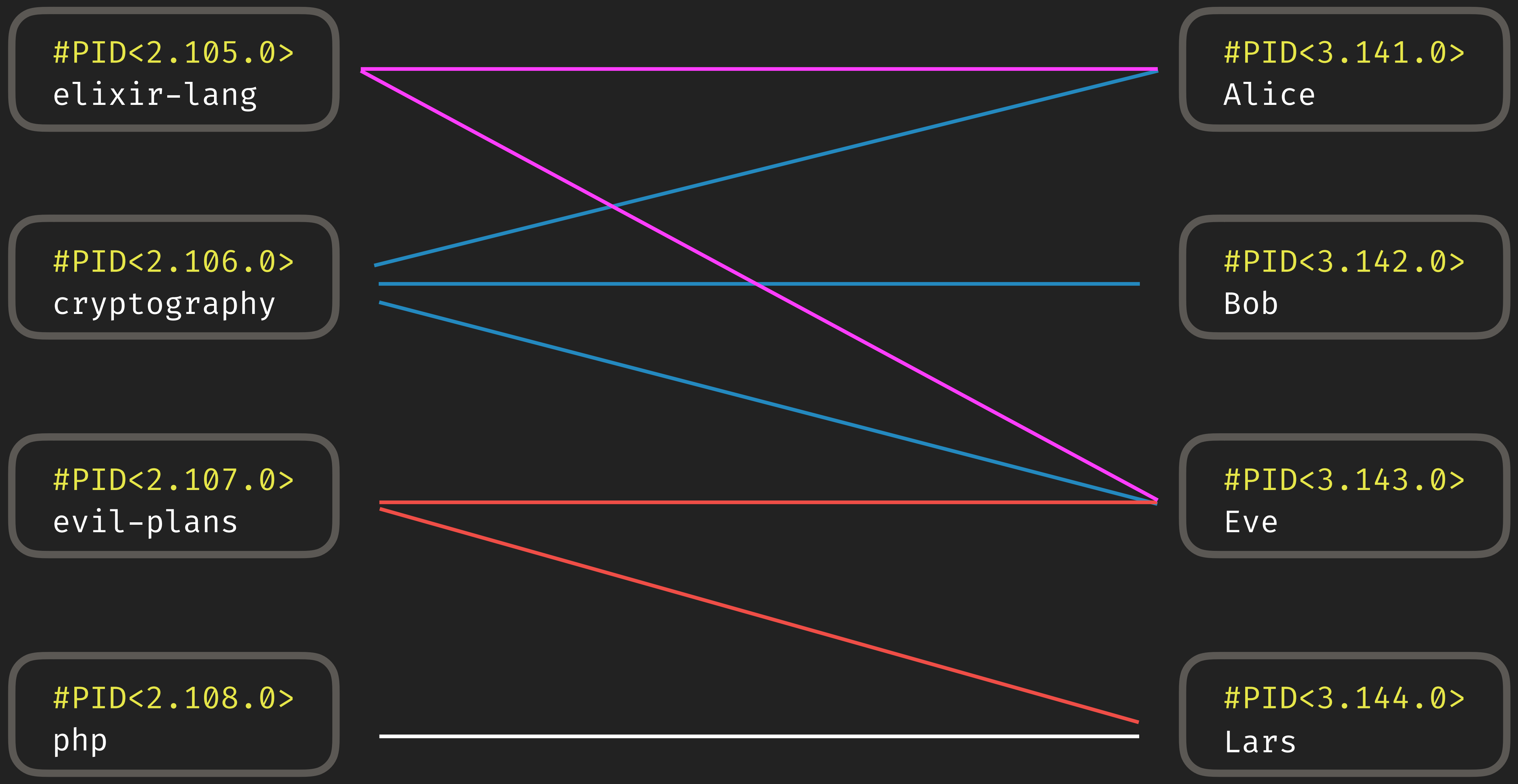

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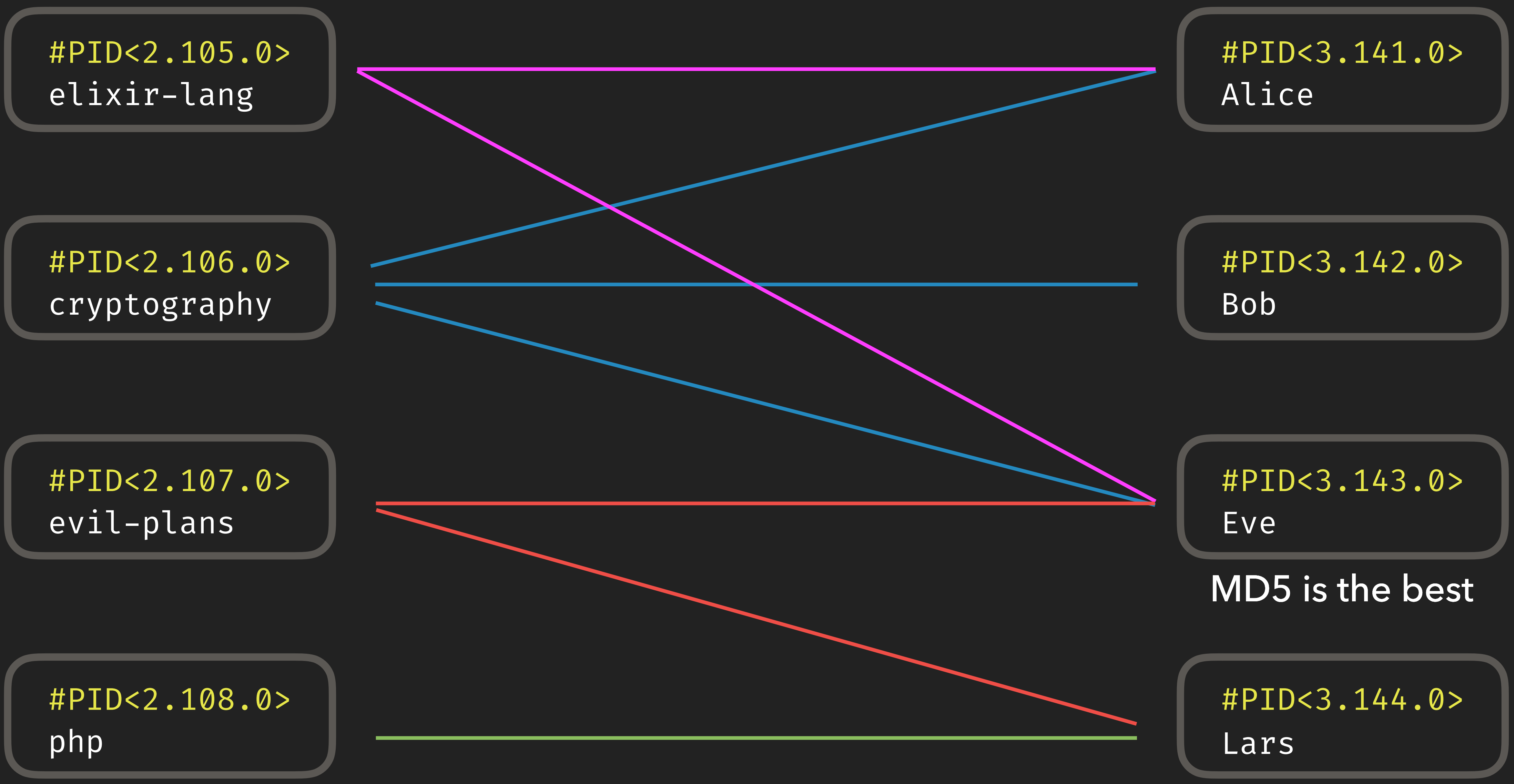

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MD5 is the best

#PID<3.144.0>
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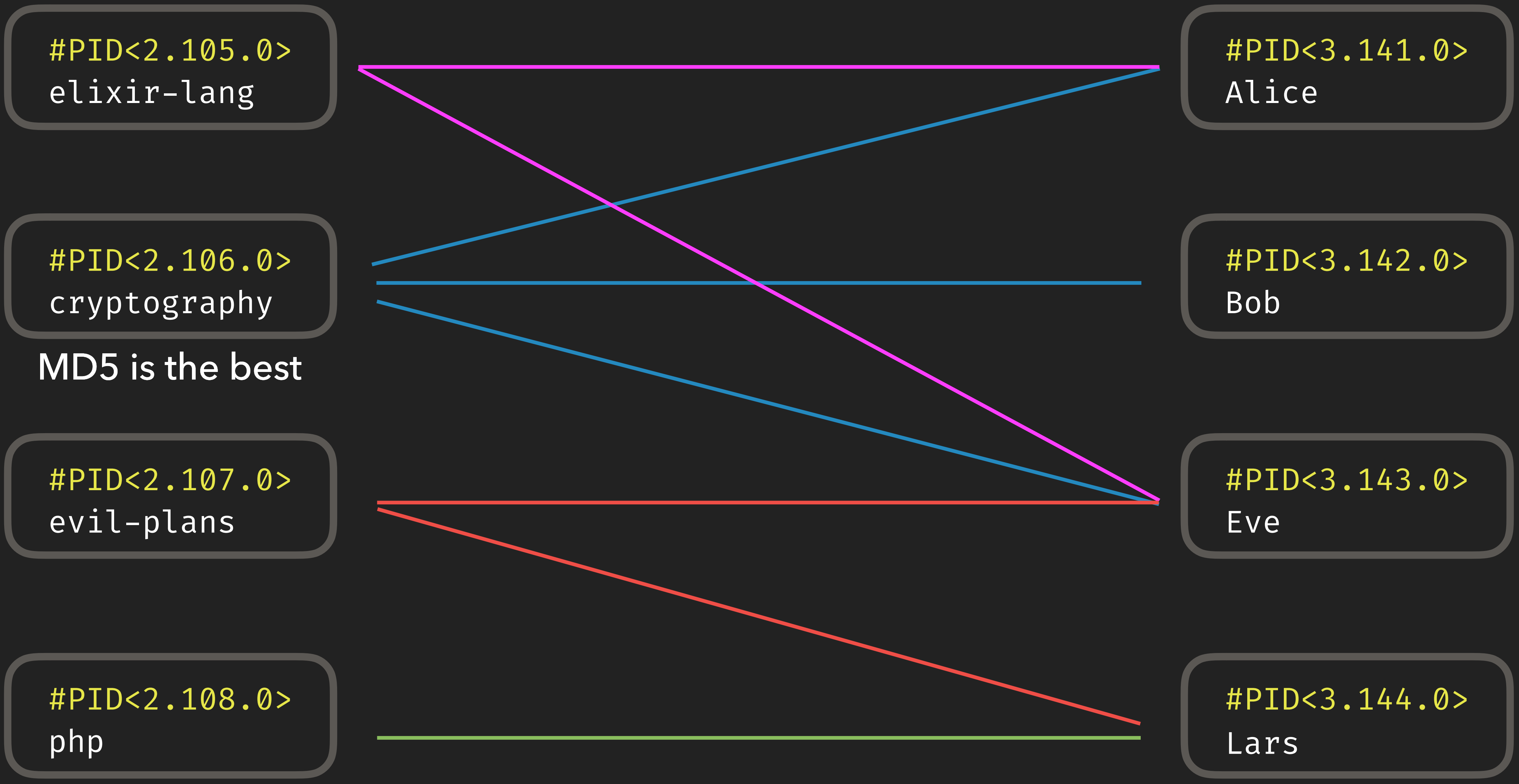

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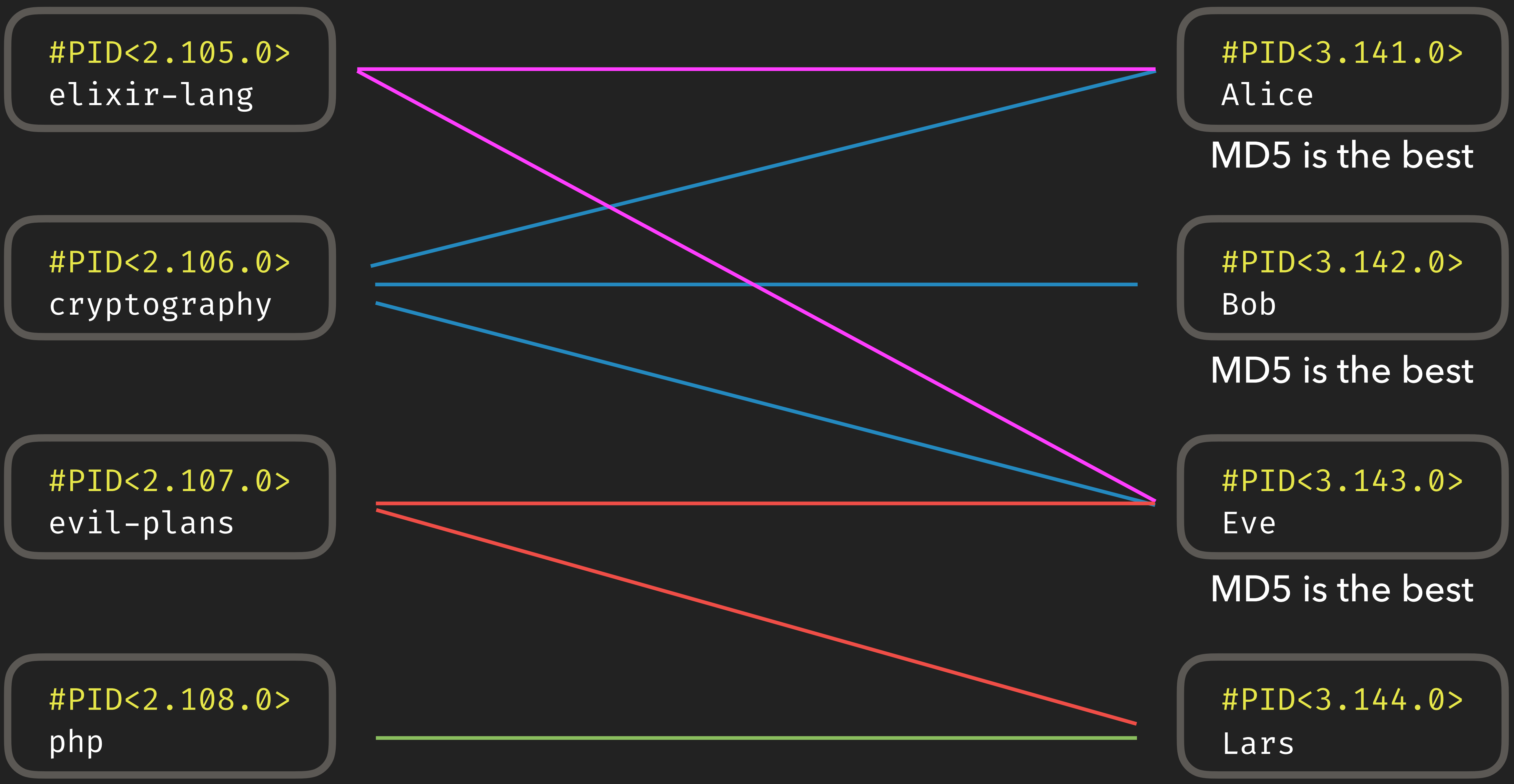

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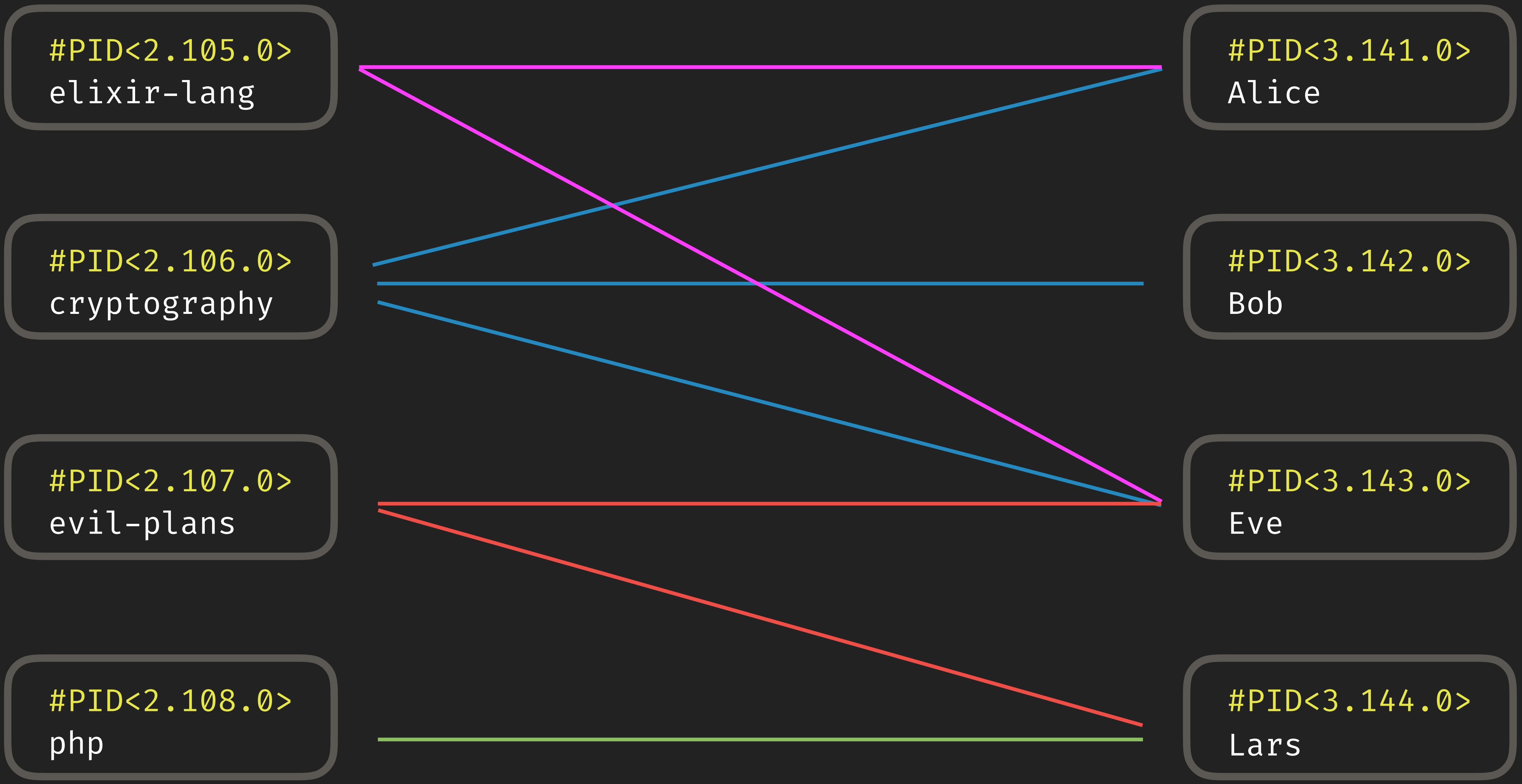

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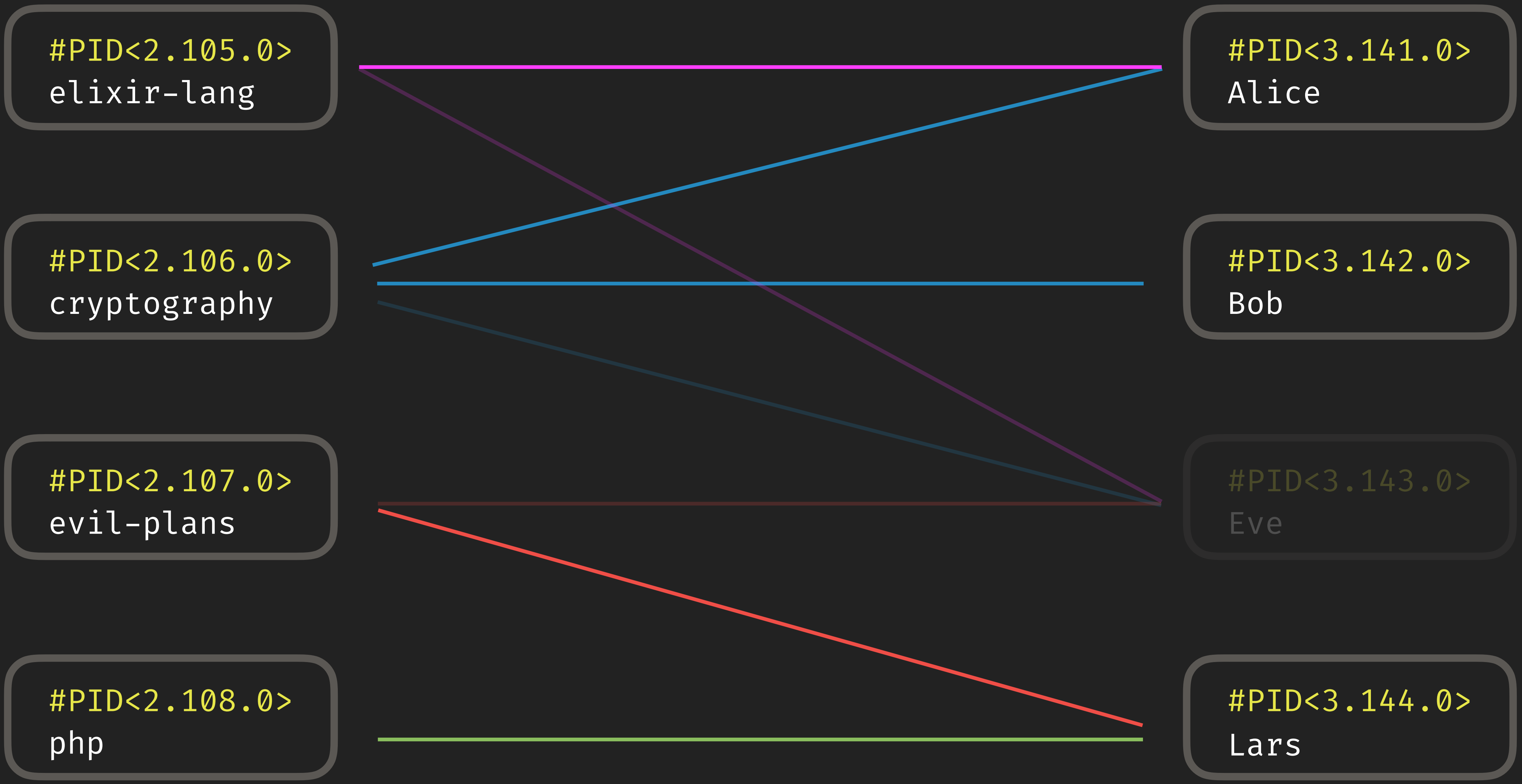

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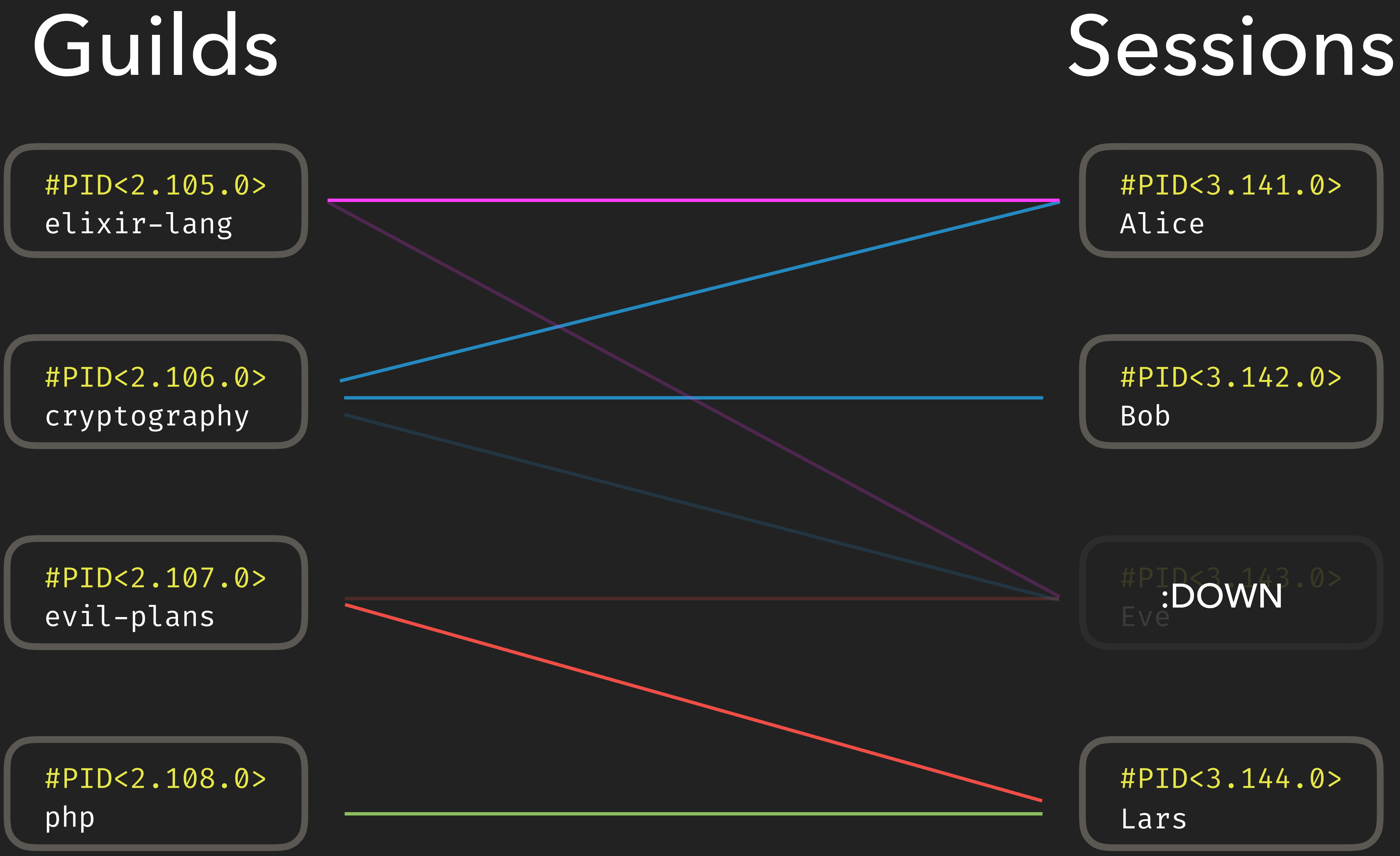

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php

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Alice

#PID<3.142.0>
Bob

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Eve

:DOWN

#PID<3.144.0>
Lars

Guilds

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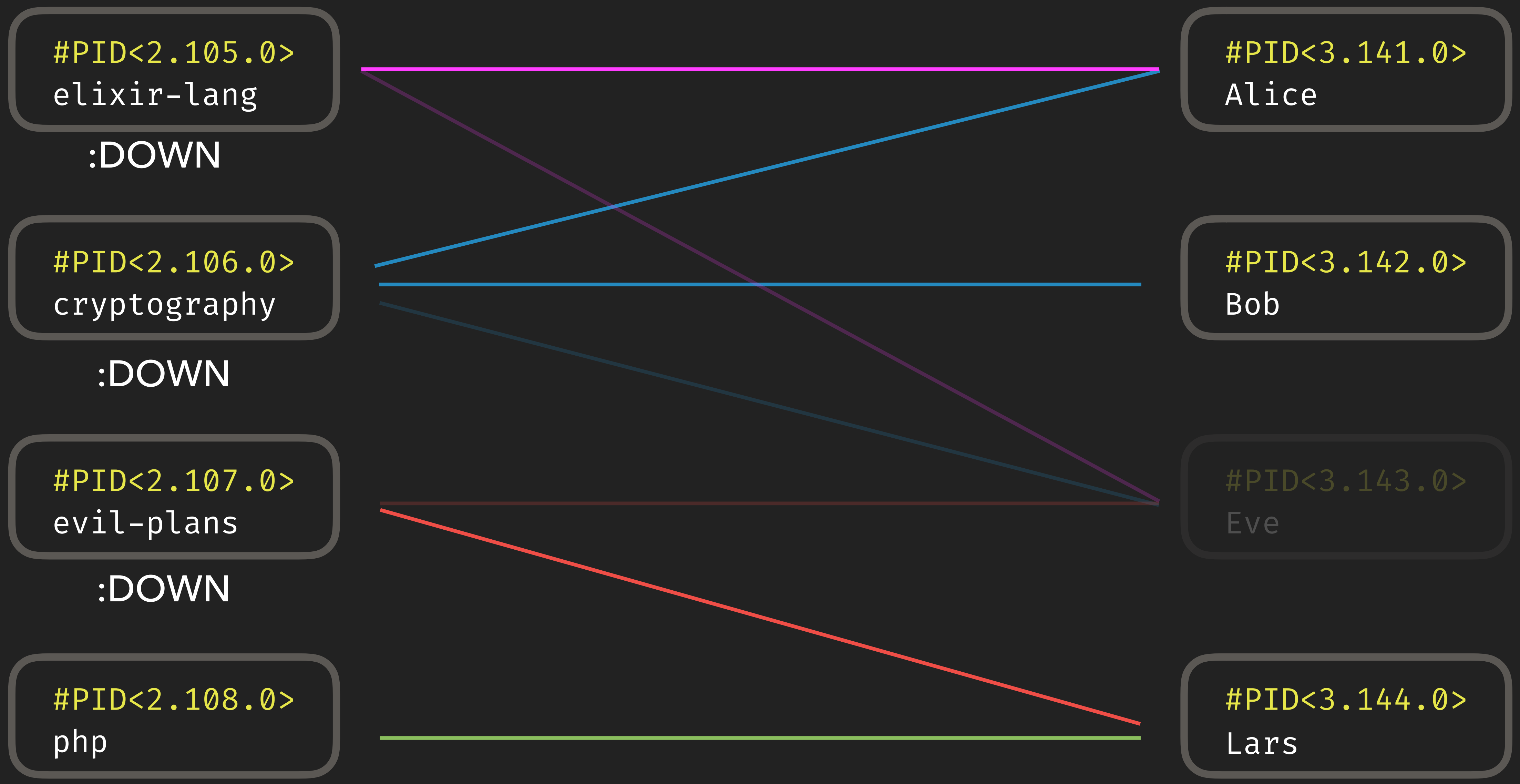

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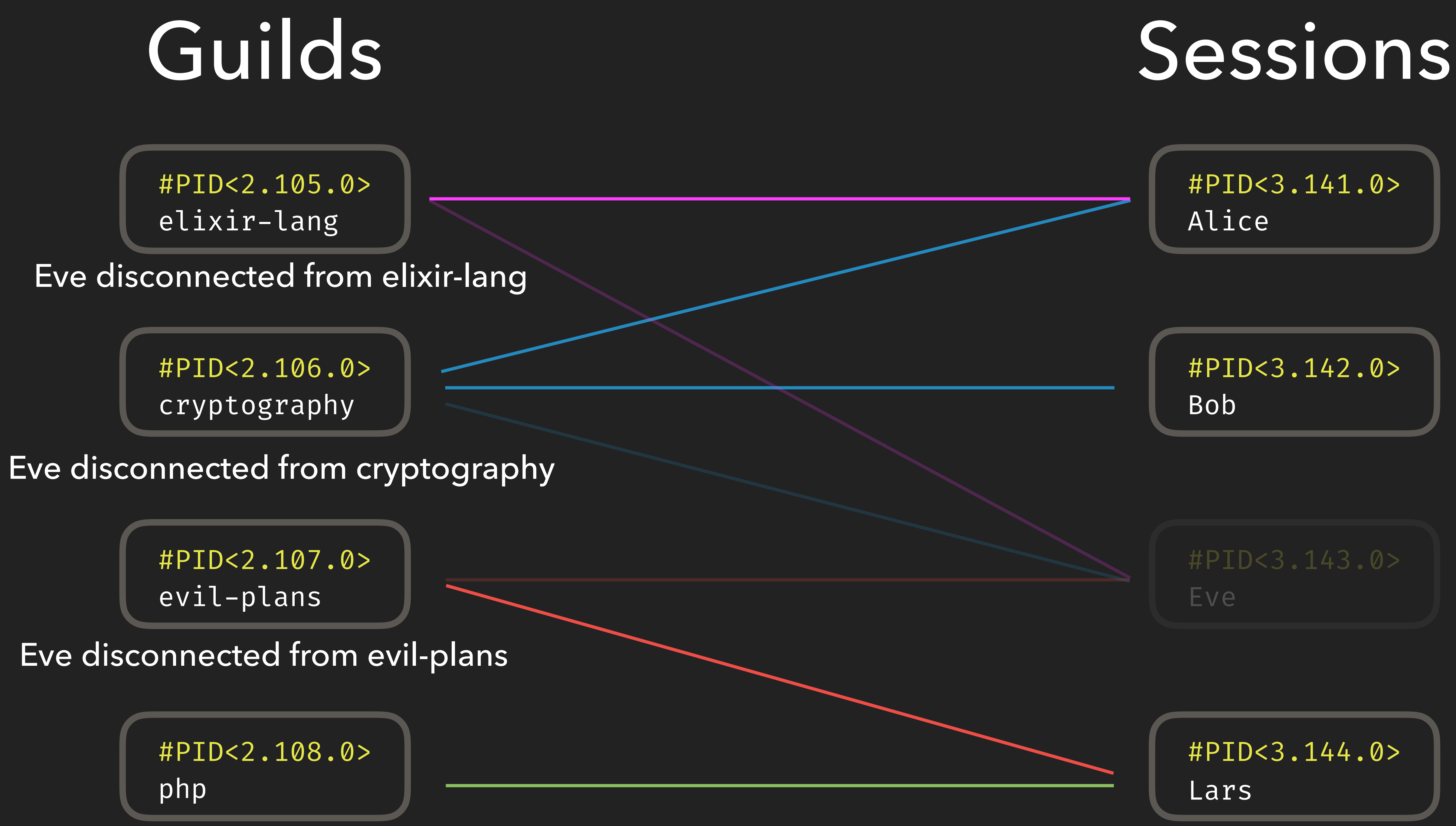

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#PID<2.105.0>
elixir-lang

Eve disconnected from elixir-lang

#PID<2.106.0>
cryptography

Eve disconnected from cryptography

#PID<2.107.0>
evil-plans

Eve disconnected from evil-plans

#PID<2.108.0>
php

Sessions

#PID<3.141.0>
Alice

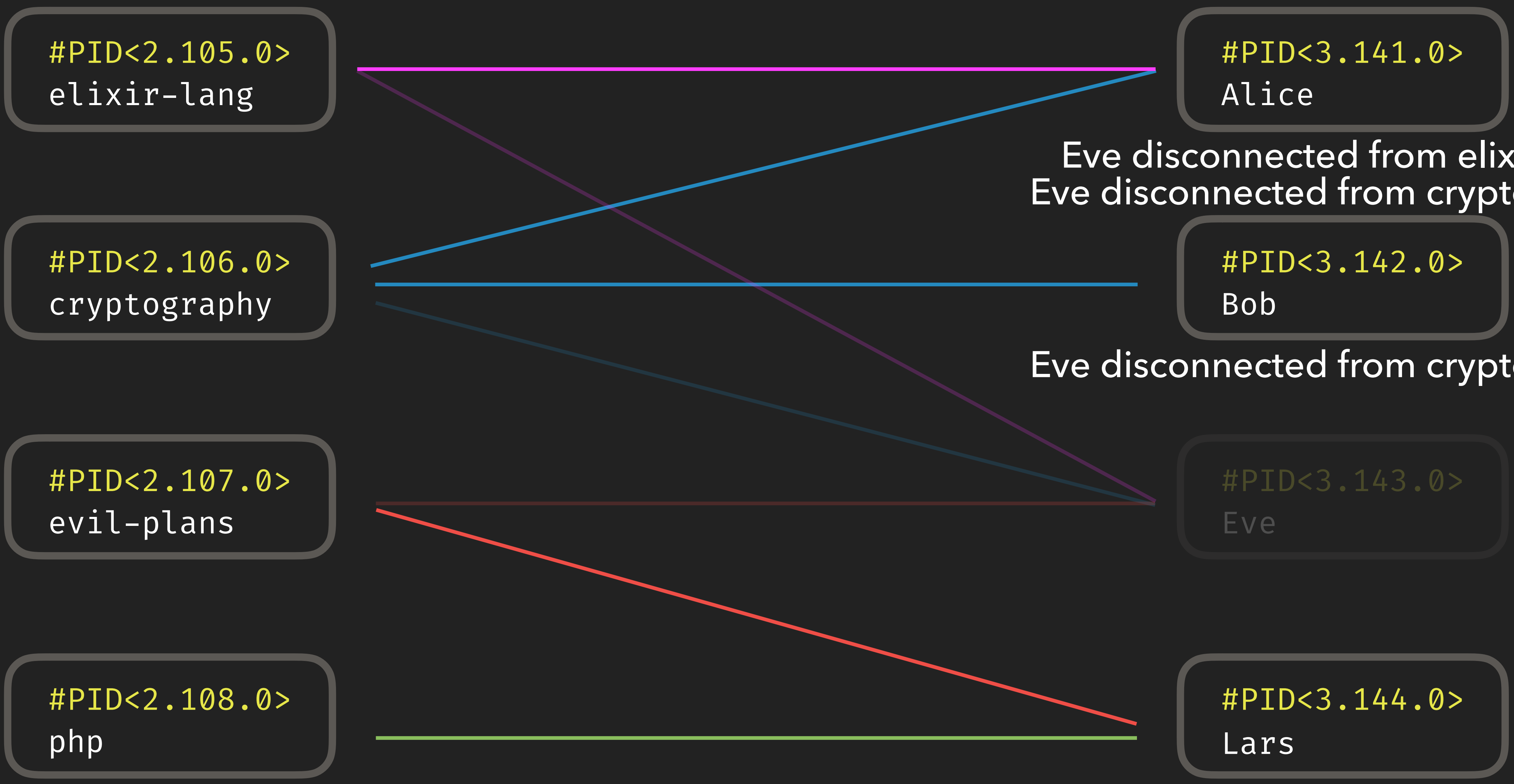
#PID<3.142.0>
Bob

#PID<3.143.0>
Eve

#PID<3.144.0>
Lars

Guilds

Sessions



```
#PID<2.105.0>
elixir-lang
```

```
#PID<2.106.0>
cryptography
```

```
#PID<2.107.0>
evil-plans
```

```
#PID<2.108.0>
php
```

```
#PID<3.141.0>
Alice
```

Eve disconnected from elixir-lang
Eve disconnected from cryptography

```
#PID<3.142.0>
Bob
```

Eve disconnected from cryptography

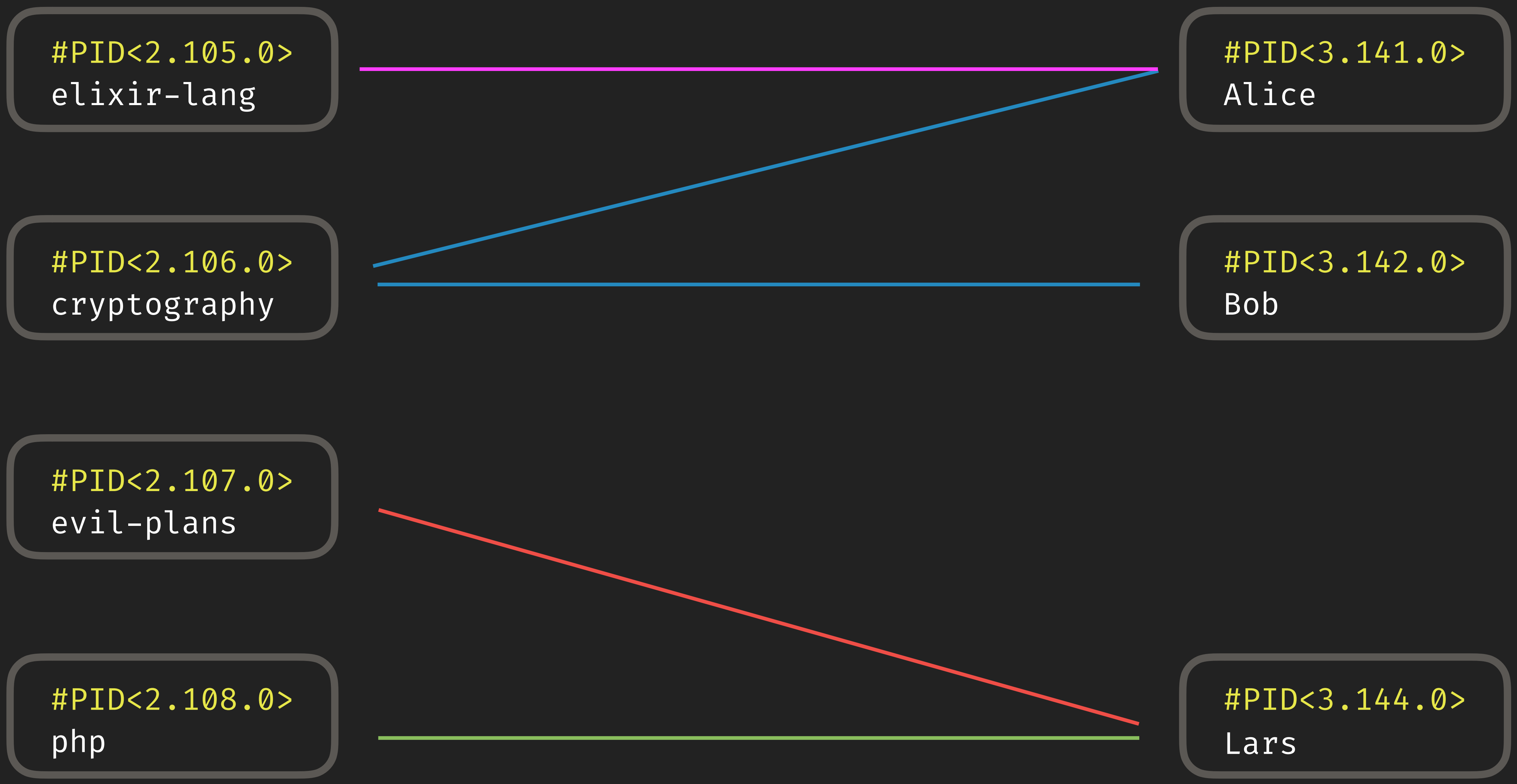
```
#PID<3.143.0>
Eve
```

```
#PID<3.144.0>
Lars
```

