Orchestrating Producers and Consumers like an Octopus

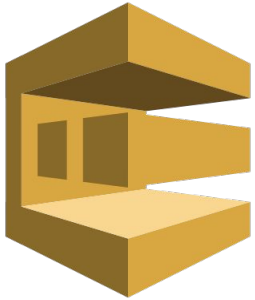
Jusabe Guedes
@dojusa

be simple

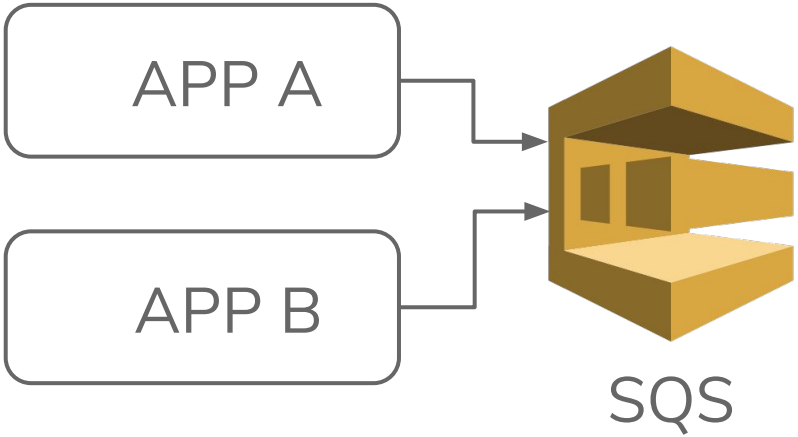
be simple

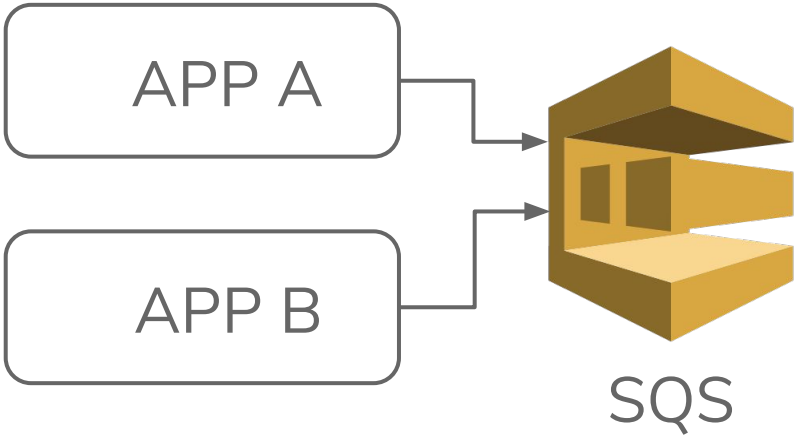
show a way, ~~not the way~~ of doing it

what is the problem?



SQS


APP A
APP B
SQS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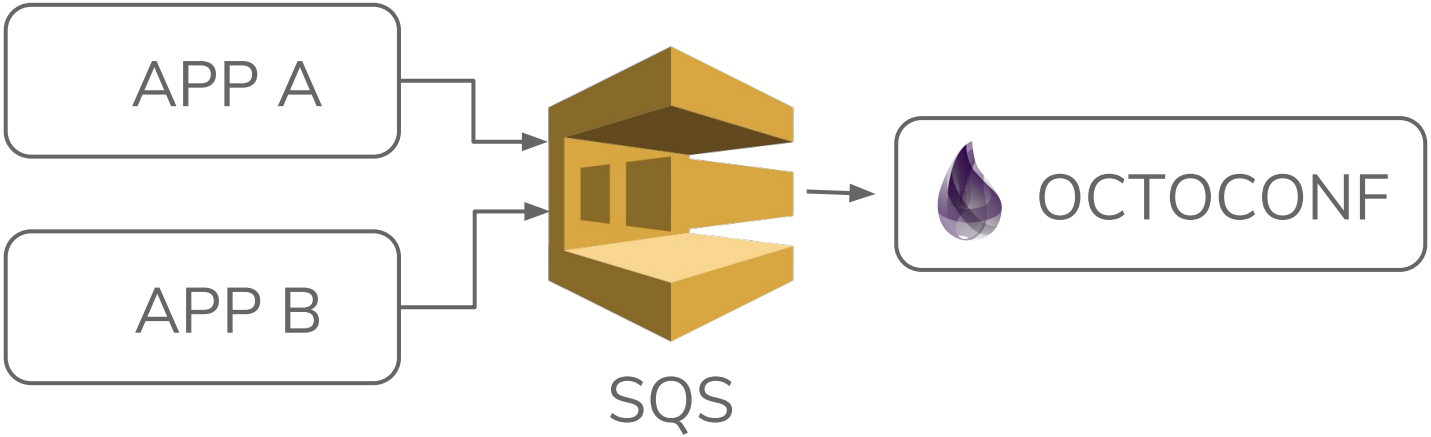
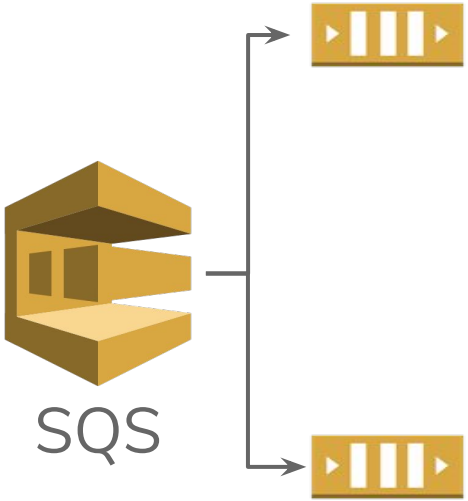

APP A
APP B
SQS
OCTOCONF


APP A
APP B
SQS
OCTOCONF
THIRD PARTY APP
THIRD PARTY APP
THIRD PARTY APP

STEPS

- A queue needs to be consumed
- Each element must pass through a pipeline
- Go to a different bucket
- Must work independently
- Flushed whenever is possible


SQS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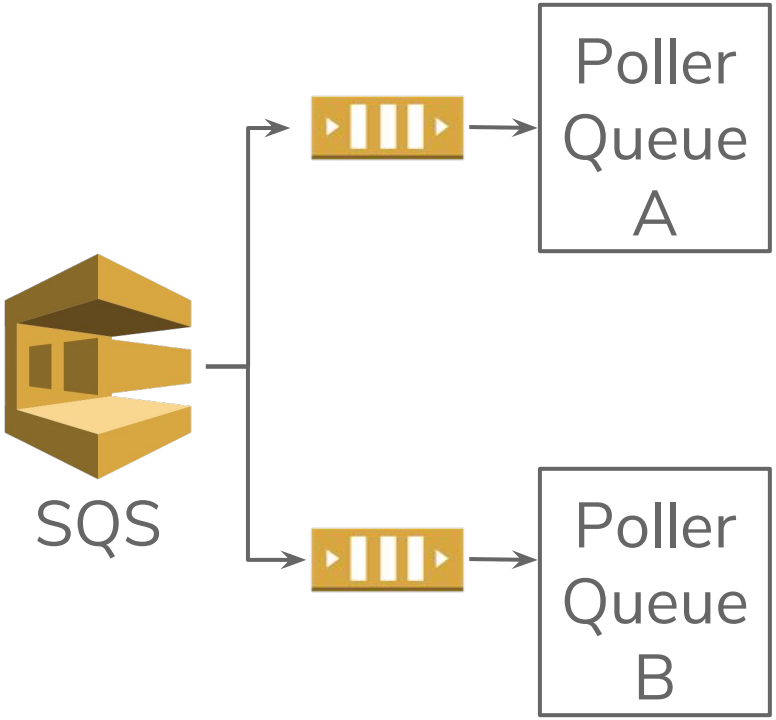
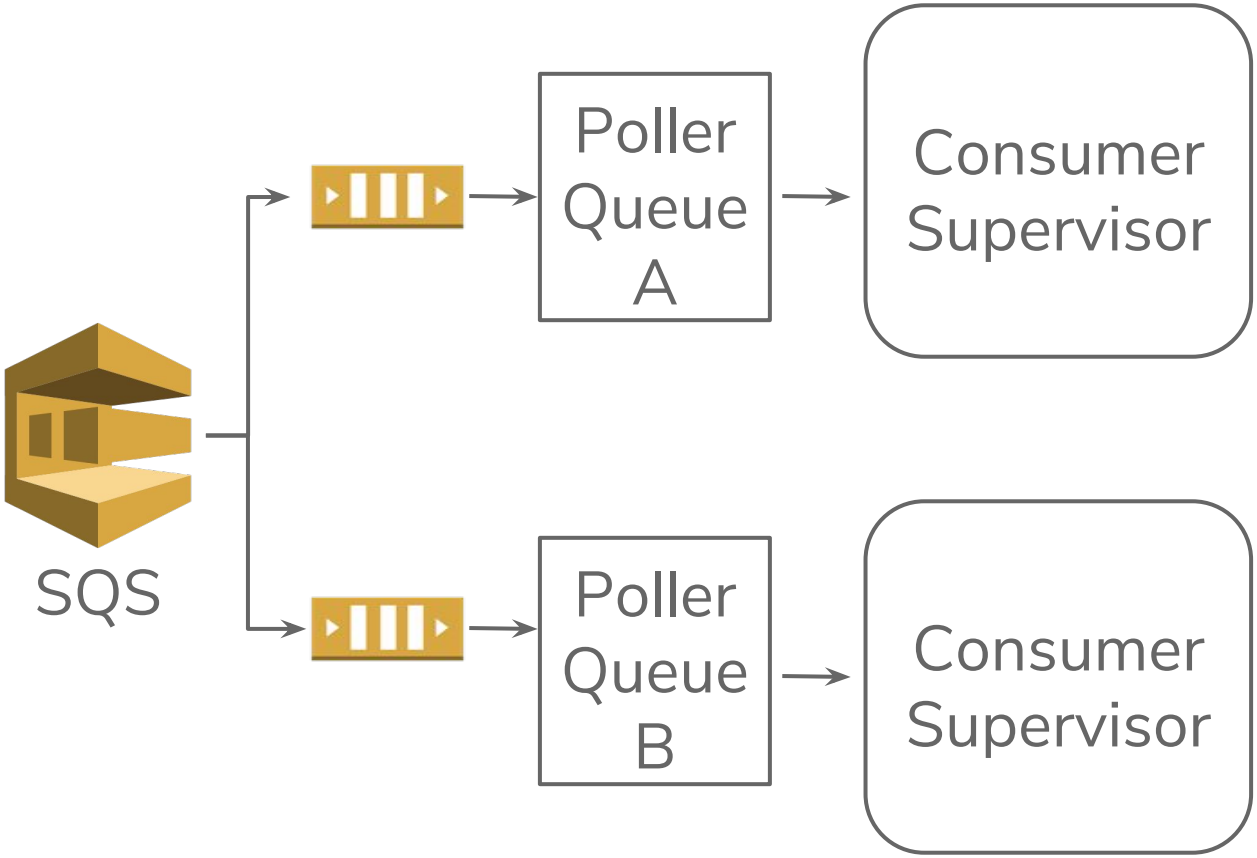
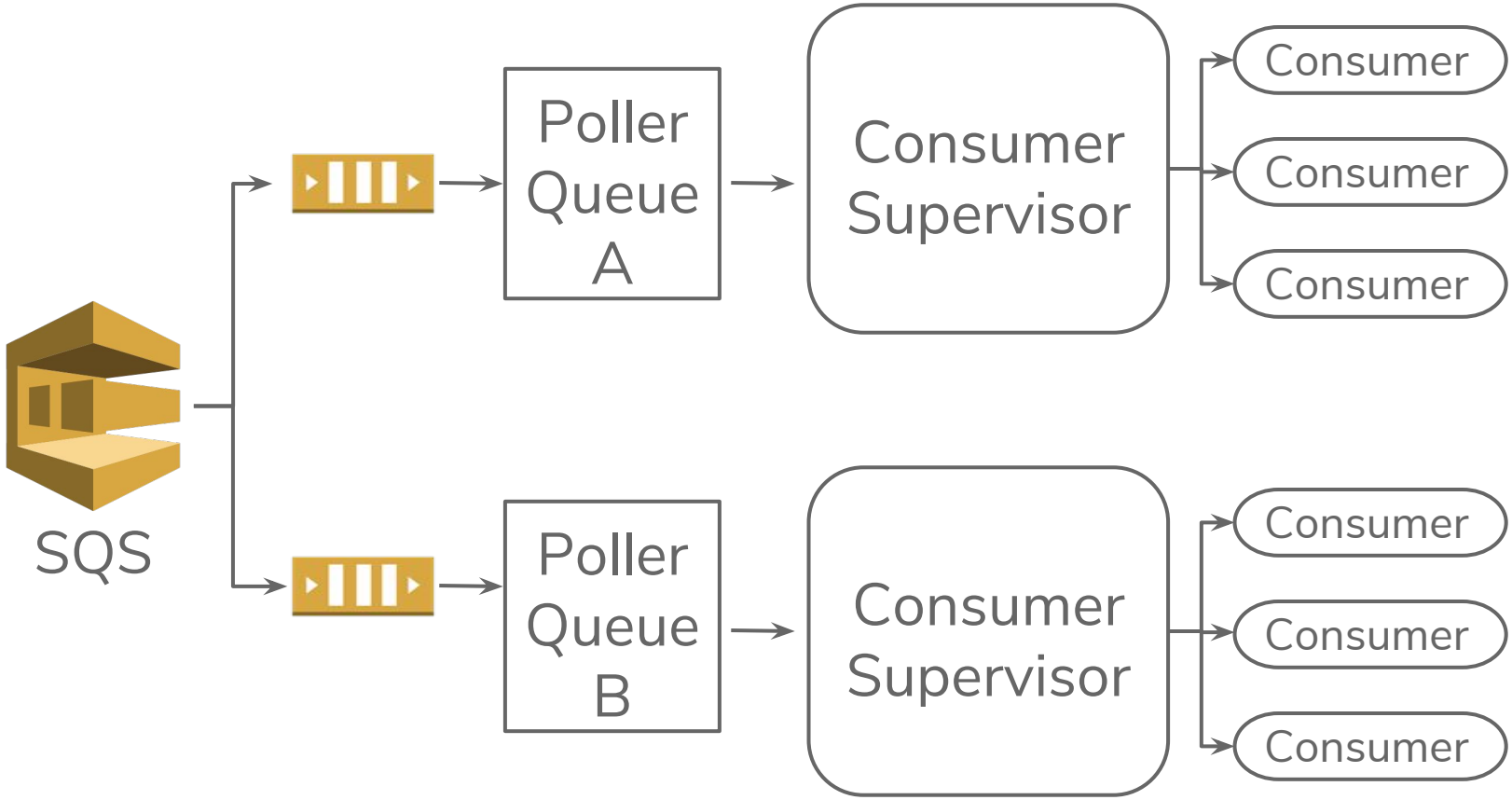