Eve disconnected from evil-plans

Guilds

Sessions



#PID<2.105.0>
elixir-lang

#PID<2.106.0>
cryptography

#PID<2.107.0>
evil-plans

#PID<2.108.0>
php

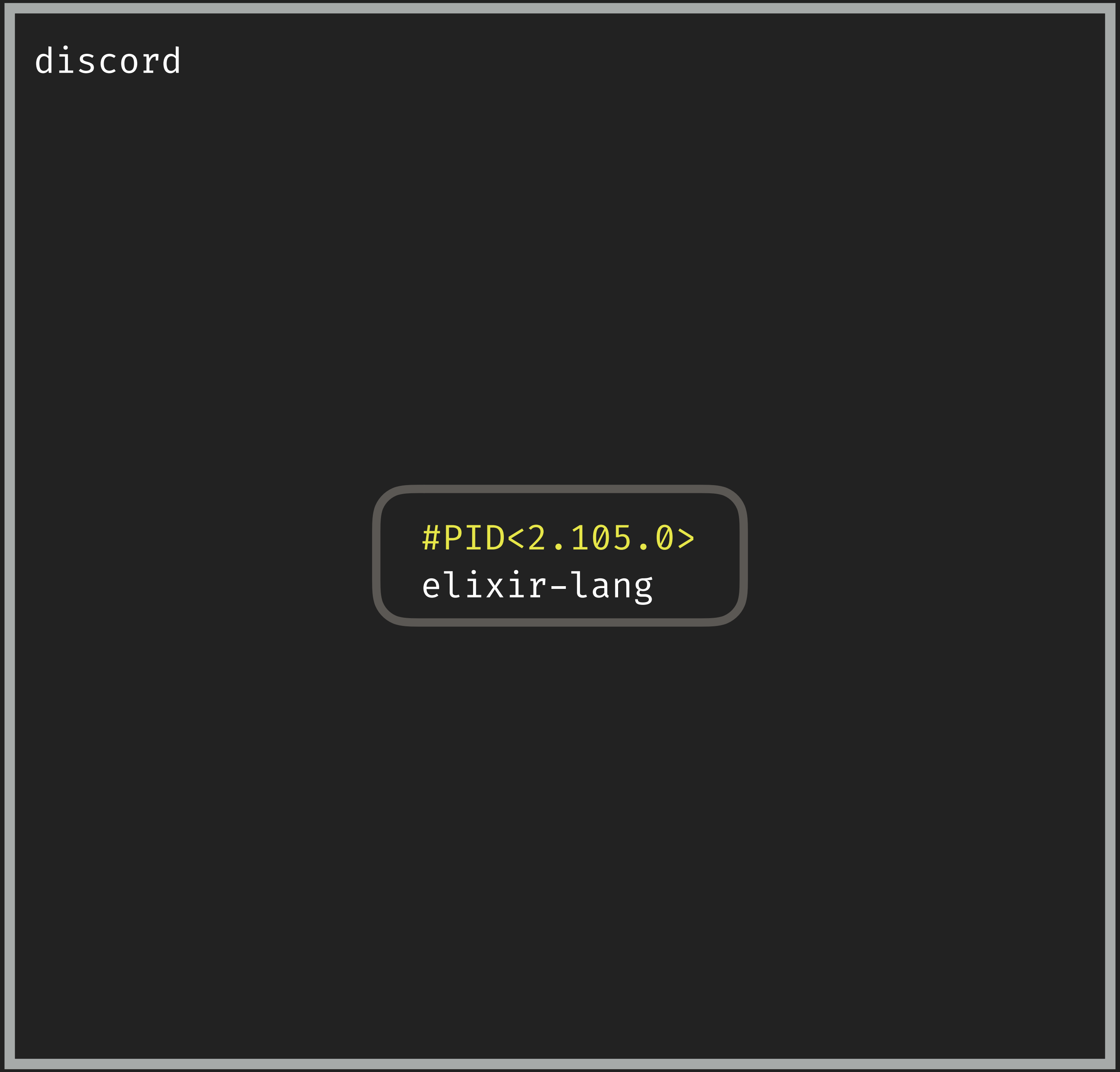
#PID<3.141.0>
Alice

#PID<3.142.0>
Bob

#PID<3.144.0>
Lars

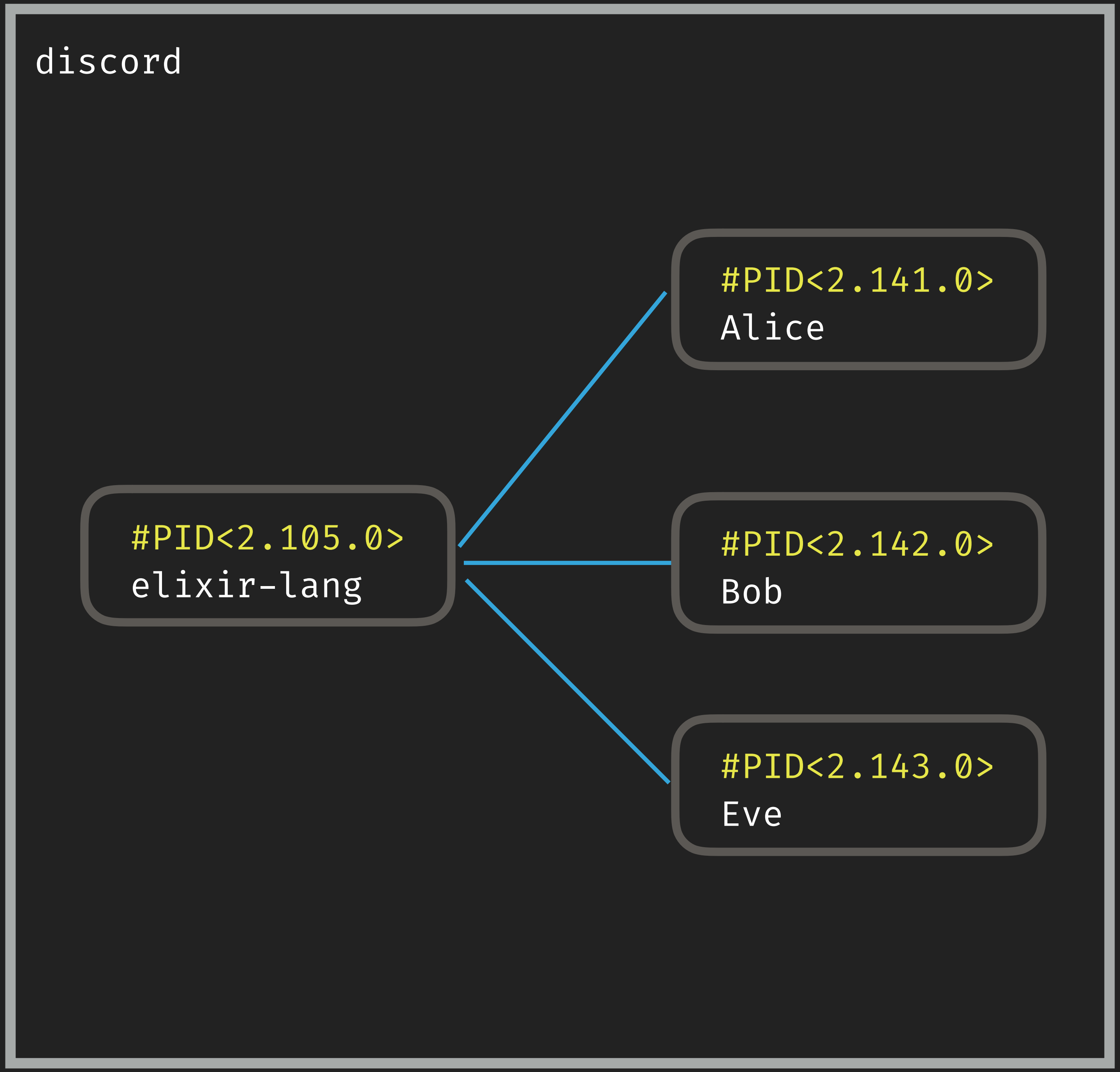
SCALING

```
#PID<2.105.0>
elixir-lang
```



discord

#PID<2.105.0>
elixir-lang



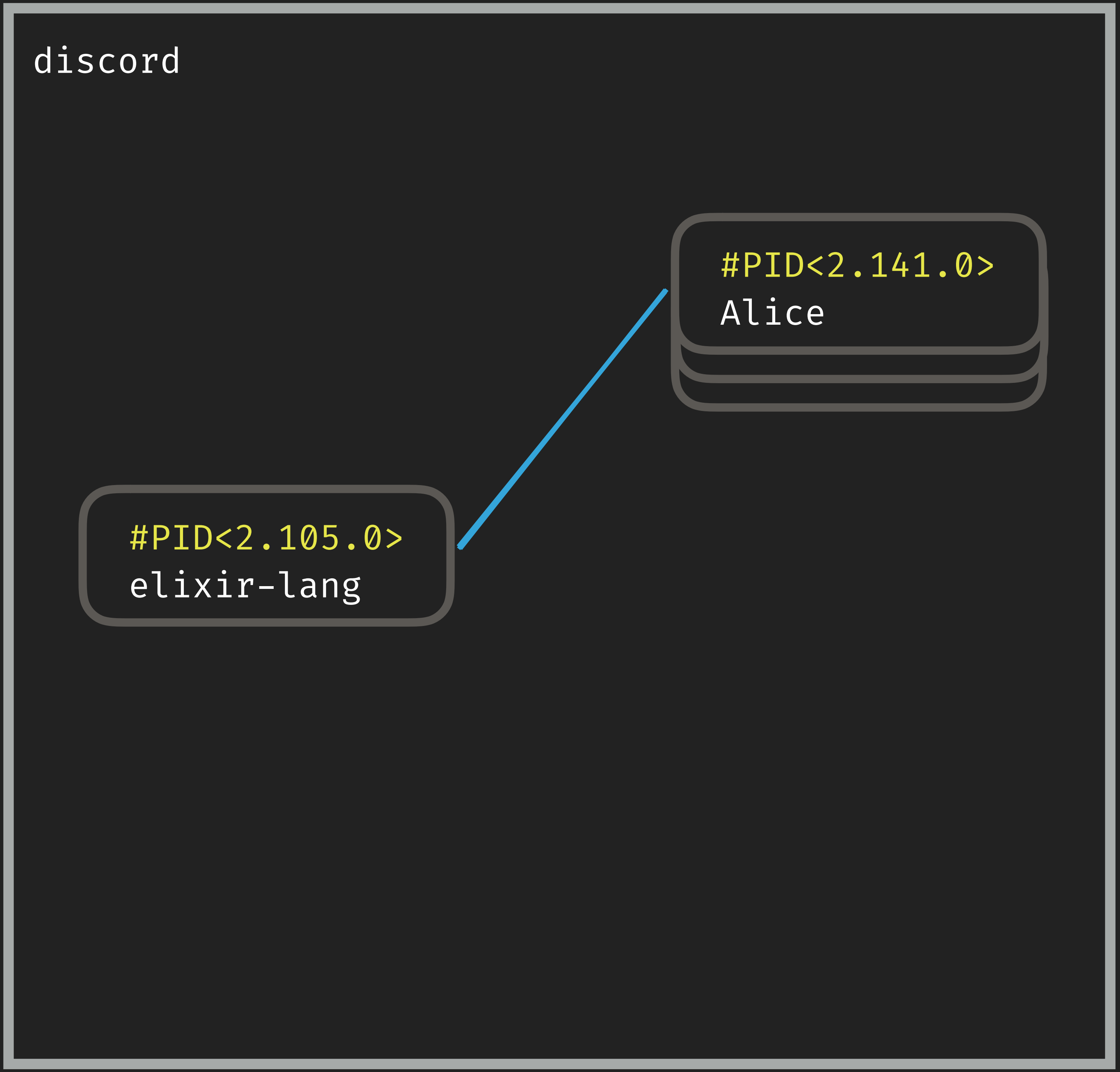
discord

#PID<2.105.0>
elixir-lang

#PID<2.141.0>
Alice

#PID<2.142.0>
Bob

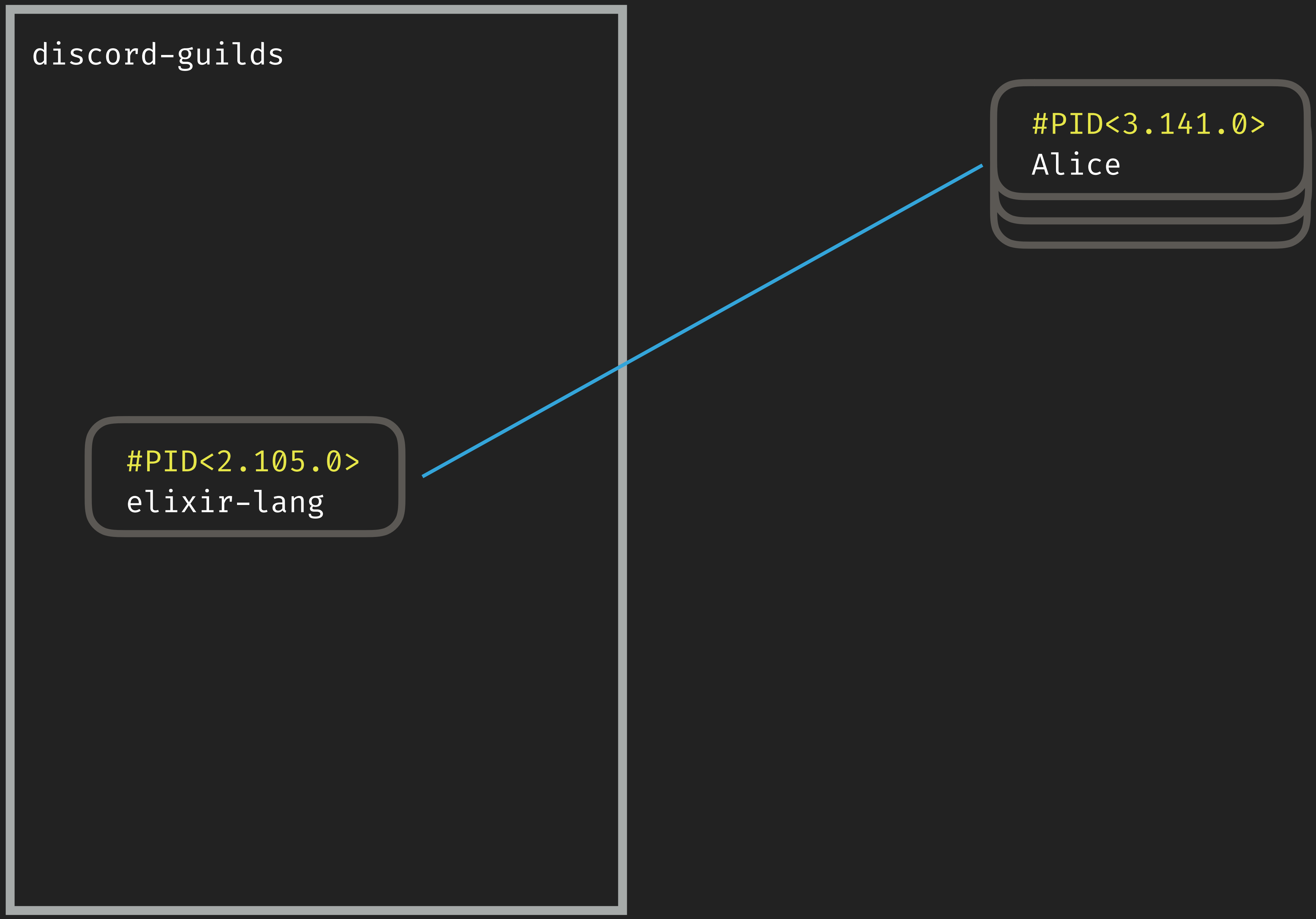
#PID<2.143.0>
Eve



discord

#PID<2.141.0>
Alice

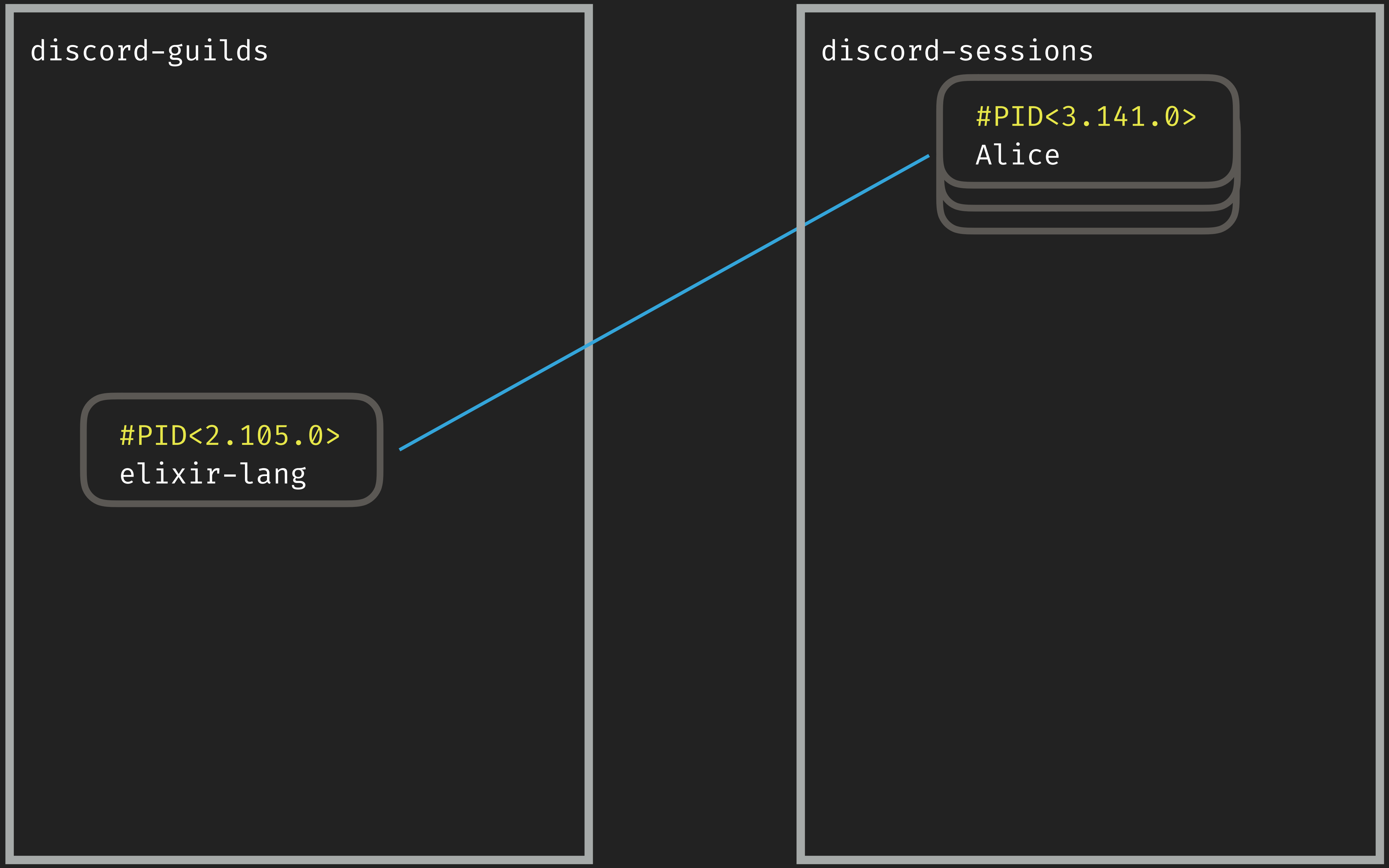
#PID<2.105.0>
elixir-lang



discord-guilds

#PID<2.105.0>
elixir-lang

#PID<3.141.0>
Alice

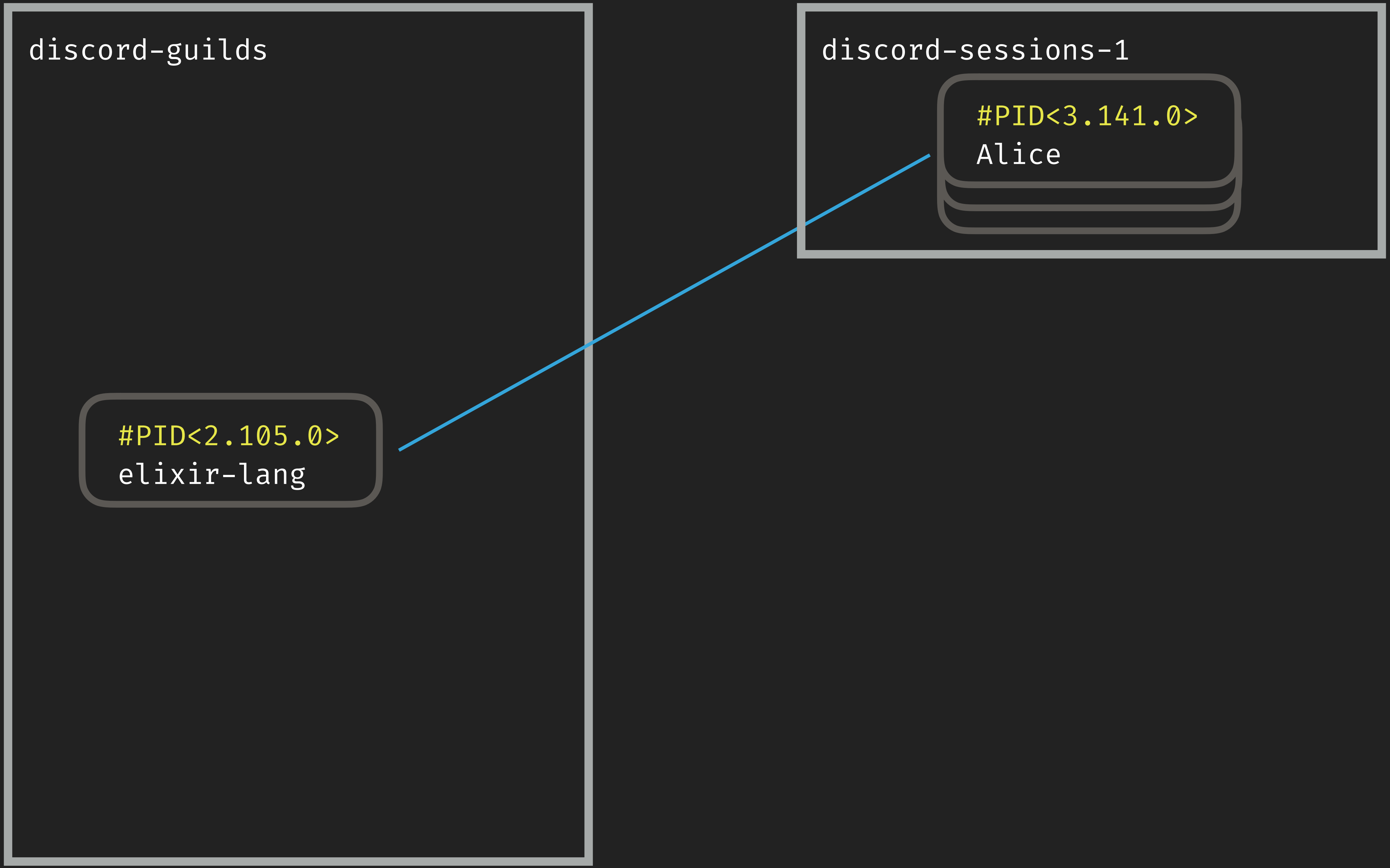


discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions

#PID<3.141.0>
Alice

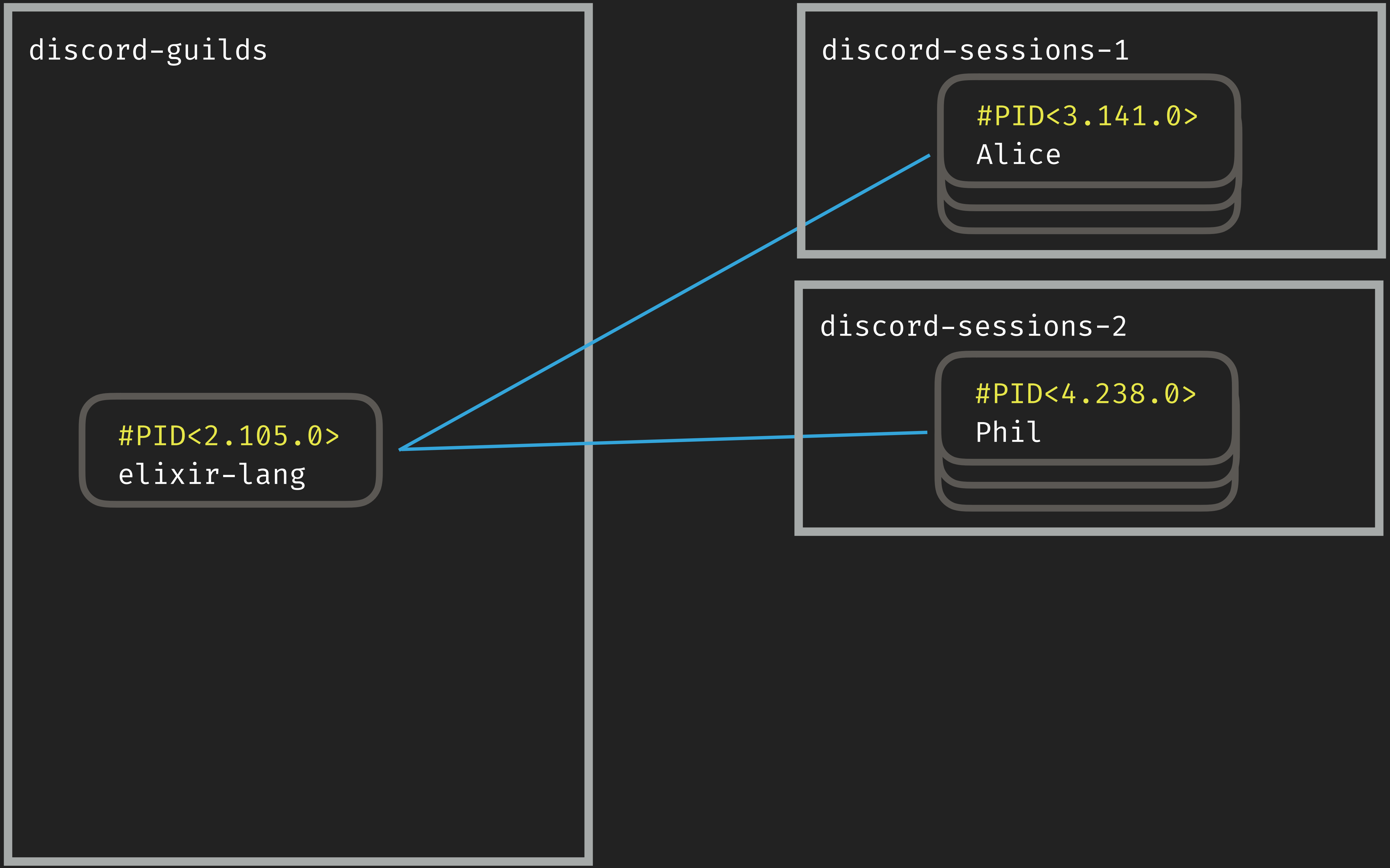


discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice



discord-guilds

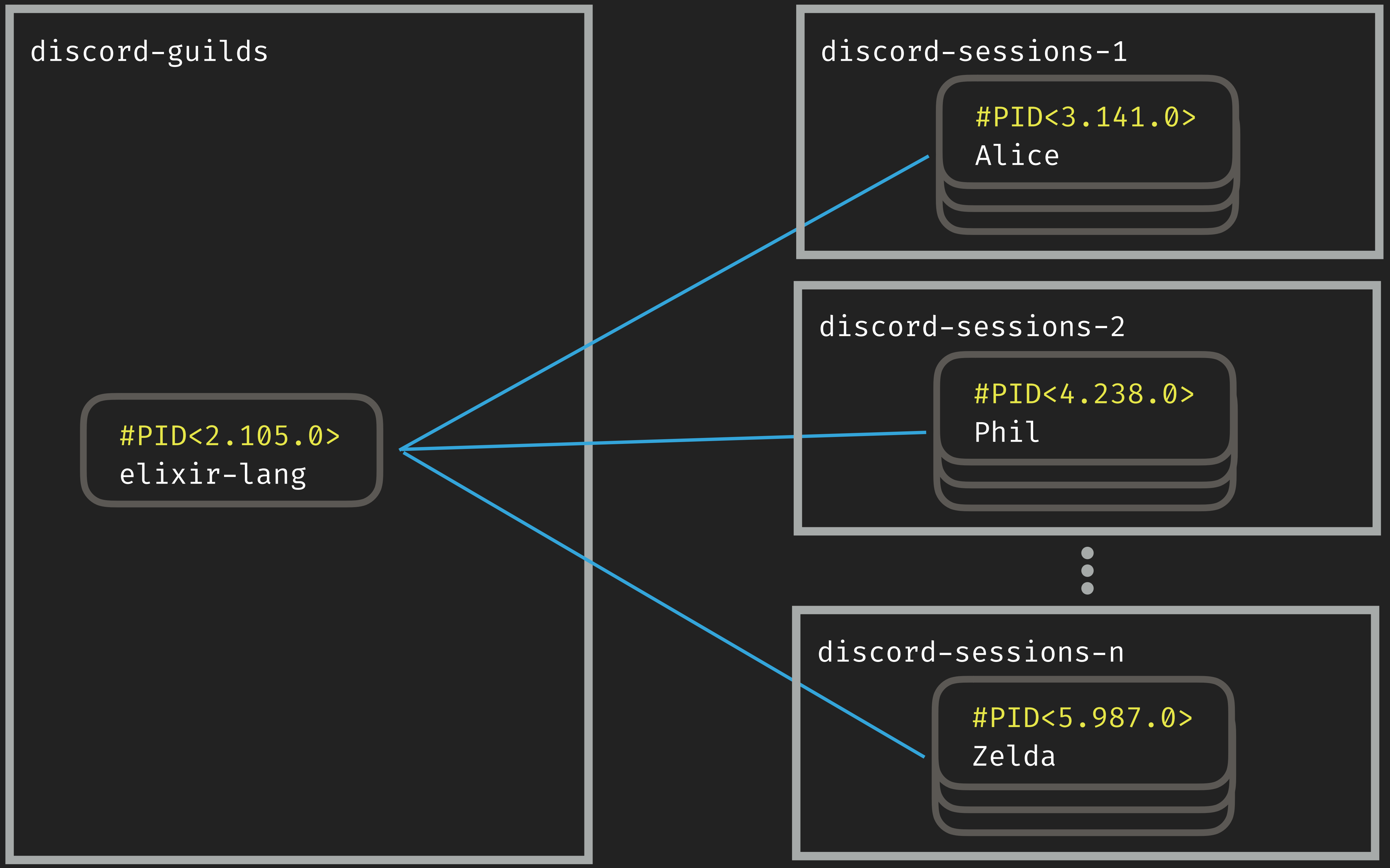
#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

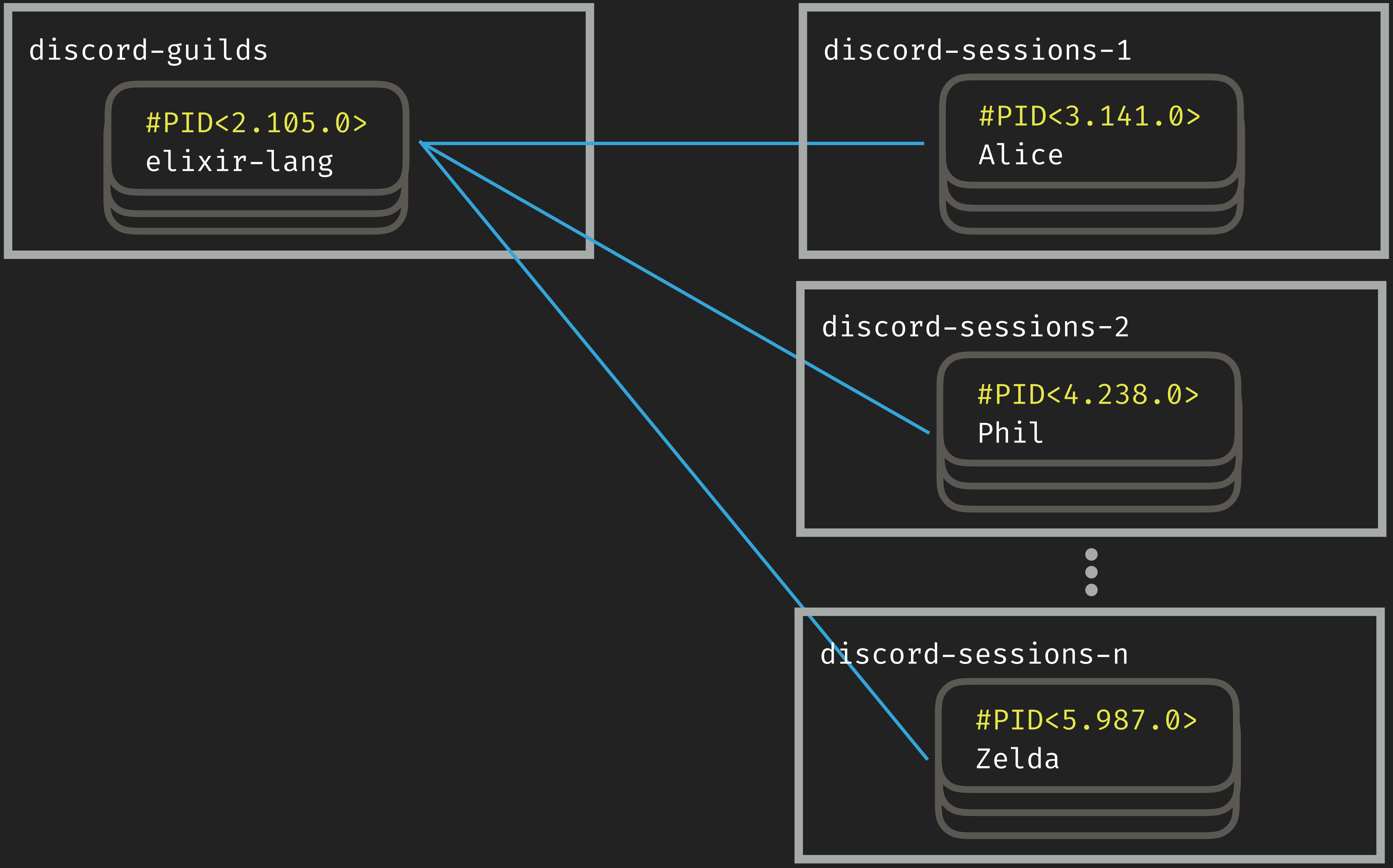
#PID<3.141.0>
Alice

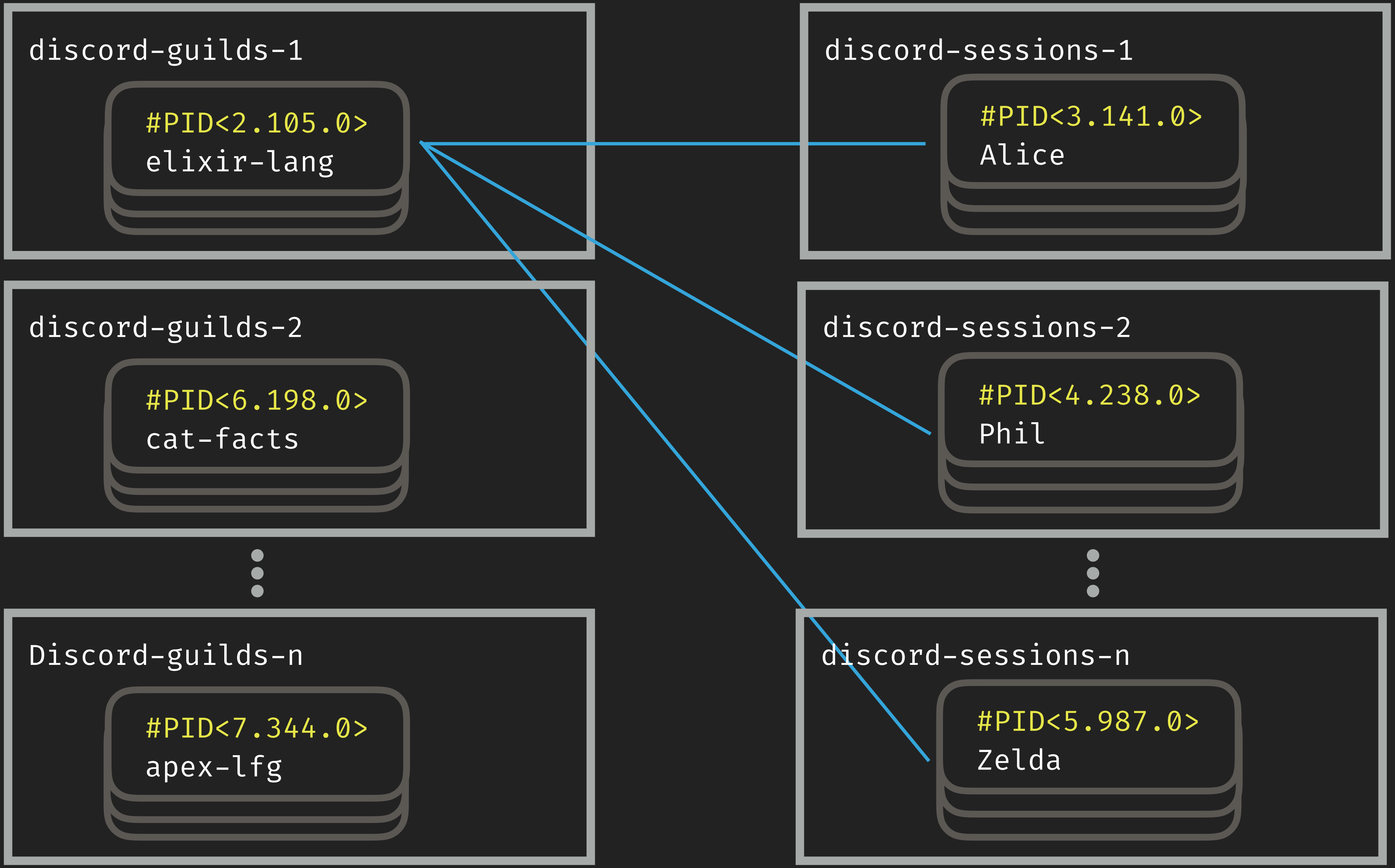
discord-sessions-2

#PID<4.238.0>
Phil

discord-sessions-n

#PID<5.987.0>
Zelda


discord-guilds
#PID<2.105.0>
elixir-lang
discord-sessions-1
#PID<3.141.0>
Alice
discord-sessions-2
#PID<4.238.0>
Phil
discord-sessions-n
#PID<5.987.0>
Zelda



discord-guilds-1

#PID<2.105.0>
elixir-lang

discord-guilds-2

#PID<6.198.0>
cat-facts

Discord-guilds-n

#PID<7.344.0>
apex-lfg

discord-sessions-1

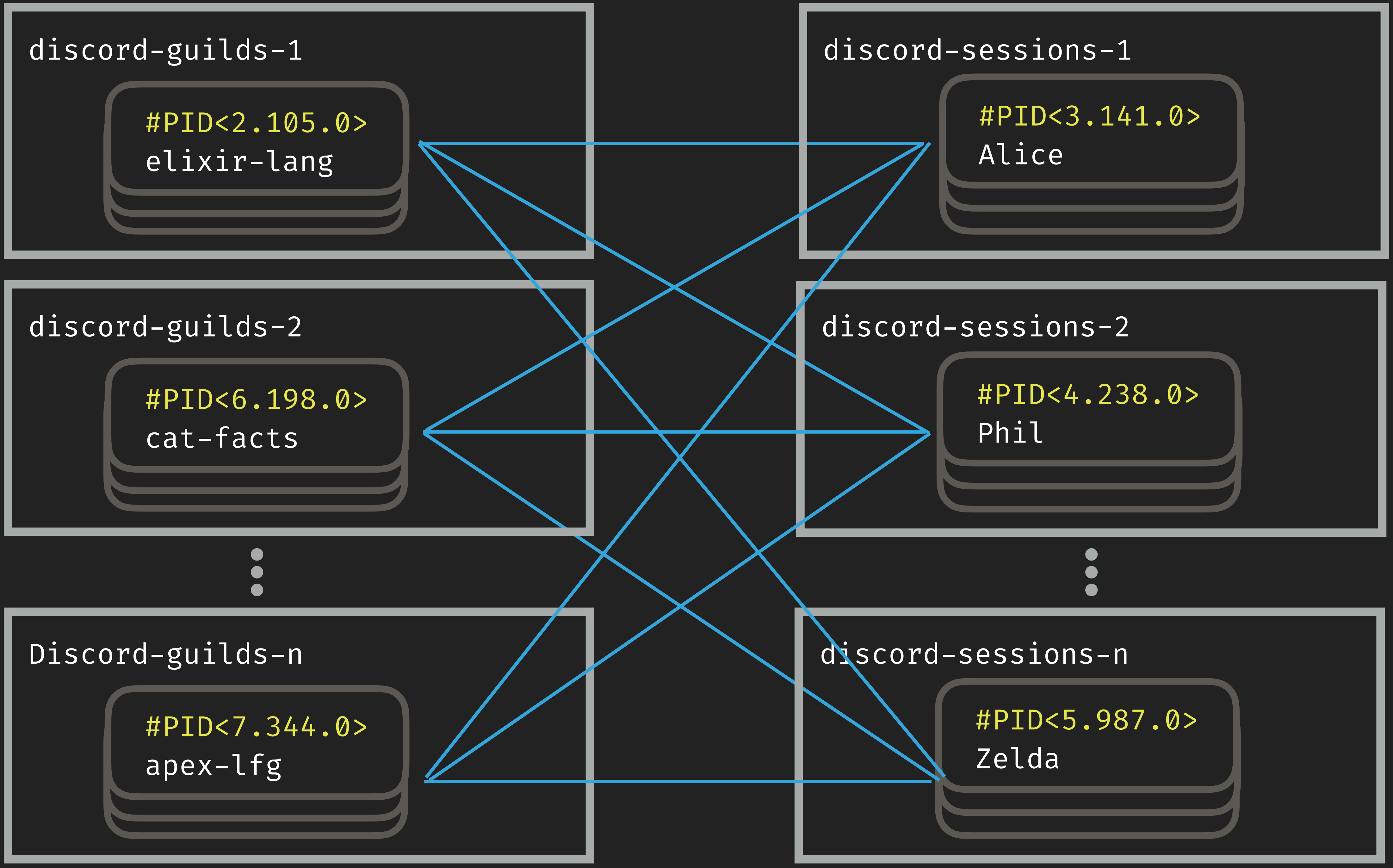
#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil

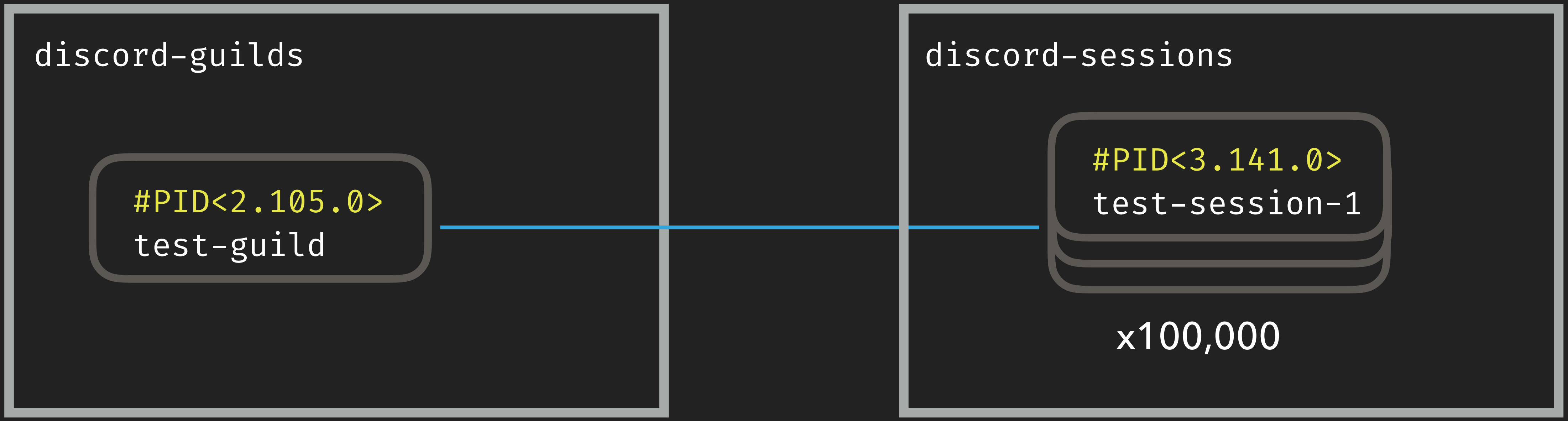
discord-sessions-n

#PID<5.987.0>
Zelda


discord-guilds-1
#PID<2.105.0>
elixir-lang
discord-guilds-2
#PID<6.198.0>
cat-facts
Discord-guilds-n
#PID<7.344.0>
apex-lfg
discord-sessions-1
#PID<3.141.0>
Alice
discord-sessions-2
#PID<4.238.0>
Phil
discord-sessions-n
#PID<5.987.0>
Zelda

PROBLEMS

THUNDER



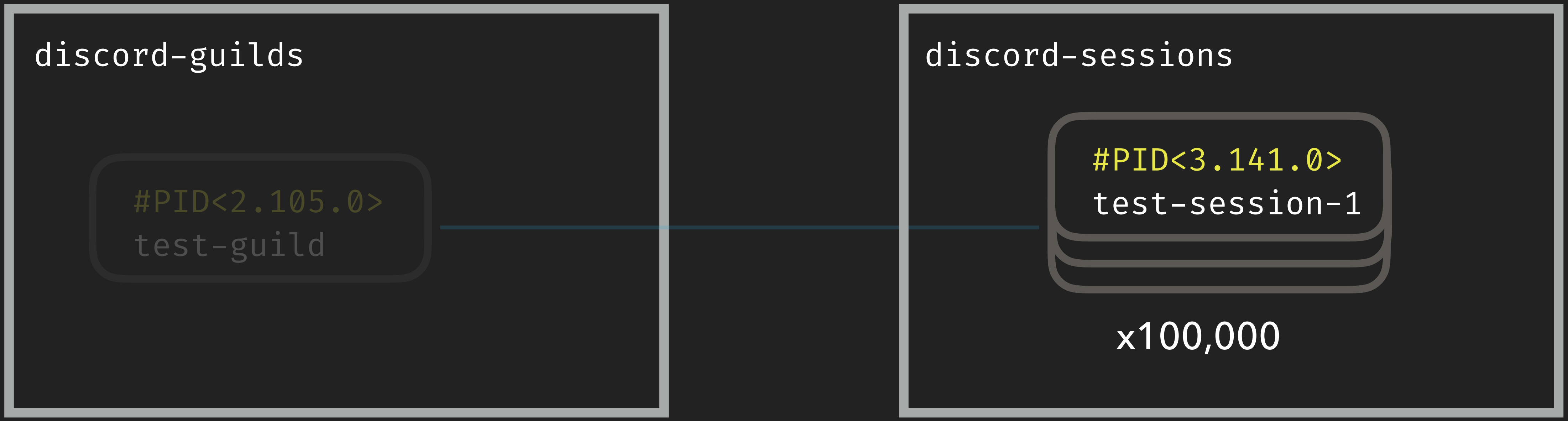
discord-guilds

#PID<2.105.0>
test-guild

discord-sessions

#PID<3.141.0>
test-session-1

x100,000



discord-guilds

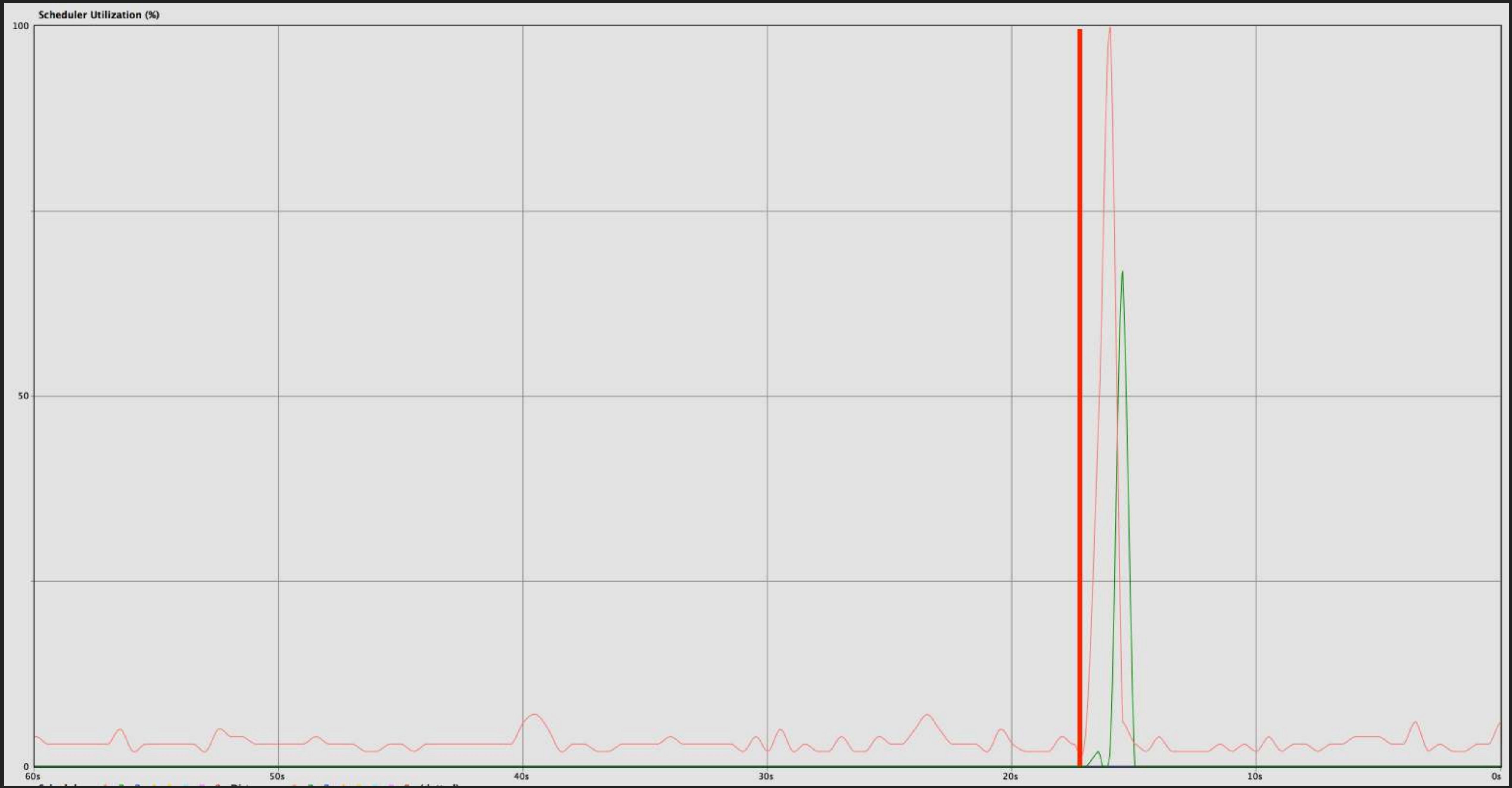
#PID<2.105.0>
test-guild

discord-sessions

#PID<3.141.0>
test-session-1

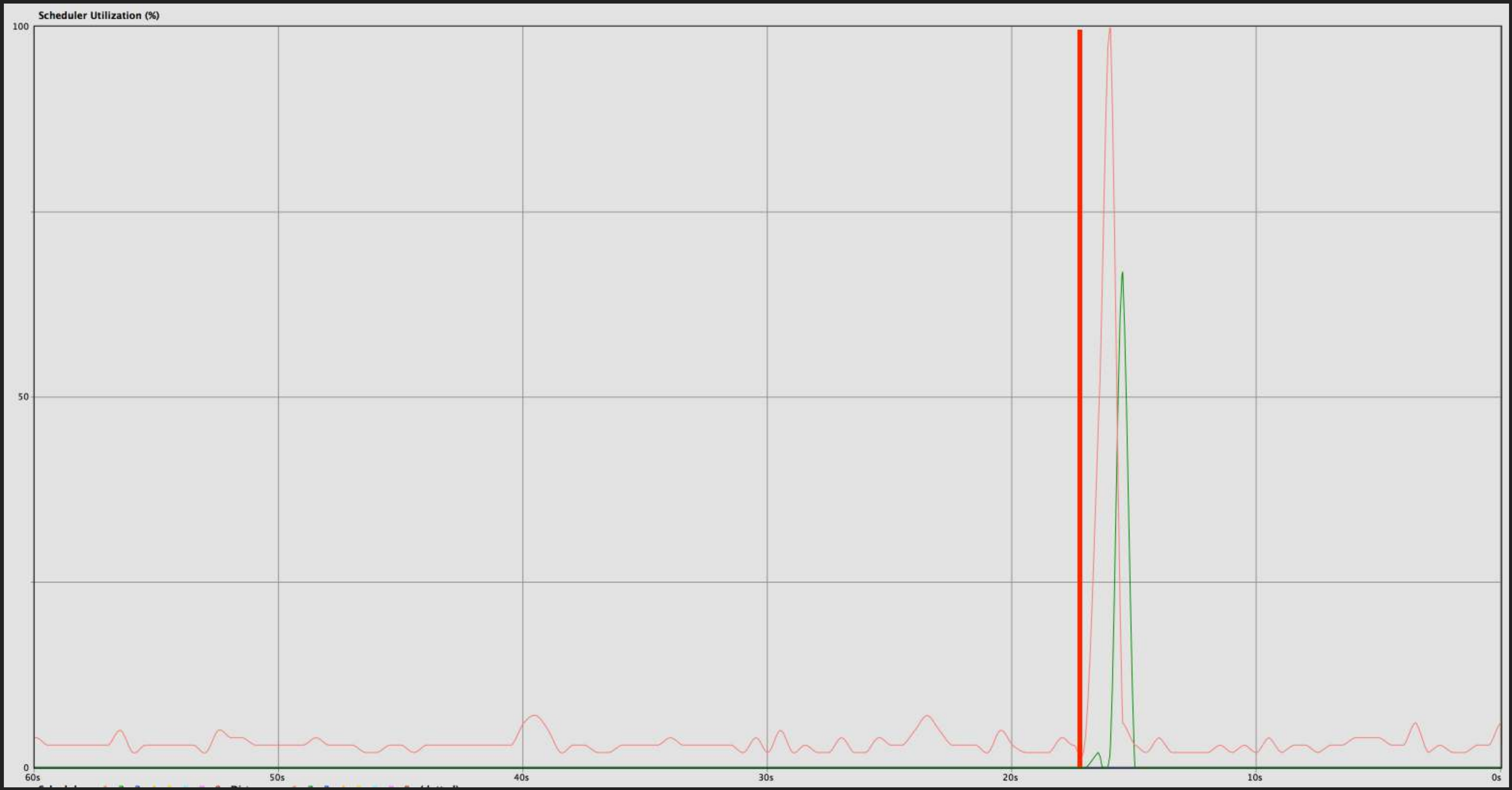
x100,000

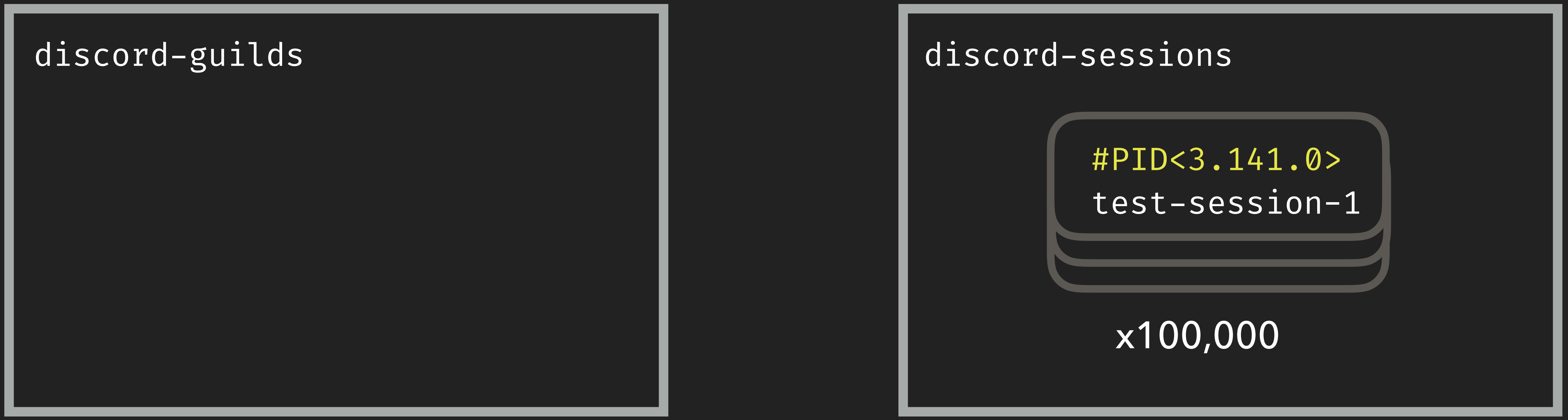
discord-guilds



discord-guilds

100% Scheduler Utilization





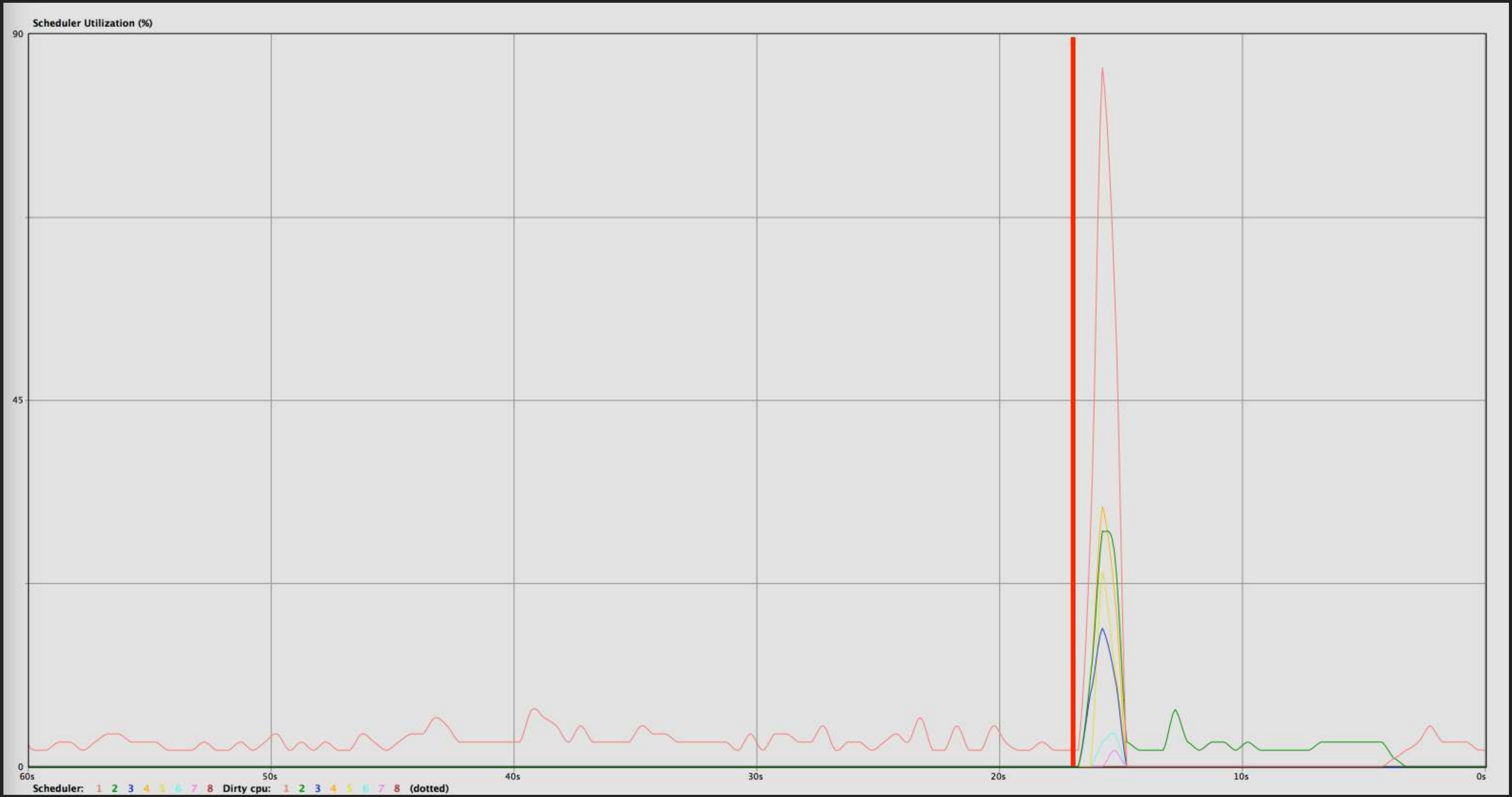
discord-guilds

discord-sessions

#PID<3.141.0>
test-session-1

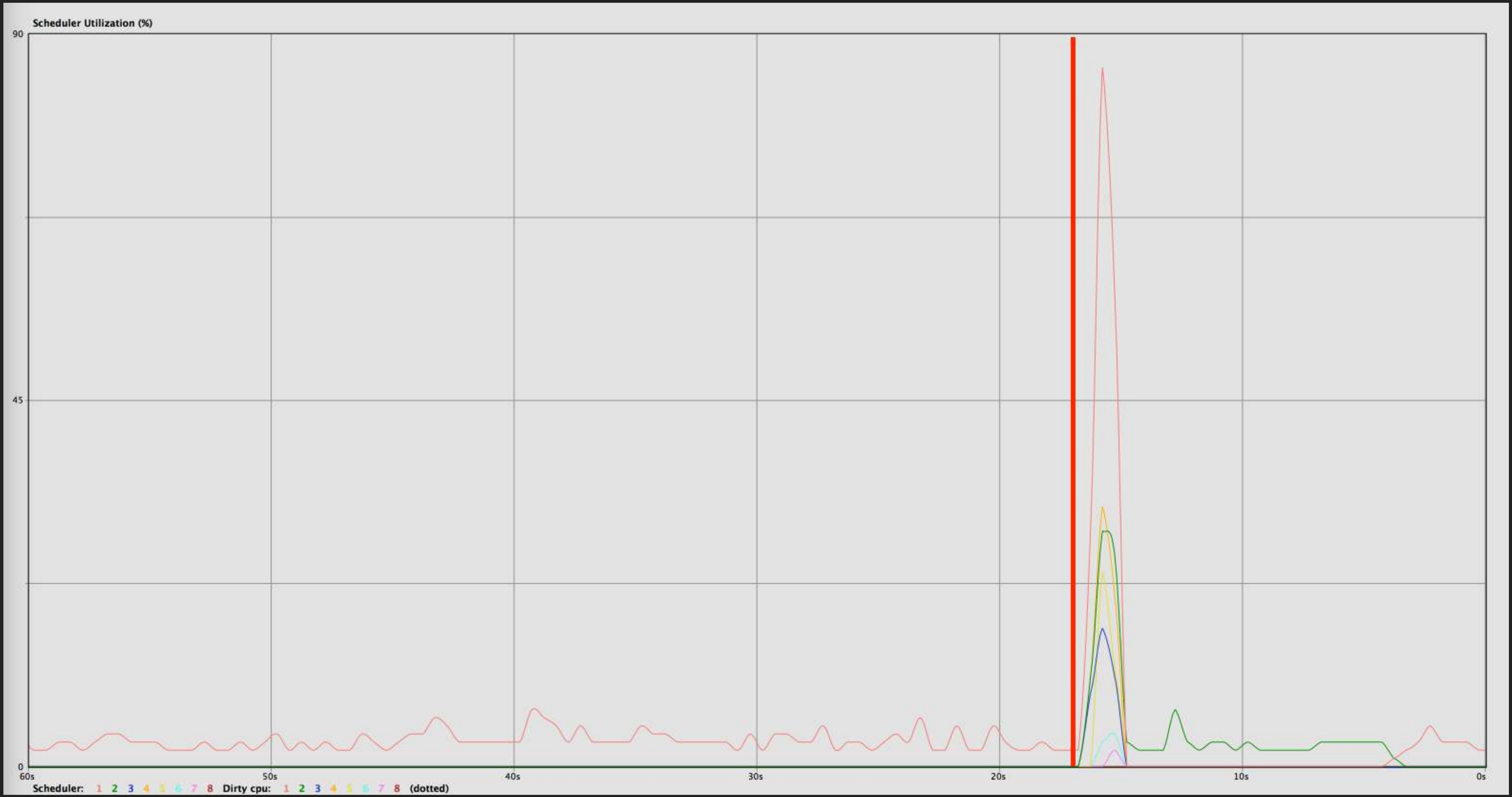
x100,000

discord-sessions



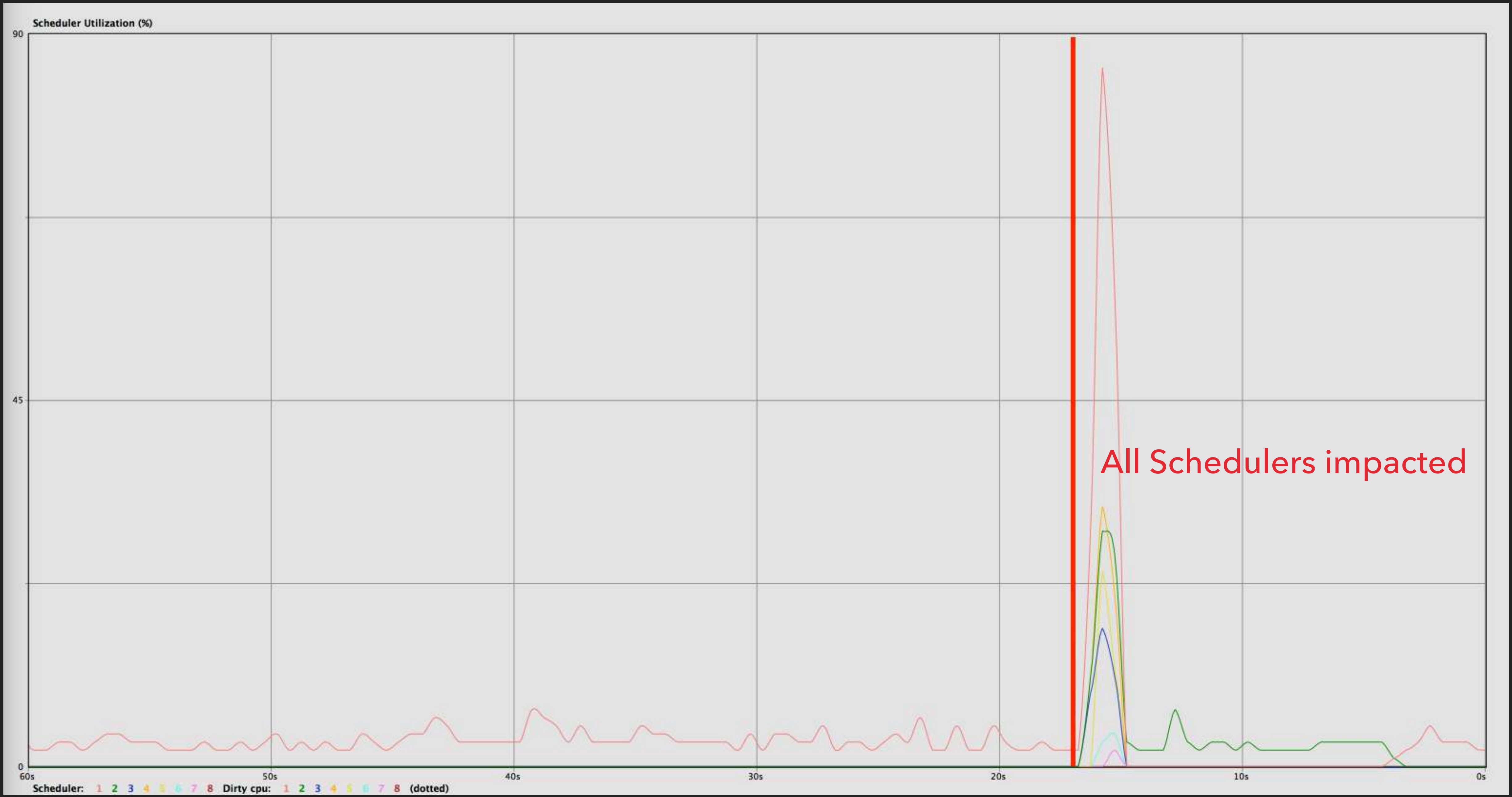
discord-sessions

~90% Scheduler Utilization



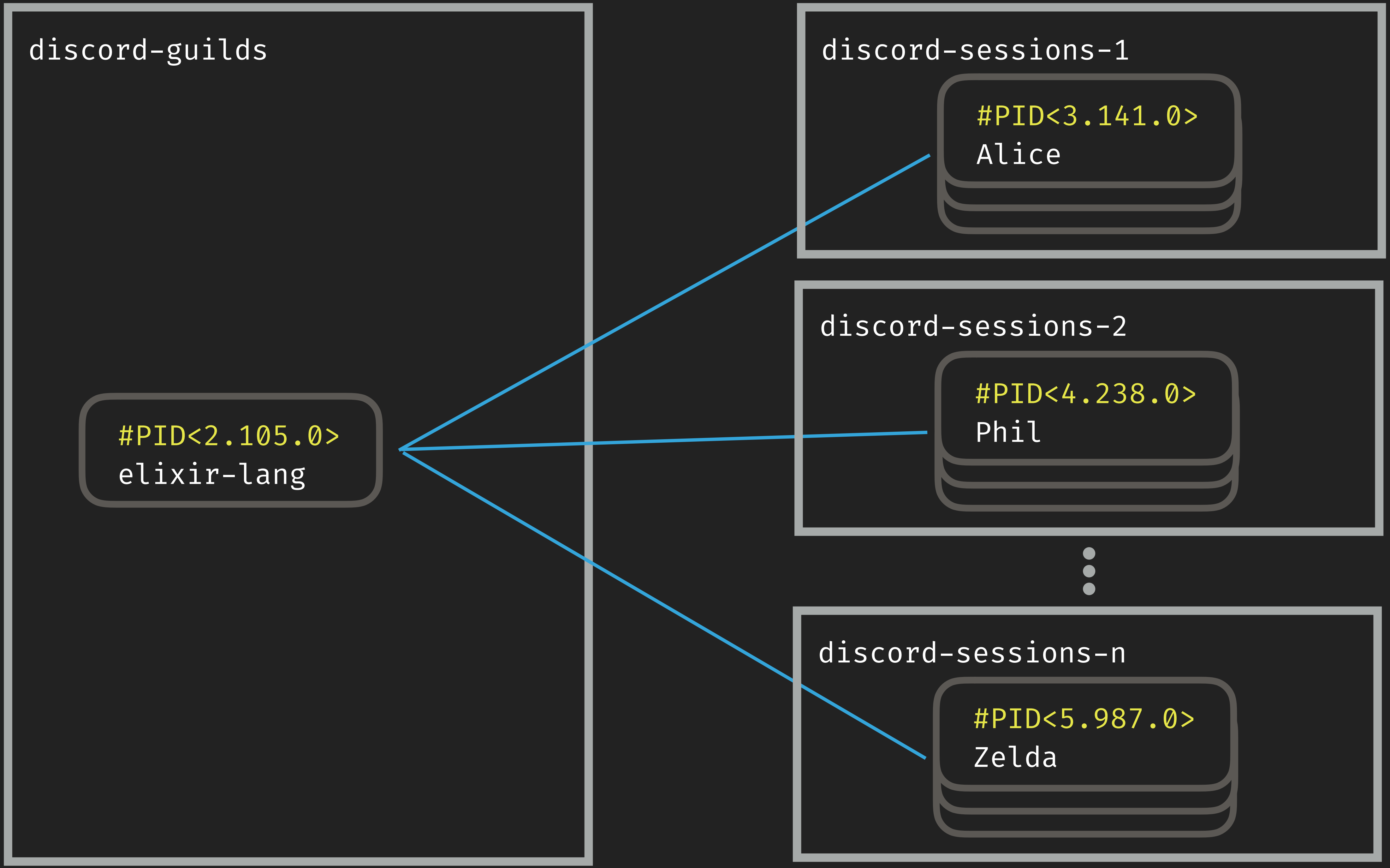
discord-sessions

~90% Scheduler Utilization



All Schedulers impacted

STARVATION


discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

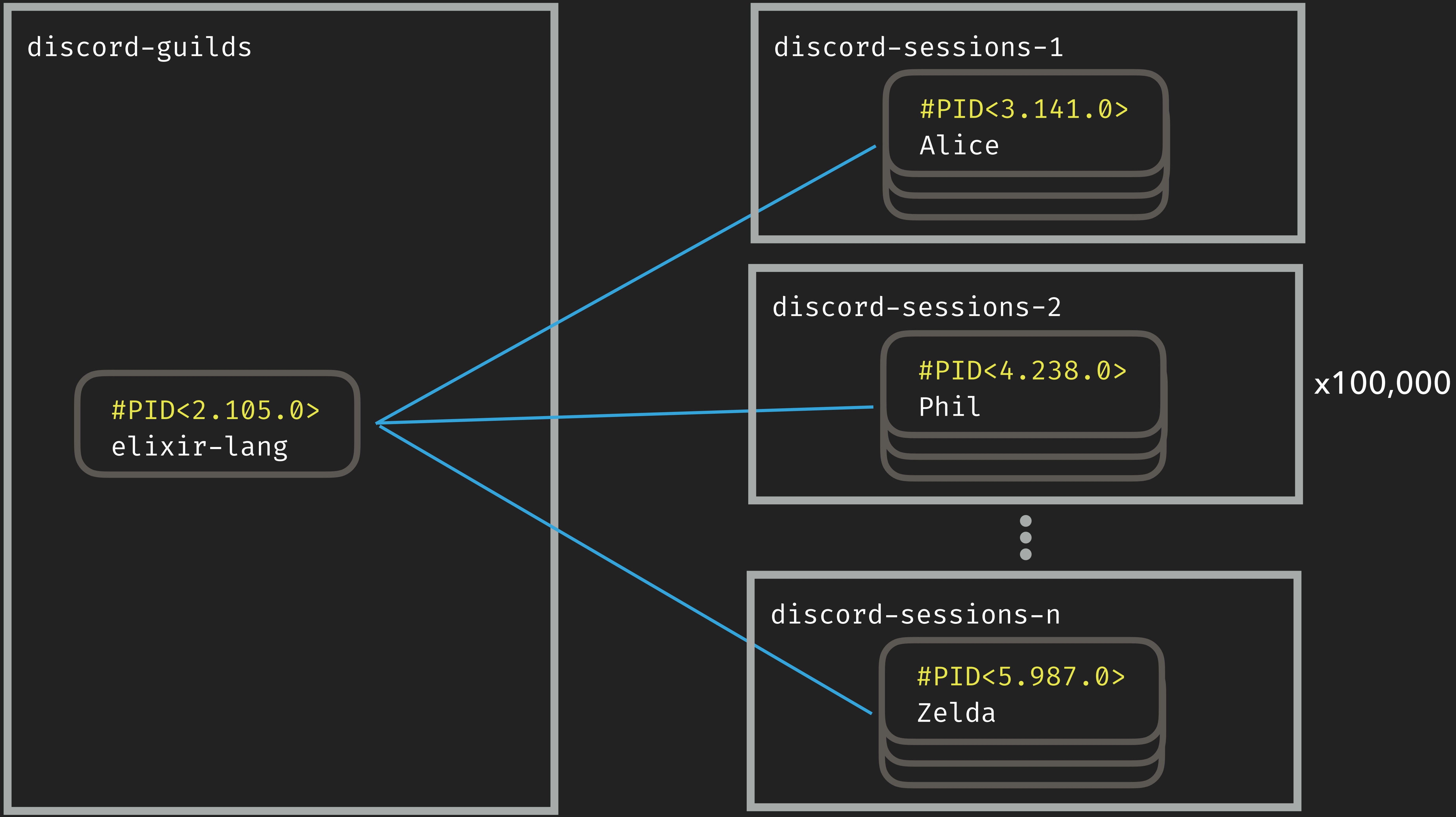
#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil

discord-sessions-n

#PID<5.987.0>
Zelda



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

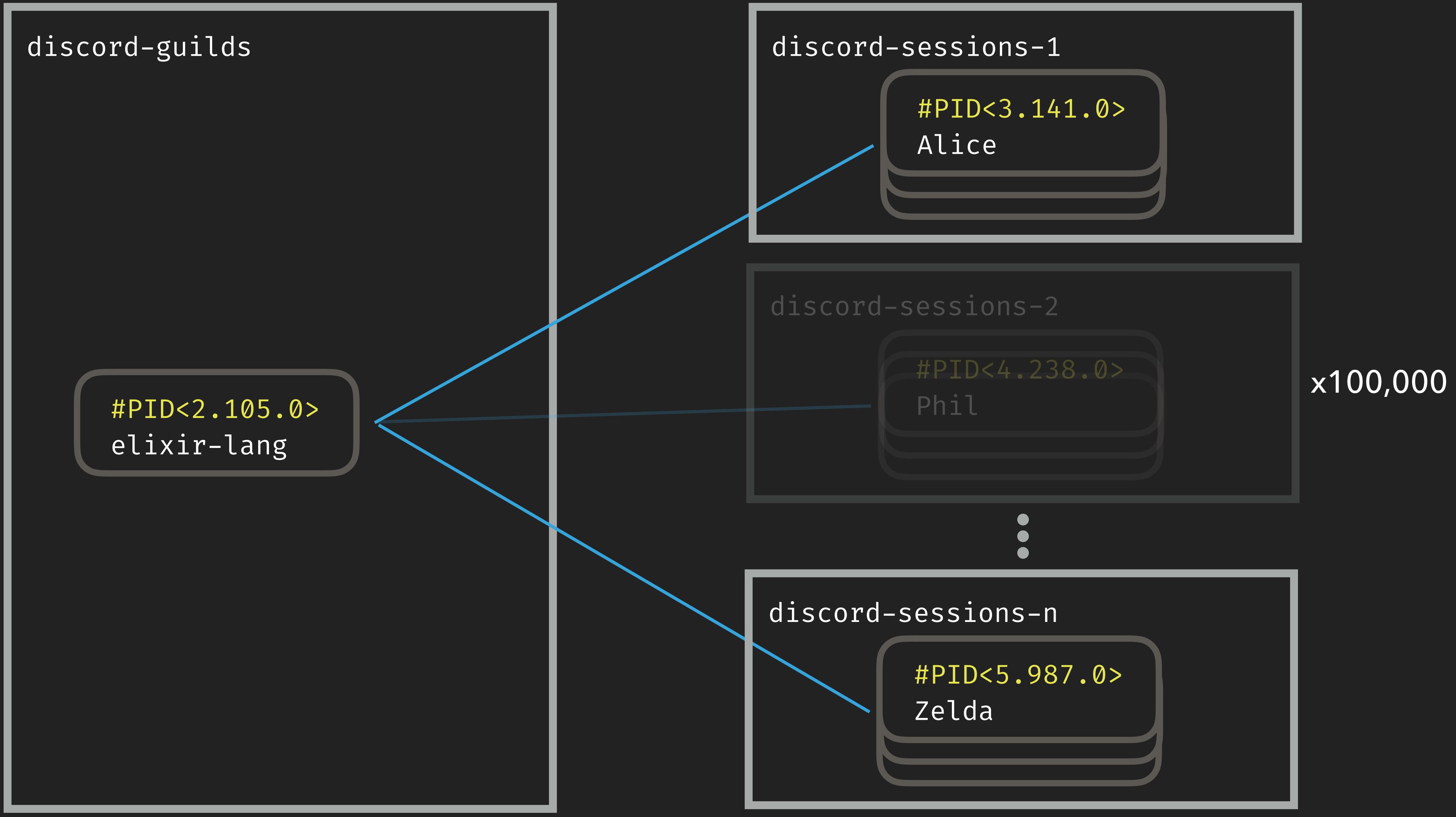
discord-sessions-2

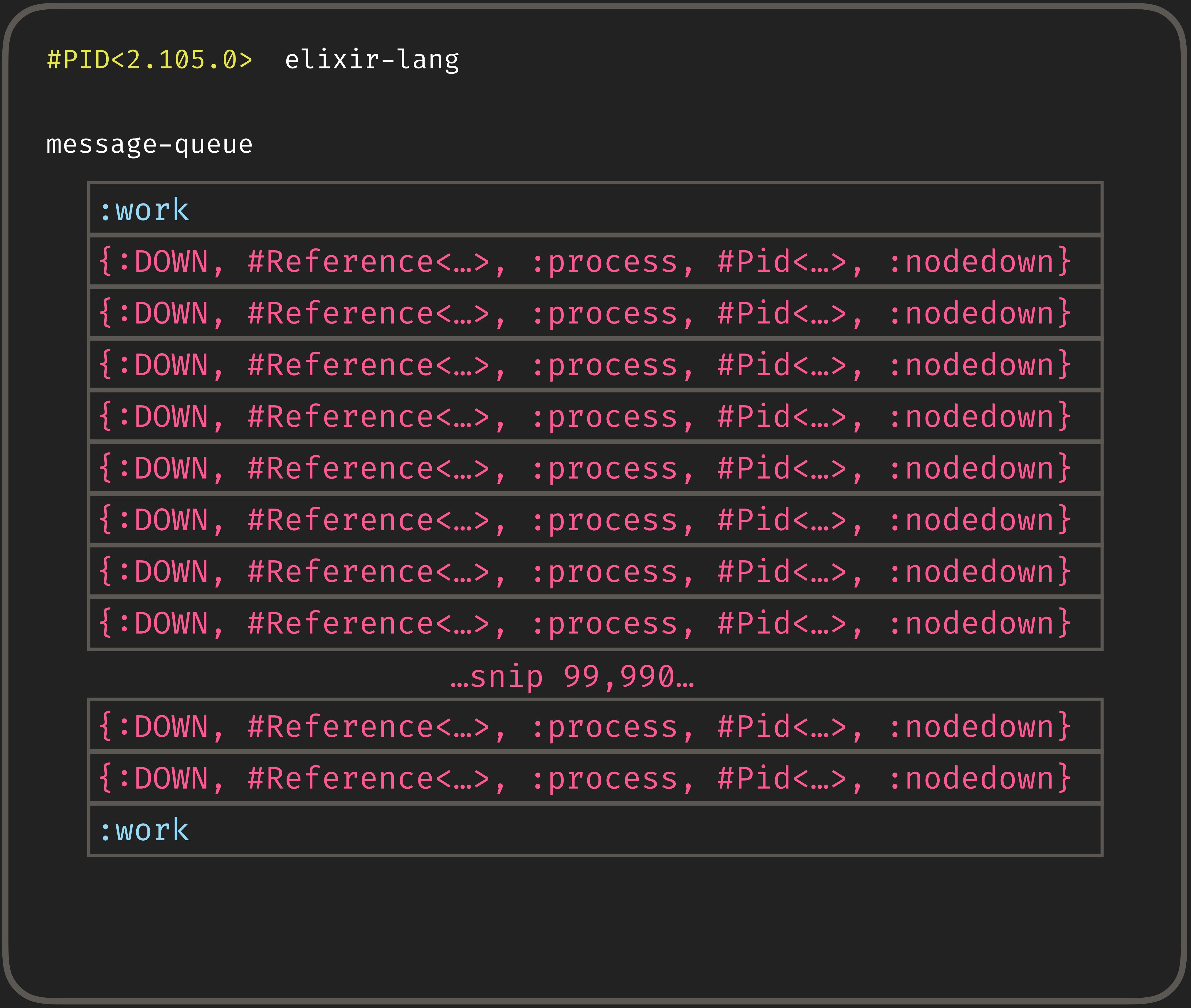
#PID<4.238.0>
Phil

x100,000

discord-sessions-n

#PID<5.987.0>
Zelda

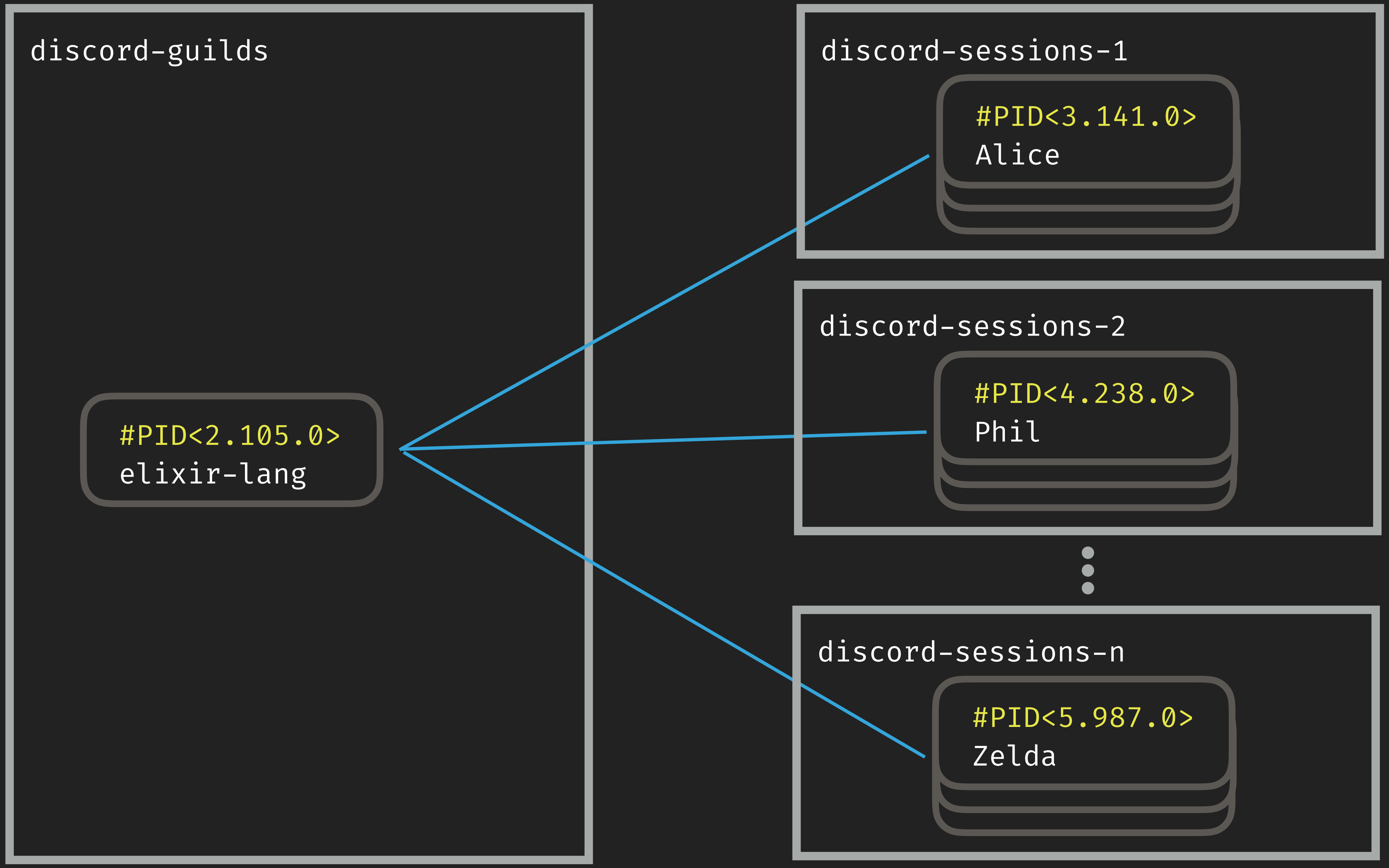

discord-guilds
#PID<2.105.0>
elixir-lang
discord-sessions-1
#PID<3.141.0>
Alice
discord-sessions-2
#PID<4.238.0>
Phil
discord-sessions-n
#PID<5.987.0>
Zelda
x100,000



```
#PID<2.105.0>  elixir-lang

message-queue
    :work
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
                       …snip 99,990…
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    :work
```