SQS
Poller Queue A
Poller Queue B


SQS
Poller Queue A
Consumer Supervisor
Poller Queue B
Consumer Supervisor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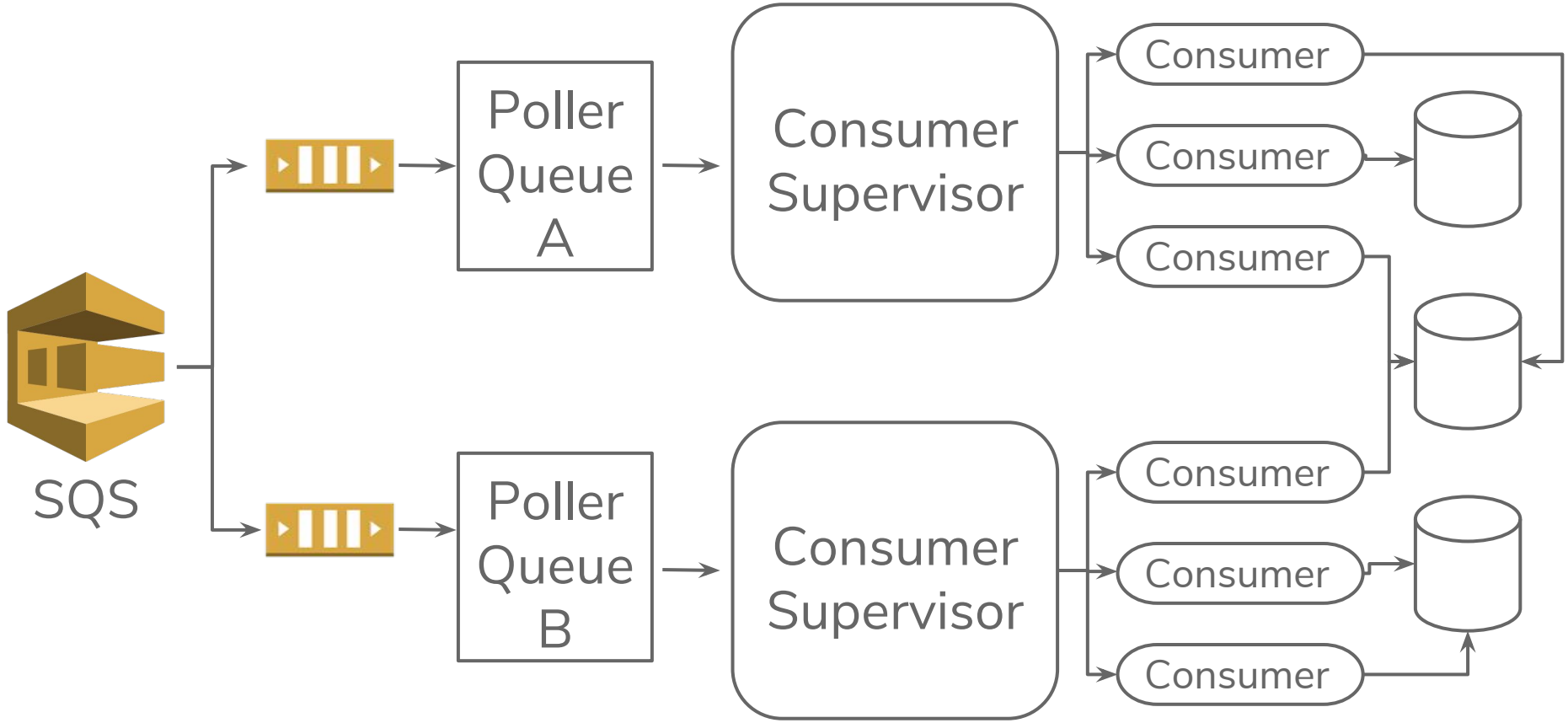
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Consumer
Consumer
Consumer
Consumer
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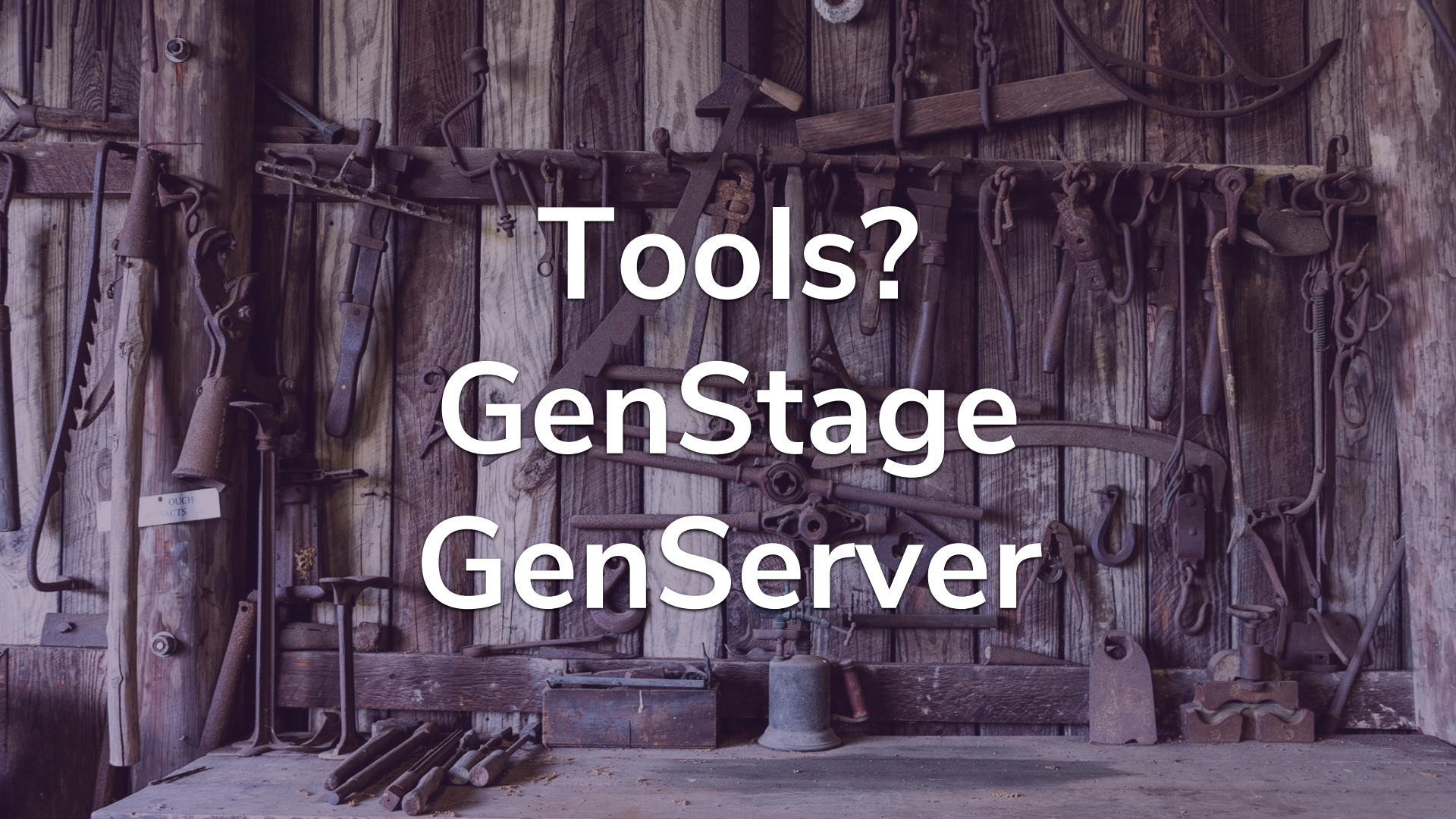
Consumer


Tools?



Tools?
GenStage
GenServer


why GenStage?


why GenStage?
back-pressure

1.

QUEUE CONSUMPTION

GenStage

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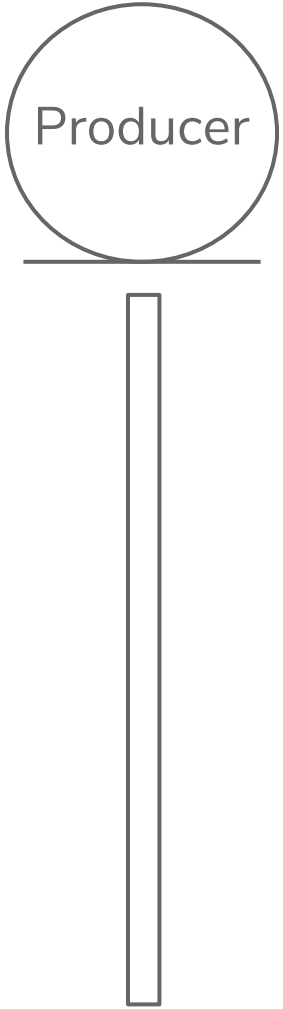
QUEUE CONSUMPTION

GenStage



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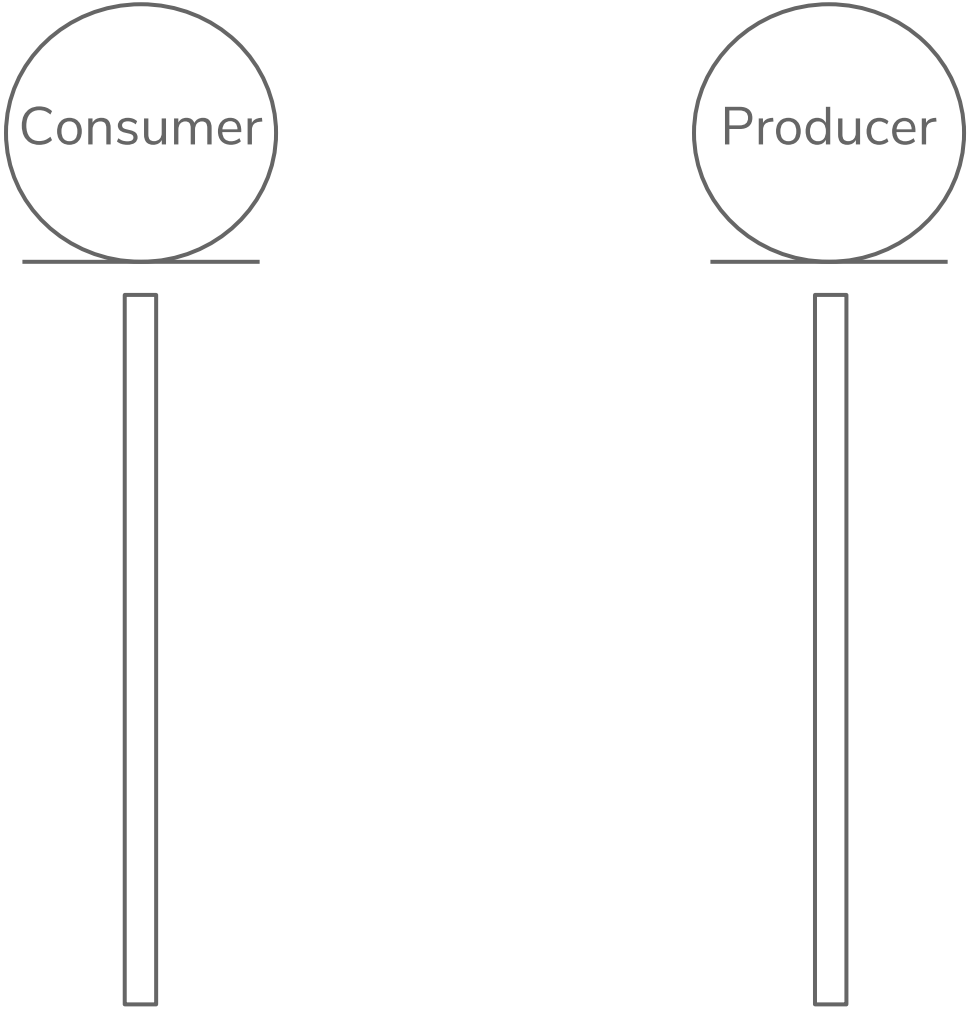
QUEUE CONSUMPTION