AMPLIFICATION



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

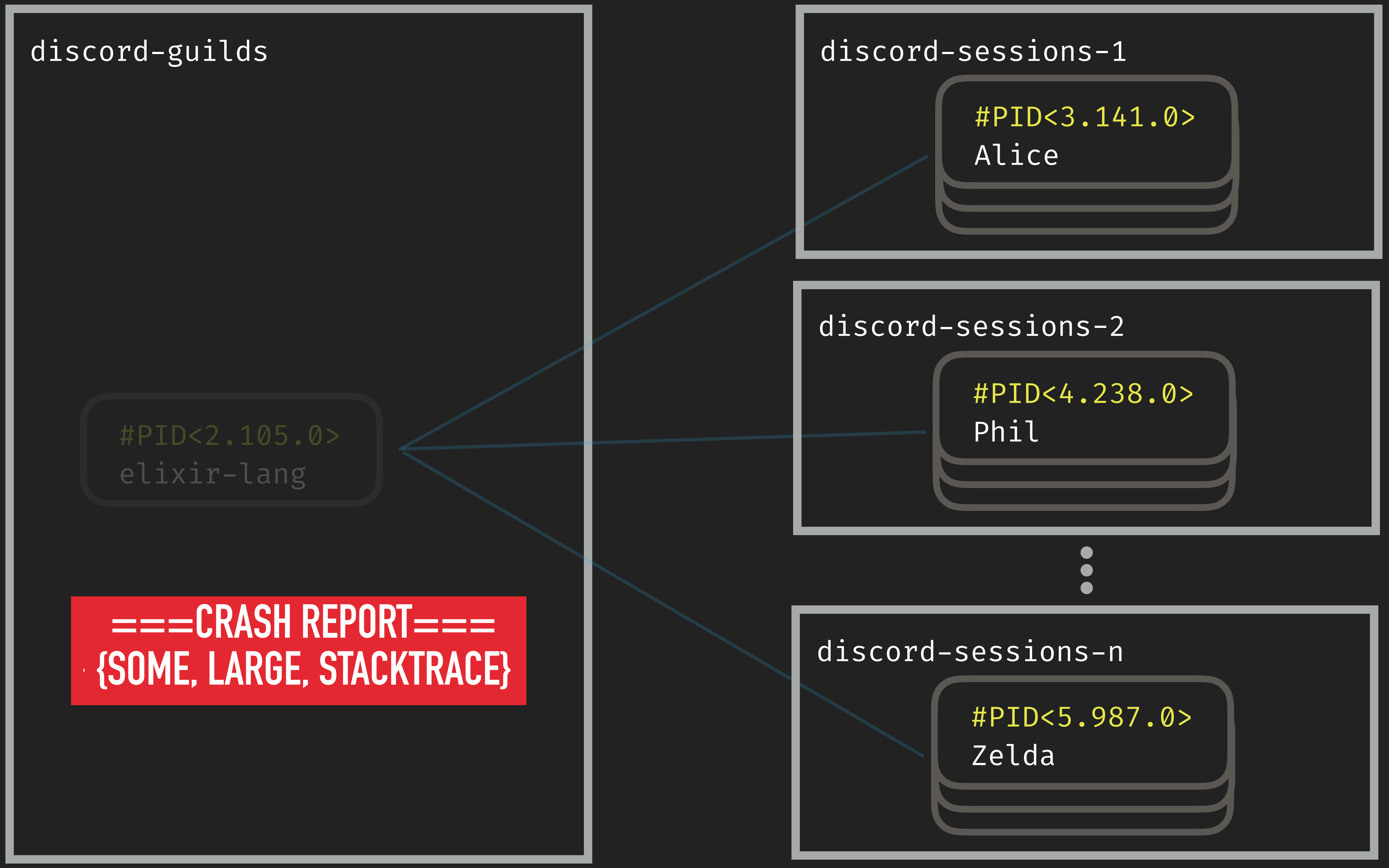
#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil

discord-sessions-n

#PID<5.987.0>
Zelda



discord-guilds

#PID<2.105.0>
elixir-lang

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

discord-sessions-1

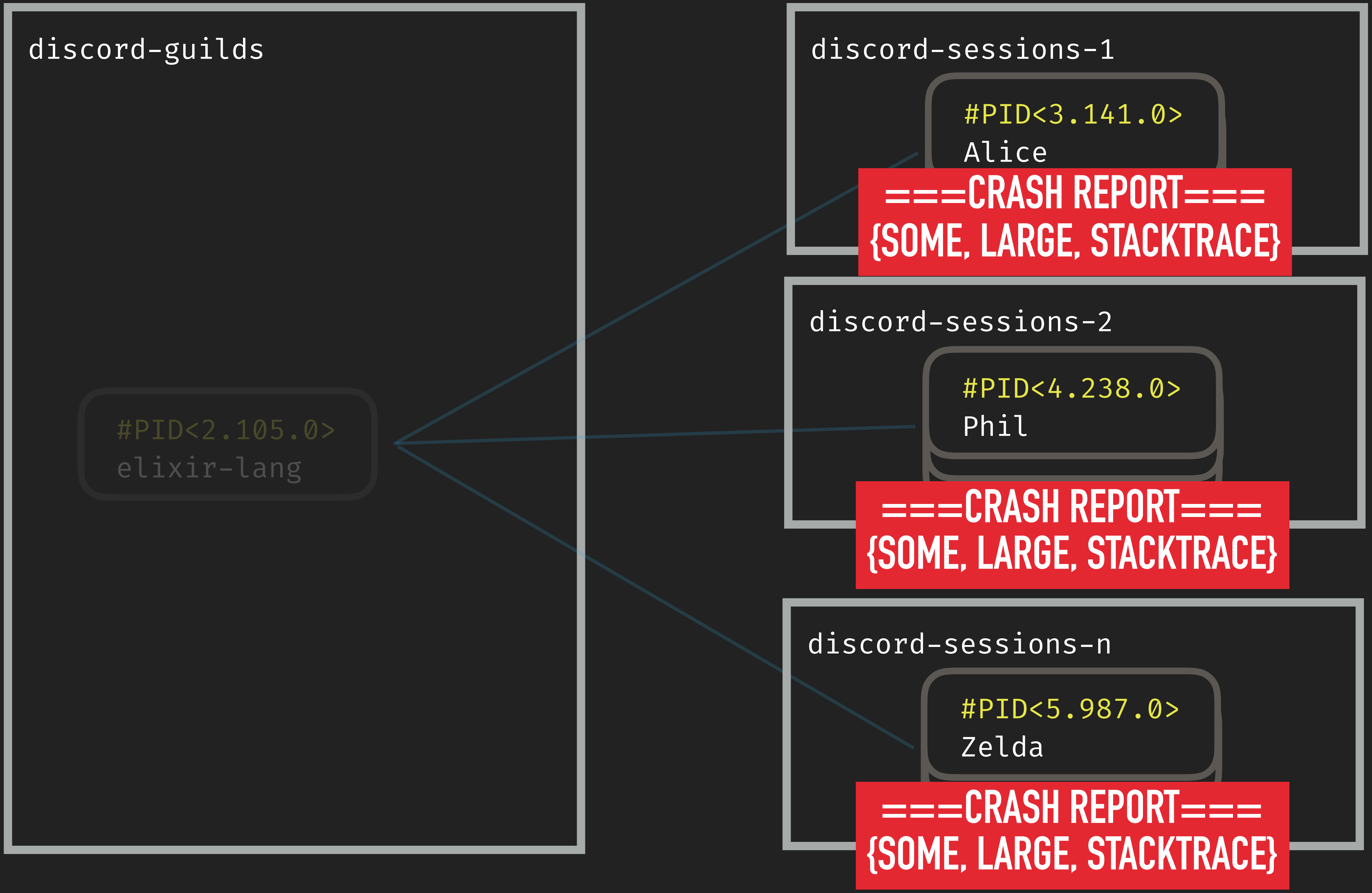
#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil

discord-sessions-n

#PID<5.987.0>
Zelda



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

discord-sessions-2

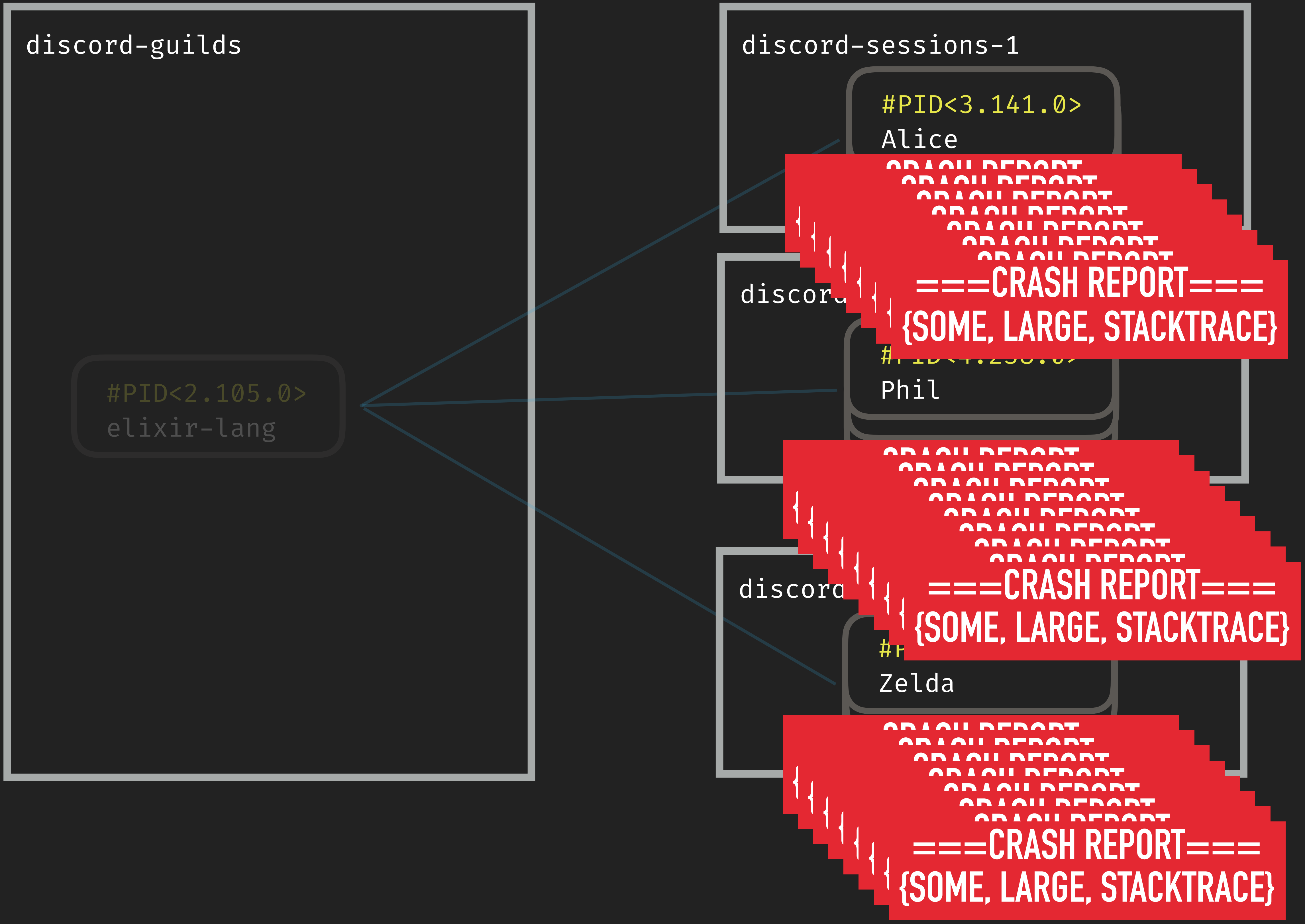
#PID<4.238.0>
Phil

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

discord-sessions-n

#PID<5.987.0>
Zelda

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

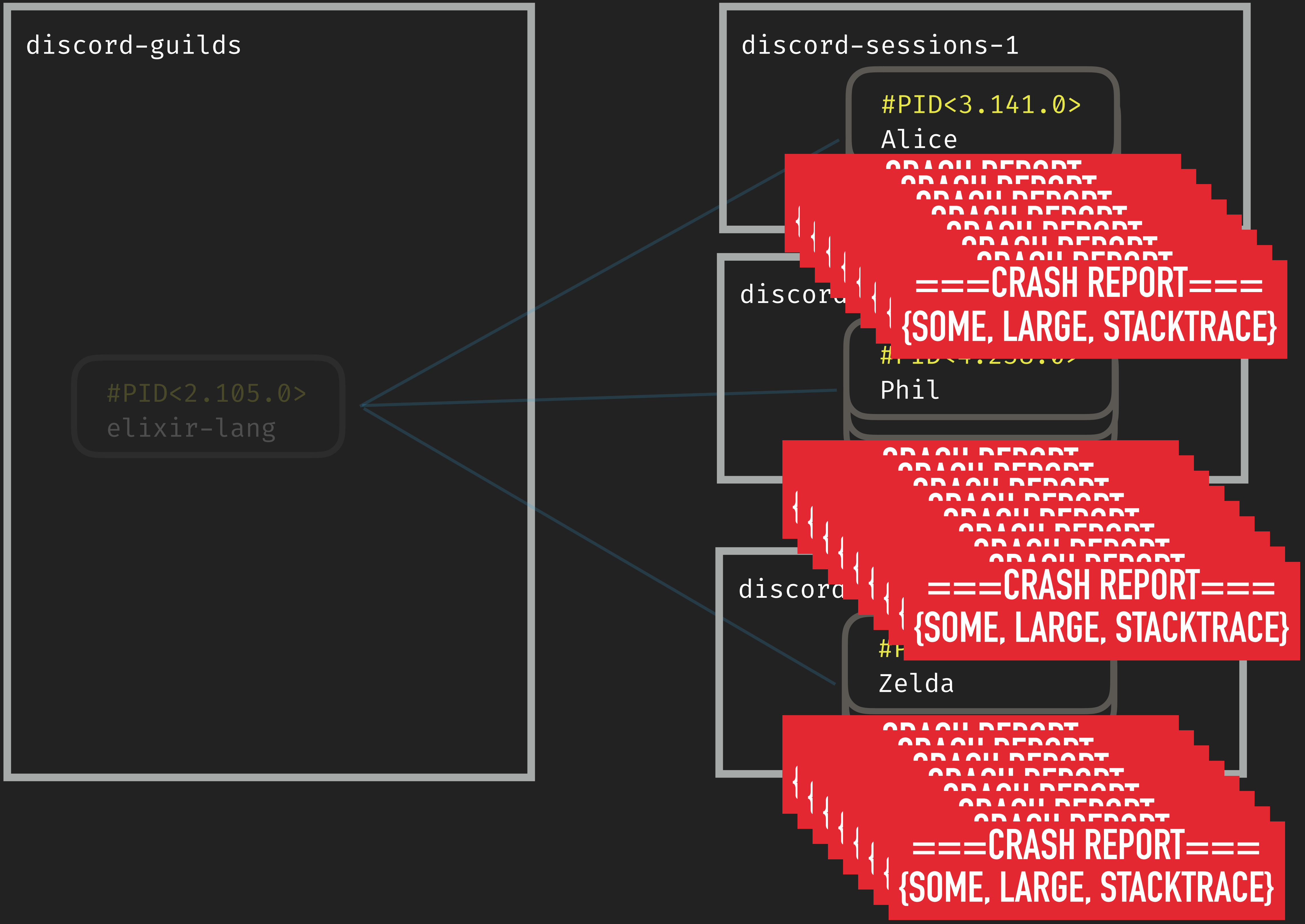
Phil

Zelda

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

discord

Phil

discord

Zelda

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

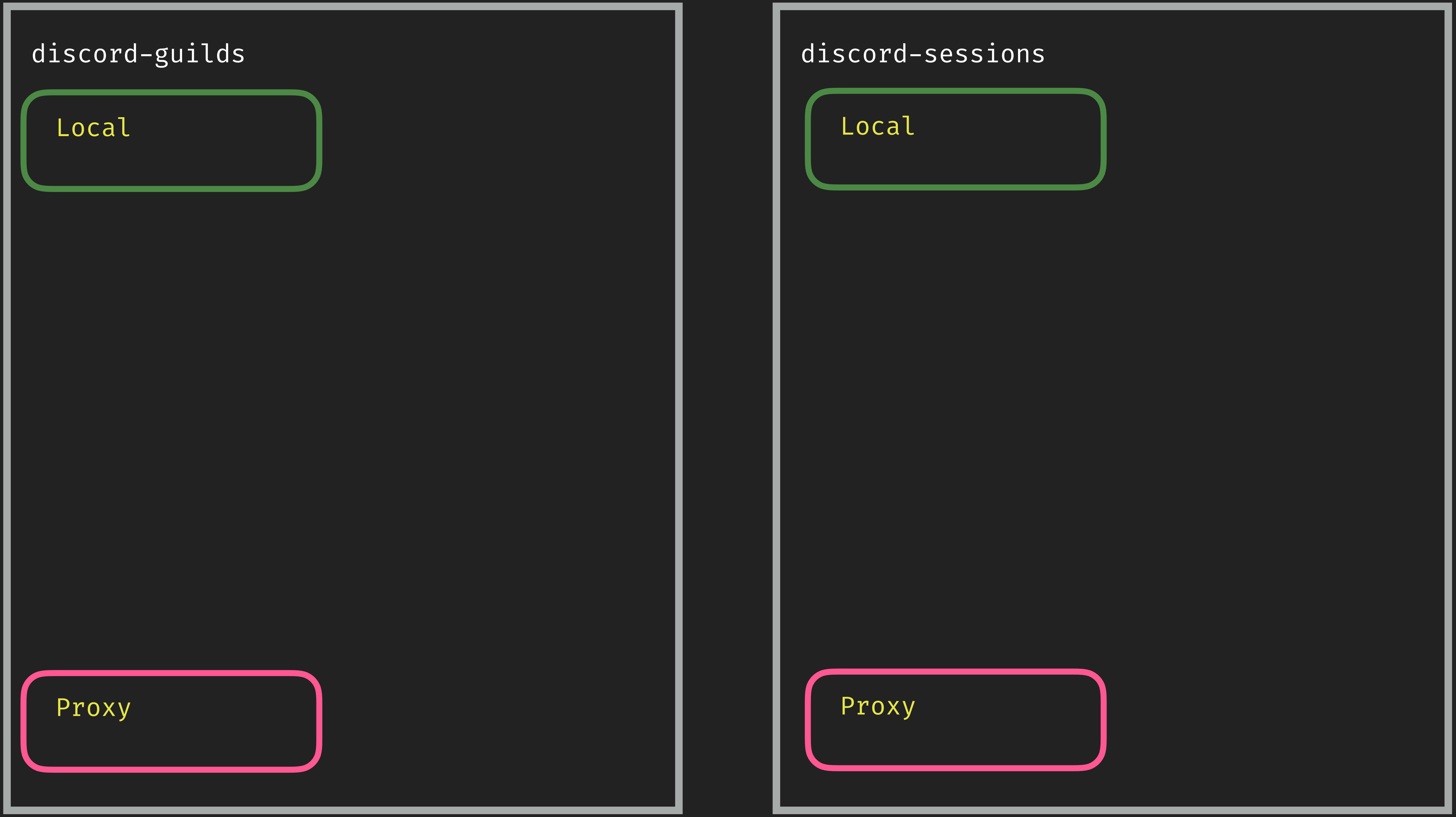
===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

DESIGN

LOCAL

LOCAL MONITORS ARE FAST AND EFFICIENT

Me



discord-guilds

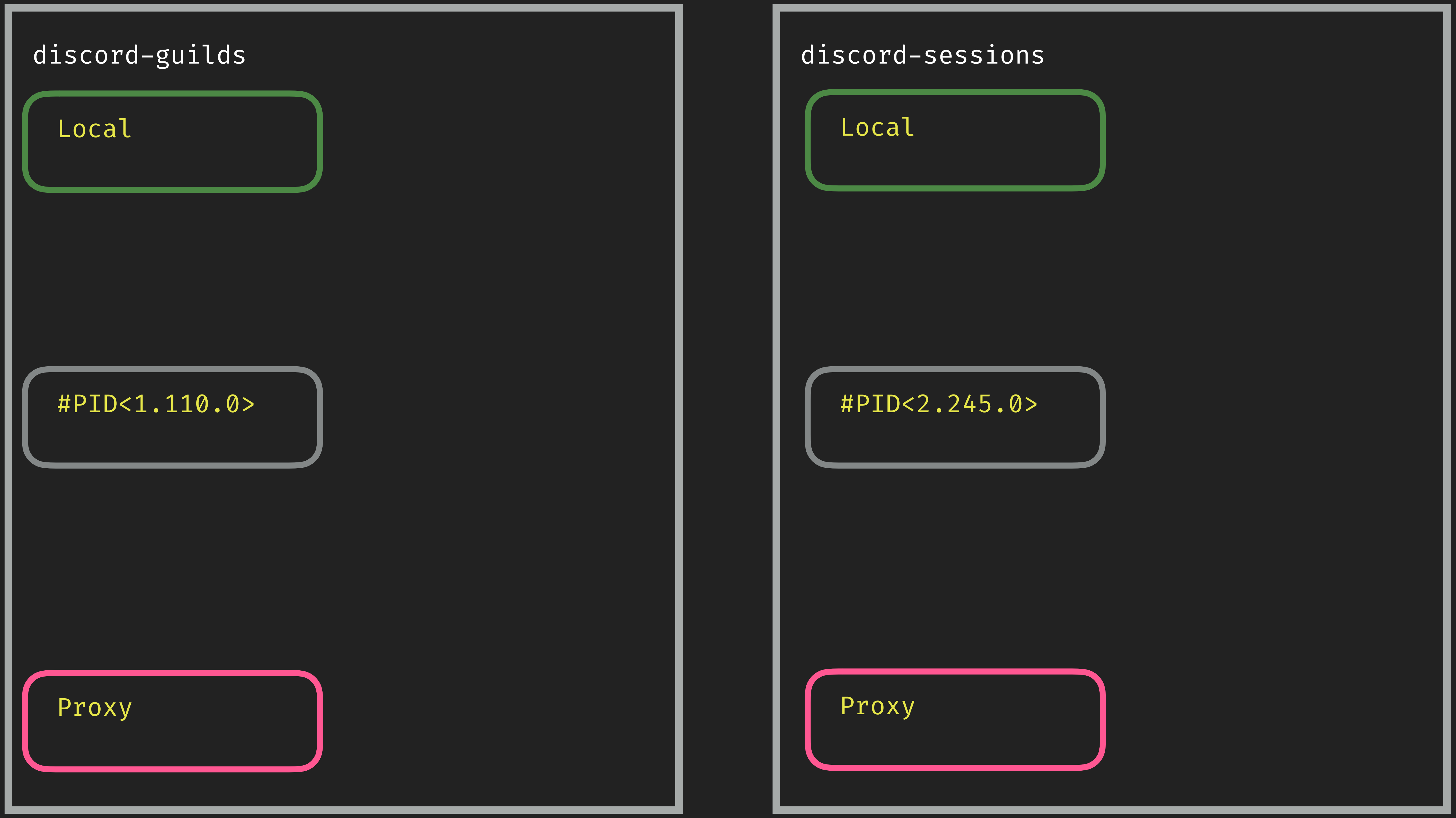
Local

Proxy

discord-sessions

Local

Proxy



discord-guilds

Local

#PID<1.110.0>

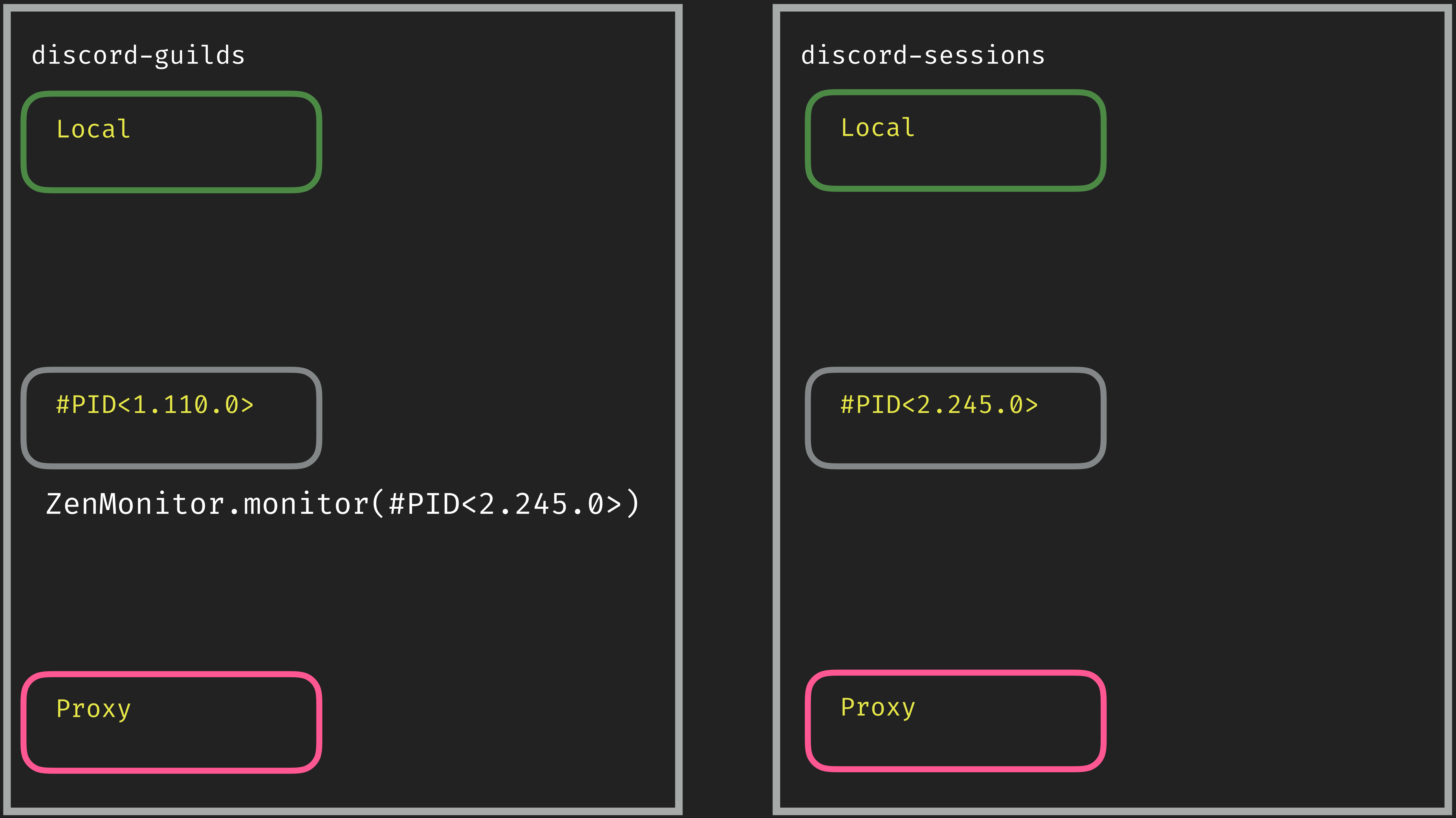
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

#PID<1.110.0>

```
ZenMonitor.monitor(#PID<2.245.0>)
```

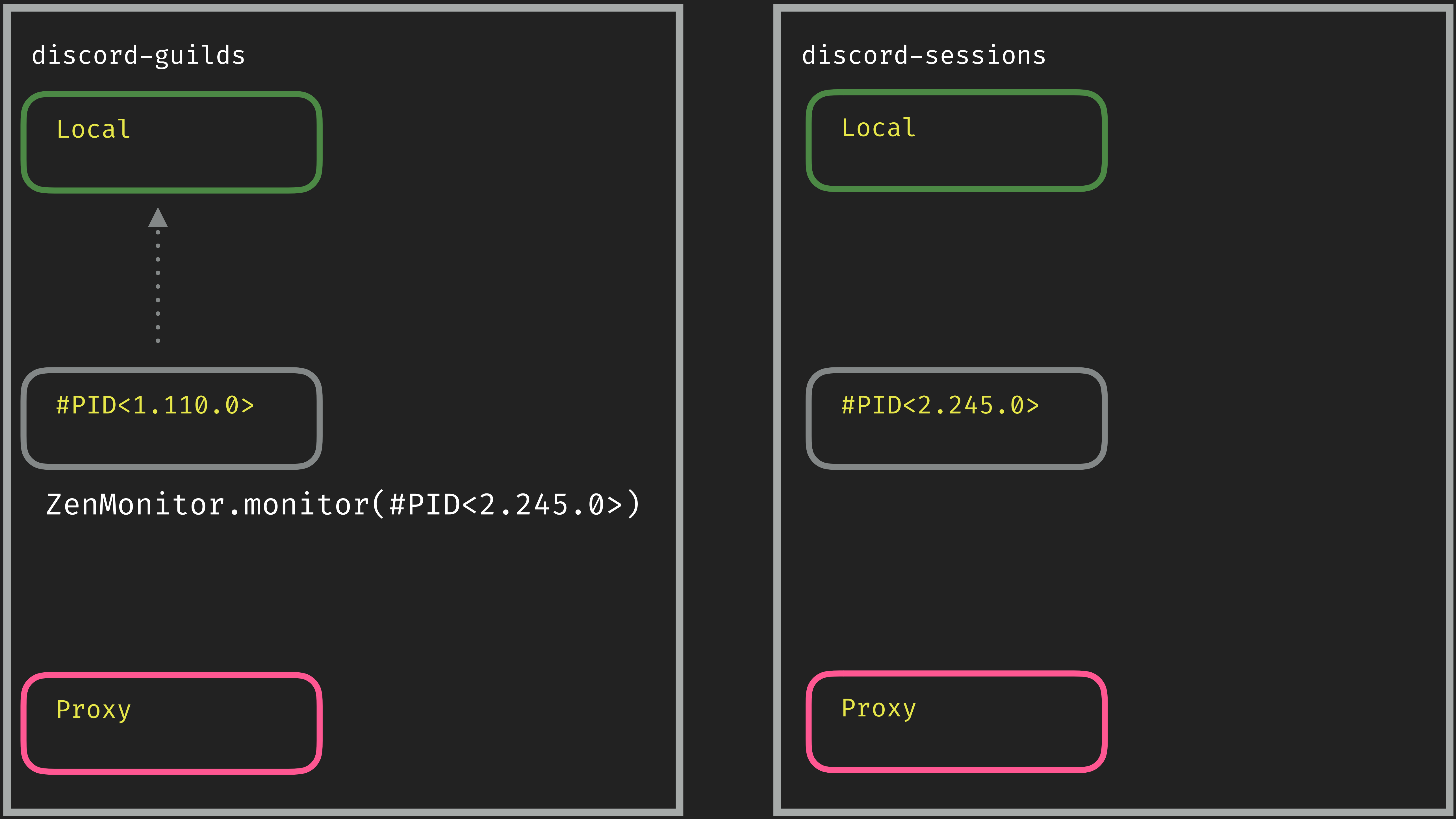
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

#PID<1.110.0>

```
ZenMonitor.monitor(#PID<2.245.0>)
```

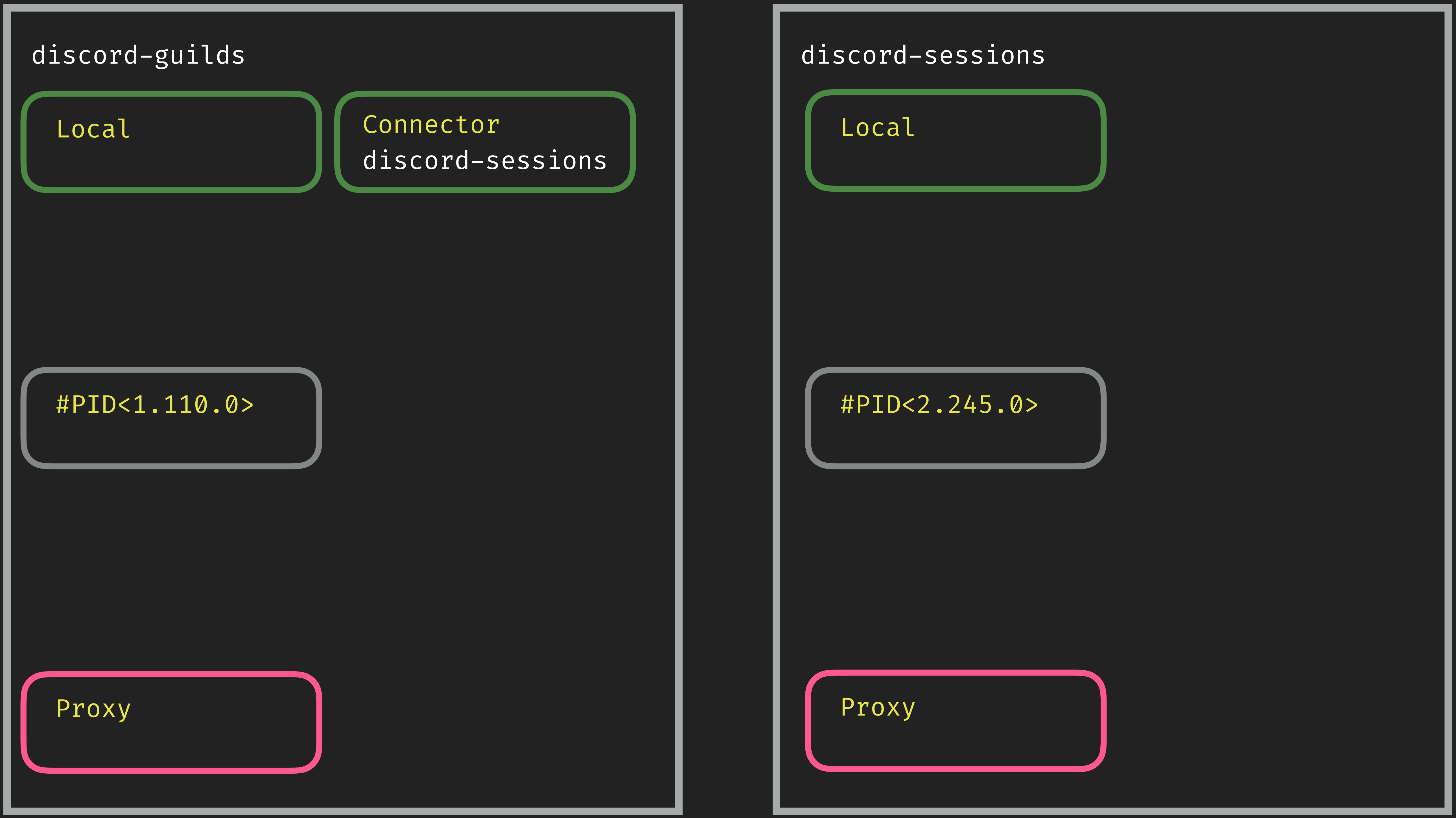
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

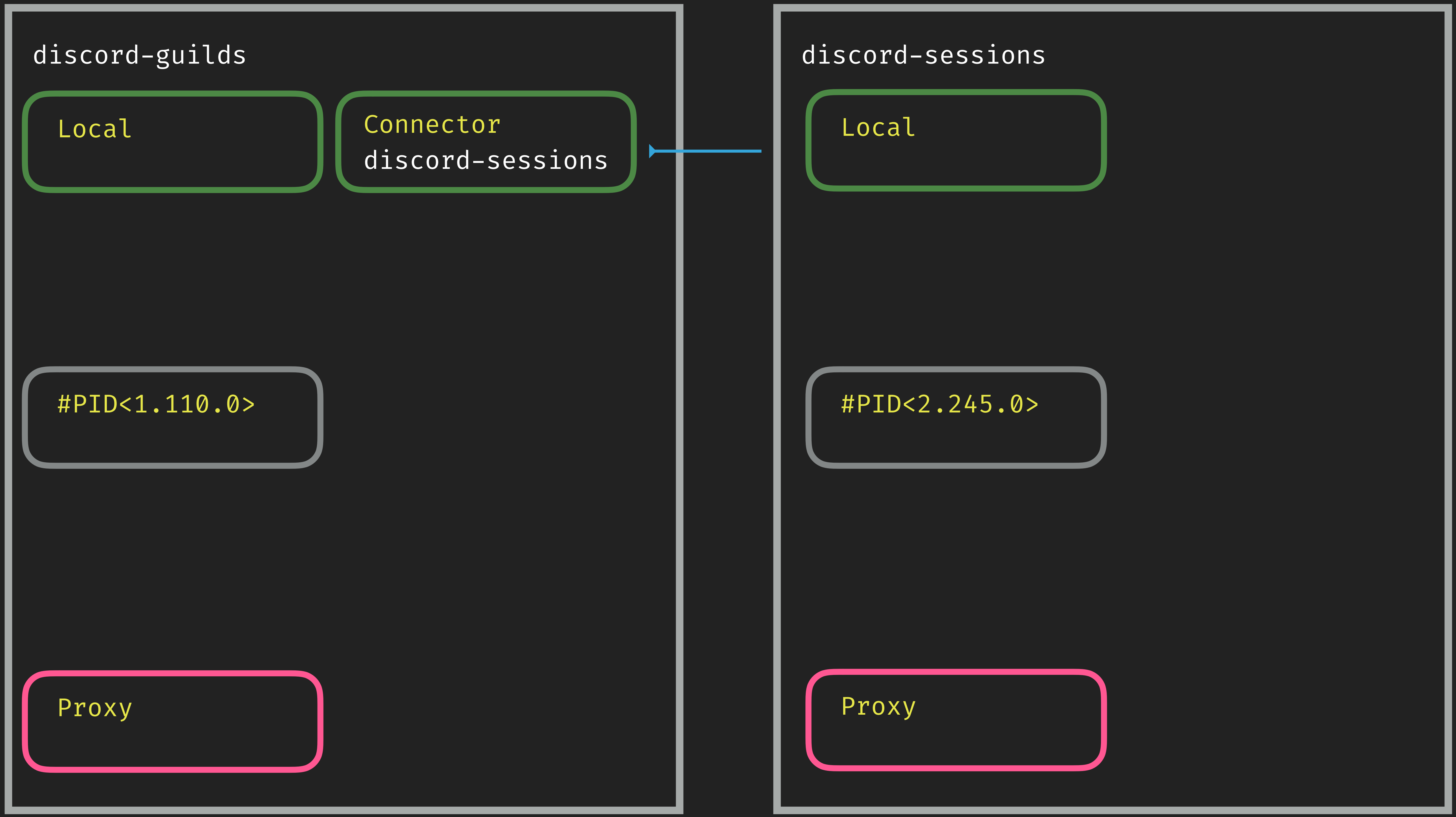
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

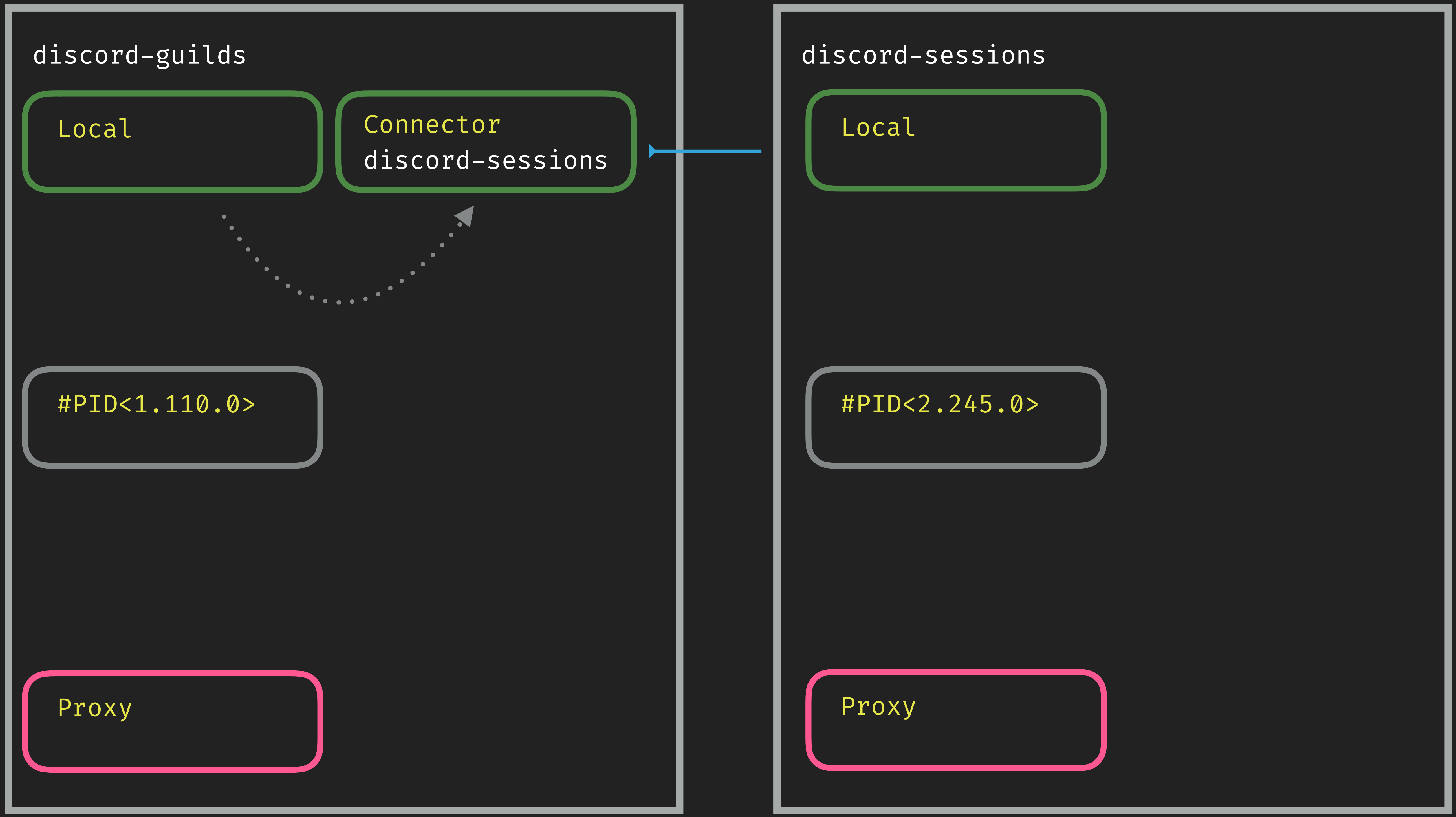
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

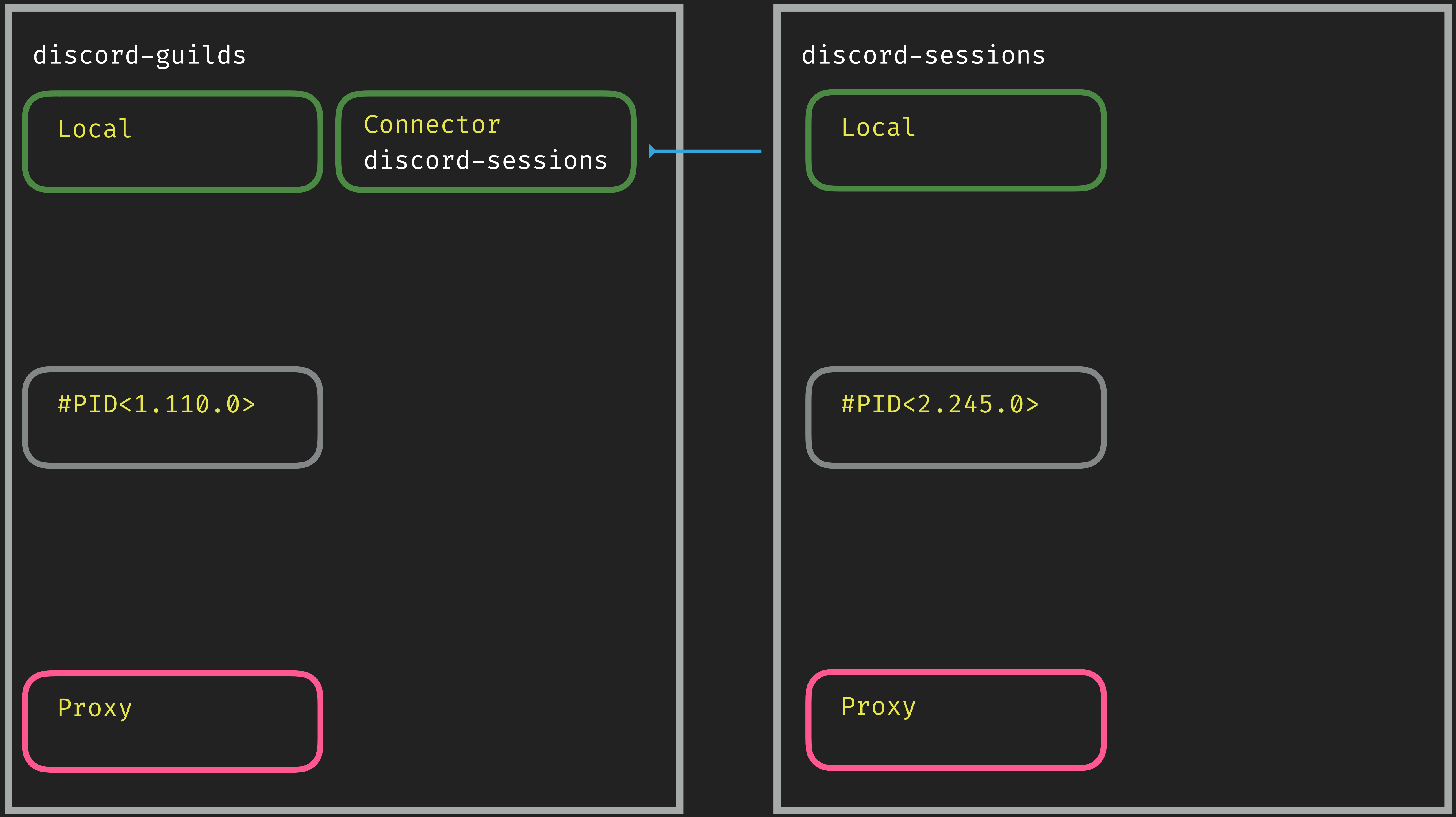
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