GenStage



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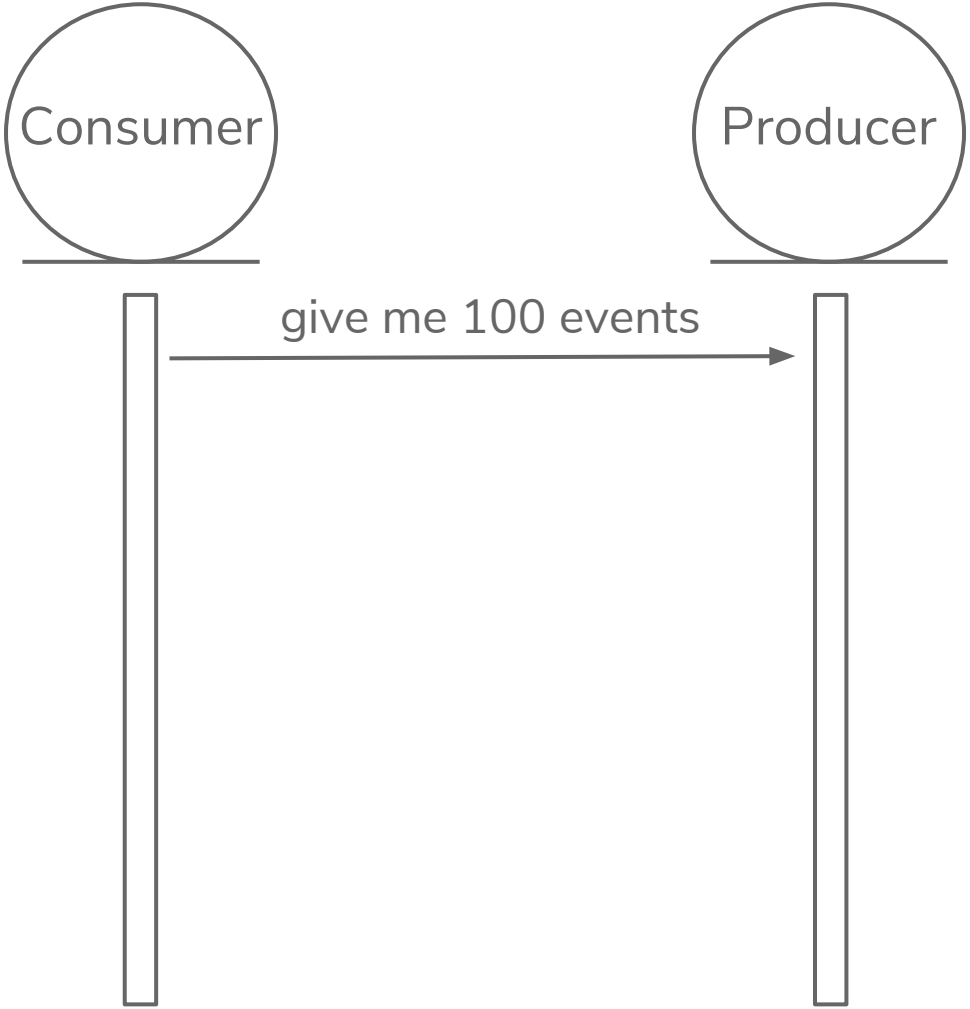

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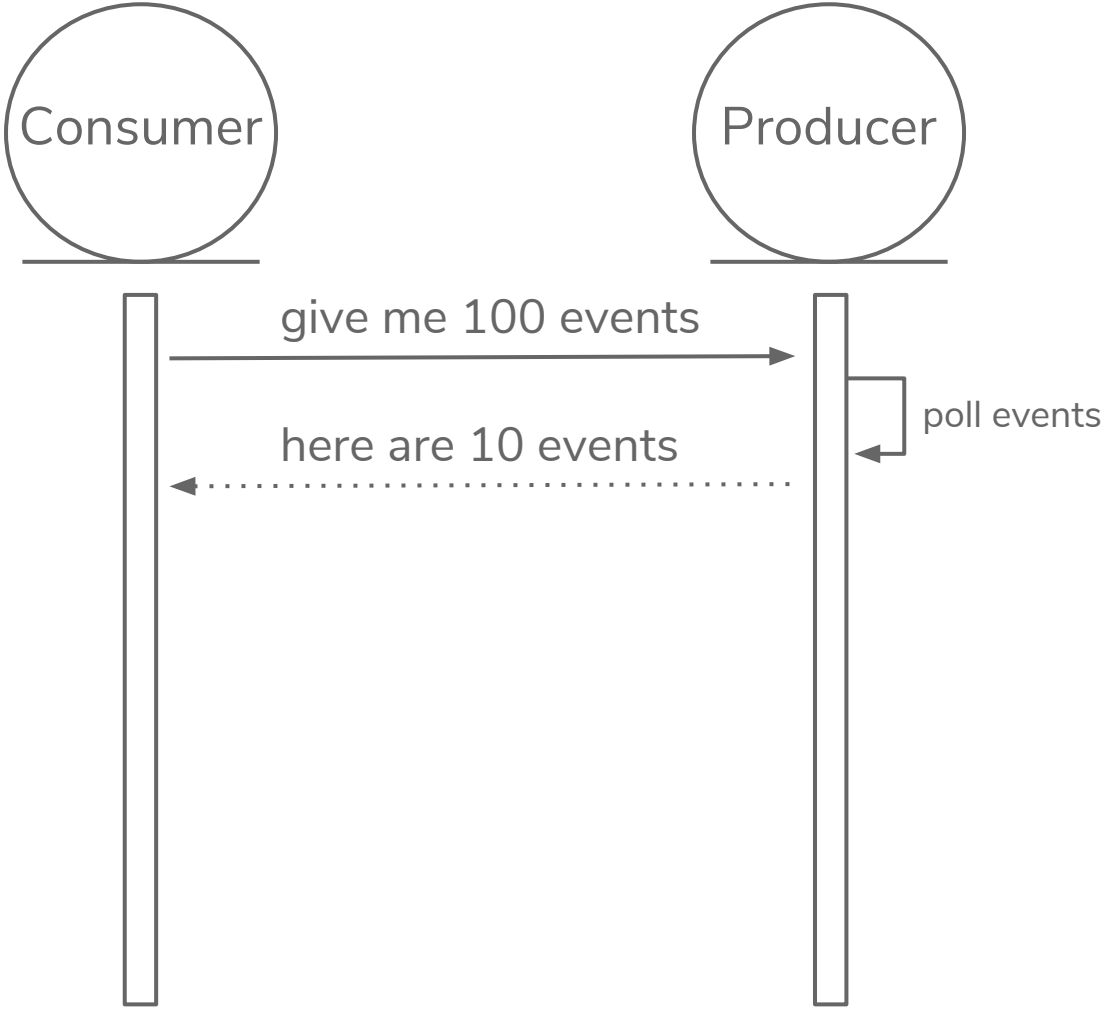

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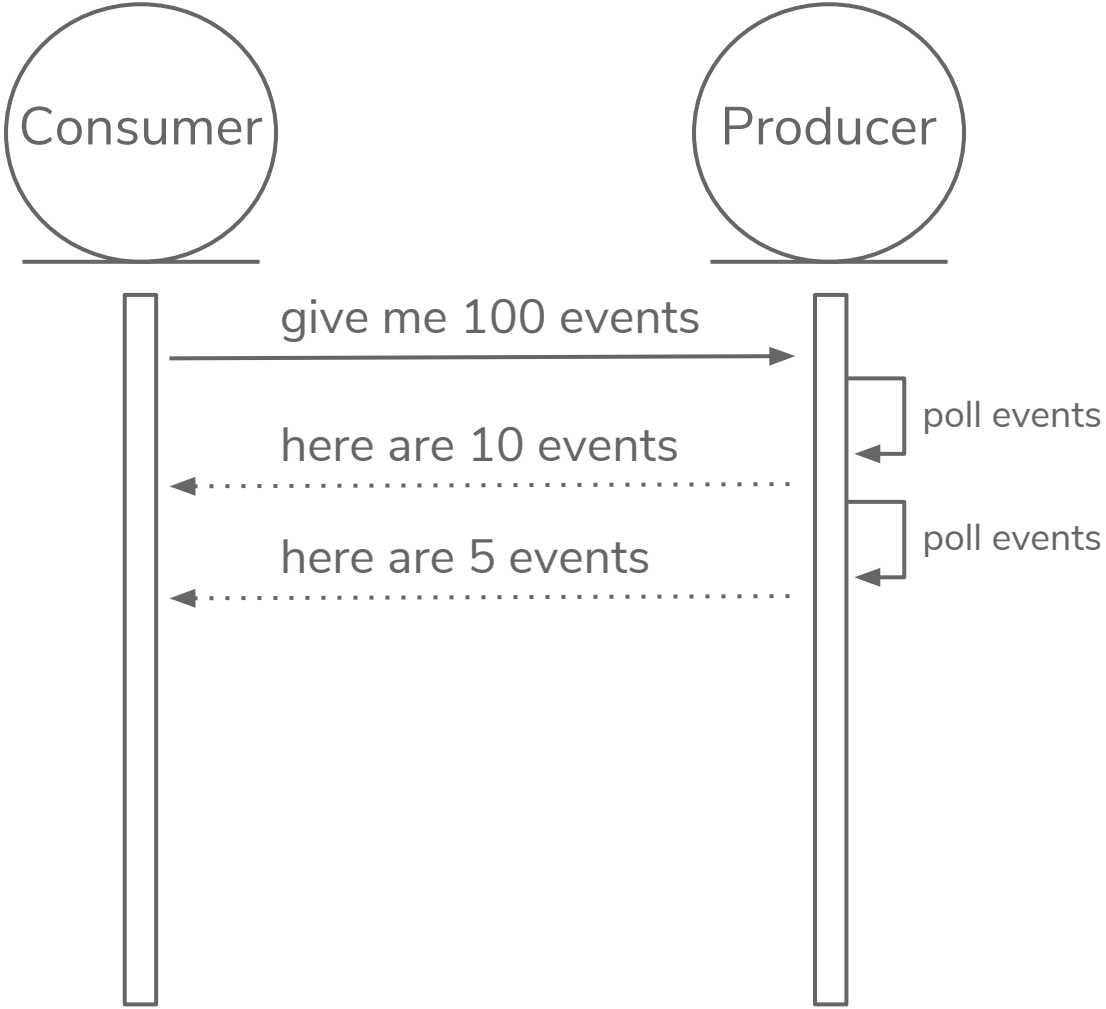

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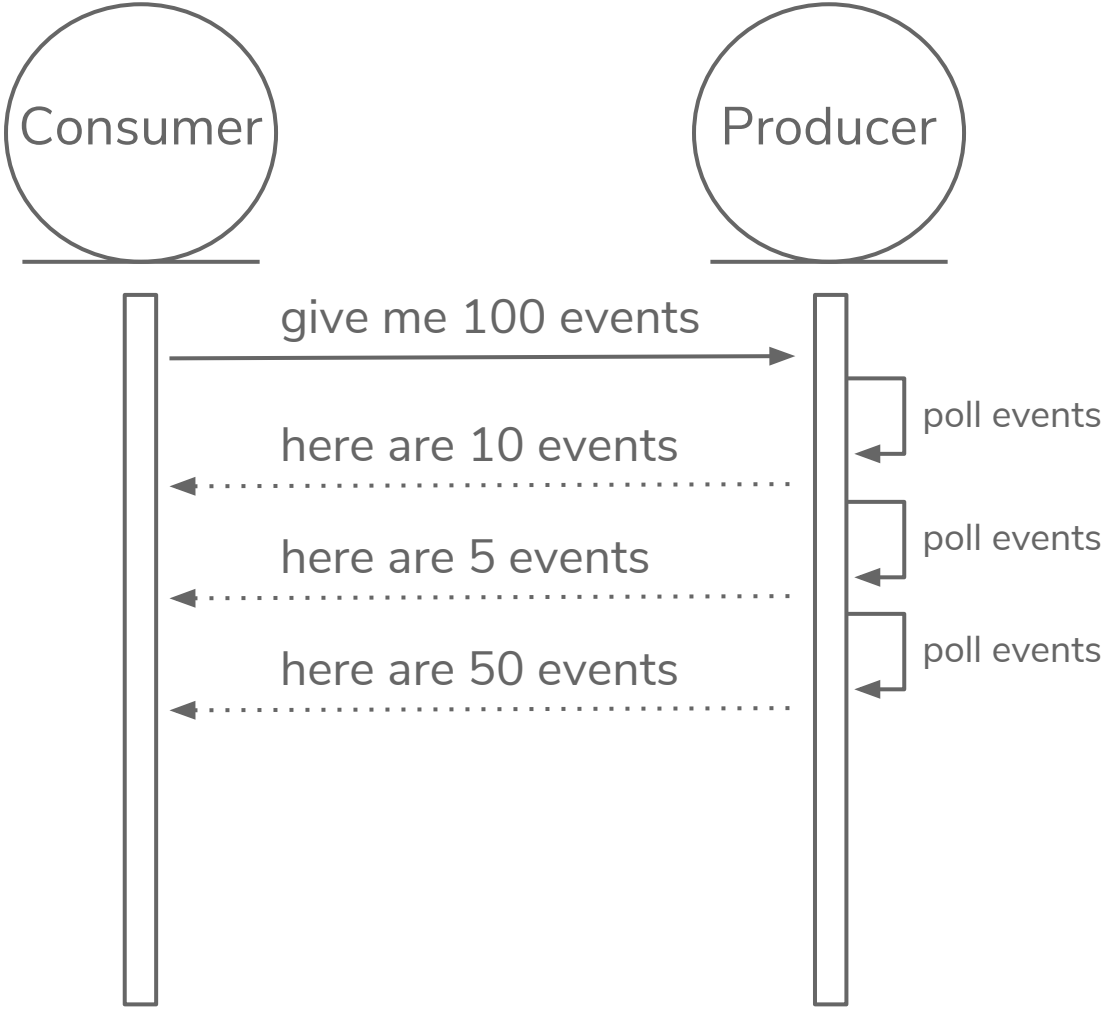

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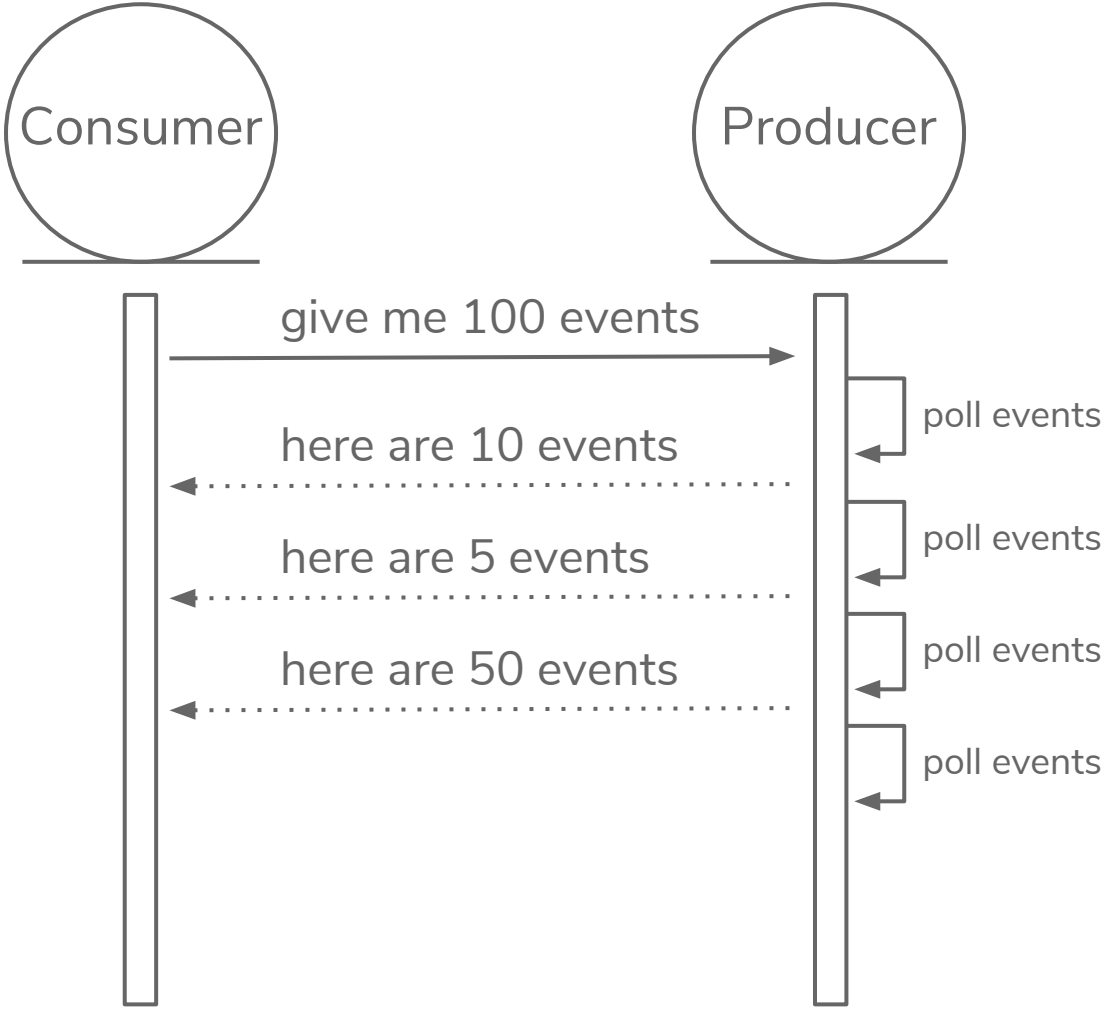

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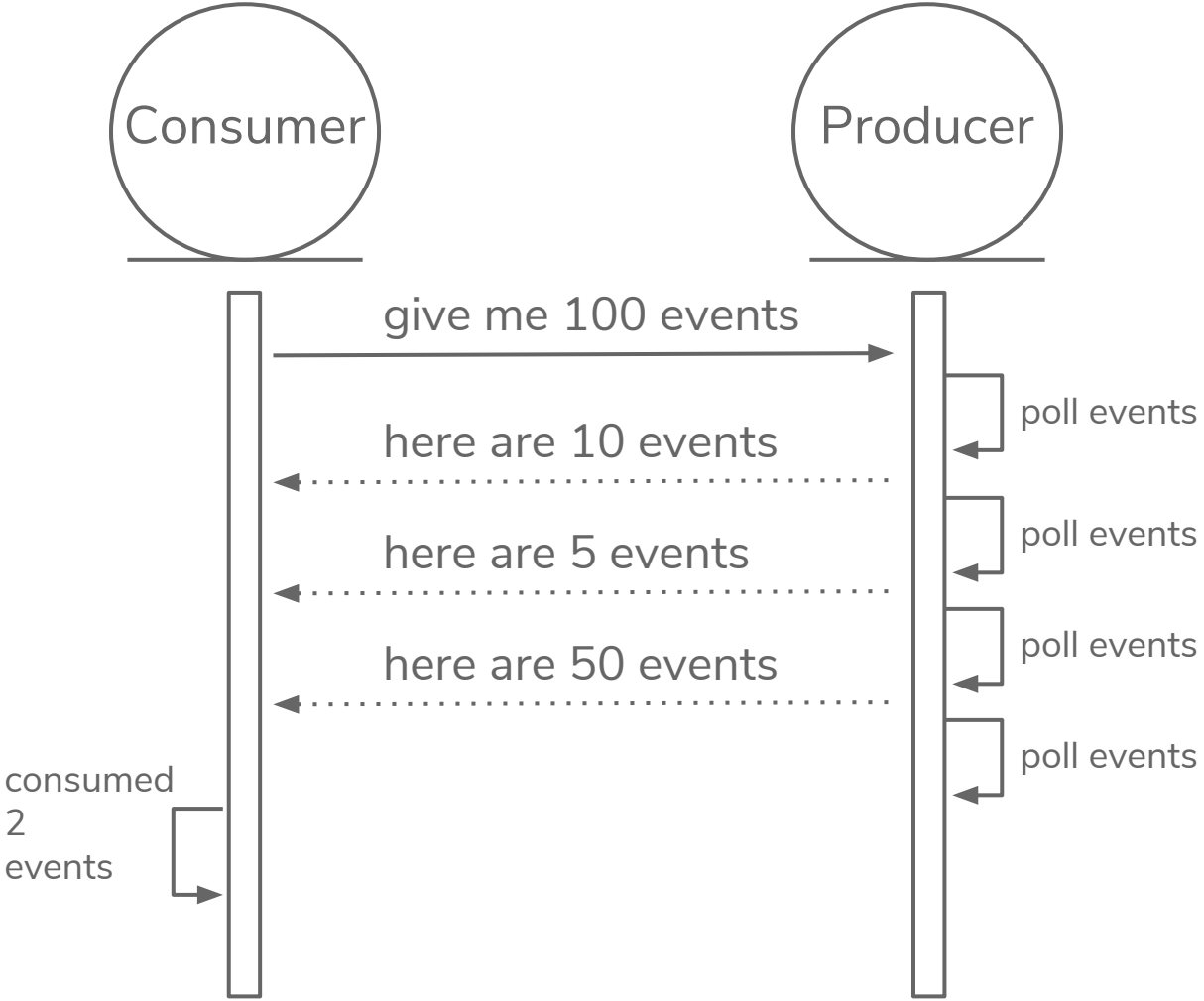

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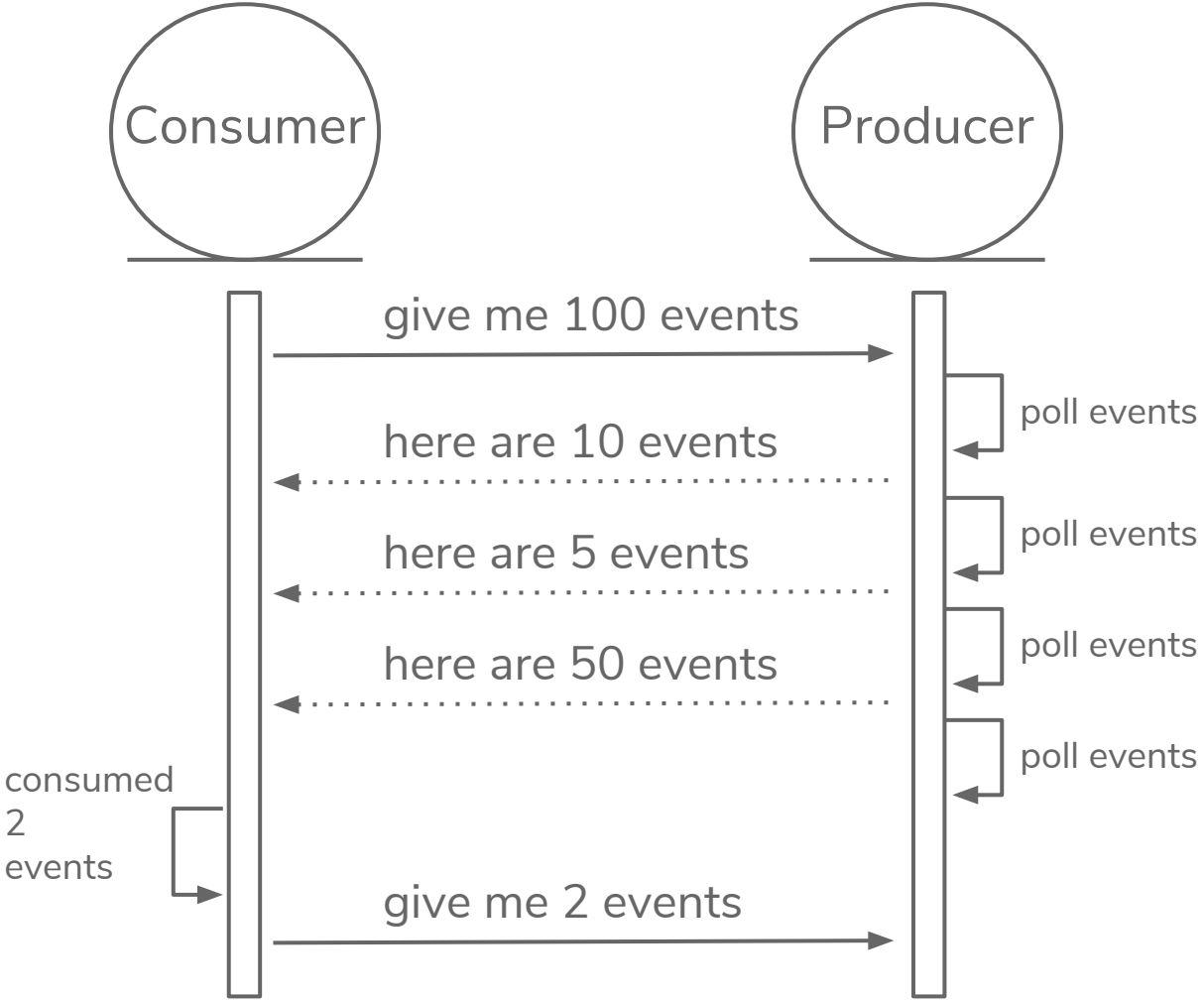

“

Talk is cheap. Show me the code.