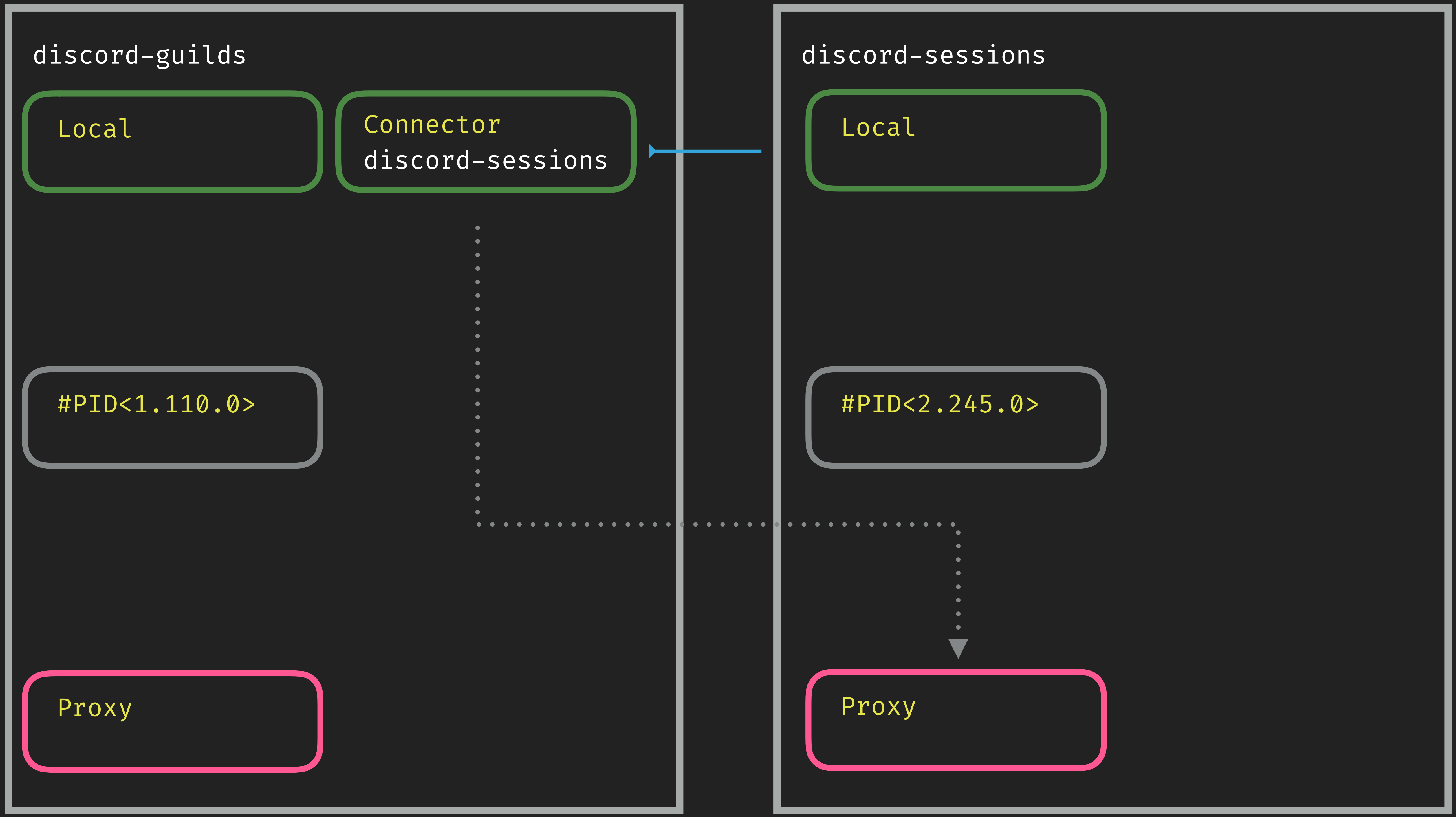
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

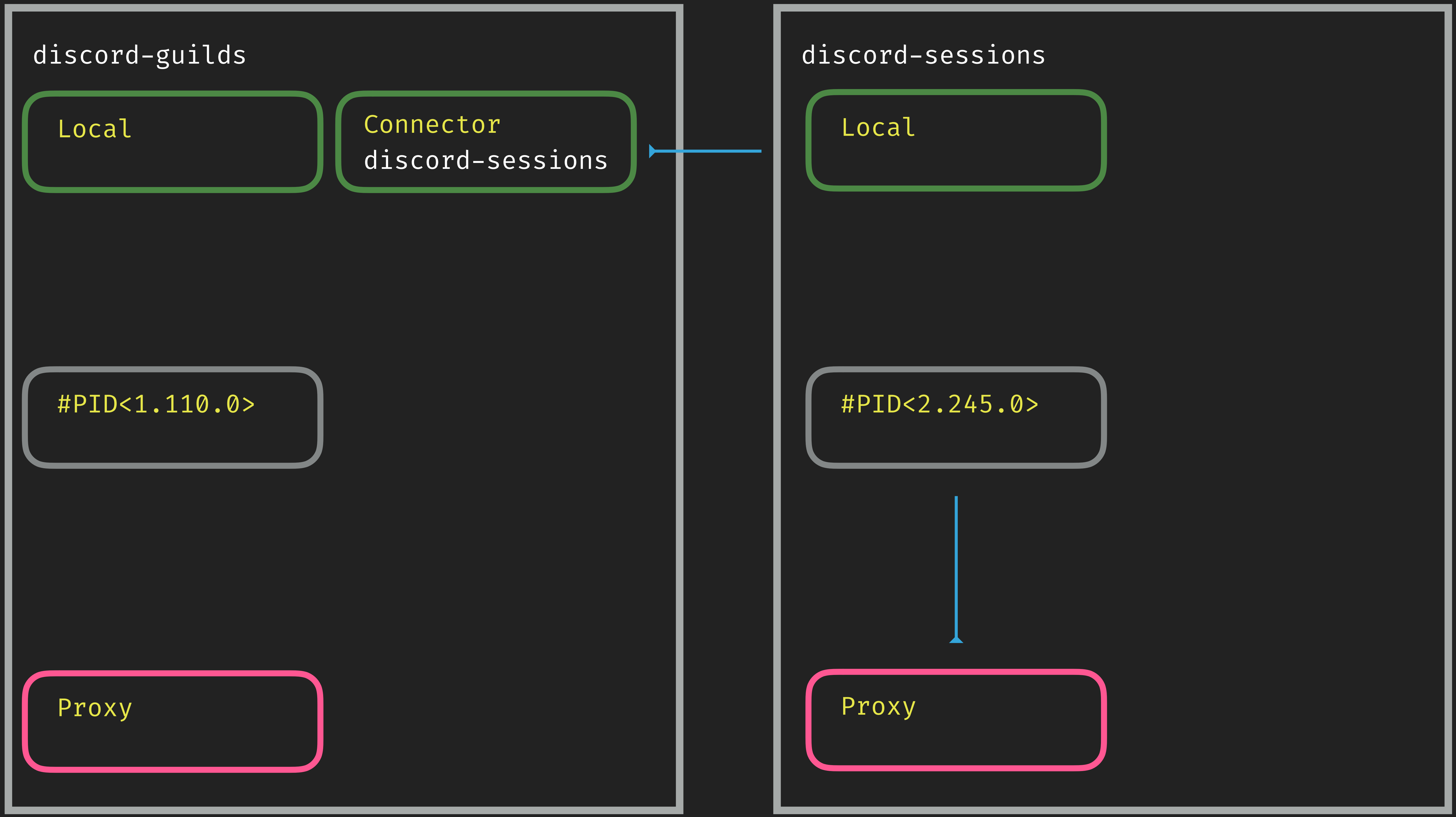
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

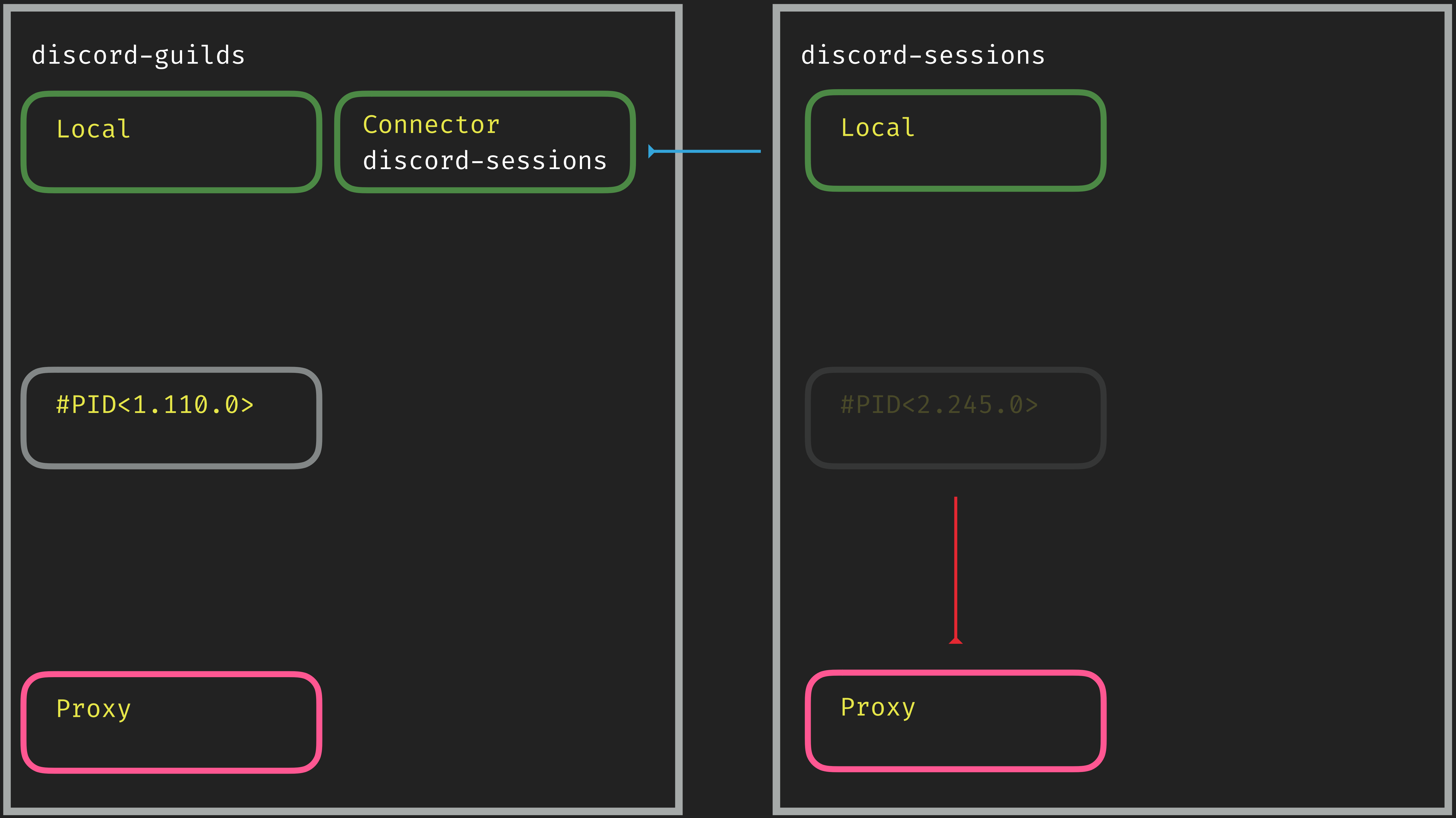
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