Linus Torvalds

0.
CONFIG

```
config :octoconf,
  queues: [
    %{
      name: "stock",
      handler: Octoconf.Handlers.Product,
      concurrency: 10
    },
    %{
      name: "invoice",
      handler: Octoconf.Handlers.Order,
      concurrency: 20
    }
  ]
```

1.

QUEUE CONSUMPTION

GenStage

Producer

```
defmodule Octoconf.Queues.Poller do
  use GenStage
```

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QUEUE CONSUMPTION

GenStage

Producer

```
defmodule Octoconf.Queues.Poller do
  use GenStage
  ...

  def init(queue) do
    {
      :producer,
      %{queue: queue[:name],
        events: :queue.new,
        pending_demand:0}
    }
  end

  ...
```

1.

QUEUE CONSUMPTION

GenStage

Producer

```
defmodule Octoconf.Queues.Poller do
  use GenStage
  ...

  def init(queue) do
    {
      :producer,
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        pending_demand:0}
    }
  end

  def handle_demand(demand, state) do
    state = %{
      state | pending_demand: state.pending_demand + demand
    }
    dispatch_events(state, [])
  end

  ...
```

1.

QUEUE CONSUMPTION

GenStage

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defmodule Octoconf.Queues.Poller do
  use GenStage
  ...

  def init(queue) do
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        pending_demand:0}
    }
  end

  def handle_demand(demand, state) do
    state = %{
      state | pending_demand: state.pending_demand + demand
    }
    dispatch_events(state, [])
  end

  ...
```

1.

QUEUE CONSUMPTION

GenStage

Producer

```
def dispatch_events(%{pending_demand: 0} = state, to_dispatch) do
  do_dispatch_events(state, to_dispatch)
end
```

1.

QUEUE CONSUMPTION

GenStage

Producer

```
def dispatch_events(%{pending_demand: 0} = state, to_dispatch) do
  do_dispatch_events(state, to_dispatch)
end

def dispatch_events(state, to_dispatch) do
  case :queue.out(state.events) do
    {{:value, event}, events} ->
      state = %{
        state | events: events, pending_demand: state.pending_demand - 1
      }
      dispatch_events(state, [event | to_dispatch])

    {:empty, events} ->
      state = %{state | events: events}
      do_dispatch_events(state, to_dispatch)
  end
end
```

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QUEUE CONSUMPTION

GenStage

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    {:empty, events} ->
      state = %{state | events: events}
      do_dispatch_events(state, to_dispatch)
  end
end

defp do_dispatch_events(state, to_dispatch) do
  if state.pending_demand > 0, do: poll()
  to_dispatch = Enum.reverse(to_dispatch)
  {:noreply, to_dispatch, state}
end
```

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QUEUE CONSUMPTION

GenStage

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def dispatch_events(%{pending_demand: 0} = state, to_dispatch) do
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  end
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defp do_dispatch_events(state, to_dispatch) do
  if state.pending_demand > 0, do: poll()
  to_dispatch = Enum.reverse(to_dispatch)
  {:noreply, to_dispatch, state}
end
```

1.

QUEUE CONSUMPTION

GenStage

Producer

```
def poll do
  GenStage.cast(self(), :poll)
end

def handle_cast(:poll, state) do
  events =
    @adapter.receive_message(state.queue)
    |> Enum.reduce(state.events, fn msg, acc ->
      Map.put(msg, :queue, state.queue)
      |> :queue.in(acc)
    end)
  dispatch_events(%{state | events: events}, [])
end
```

STEPS

- ~~A queue needs to be consumed~~
- Each element must pass through a pipeline
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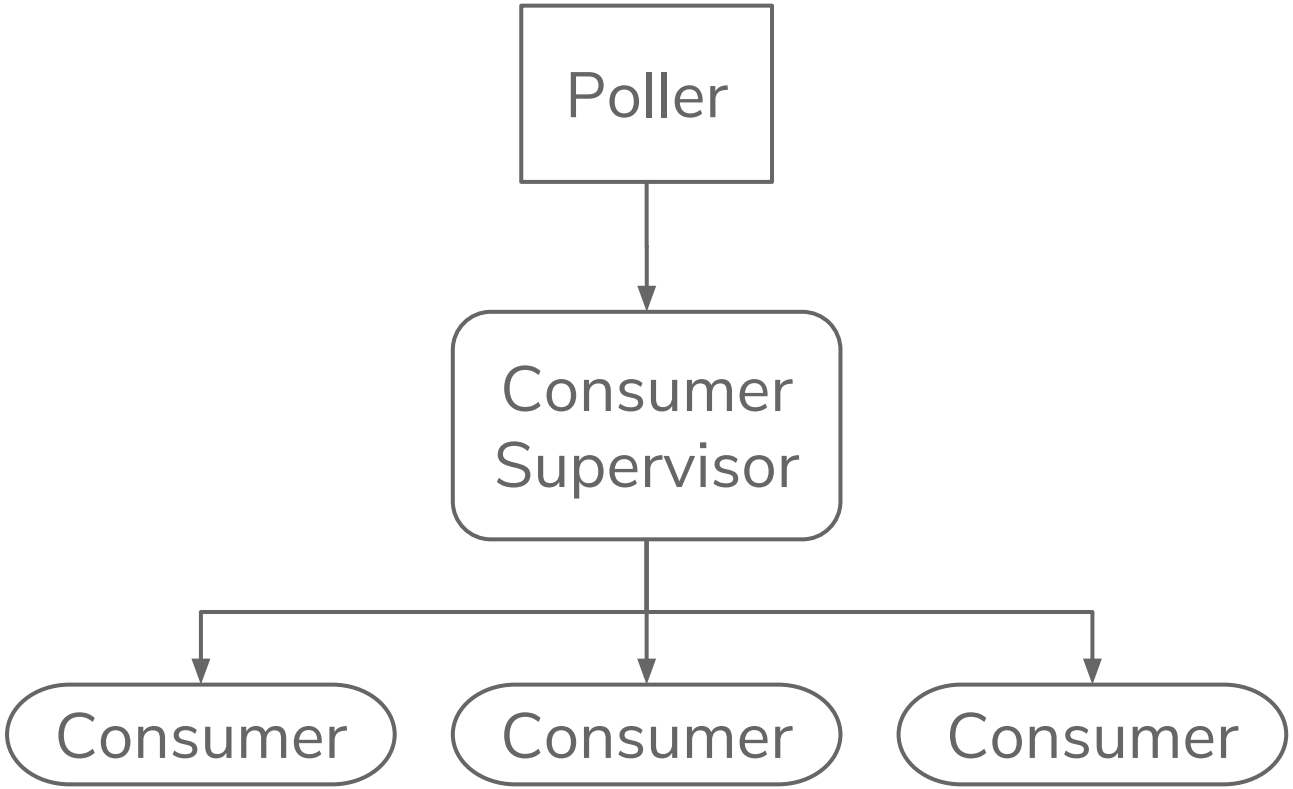
2.

CONSUME MESSAGE

GenStage

Consumer



2.

CONSUME MESSAGE

GenStage

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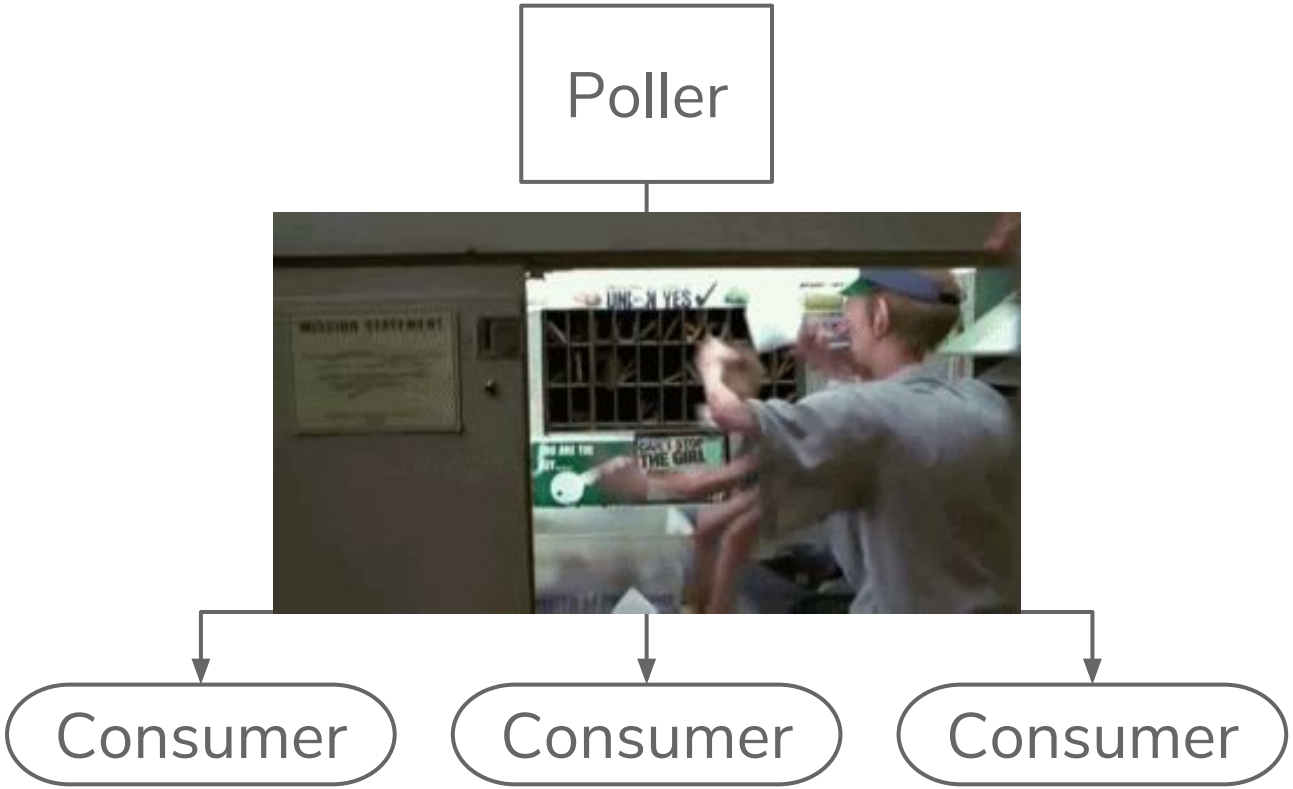

2.

CONSUME MESSAGE

GenStage

Consumer

```
defmodule Octoconf.Queues.Consumer do
  def start_link(queue) do
    import Supervisor.Spec
    children = [
      worker(queue[:handler], [], restart: :temporary)
    ]
    opts = [
      strategy: :one_for_one,
      subscribe_to: [
        {
          Octoconf.Registry.via_tuple(
            {Octoconf.Queues.Poller, queue[:name]}
          ),
          min_demand: 0,
          max_demand: queue[:concurrency]
        }
      ]
    ]
    ConsumerSupervisor.start_link(children, opts)
  end
end
```

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CONSUME MESSAGE

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          ),
          min_demand: 0,
          max_demand: queue[:concurrency]
        }
      ]
    ]
    ConsumerSupervisor.start_link(children, opts)
  end
end
```

2.

CONSUME MESSAGE

GenStage

Consumer

```
defmodule Octoconf.Handlers.Product do
  def start_link(message) do
    Task.start_link(__MODULE__, :handle, [message])
  end

  def handle(message) do
    message
    |> do_some
    |> real
    |> stuff
    |> here
    |> Octoconf.Dispatchers.Partner.add_message
  end
end
```

STEPS

- ~~A queue needs to be consumed~~
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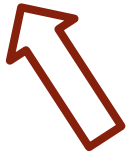

STEPS

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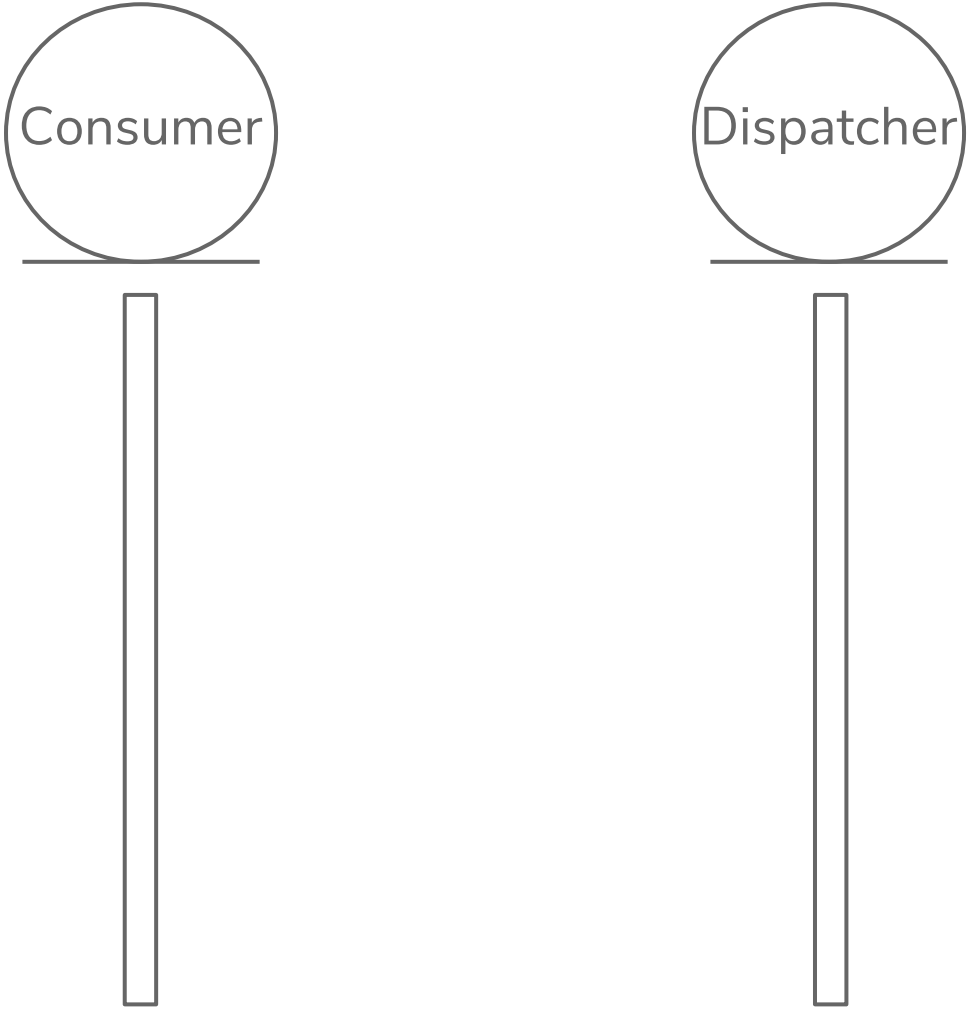
3.

DISPATCH MESSAGES

GenServer



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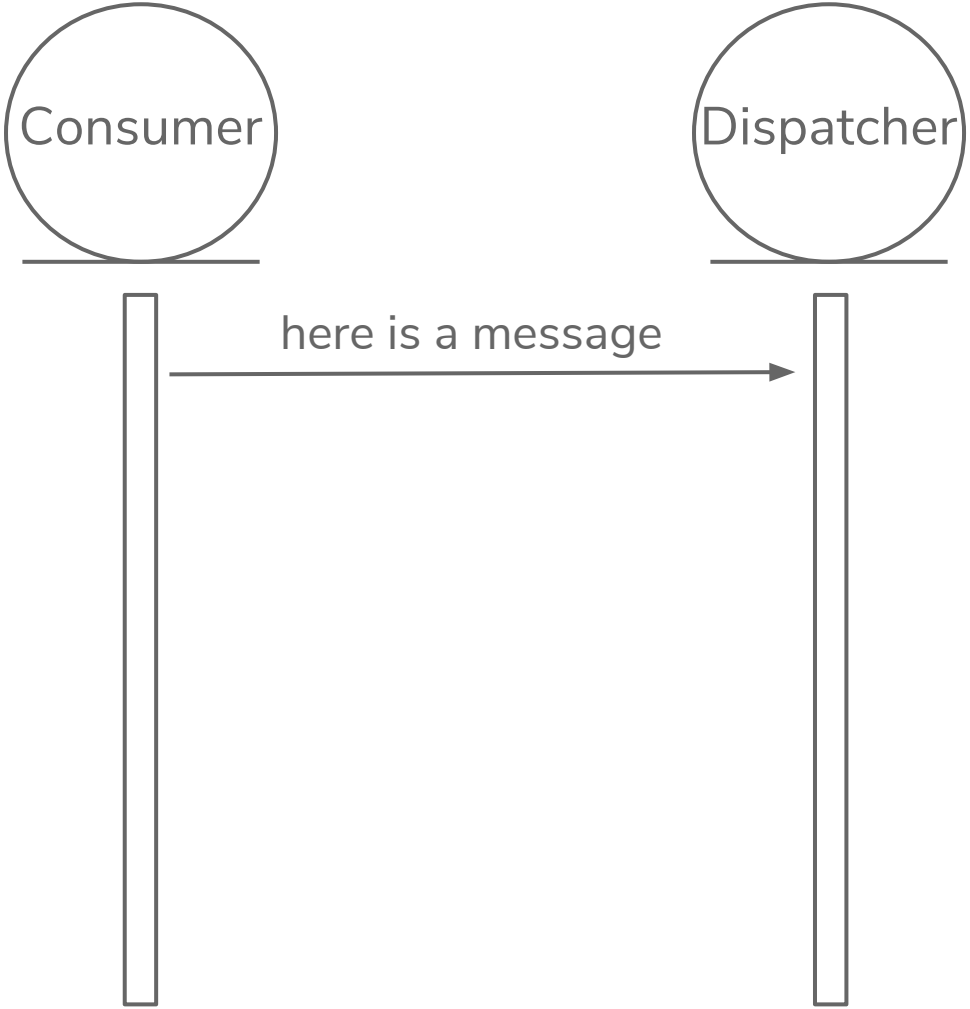

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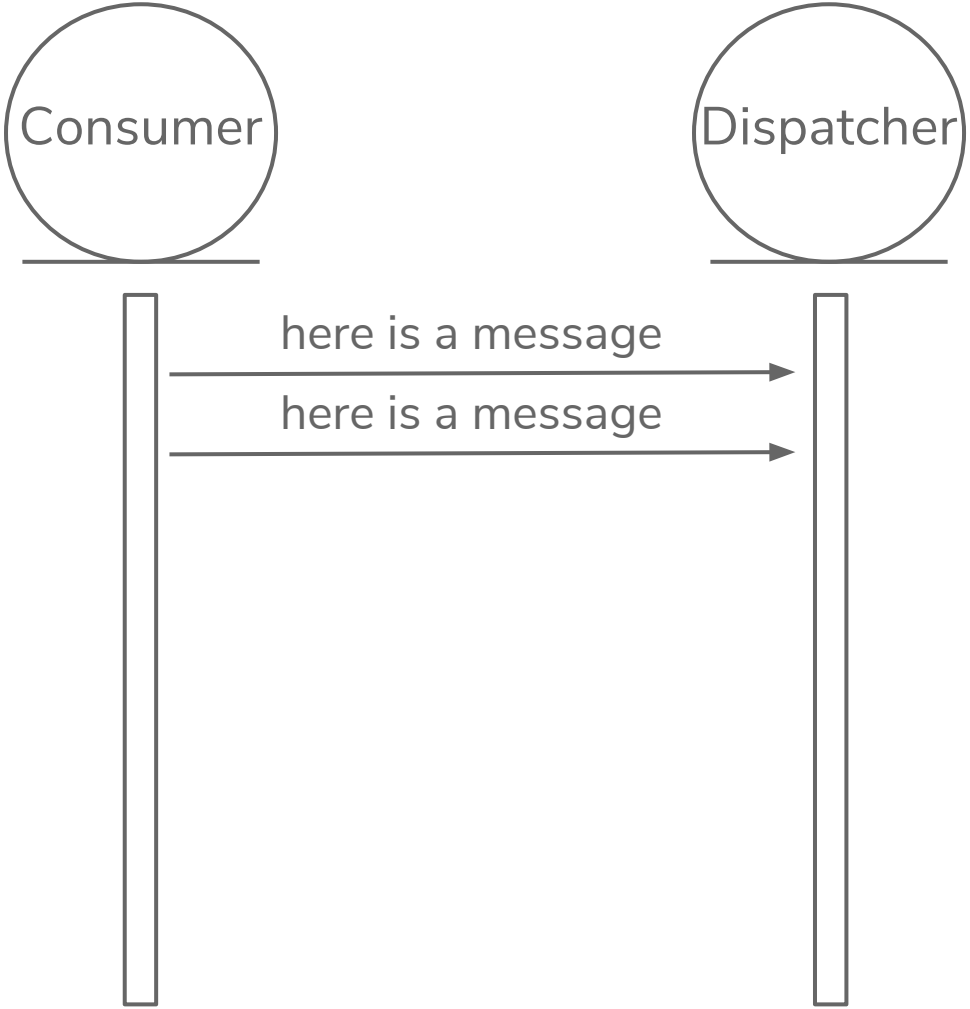

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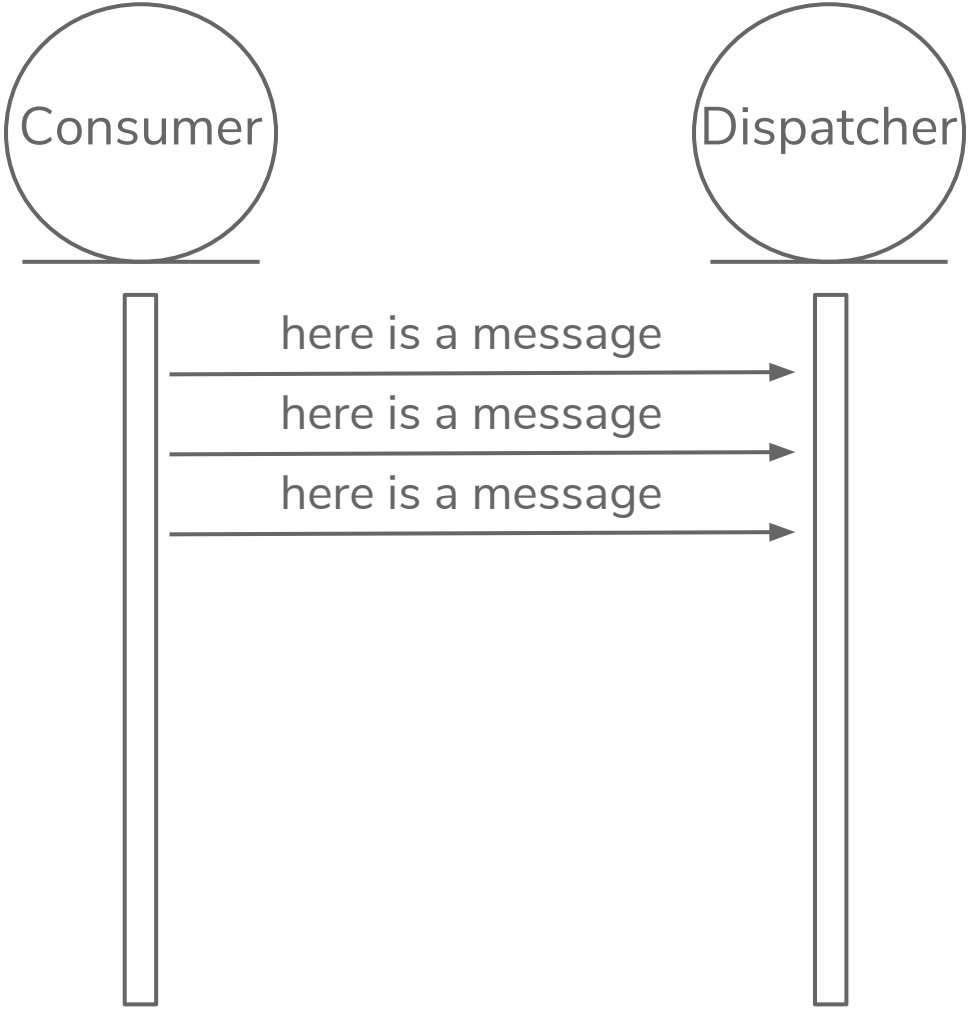