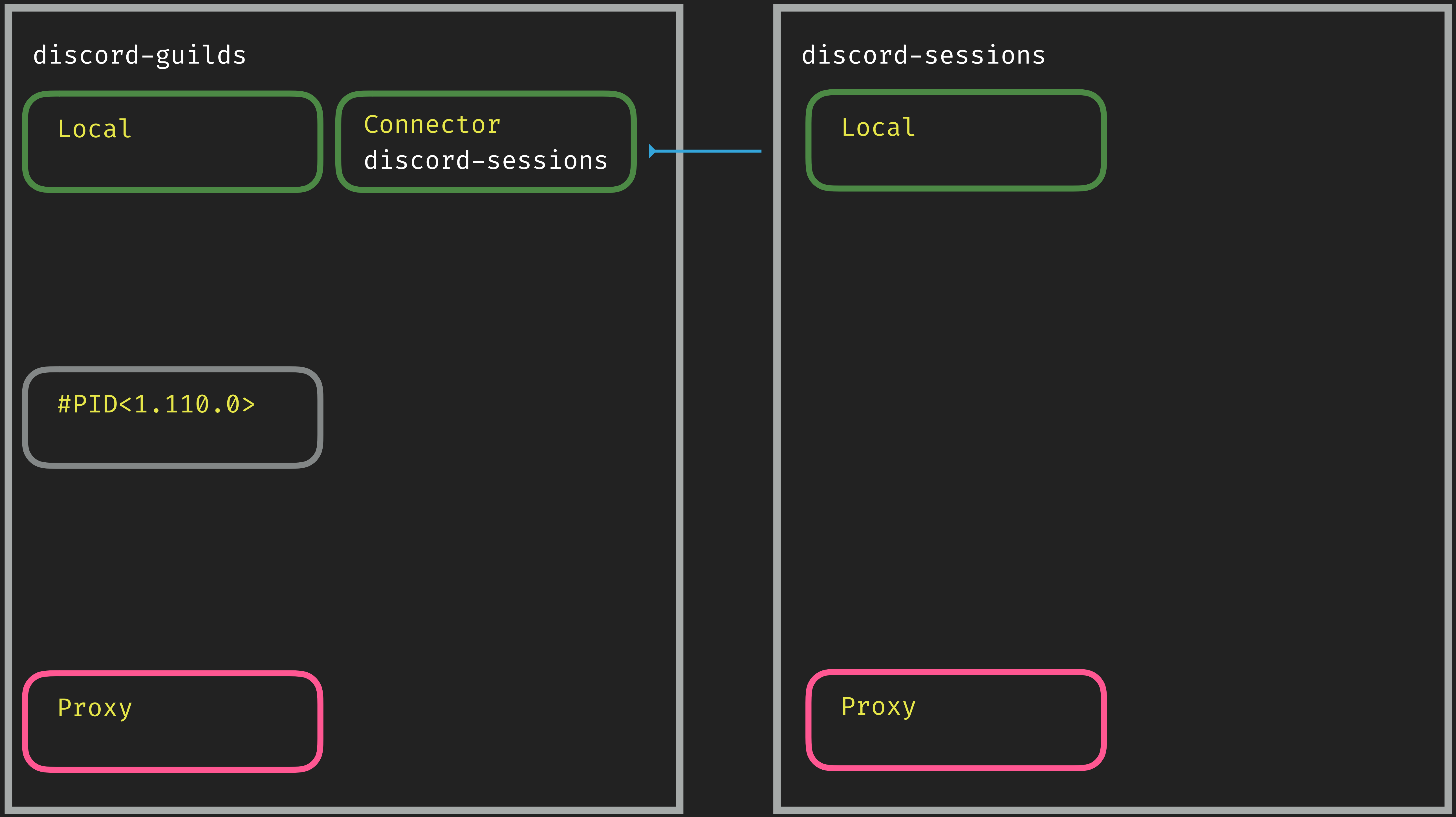
Proxy

discord-sessions

Local

#PID<2.245.0>

Proxy



discord-guilds

Local

Connector
discord-sessions

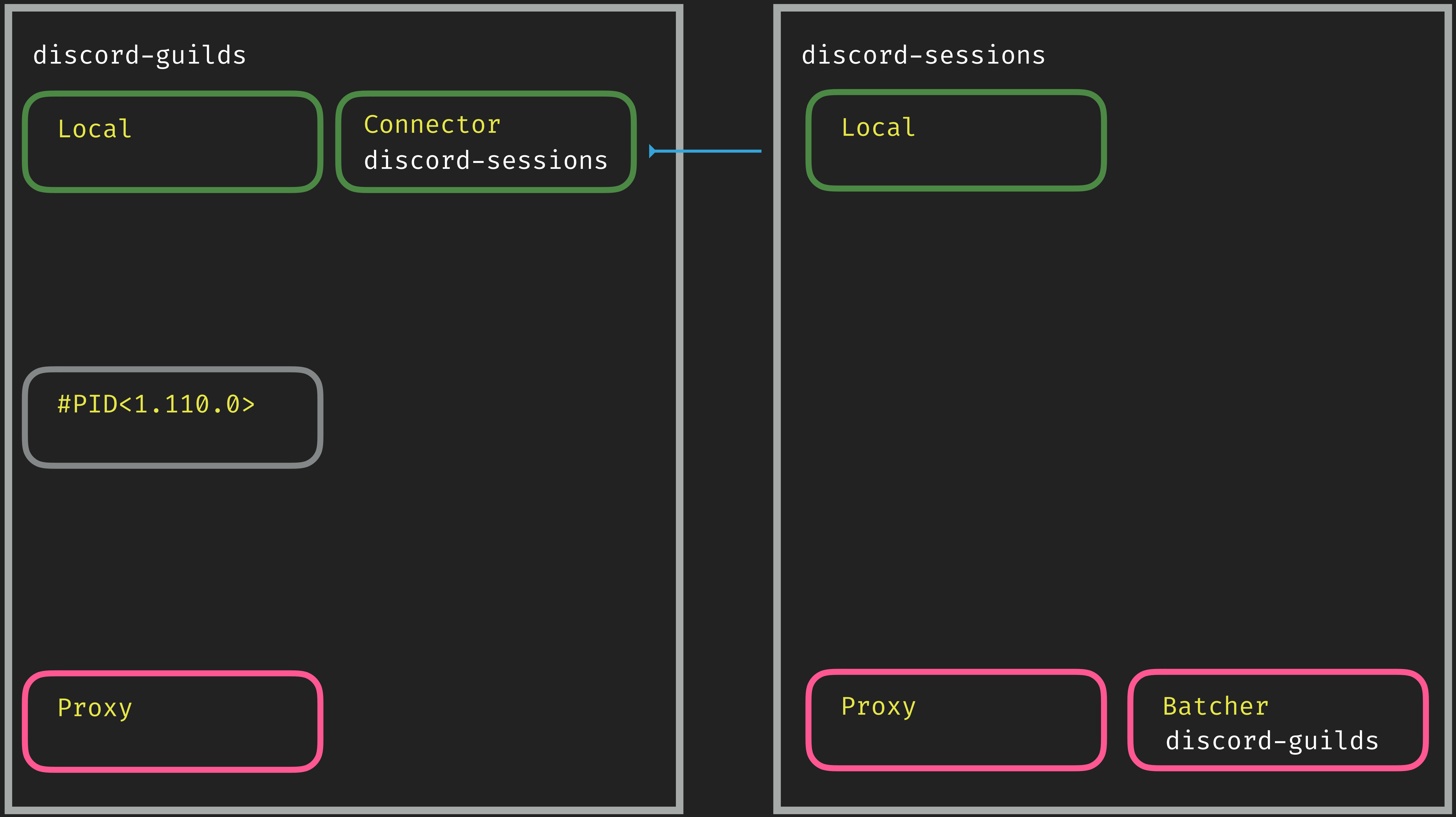
#PID<1.110.0>

Proxy

discord-sessions

Local

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

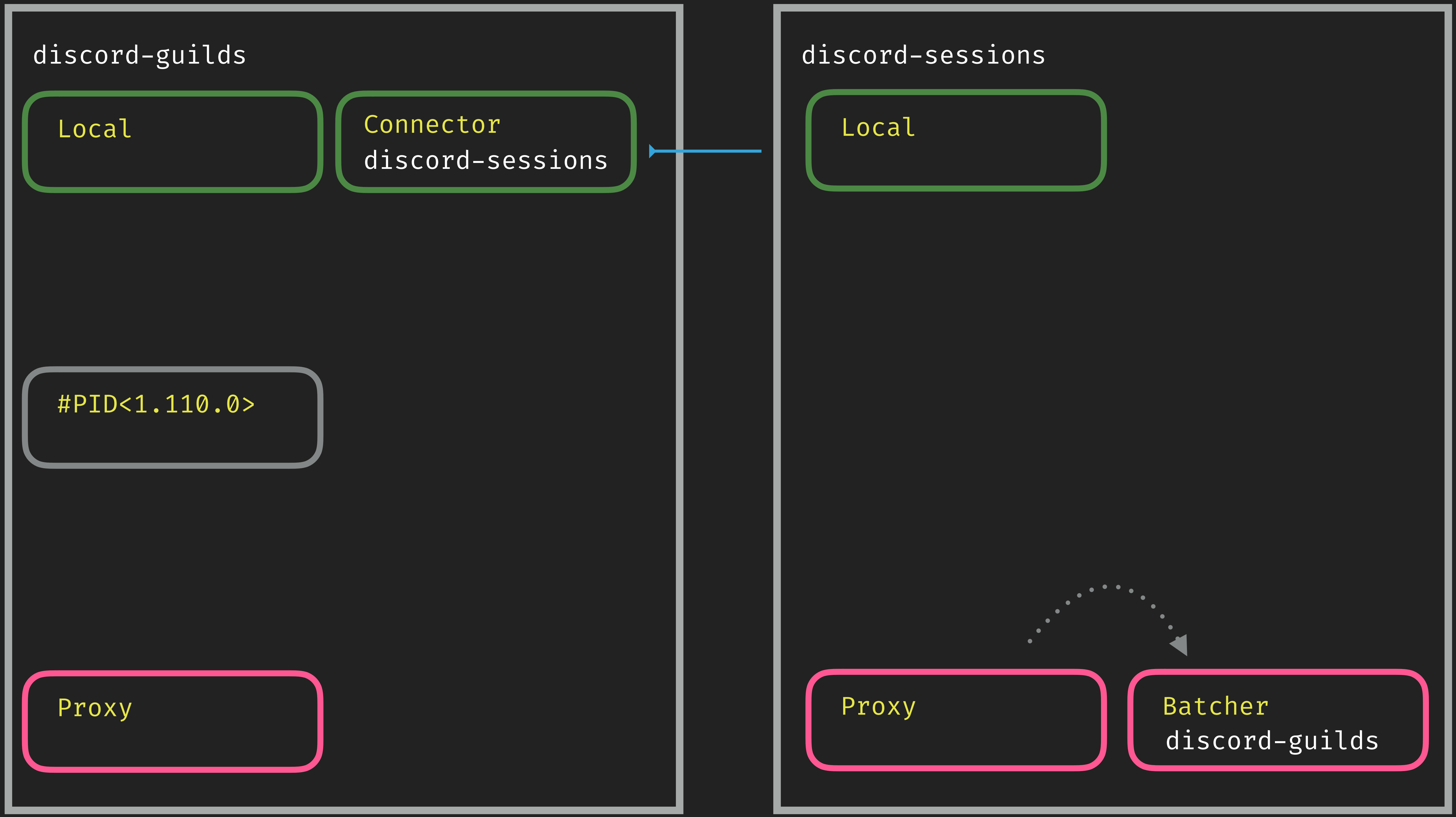
Proxy

discord-sessions

Local

Proxy

Batcher
discord-guilds



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

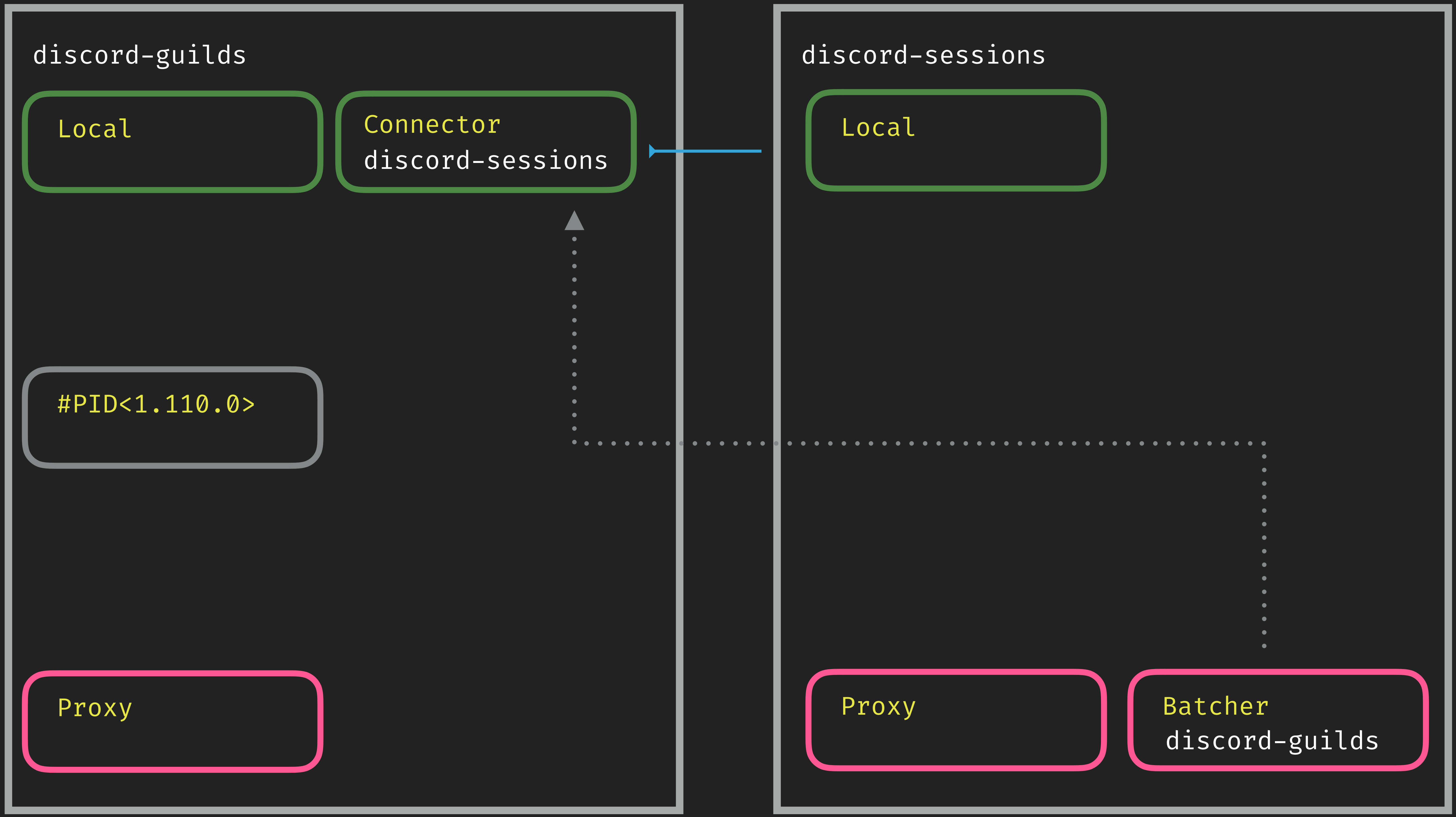
Proxy

discord-sessions

Local

Proxy

Batcher
discord-guilds



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

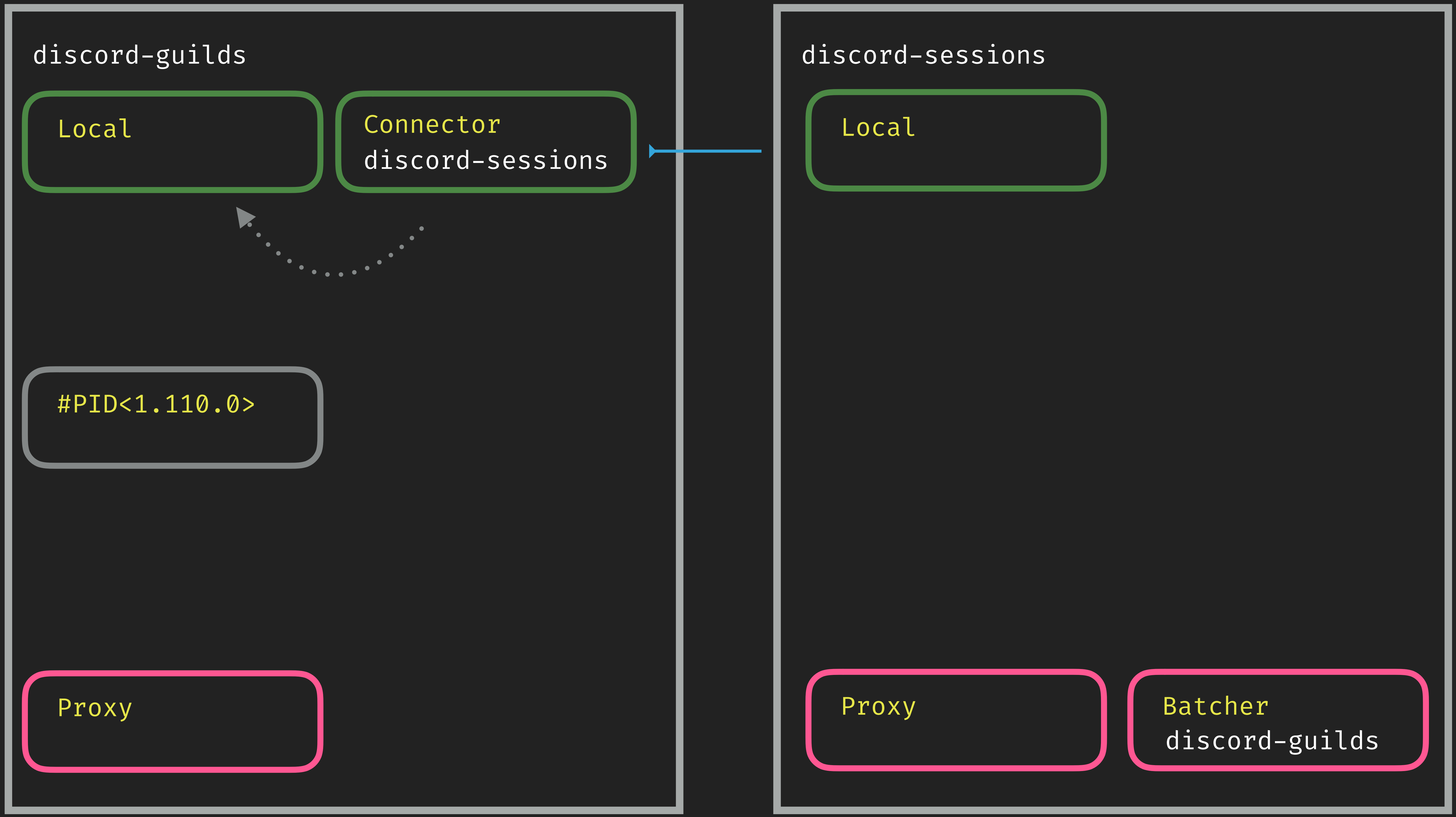
Proxy

discord-sessions

Local

Proxy

Batcher
discord-guilds



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

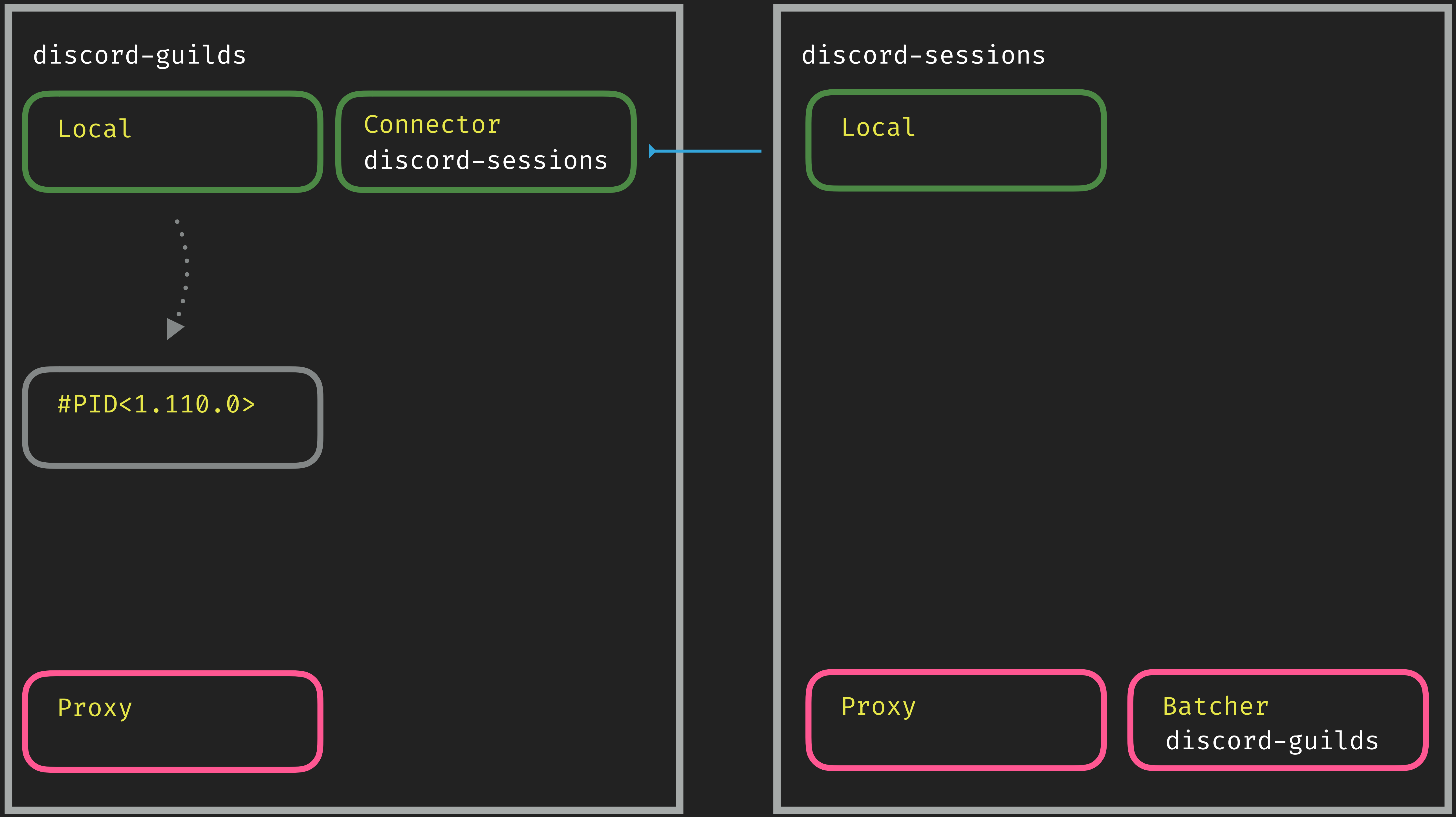
Proxy

discord-sessions

Local

Proxy

Batcher
discord-guilds



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>

Proxy

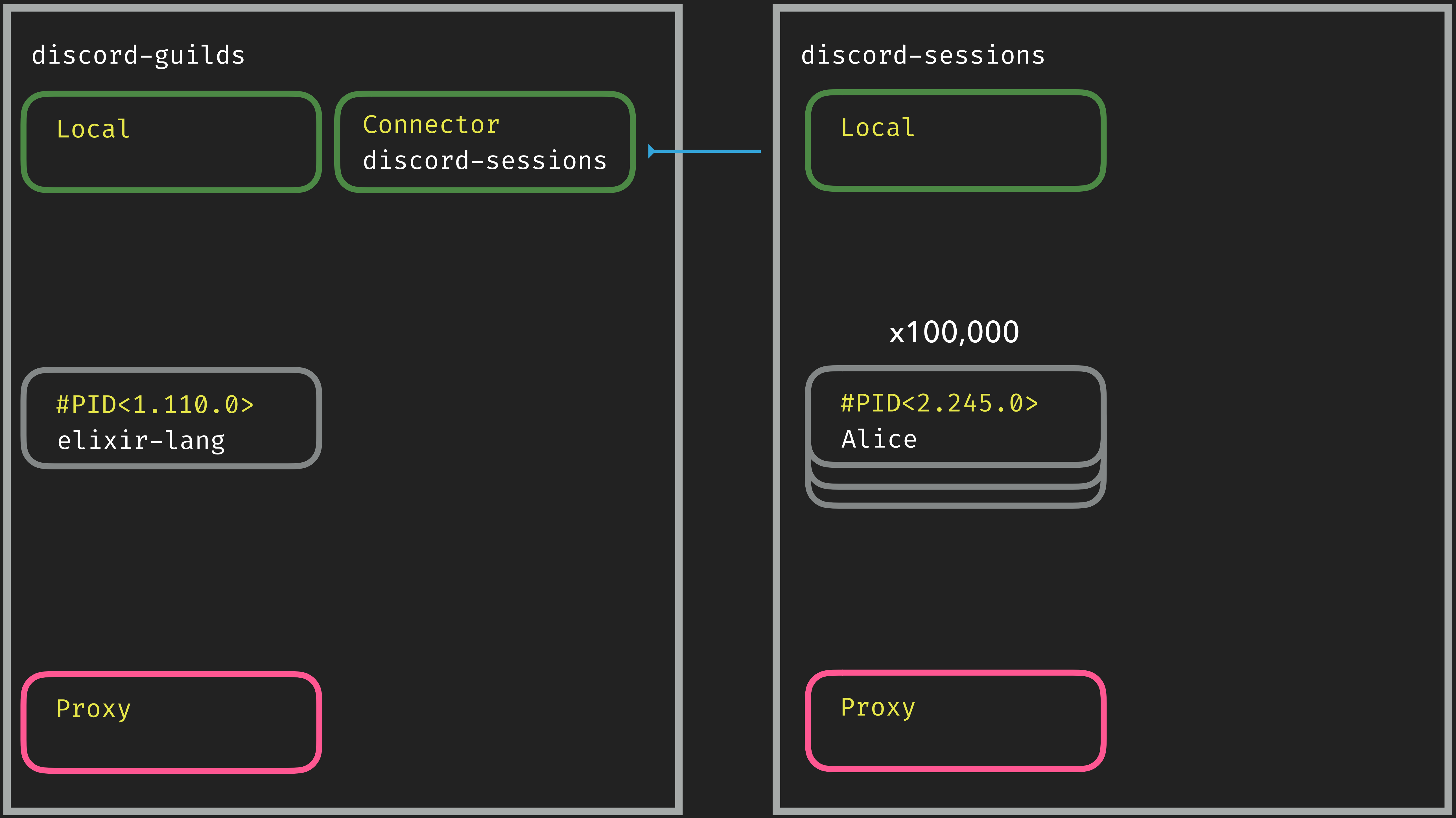
discord-sessions

Local

Proxy

Batcher
discord-guilds

THROTTLED



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>
elixir-lang

Proxy

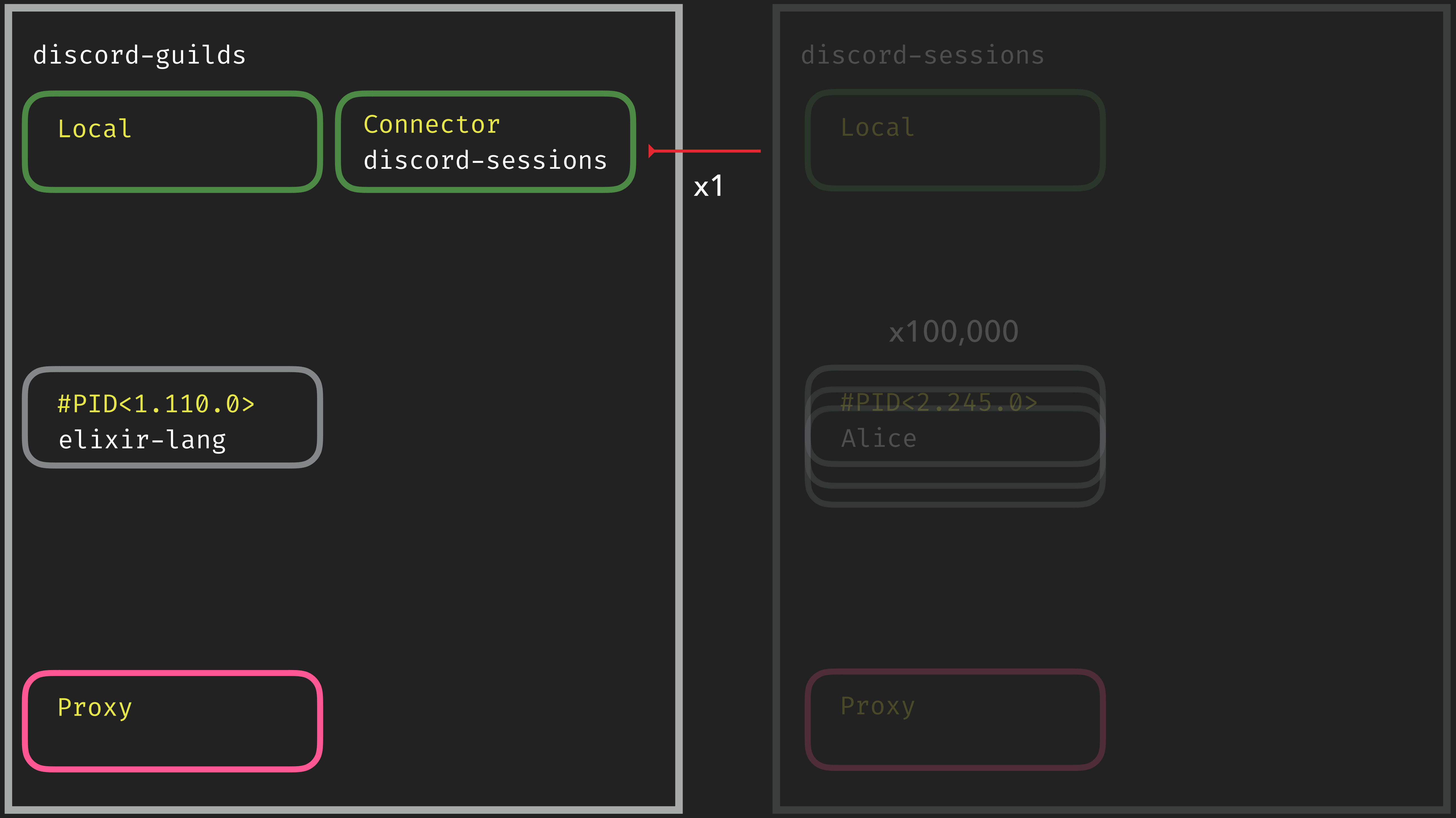
discord-sessions

Local

x100,000

#PID<2.245.0>
Alice

Proxy



discord-guilds

Local

Connector
discord-sessions

#PID<1.110.0>
elixir-lang

Proxy

x1

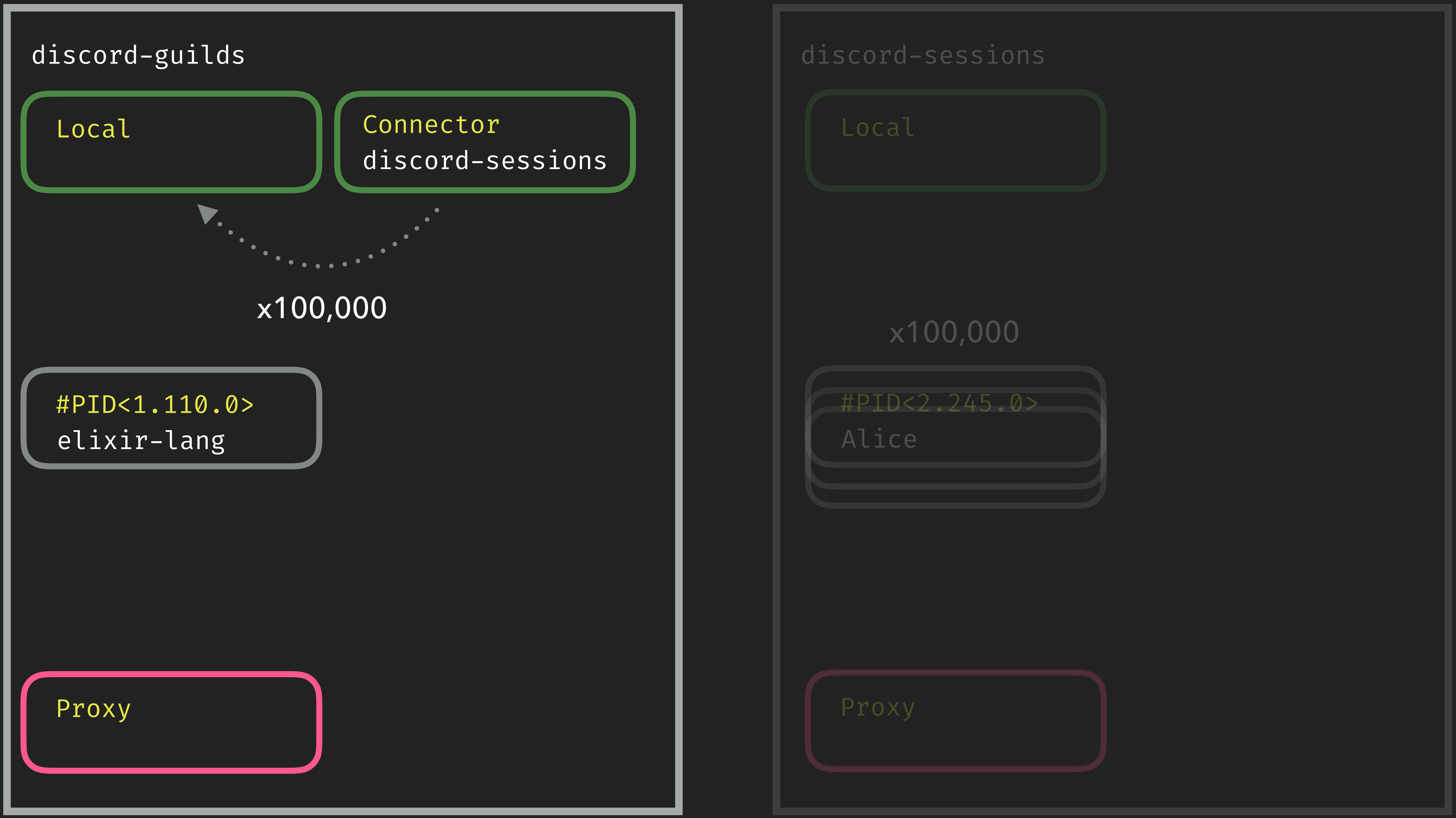
discord-sessions

Local

x100,000

#PID<2.245.0>
Alice

Proxy



discord-guilds

Local

Connector
discord-sessions

x100,000

#PID<1.110.0>
elixir-lang

Proxy

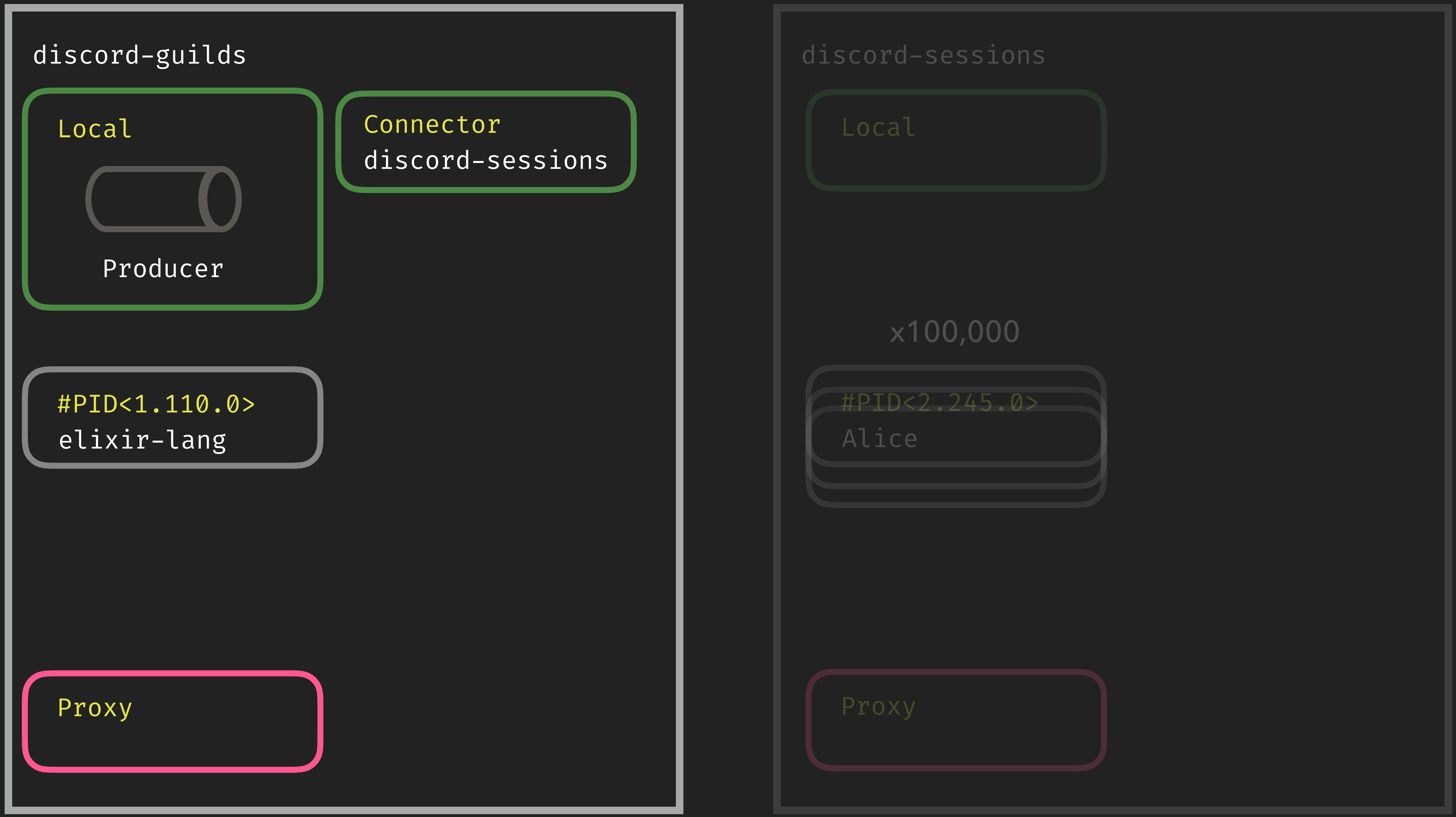
discord-sessions

Local

x100,000

#PID<2.245.0>
Alice

Proxy



discord-guilds

Local

Producer

Connector
discord-sessions

#PID<1.110.0>
elixir-lang

Proxy

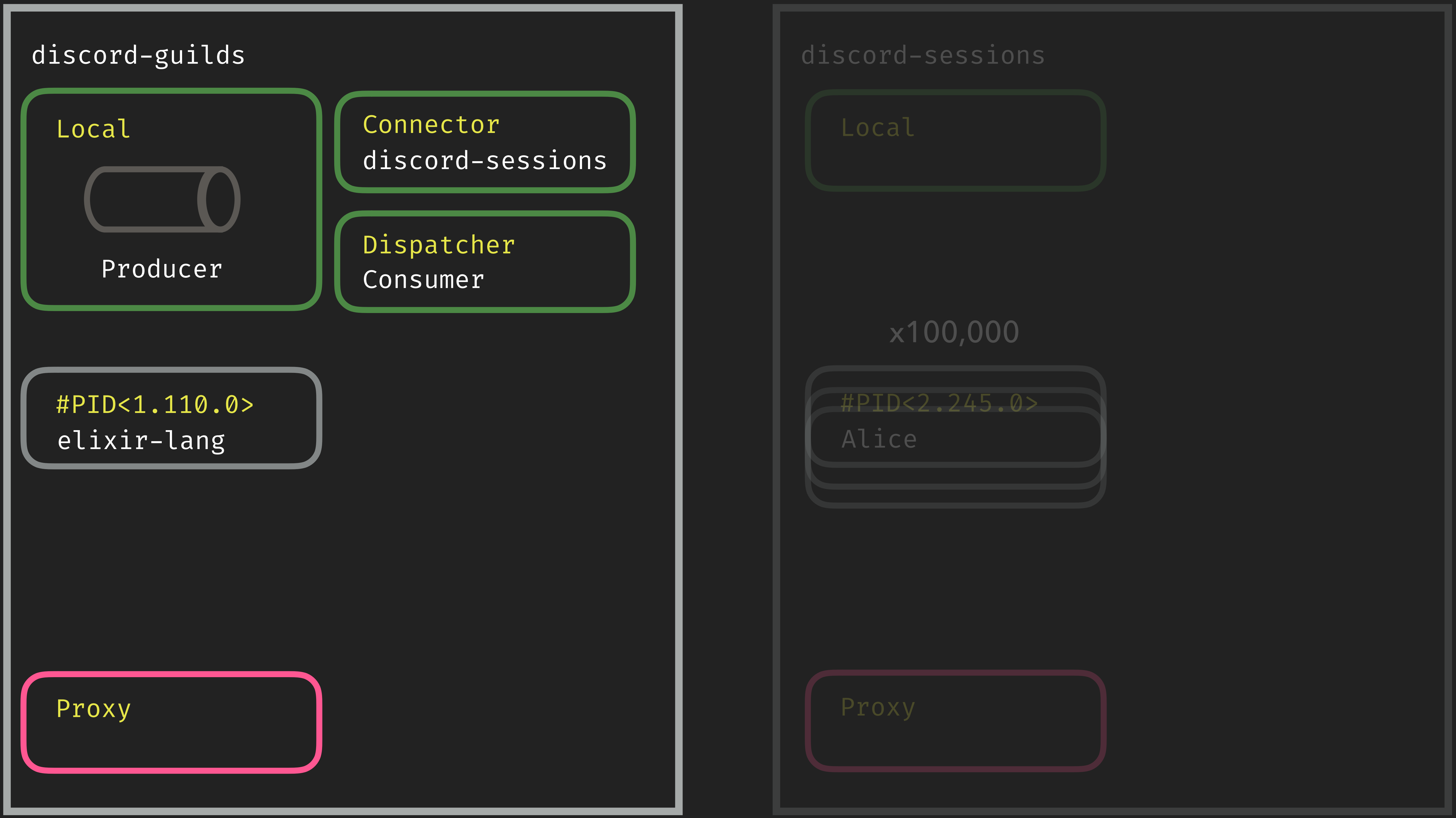
discord-sessions

Local

x100,000

#PID<2.245.0>
Alice

Proxy



discord-guilds

Local

Producer

Connector
discord-sessions

Dispatcher
Consumer

#PID<1.110.0>
elixir-lang

Proxy

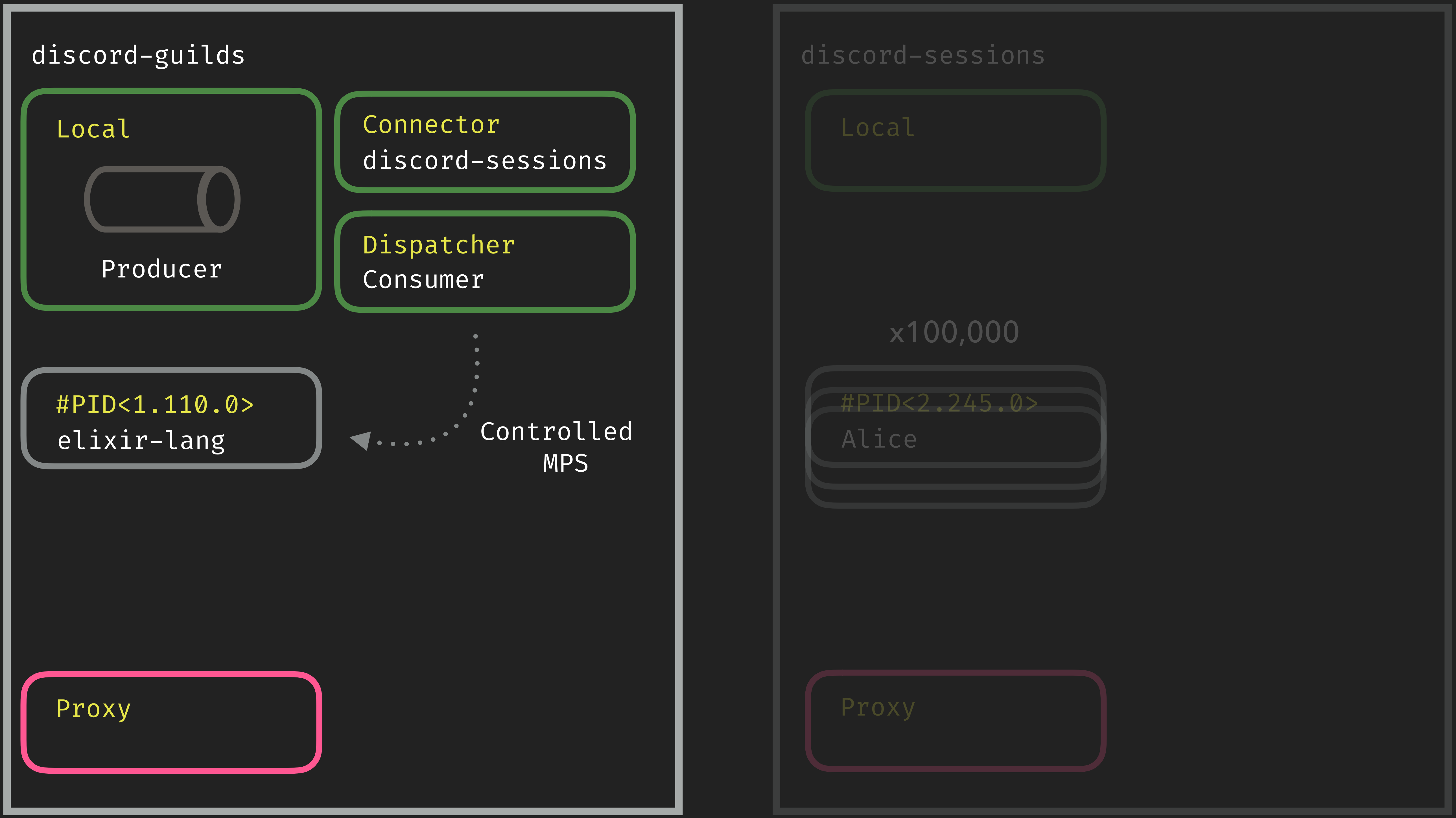
discord-sessions

Local

x100,000

#PID<2.245.0>
Alice

Proxy



discord-guilds

Local

Producer

Connector
discord-sessions

Dispatcher
Consumer

#PID<1.110.0>
elixir-lang

Controlled
MPS

Proxy

discord-sessions

Local

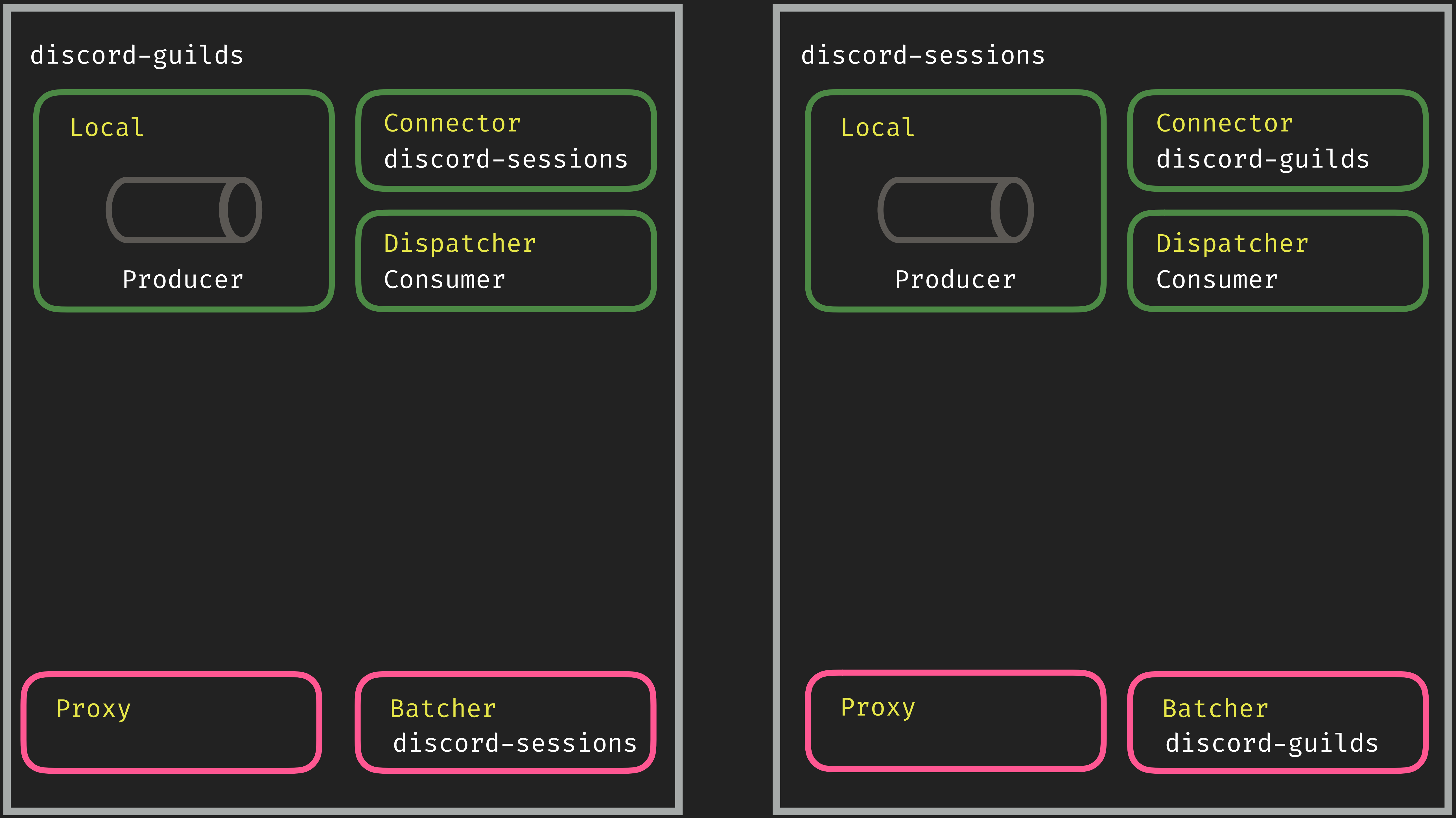
x100,000

#PID<2.245.0>
Alice

Proxy

BATCHED

DISCORD



discord-guilds

Local

Producer

Connector
discord-sessions

Dispatcher
Consumer

Proxy

Batcher
discord-sessions

discord-sessions

Local

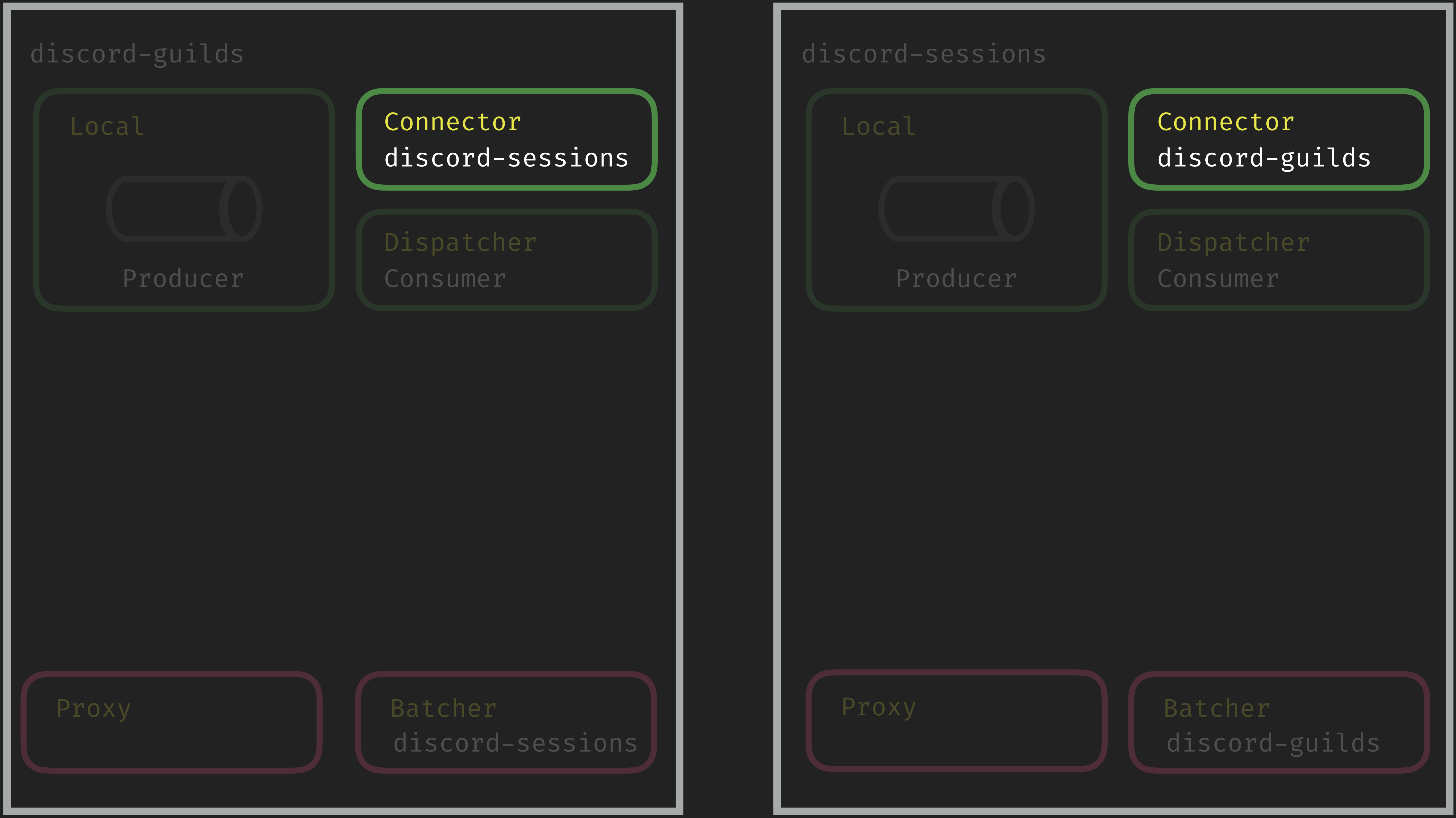
Producer

Connector
discord-guilds

Dispatcher
Consumer

Proxy

Batcher
discord-guilds



discord-guilds

Local

Producer

Connector
discord-sessions

Dispatcher
Consumer

Proxy

Batcher
discord-sessions

discord-sessions

Local

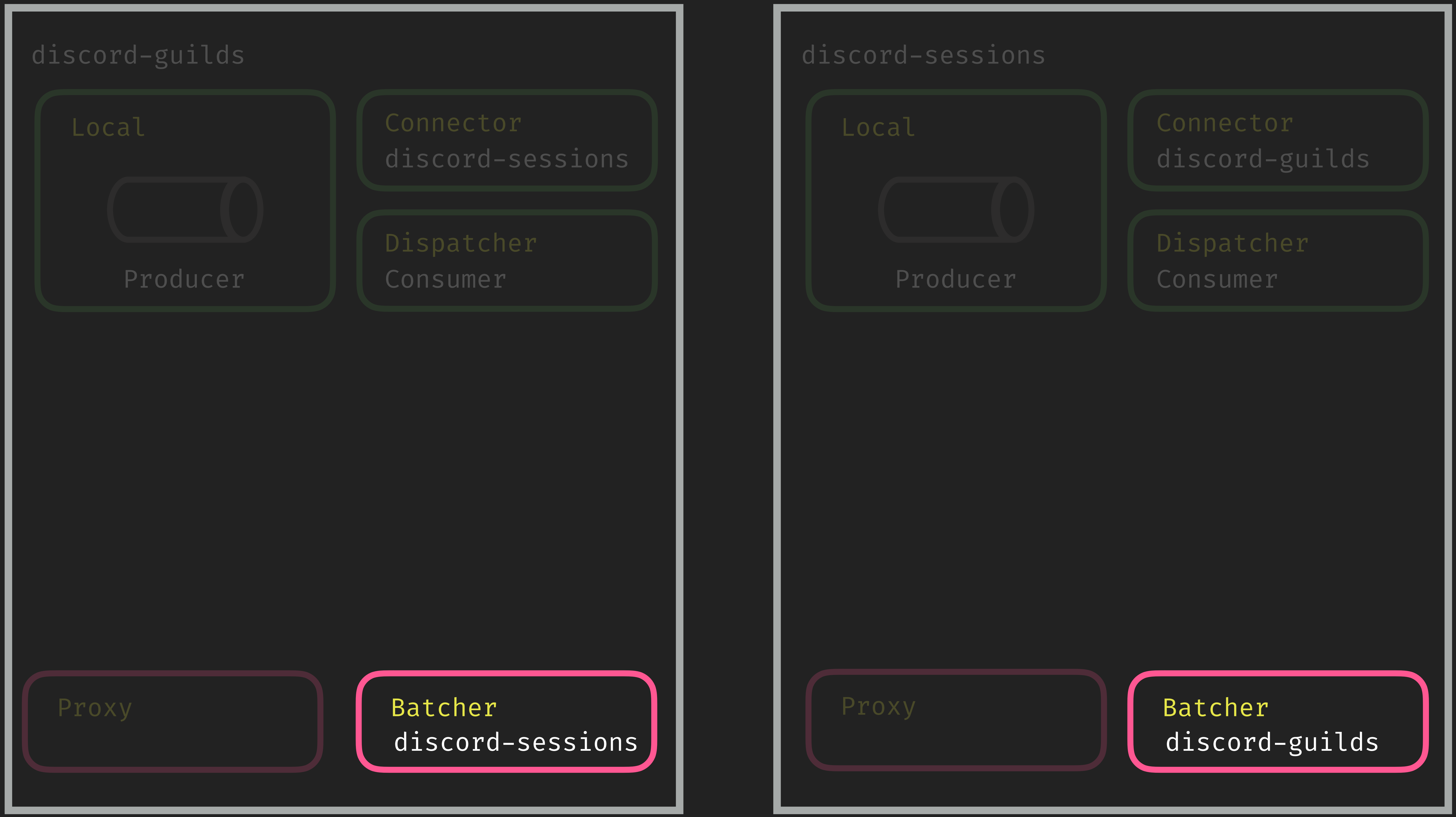
Producer

Connector
discord-guilds

Dispatcher
Consumer

Proxy

Batcher
discord-guilds



discord-guilds

Local

Producer

Connector
discord-sessions

Dispatcher
Consumer

Proxy

Batcher
discord-sessions

discord-sessions

Local

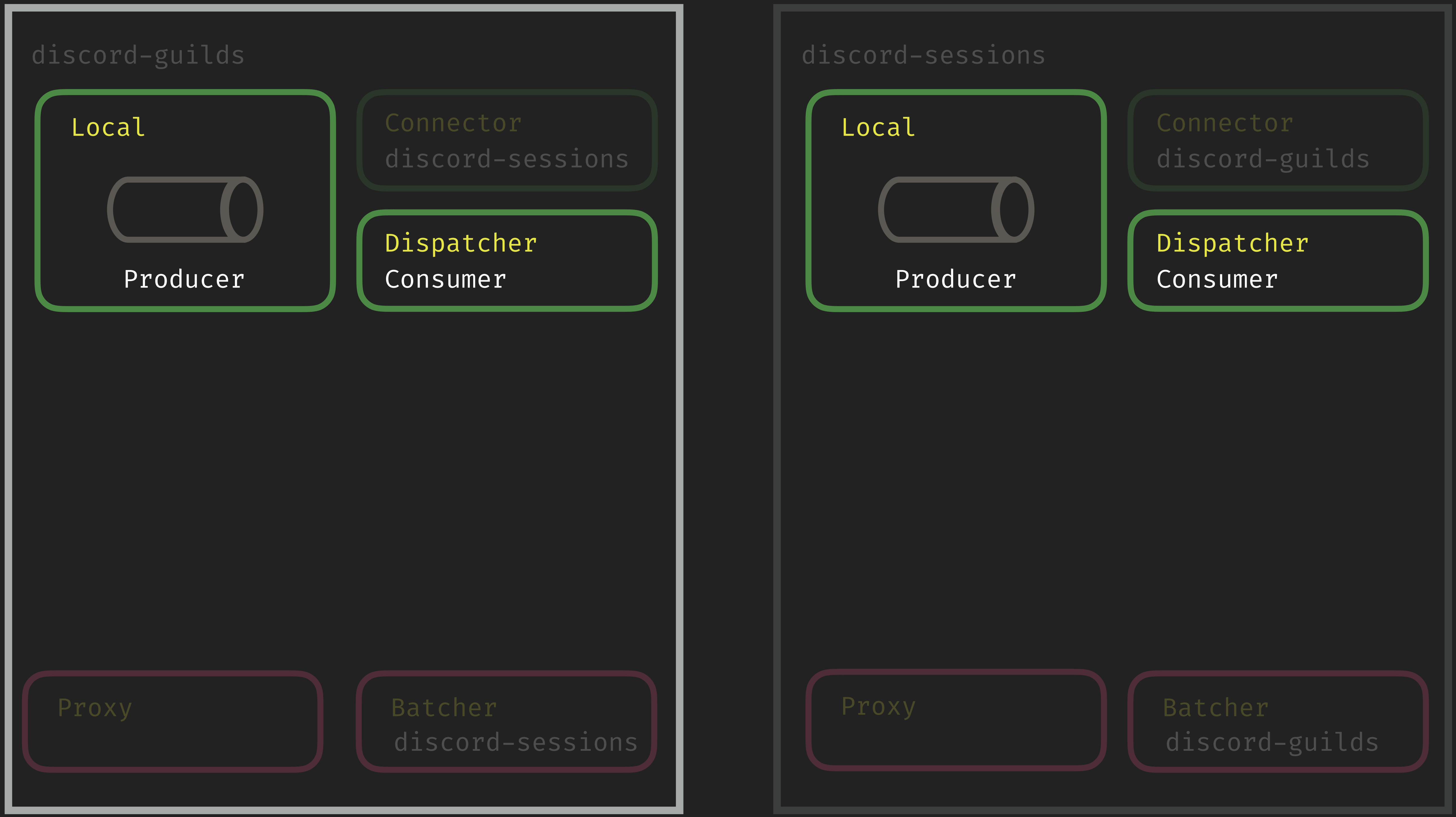
Producer

Connector
discord-guilds

Dispatcher
Consumer

Proxy

Batcher
discord-guilds



discord-guilds

Local

Producer

Connector
discord-sessions

Dispatcher
Consumer

Proxy

Batcher
discord-sessions

discord-sessions

Local

Producer

Connector
discord-guilds

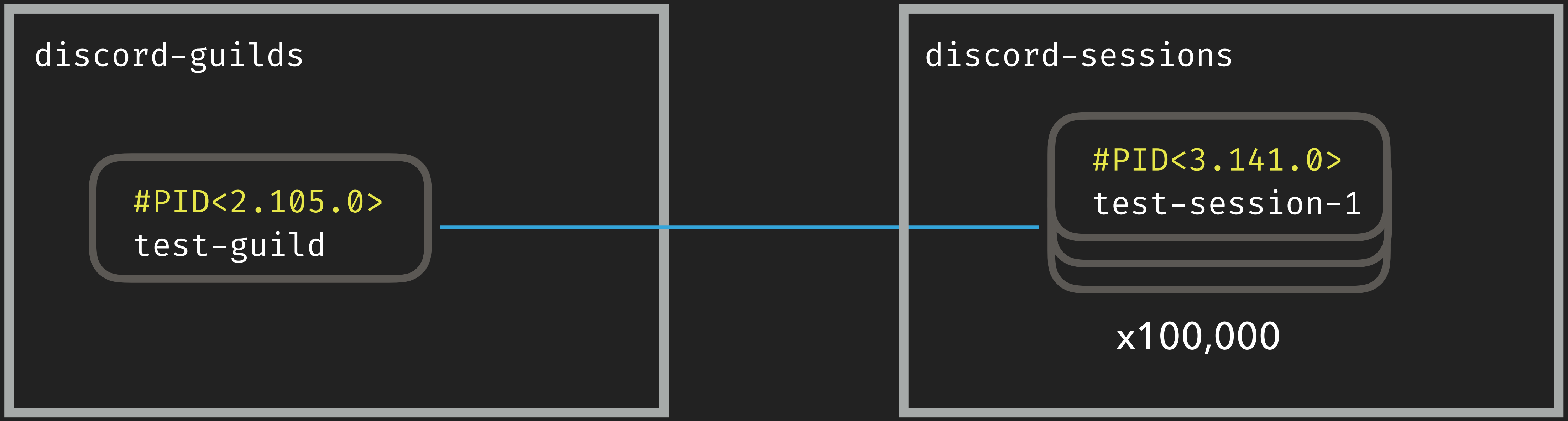
Dispatcher
Consumer

Proxy

Batcher
discord-guilds

BENEFITS

CALMING



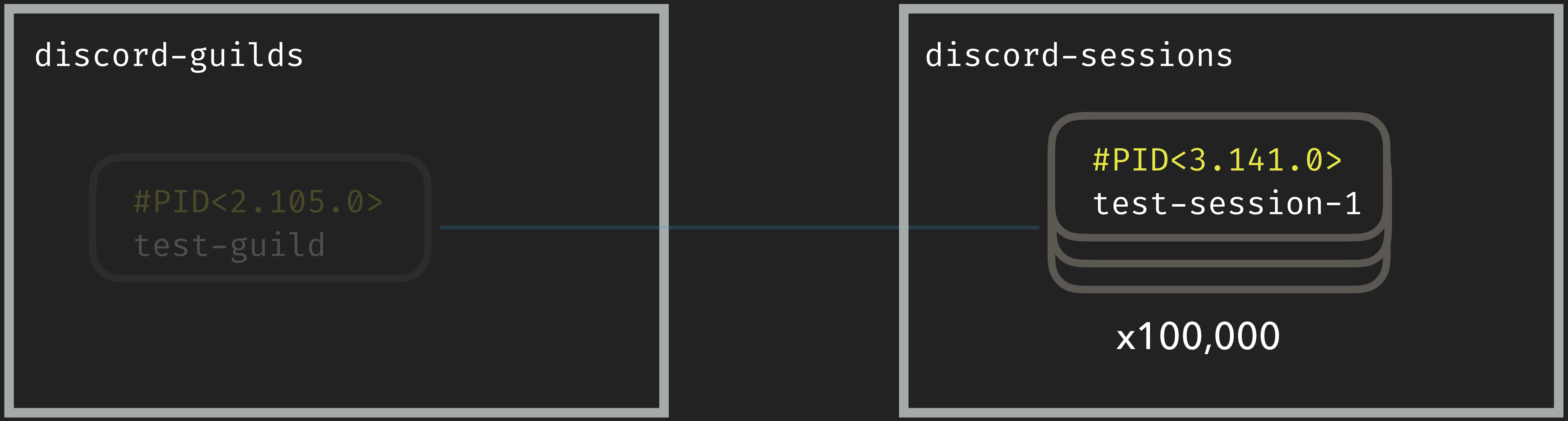
discord-guilds

#PID<2.105.0>
test-guild

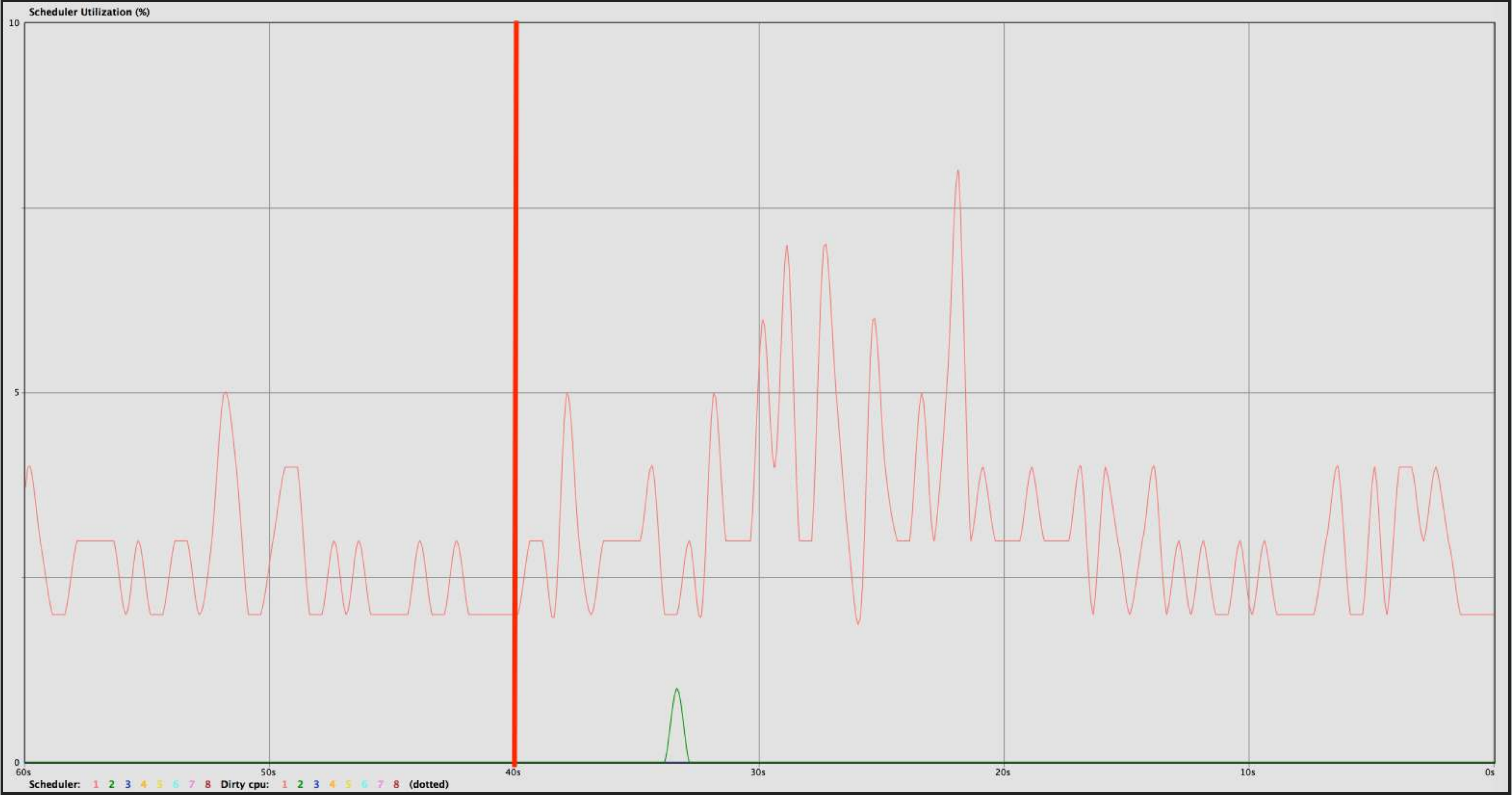
discord-sessions

#PID<3.141.0>
test-session-1

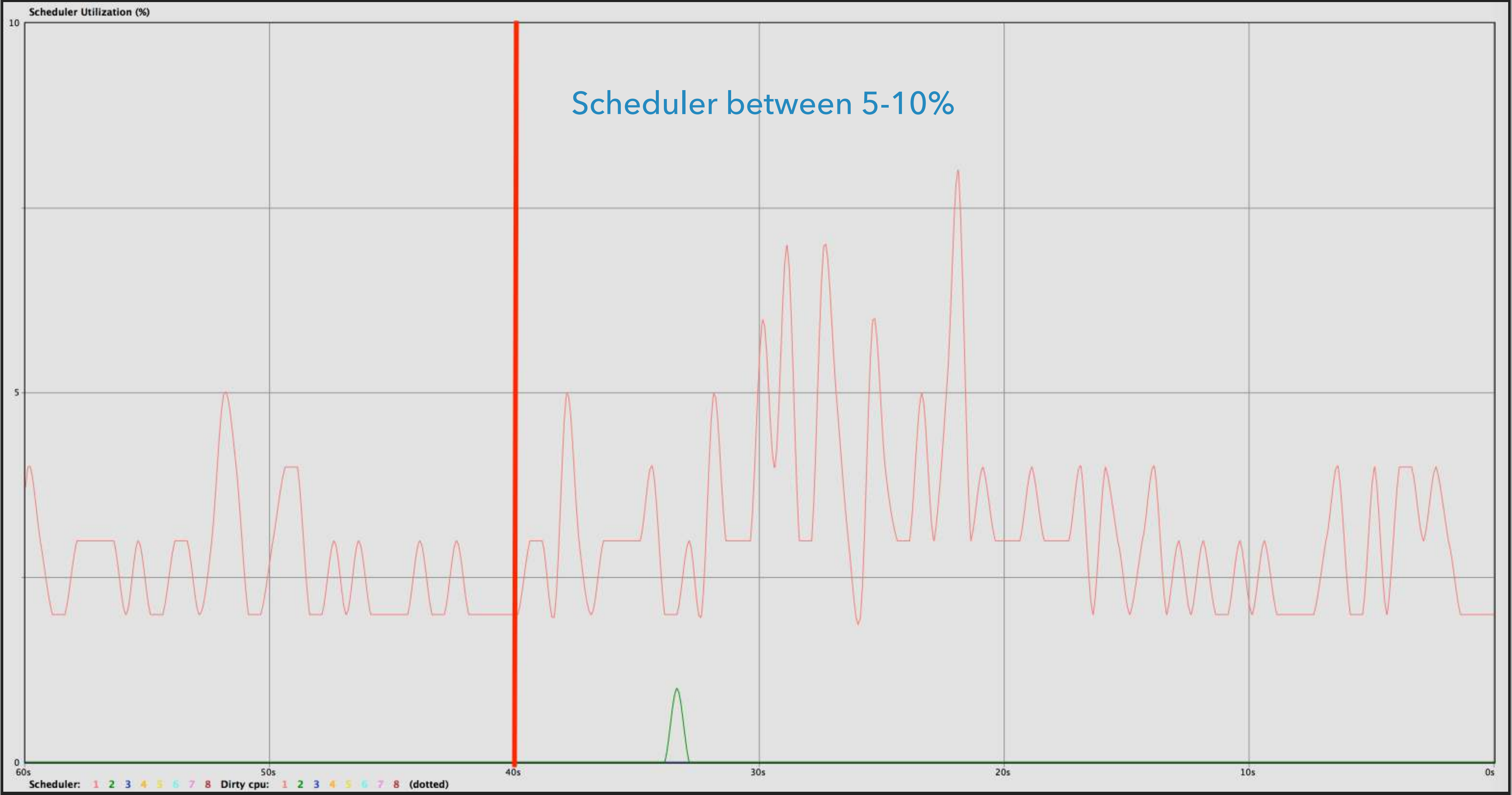
x100,000


discord-guilds
#PID<2.105.0>
test-guild
discord-sessions
#PID<3.141.0>
test-session-1
x100,000