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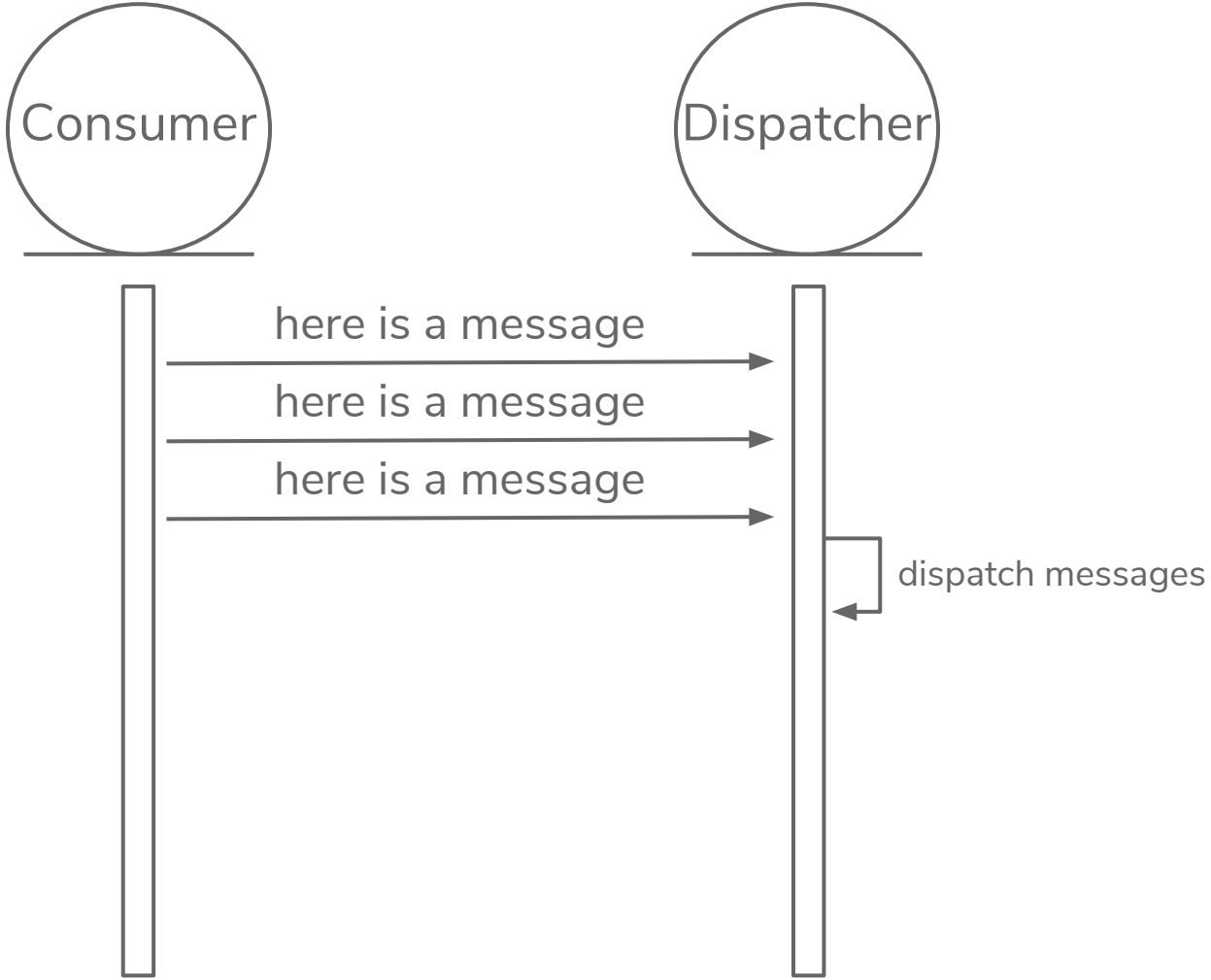

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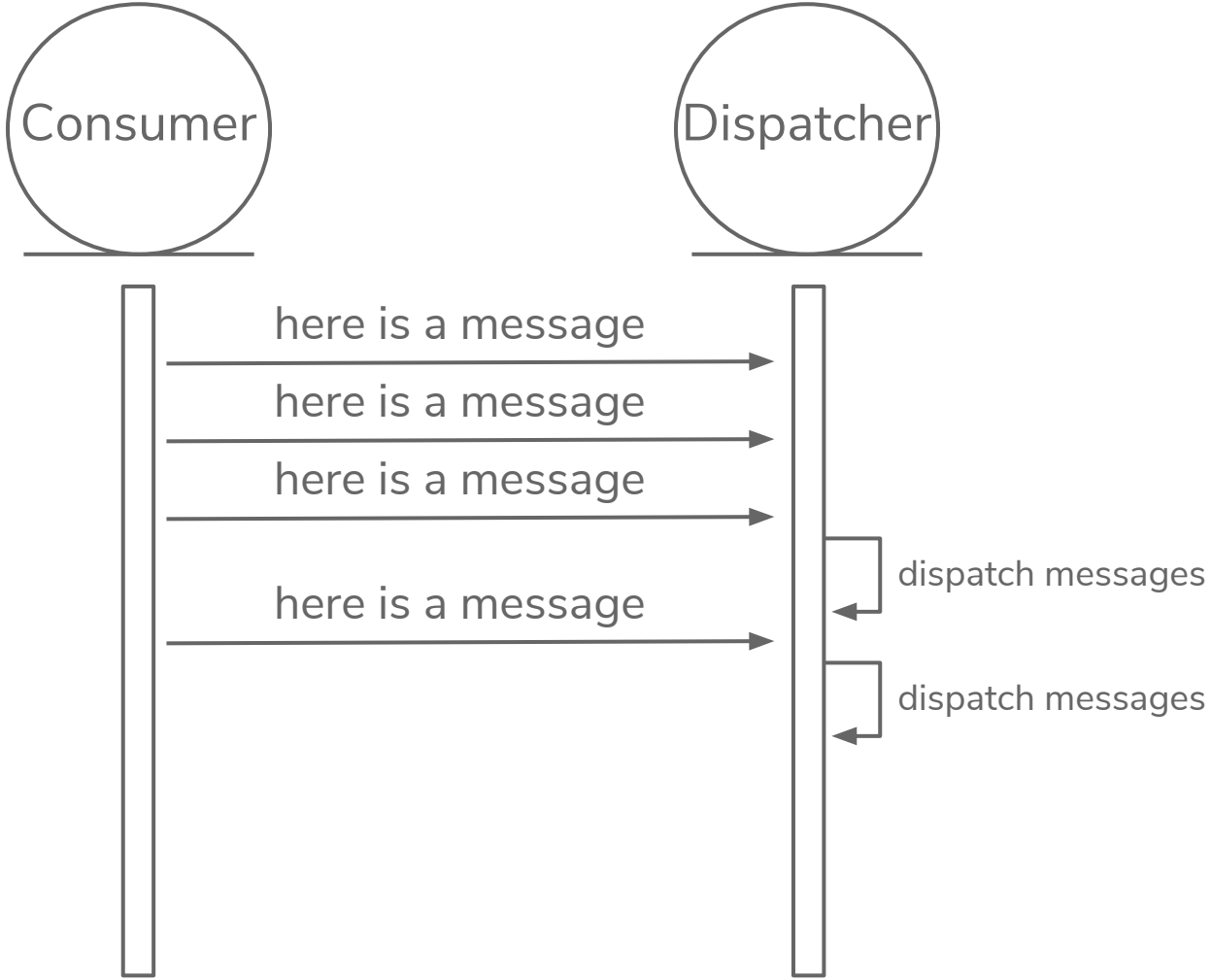

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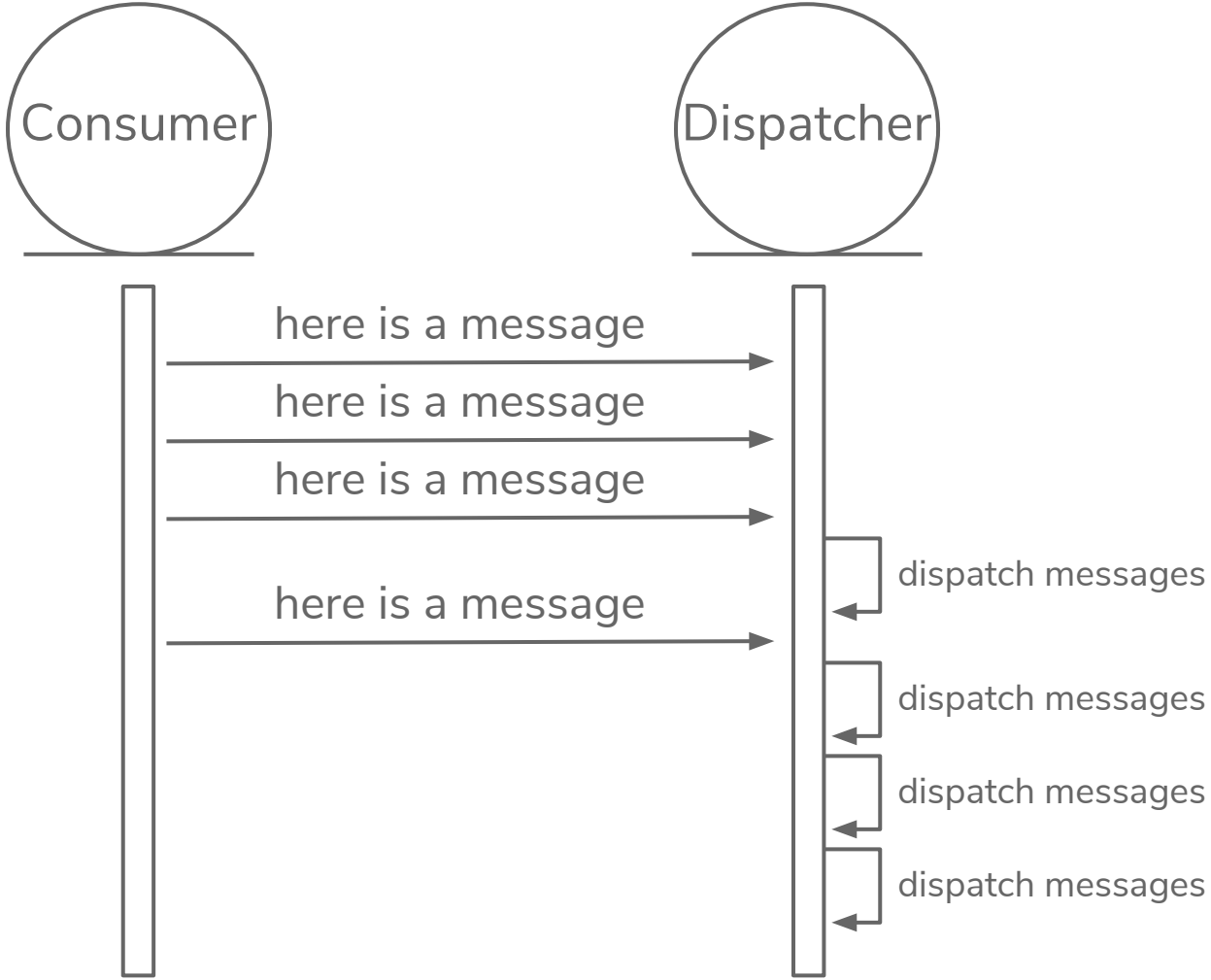