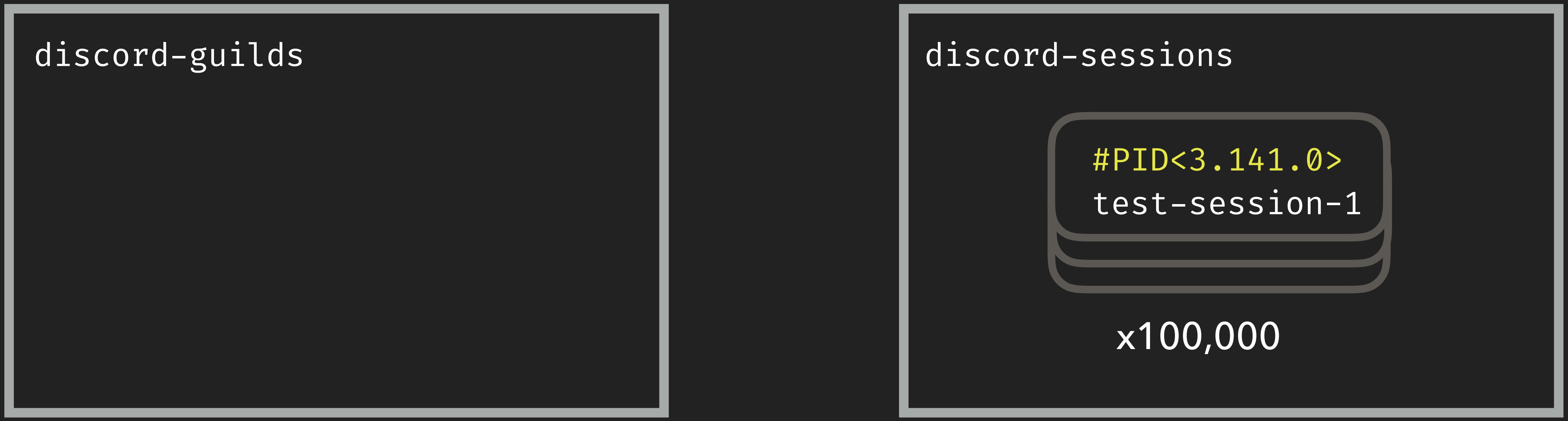
discord-guilds



discord-guilds



Scheduler between 5-10%



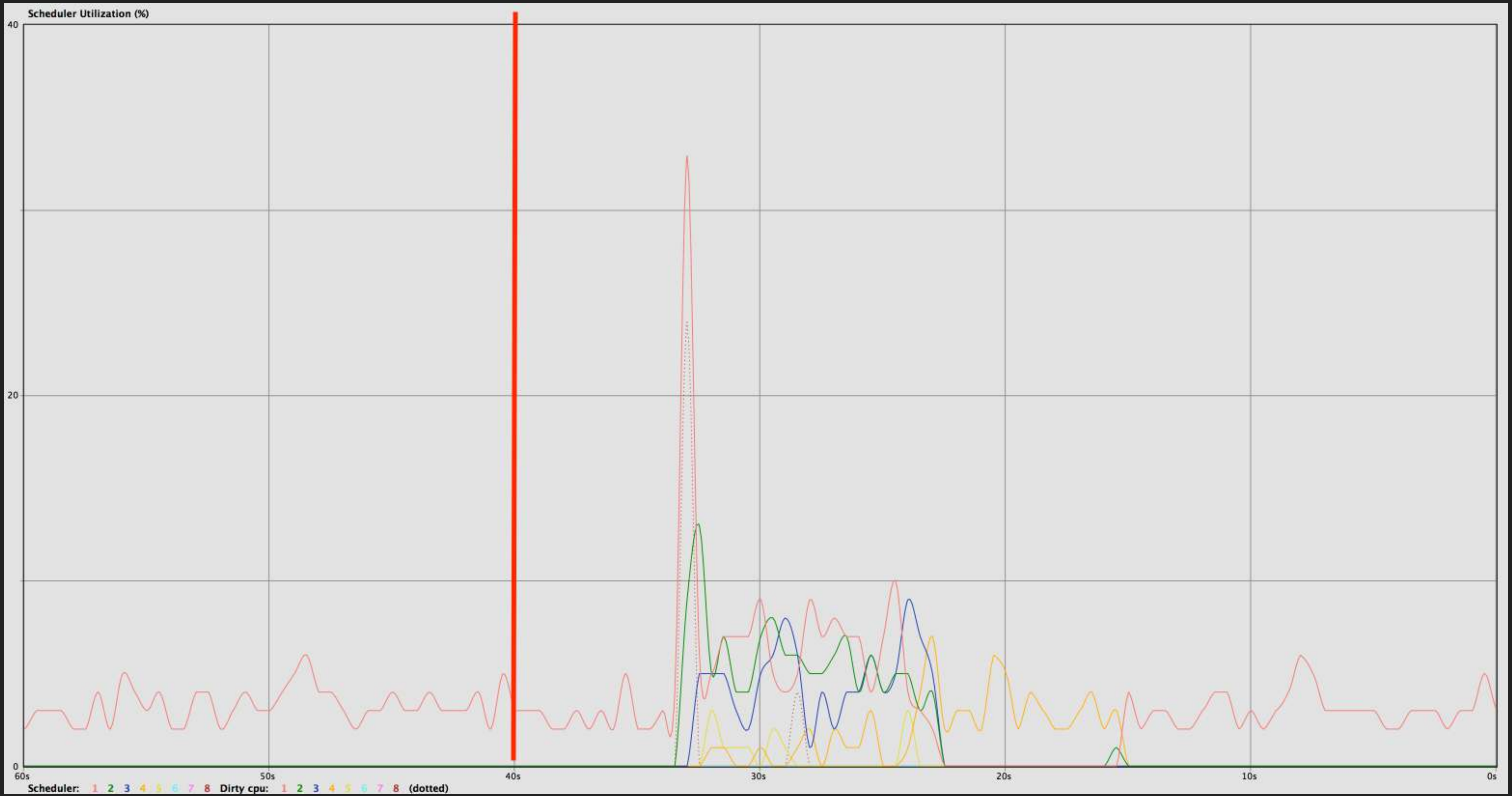
discord-guilds

discord-sessions

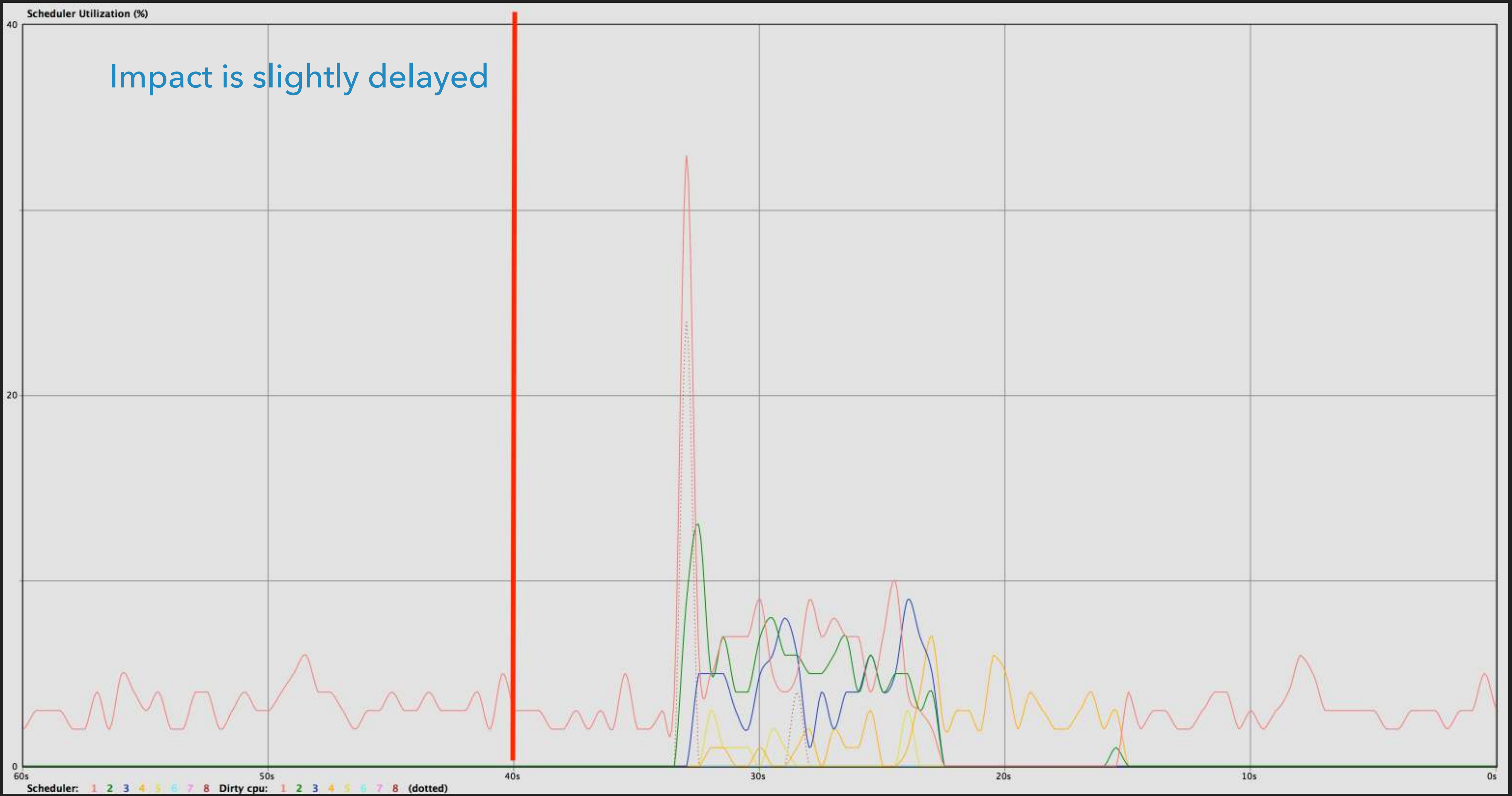
#PID<3.141.0>
test-session-1

x100,000

discord-sessions

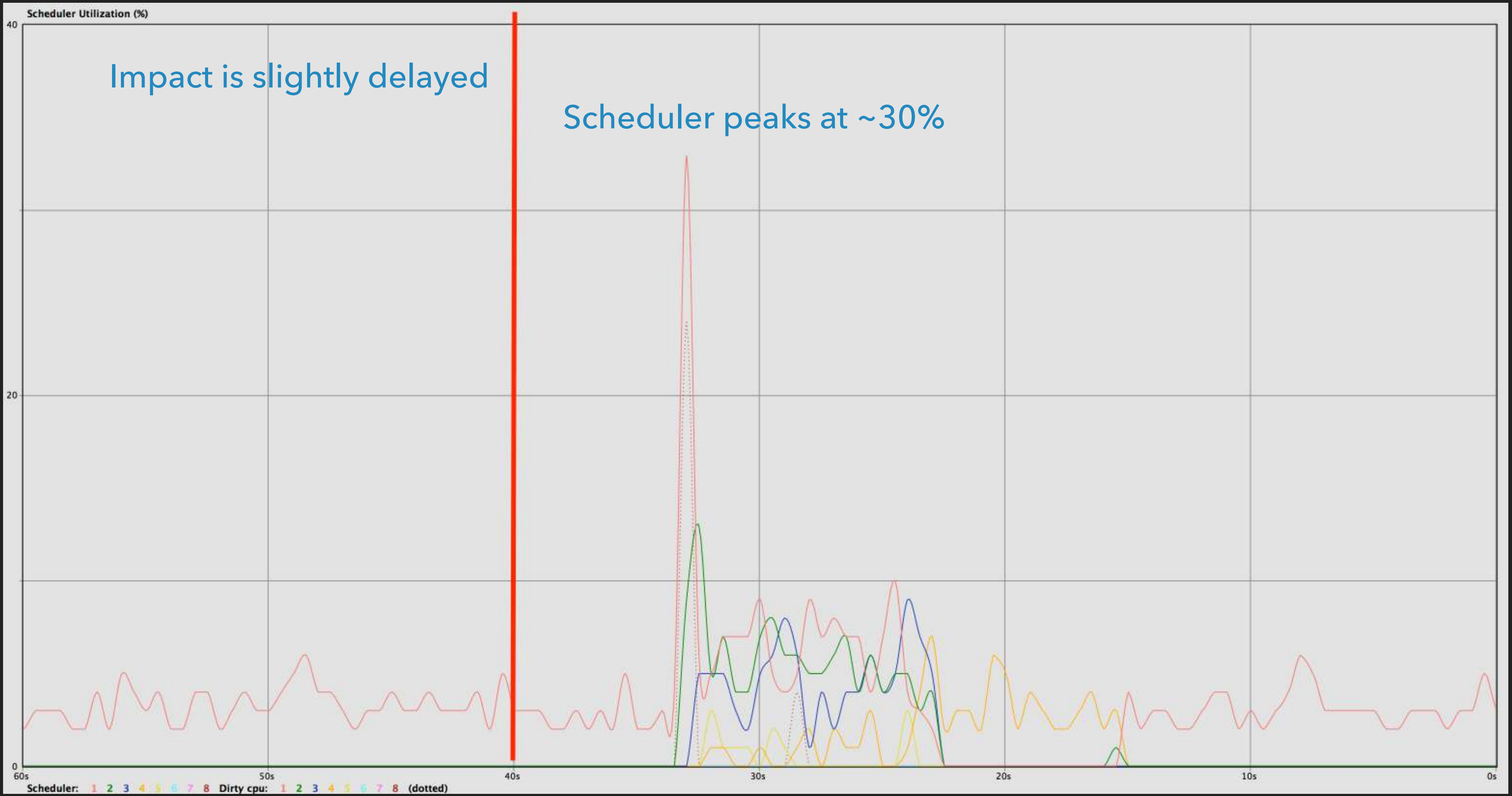


discord-sessions



Impact is slightly delayed

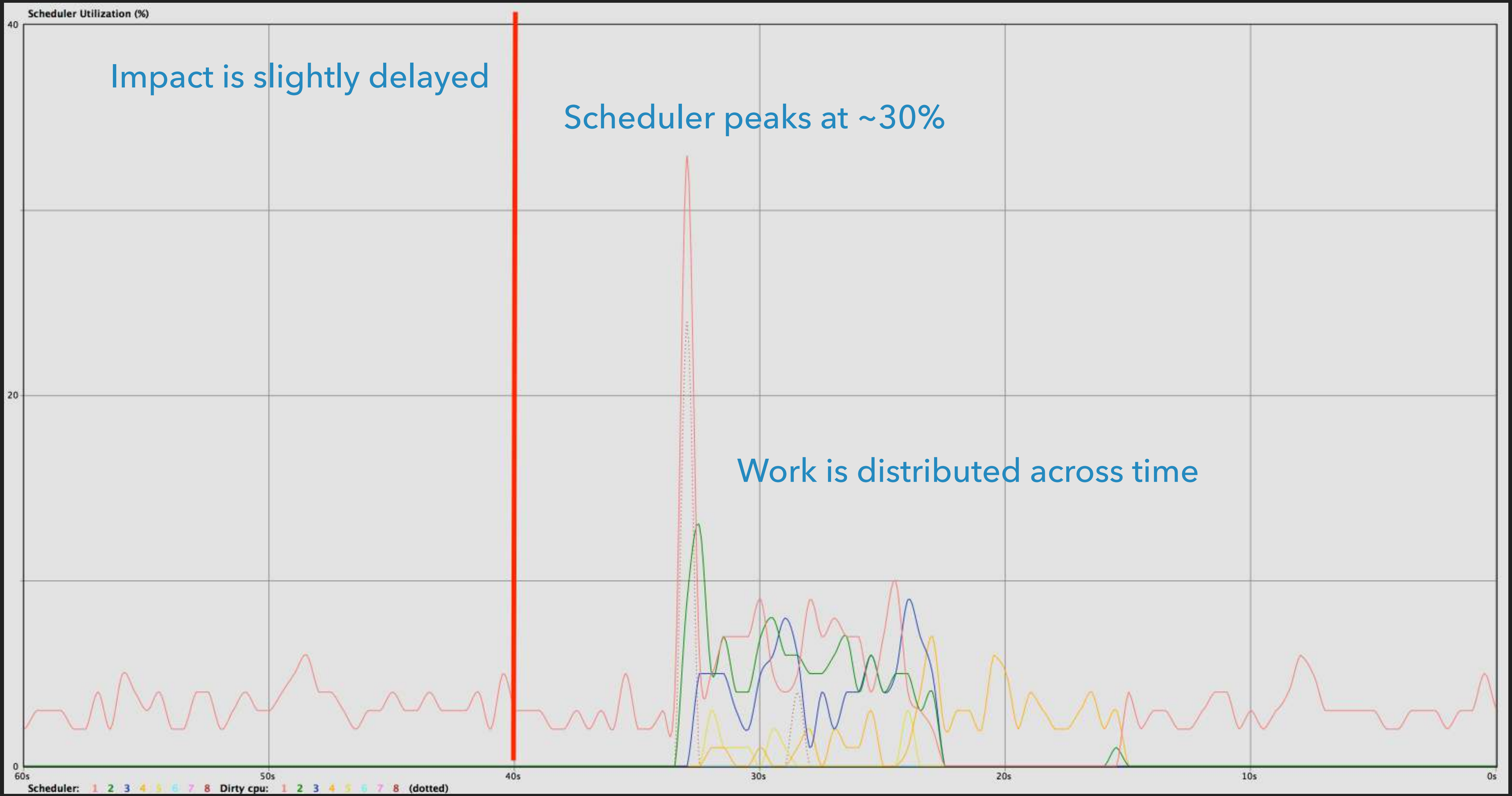
discord-sessions



Impact is slightly delayed

Scheduler peaks at ~30%

discord-sessions

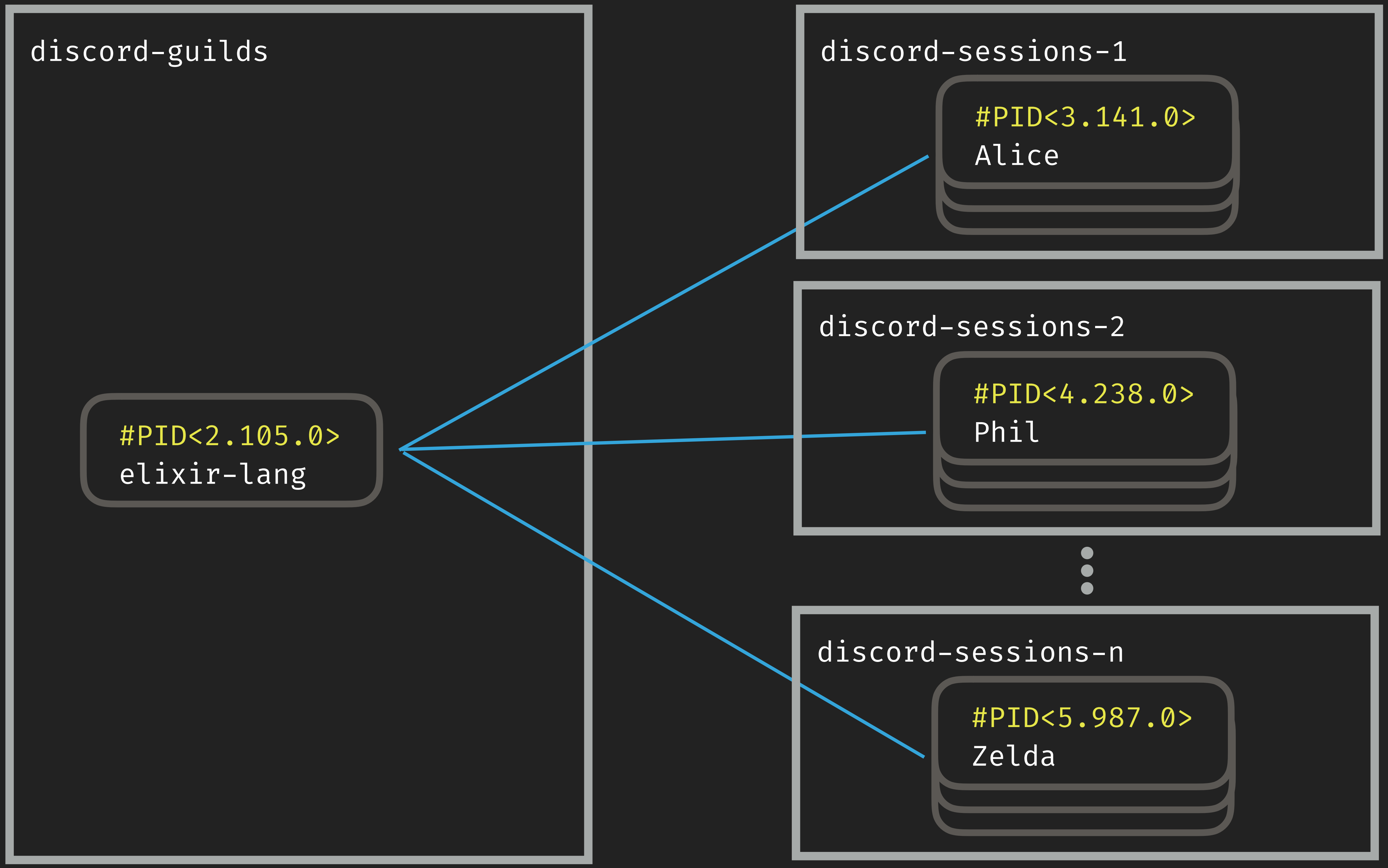


Impact is slightly delayed

Scheduler peaks at ~30%

Work is distributed across time

INTERLACING



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

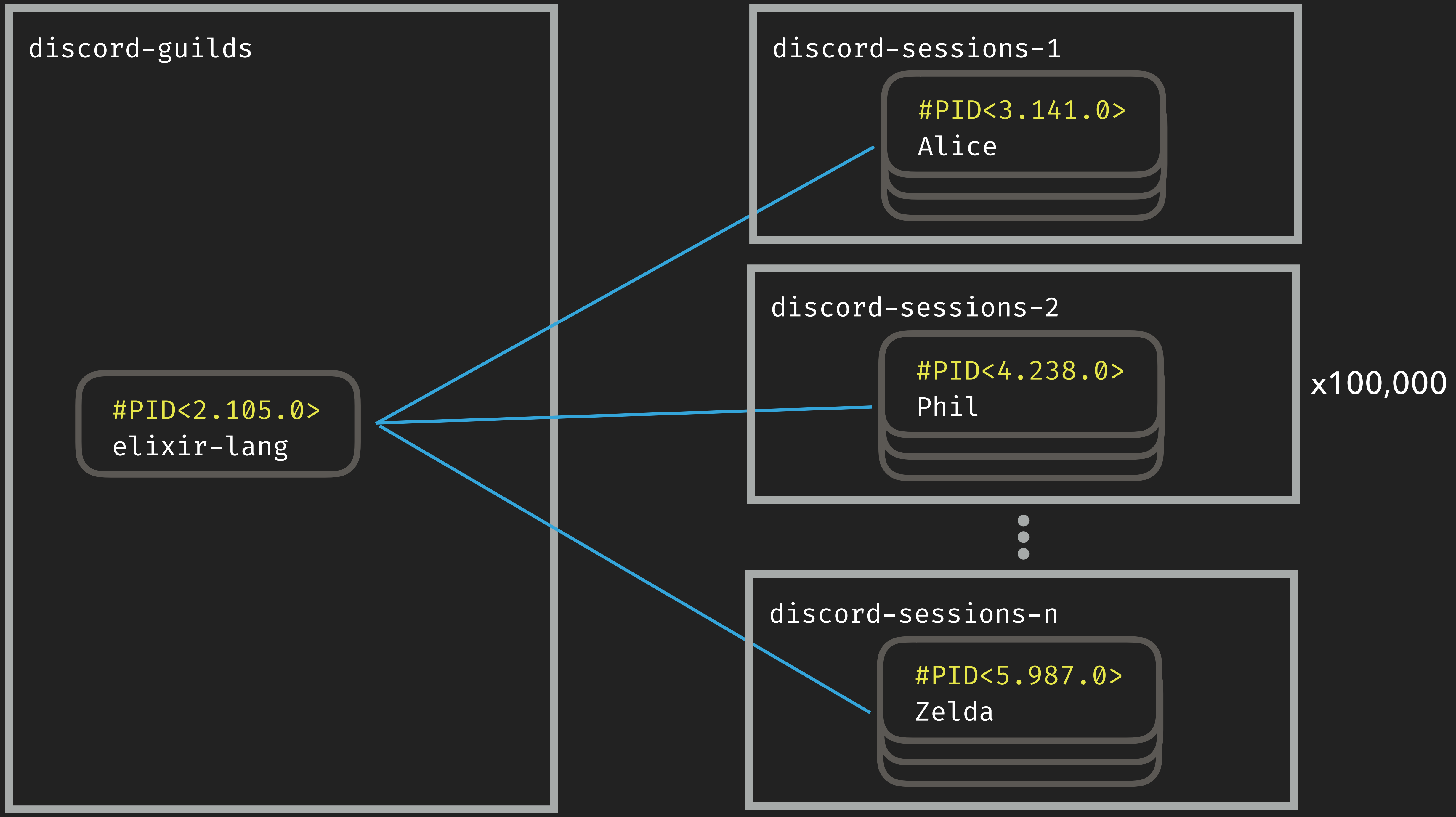
#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil

discord-sessions-n

#PID<5.987.0>
Zelda



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

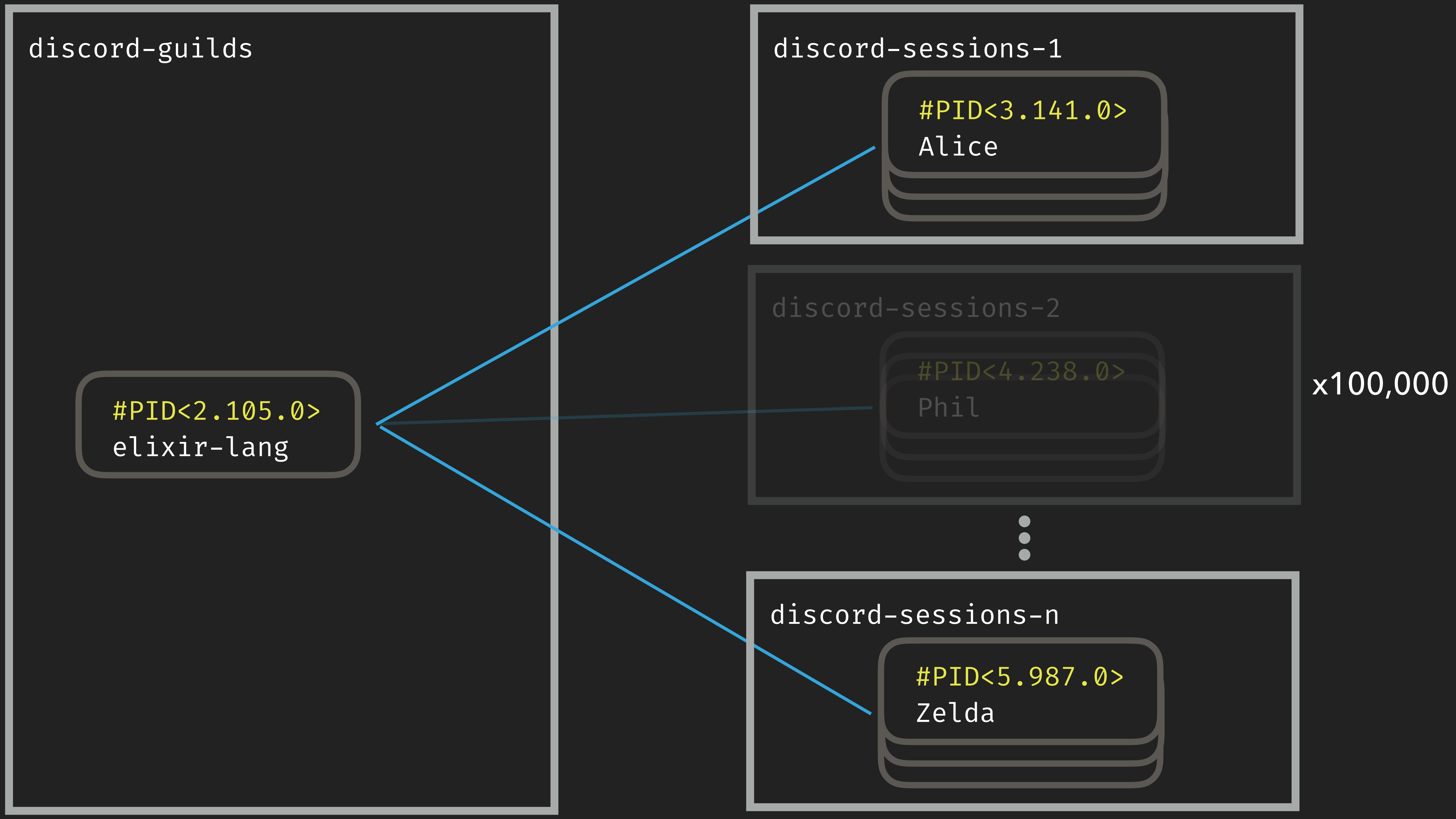
discord-sessions-2

#PID<4.238.0>
Phil

x100,000

discord-sessions-n

#PID<5.987.0>
Zelda



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

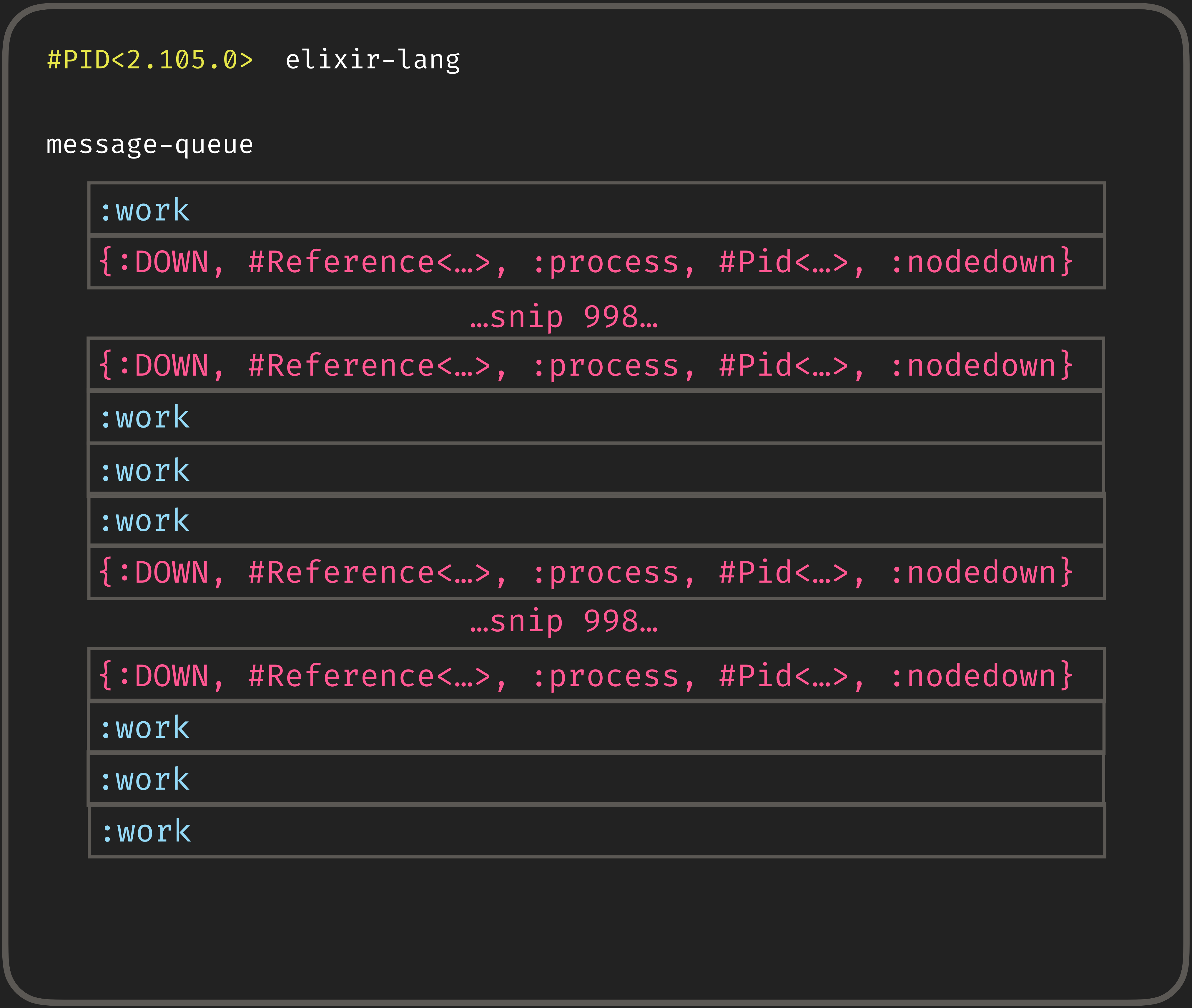
discord-sessions-2

#PID<4.238.0>
Phil

x100,000

discord-sessions-n

#PID<5.987.0>
Zelda



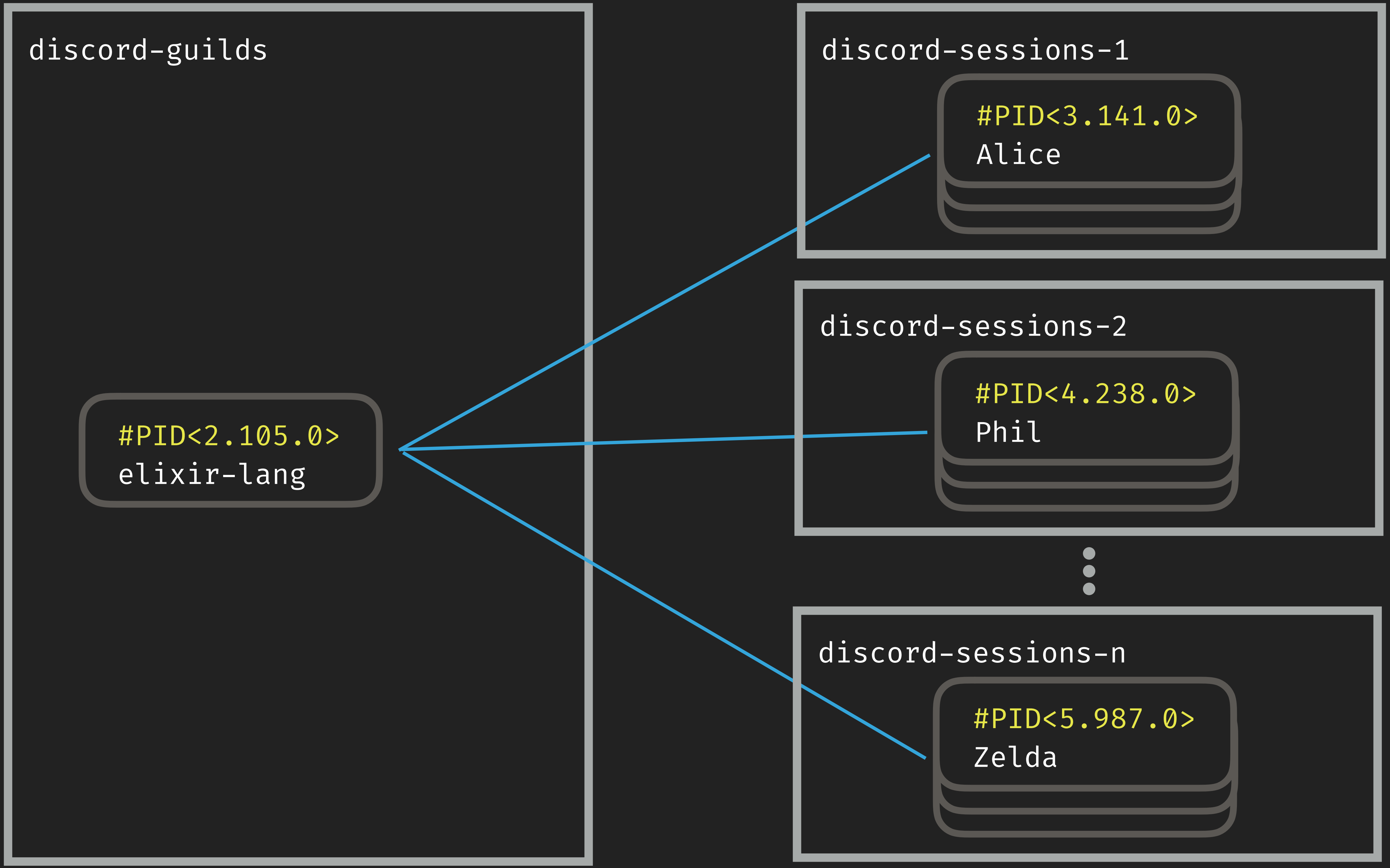
```
#PID<2.105.0>  elixir-lang

message-queue

    :work
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
                    …snip 998…
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    :work
    :work
    :work
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
                    …snip 998…
    {:DOWN, #Reference<…>, :process, #Pid<…>, :nodedown}
    :work
    :work
    :work
```

TRUNCATION

DISCORD



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

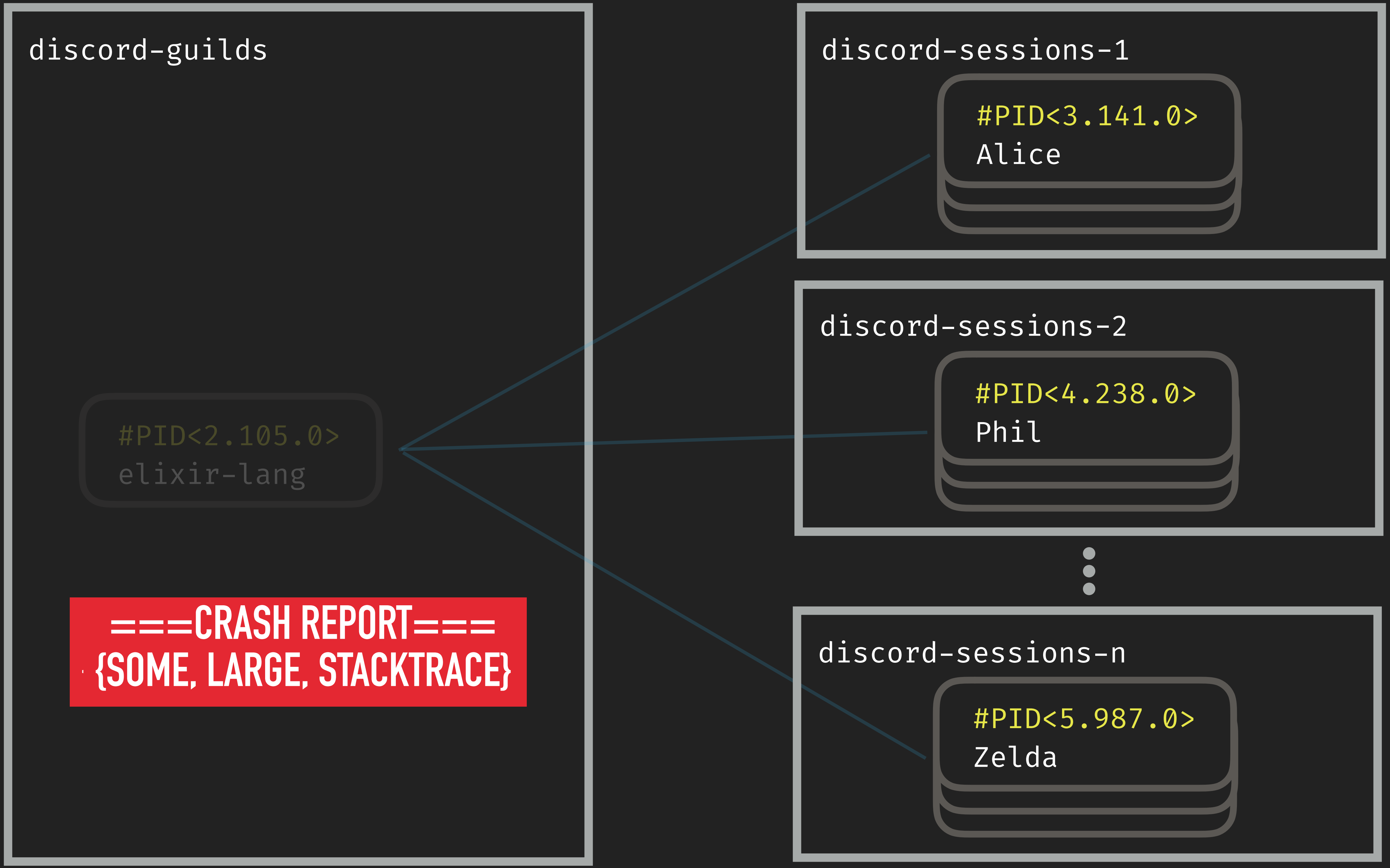
#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil

discord-sessions-n

#PID<5.987.0>
Zelda



discord-guilds

#PID<2.105.0>
elixir-lang

===CRASH REPORT===
{SOME, LARGE, STACKTRACE}

discord-sessions-1

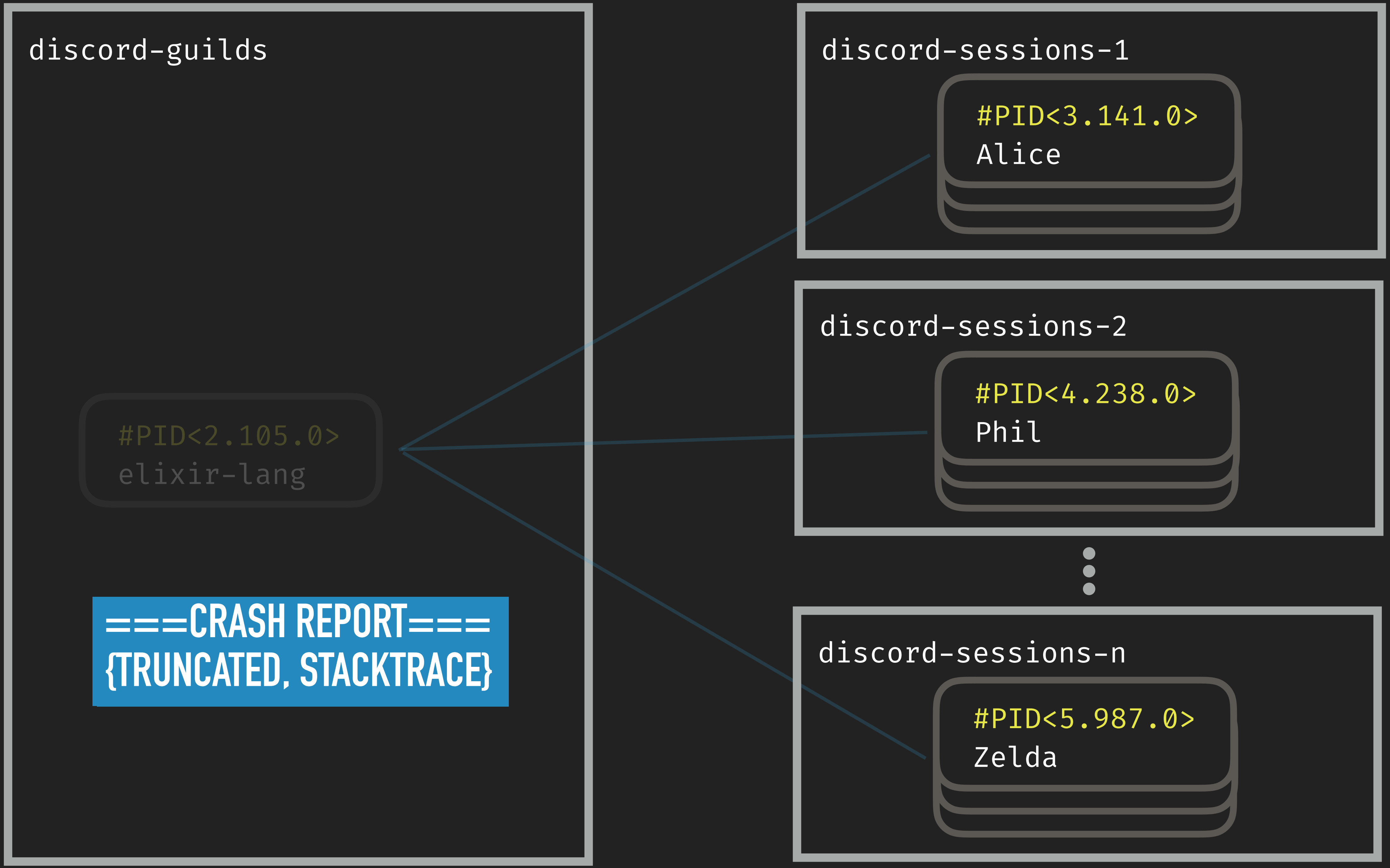
#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil

discord-sessions-n

#PID<5.987.0>
Zelda



discord-guilds

#PID<2.105.0>
elixir-lang

===CRASH REPORT===
{TRUNCATED, STACKTRACE}

discord-sessions-1

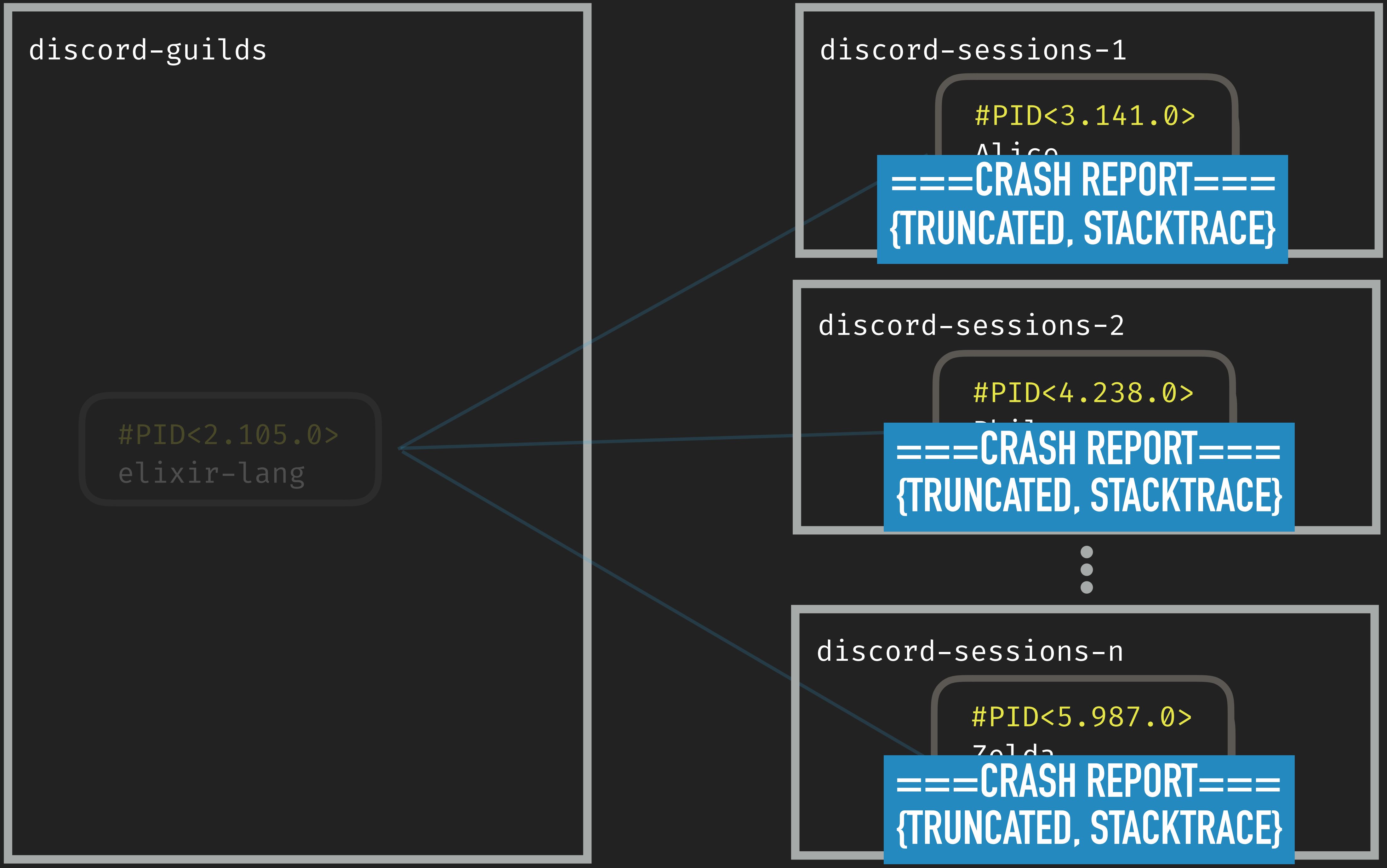
#PID<3.141.0>
Alice

discord-sessions-2

#PID<4.238.0>
Phil

discord-sessions-n

#PID<5.987.0>
Zelda



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

===CRASH REPORT===
{TRUNCATED, STACKTRACE}

discord-sessions-2

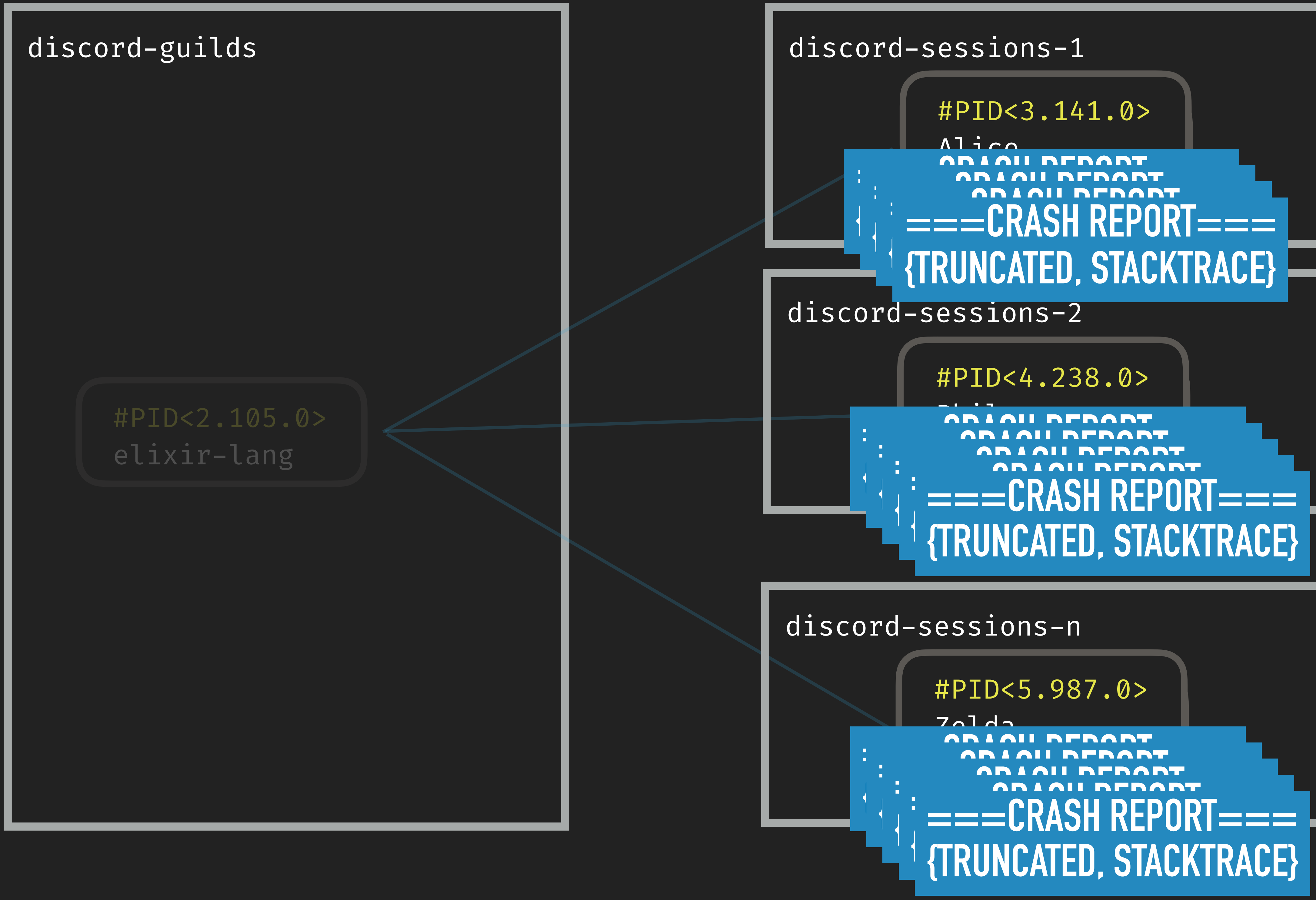
#PID<4.238.0>
Phil

===CRASH REPORT===
{TRUNCATED, STACKTRACE}

discord-sessions-n

#PID<5.987.0>
Zelda

===CRASH REPORT===
{TRUNCATED, STACKTRACE}



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

===CRASH REPORT===
{TRUNCATED, STACKTRACE}

discord-sessions-2

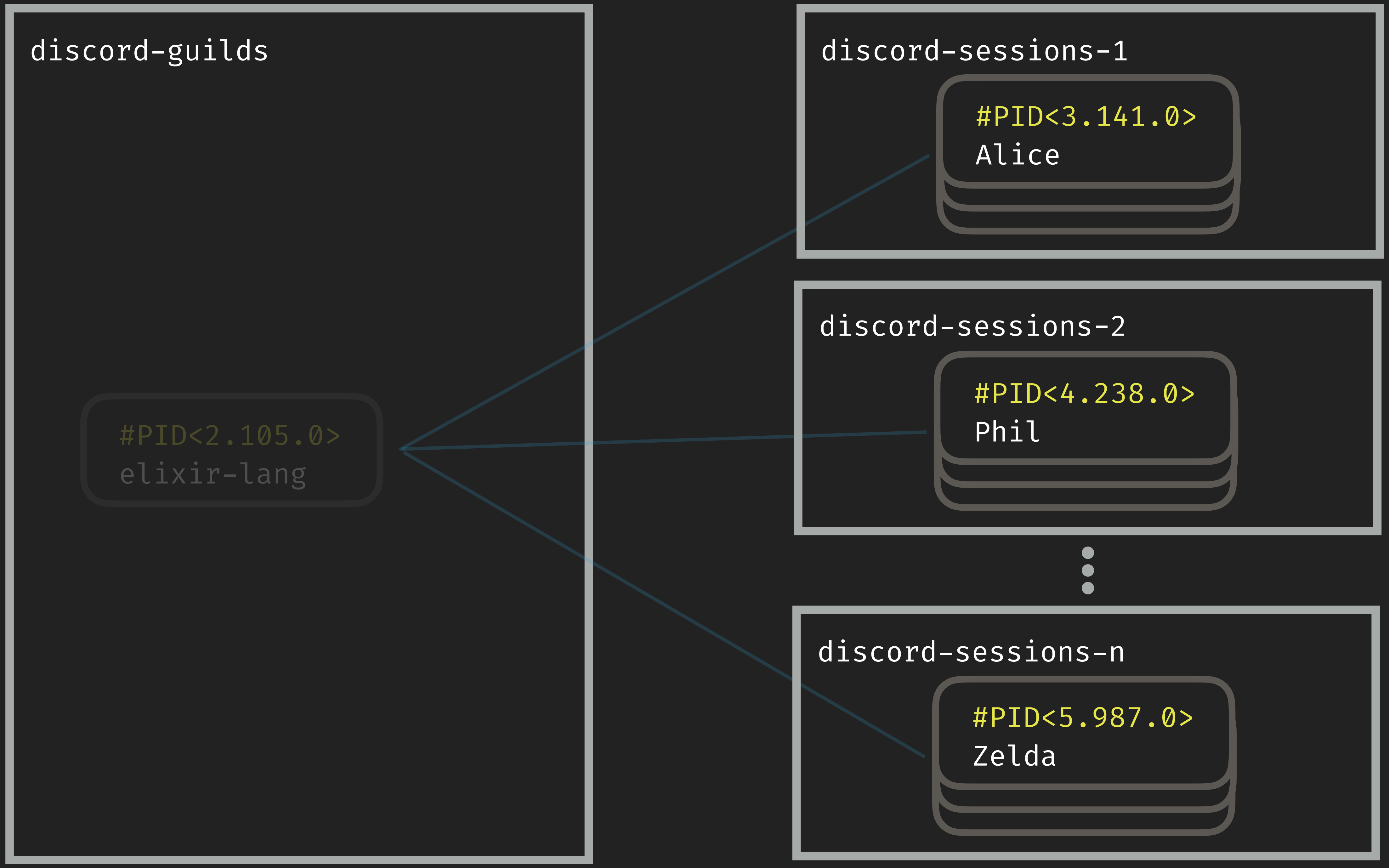
#PID<4.238.0>
Phil

===CRASH REPORT===
{TRUNCATED, STACKTRACE}

discord-sessions-n

#PID<5.987.0>
Zelda

===CRASH REPORT===
{TRUNCATED, STACKTRACE}



discord-guilds

#PID<2.105.0>
elixir-lang

discord-sessions-1

#PID<3.141.0>
Alice

discord-sessions-2

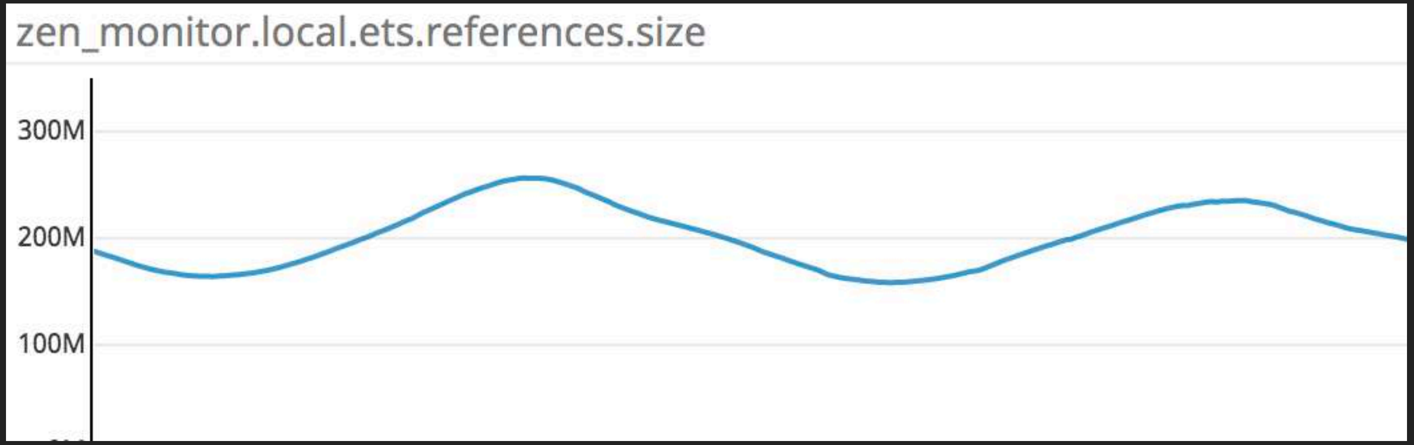
#PID<4.238.0>
Phil

discord-sessions-n

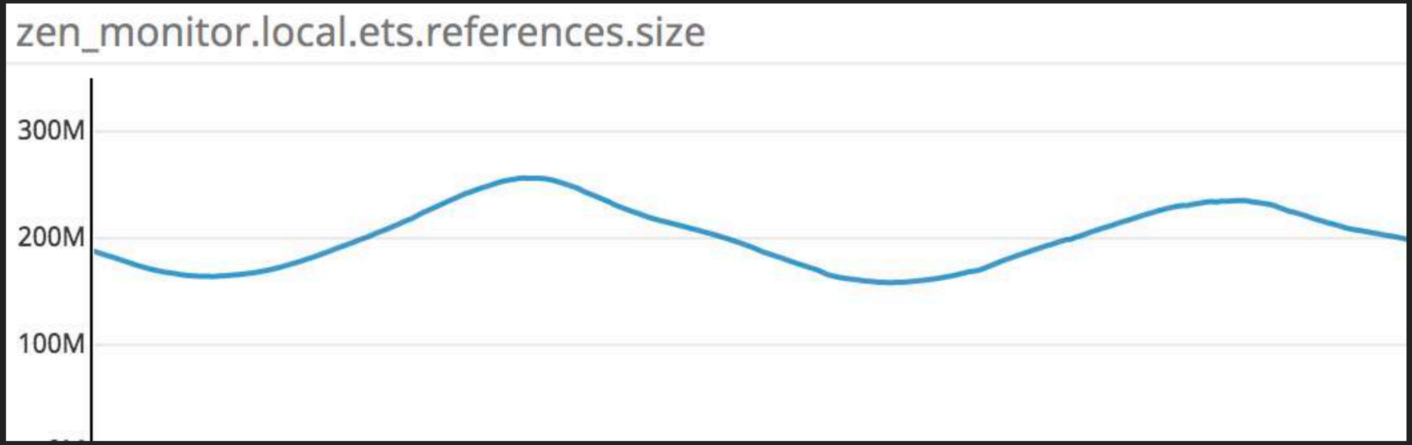
#PID<5.987.0>
Zelda

READY

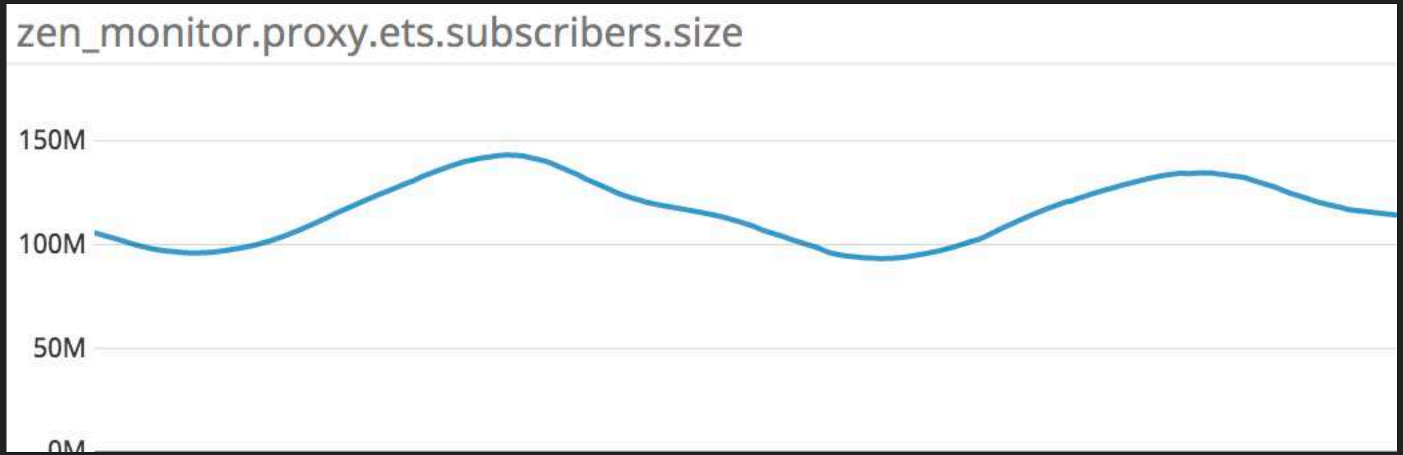
BATTLE TESTED



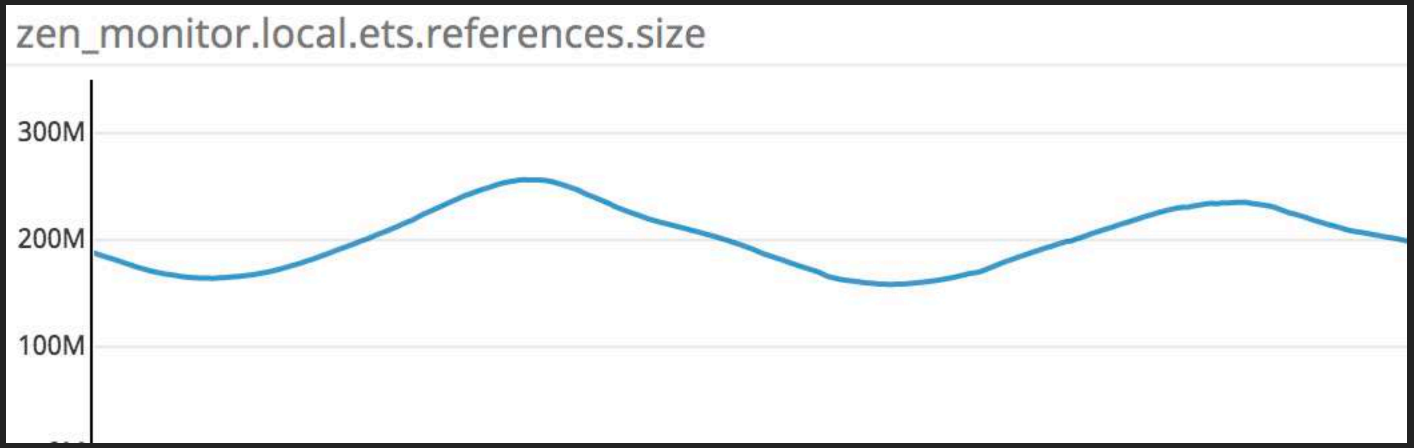
250 Million Local Monitors



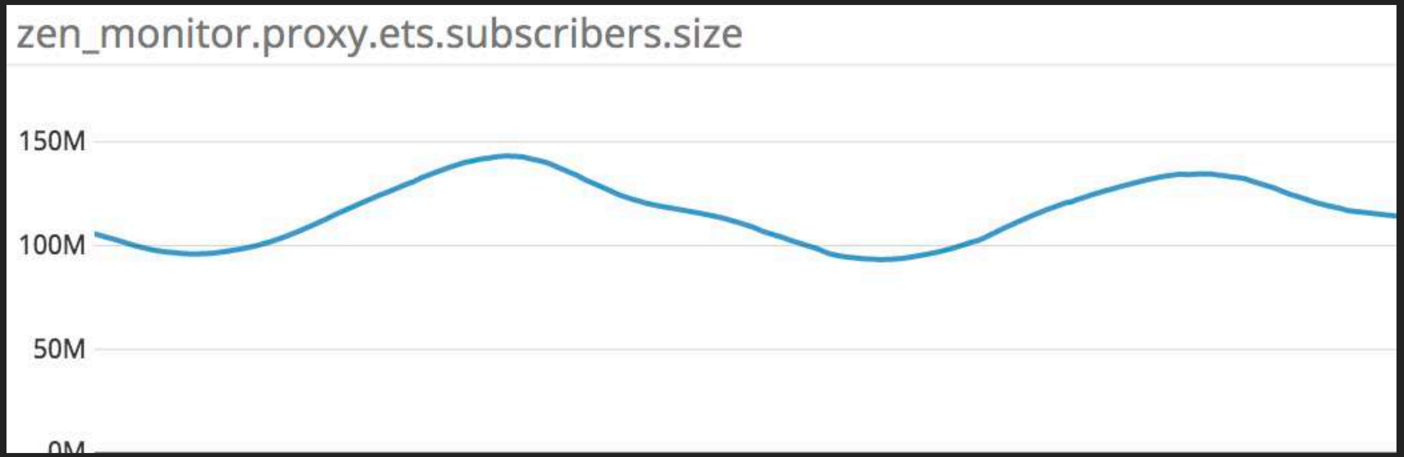
250 Million Local Monitors



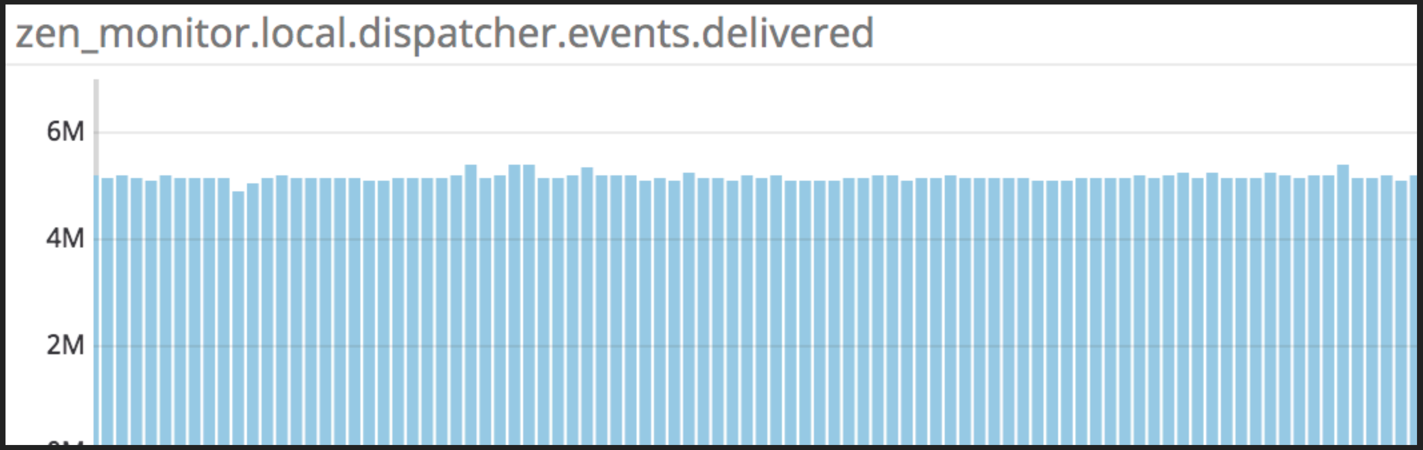
Monitoring 150 Million Remote Processes



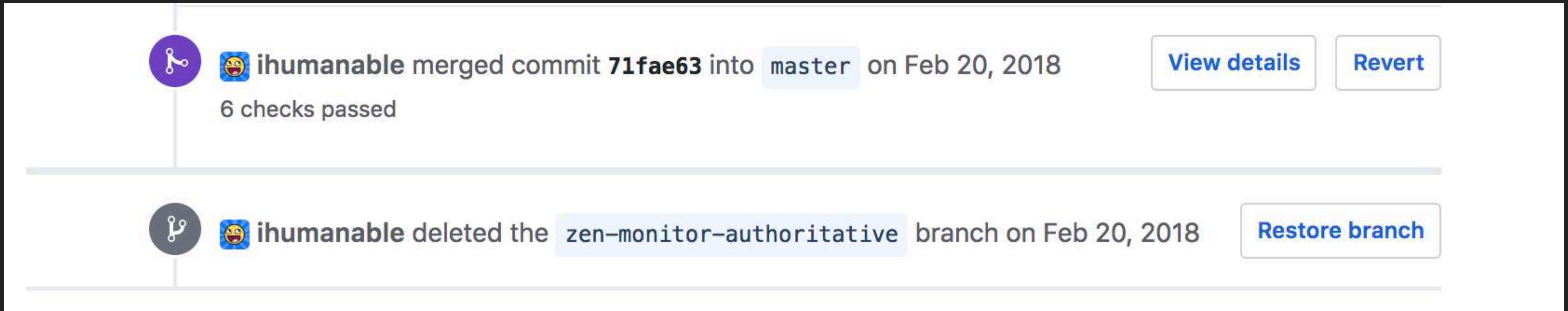
250 Million Local Monitors



Monitoring 150 Million Remote Processes



Regularly delivering millions of events



ihumanable merged commit 71fae63 into master on Feb 20, 2018

6 checks passed

ihumanable deleted the zen-monitor-authoritative branch on Feb 20, 2018

Running in Production for over a year

INSTRUMENTED

LOCAL METRICS

- zen_monitor.local.demonitor
- zen_monitor.local.enqueue
- zen_monitor.local.monitor
- zen_monitor.local.batch_length
- zen_monitor.local.message_queue_len
- zen_monitor.local.ets.references.size

CONNECTOR METRICS

- zen_monitor.local.connector.enqueue
- zen_monitor.local.connector.sweep

DISPATCHER METRICS

- zen_monitor.local.dispatcher.events.delivered
- zen_montior.local.dispatcher.events.processed

PROXY METRICS

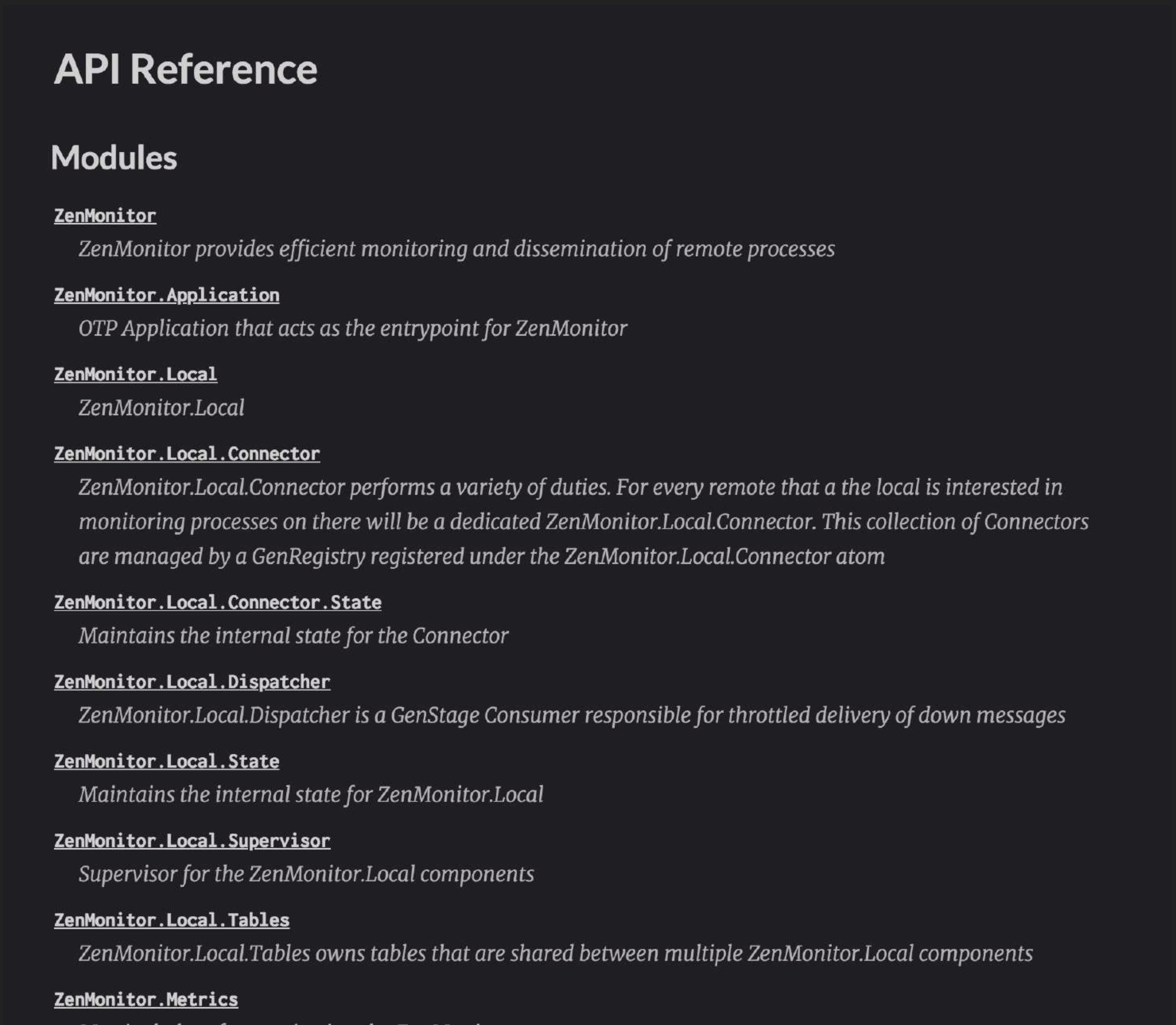
- zen_monitor.proxy.message_queue_len
- zen_monitor.proxy.ets.subscribers.size

BATCHER METRICS

- zen_monitor.proxy.batcher.enqueue
- zen_montior.proxy.batcher.sweep

DOCUMENTED

Full API Reference



API Reference

Modules

`ZenMonitor`
ZenMonitor provides efficient monitoring and dissemination of remote processes

`ZenMonitor.Application`
OTP Application that acts as the entrypoint for ZenMonitor

`ZenMonitor.Local`
ZenMonitor.Local

`ZenMonitor.Local.Connector`
ZenMonitor.Local.Connector performs a variety of duties. For every remote that a the local is interested in monitoring processes on there will be a dedicated ZenMonitor.Local.Connector. This collection of Connectors are managed by a GenRegistry registered under the ZenMonitor.Local.Connector atom

`ZenMonitor.Local.Connector.State`
Maintains the internal state for the Connector

`ZenMonitor.Local.Dispatcher`
ZenMonitor.Local.Dispatcher is a GenStage Consumer responsible for throttled delivery of down messages

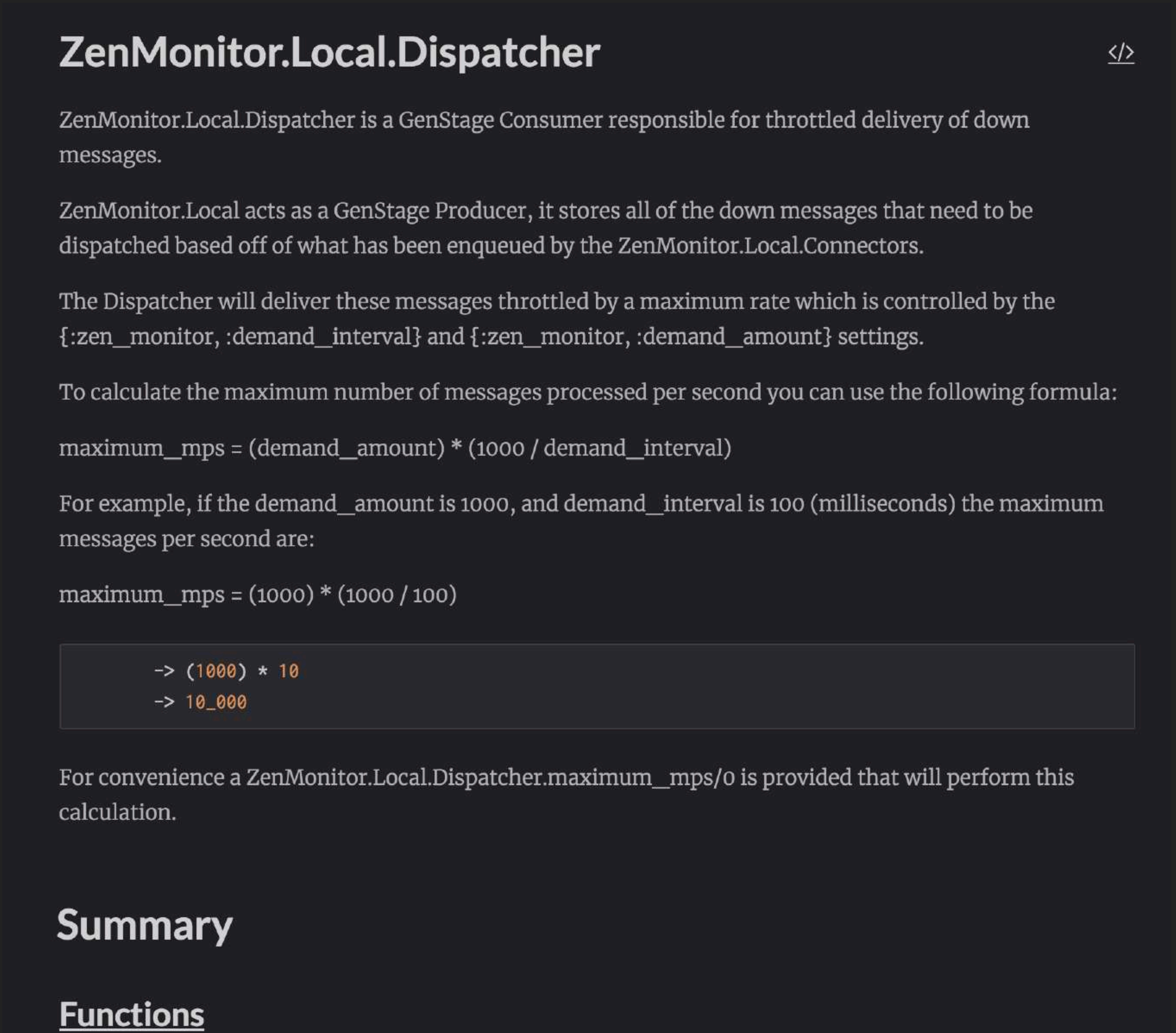
`ZenMonitor.Local.State`
Maintains the internal state for ZenMonitor.Local

`ZenMonitor.Local.Supervisor`
Supervisor for the ZenMonitor.Local components

`ZenMonitor.Local.Tables`
ZenMonitor.Local.Tables owns tables that are shared between multiple ZenMonitor.Local components

`ZenMonitor.Metrics`

Detailed Module Documentation



ZenMonitor.Local.Dispatcher

ZenMonitor.Local.Dispatcher is a GenStage Consumer responsible for throttled delivery of down messages.

ZenMonitor.Local acts as a GenStage Producer, it stores all of the down messages that need to be dispatched based off of what has been enqueued by the ZenMonitor.Local.Connectors.

The Dispatcher will deliver these messages throttled by a maximum rate which is controlled by the {:zen_monitor, :demand_interval} and {:zen_monitor, :demand_amount} settings.

To calculate the maximum number of messages processed per second you can use the following formula:

maximum_mps = (demand_amount) * (1000 / demand_interval)

For example, if the demand_amount is 1000, and demand_interval is 100 (milliseconds) the maximum messages per second are:

maximum_mps = (1000) * (1000 / 100)

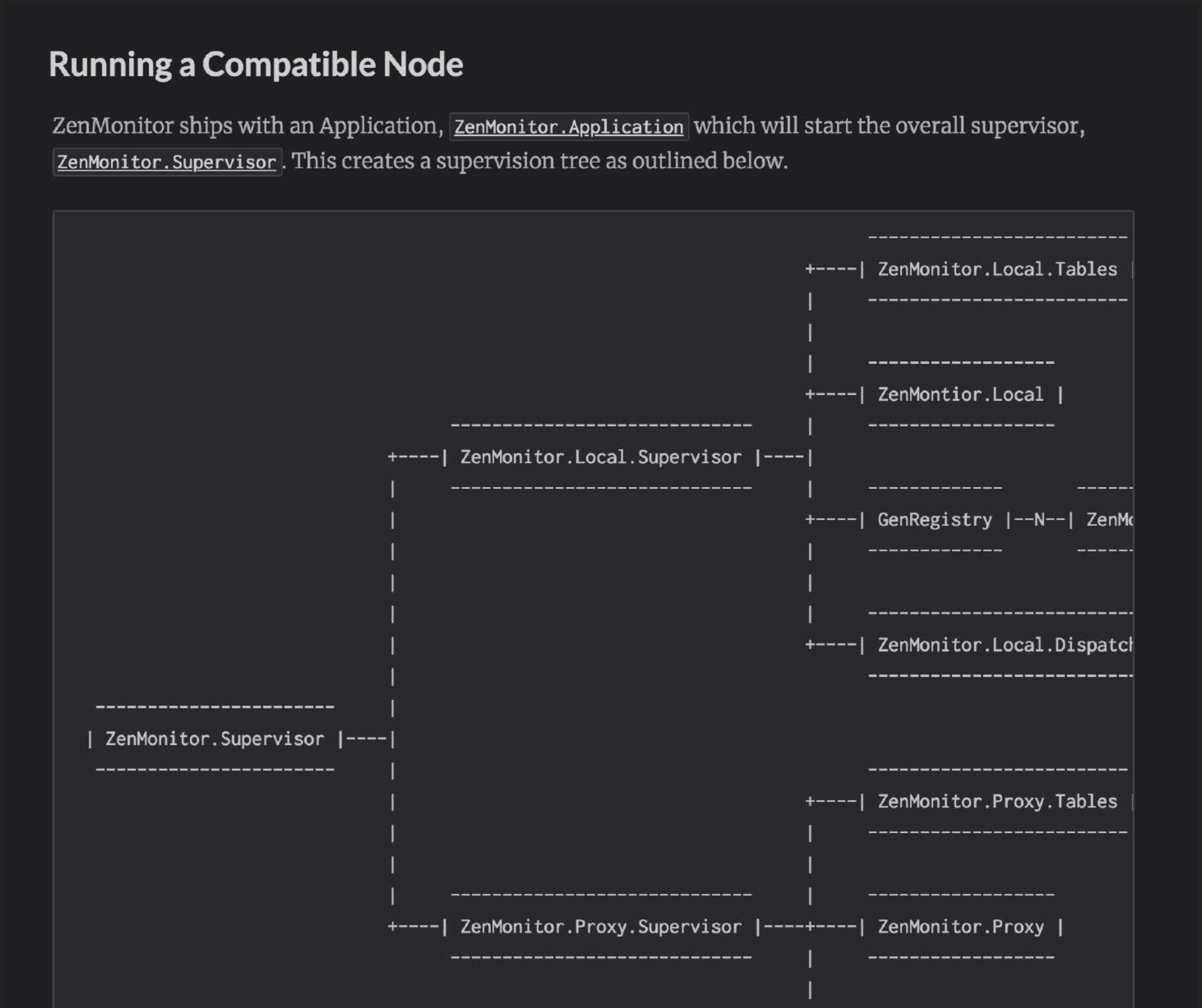
```
      -> (1000) * 10
      -> 10_000
```

For convenience a ZenMonitor.Local.Dispatcher.maximum_mps/0 is provided that will perform this calculation.

Summary

Functions

Design Docs Included



Running a Compatible Node

ZenMonitor ships with an Application, `ZenMonitor.Application` which will start the overall supervisor, `ZenMonitor.Supervisor`. This creates a supervision tree as outlined below.

```
                                                                           -------------------------
                                                                     +----| ZenMonitor.Local.Tables |
                                                                     |     -------------------------
                                                                     |
                                                                     |     ------------------
                                                                     +----| ZenMontior.Local |
                                   -----------------------------     |     ------------------
                             +----| ZenMonitor.Local.Supervisor |----|
                             |     -----------------------------     |     -------------       ------
                             |                                       +----| GenRegistry |--N--| ZenMo
                             |                                       |     -------------       ------
                             |                                       |
                             |                                       |     --------------------------
                             |                                       +----| ZenMonitor.Local.Dispatch
                             |                                             --------------------------
 -----------------------     |
| ZenMonitor.Supervisor |----|
 -----------------------     |                                             -------------------------
                             |                                       +----| ZenMonitor.Proxy.Tables |
                             |                                       |     -------------------------
                             |                                       |
                             |     -----------------------------     |     ------------------
                             +----| ZenMonitor.Proxy.Supervisor |----+----| ZenMonitor.Proxy |
                                   -----------------------------     |     ------------------
                                                                     |
```

OPEN SOURCE

Discord ❤️ Open Source

https://github.com/discordapp/zen_monitor

GET STARTED

INSTALL

```
def deps do
  [
    {:zen_monitor, "~> 1.0.0"}
  ]
end
```

REPLACE

```
ZenMonitor.monitor(pid)
ZenMonitor.demonitor(pid)
```

DISCORD

WANT TO SOLVE PROBLEMS LIKE THIS?

DISCORD IS HIRING

DISCORD

DISCORDAPP.COM/JOBS

THANK YOU!

QUESTIONS?