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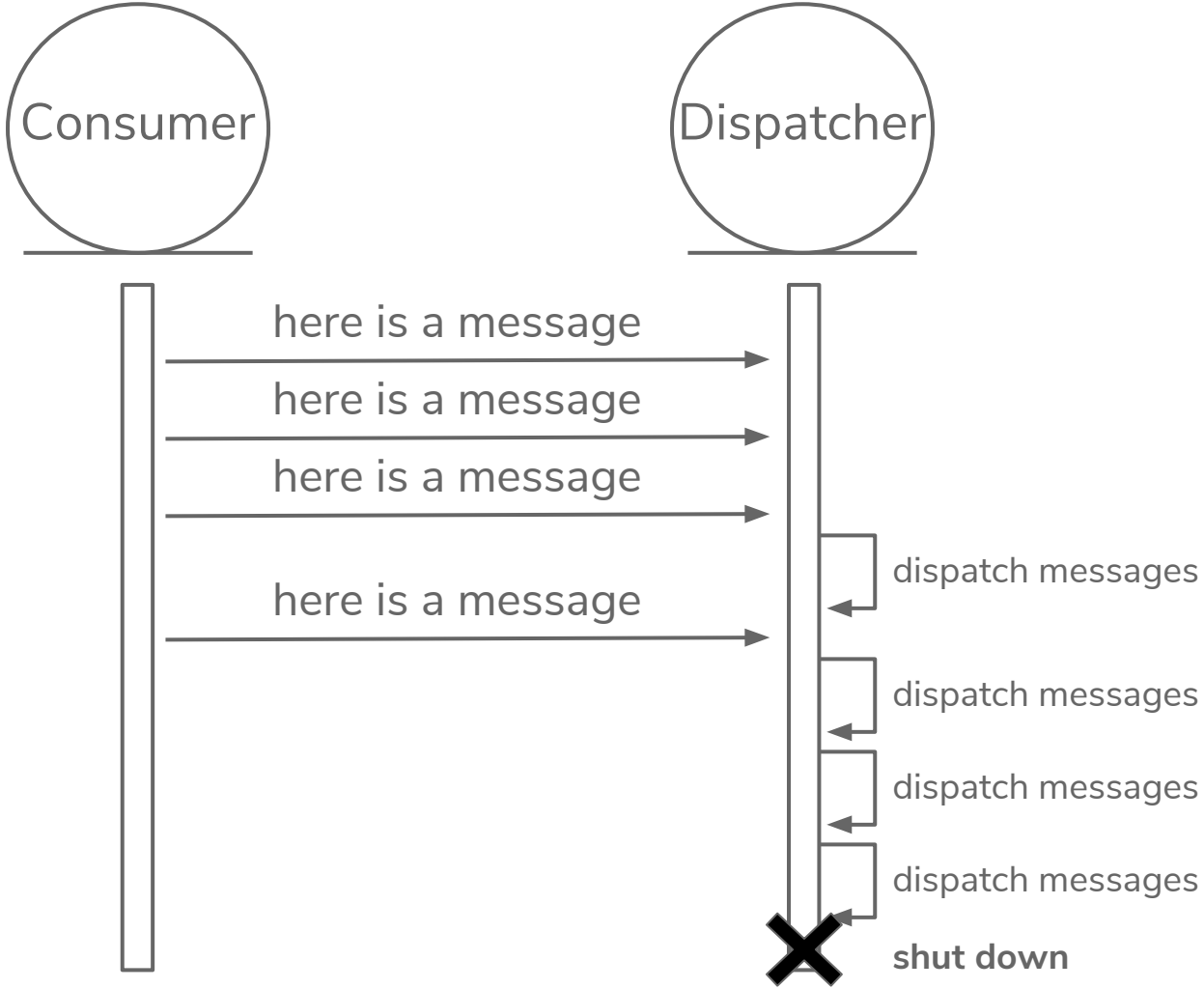

3.

DISPATCH MESSAGES

GenServer

```elixir
defmodule Octoconf.Dispatchers.Partner do

  ...

  def add_message(message) do
    name = process_name(message)
    unless Octoconf.Registry.exists_globally?(name) do
      Dispatchers.Supervisor.add_dispatcher(__MODULE__, name, message)
    end
    Octoconf.Registry.via_global_tuple(name)
    |> GenServer.cast({:add_message, message})
  end

  def handle_cast({:add_message, message}, state) do
    state = %{state | events: :queue.in(message, state.events)}
    {:noreply, state}
  end

  ...

end
```

3.

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    end
    Octoconf.Registry.via_global_tuple(name)
    |> GenServer.cast({:add_message, message})
  end

  def handle_cast({:add_message, message}, state) do
    state = %{state | events: :queue.in(message, state.events)}
    {:noreply, state}
  end

  ...

end
```

3.

DISPATCH MESSAGES

GenServer

```
defmodule Octoconf.Dispatchers.Partner do
  ...

  def init(message) do
    send(self(), :dispatch_events)
    {
      :ok,
      %{
        account: message.body[:account],
        queue: message[:queue],
        events: :queue.new,
        empty_dispatch: 0
      }
    }
  end

  ...
end
```

3.

DISPATCH MESSAGES

GenServer

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  ...

  def init(message) do
    send(self(), :dispatch_events)
    {
      :ok,
      %{
        account: message.body[:account],
        queue: message[:queue],
        events: :queue.new,
        empty_dispatch: 0
      }
    }
  end

  ...
end
```

3.

DISPATCH MESSAGES

GenServer

```
def handle_info(:dispatch_events, state) do
  state = dispatch_events(state)
  if state.empty_dispatch >= @empty_dispatch_limit do
    {:stop, :normal, state}
  else
    Process.send_after(
      self(),
      :dispatch_events,
      @dispatch_timeout
    )
    {:noreply, state}
  end
end
```

STEPS

- ~~A queue needs to be consumed~~
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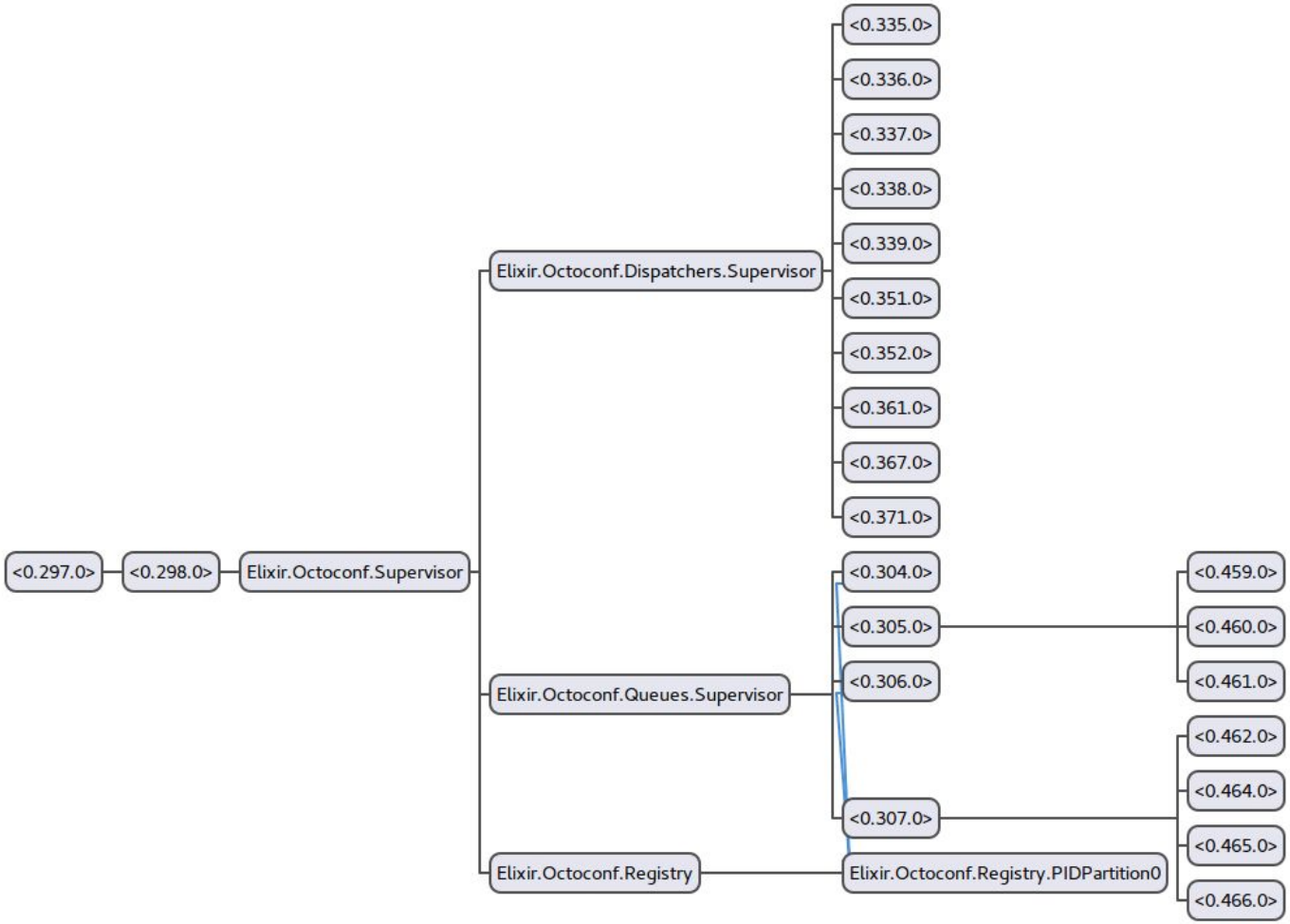
<0.297.0>
<0.298.0>
Elixir.Octoconf.Supervisor
Elixir.Octoconf.Dispatchers.Supervisor
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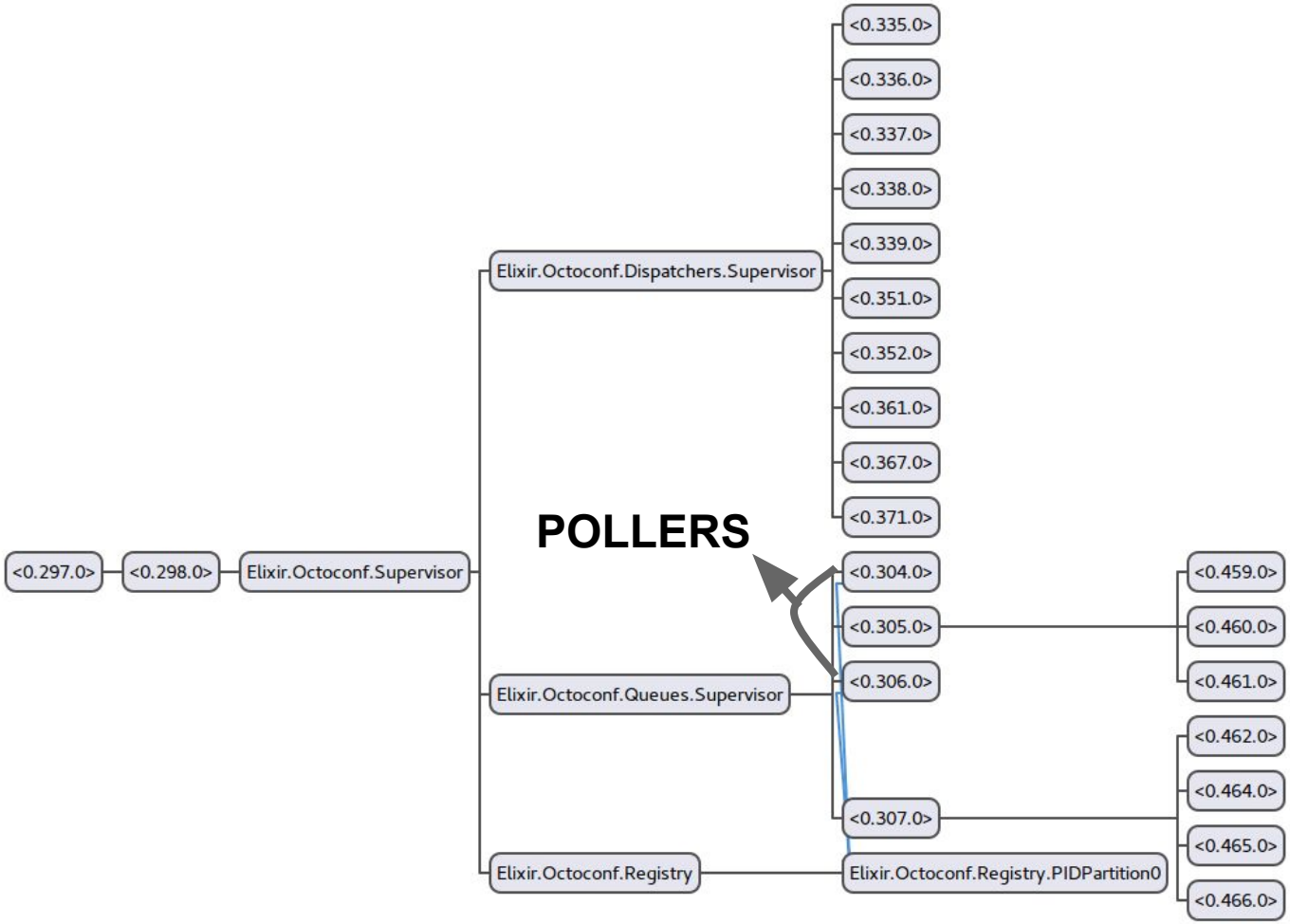
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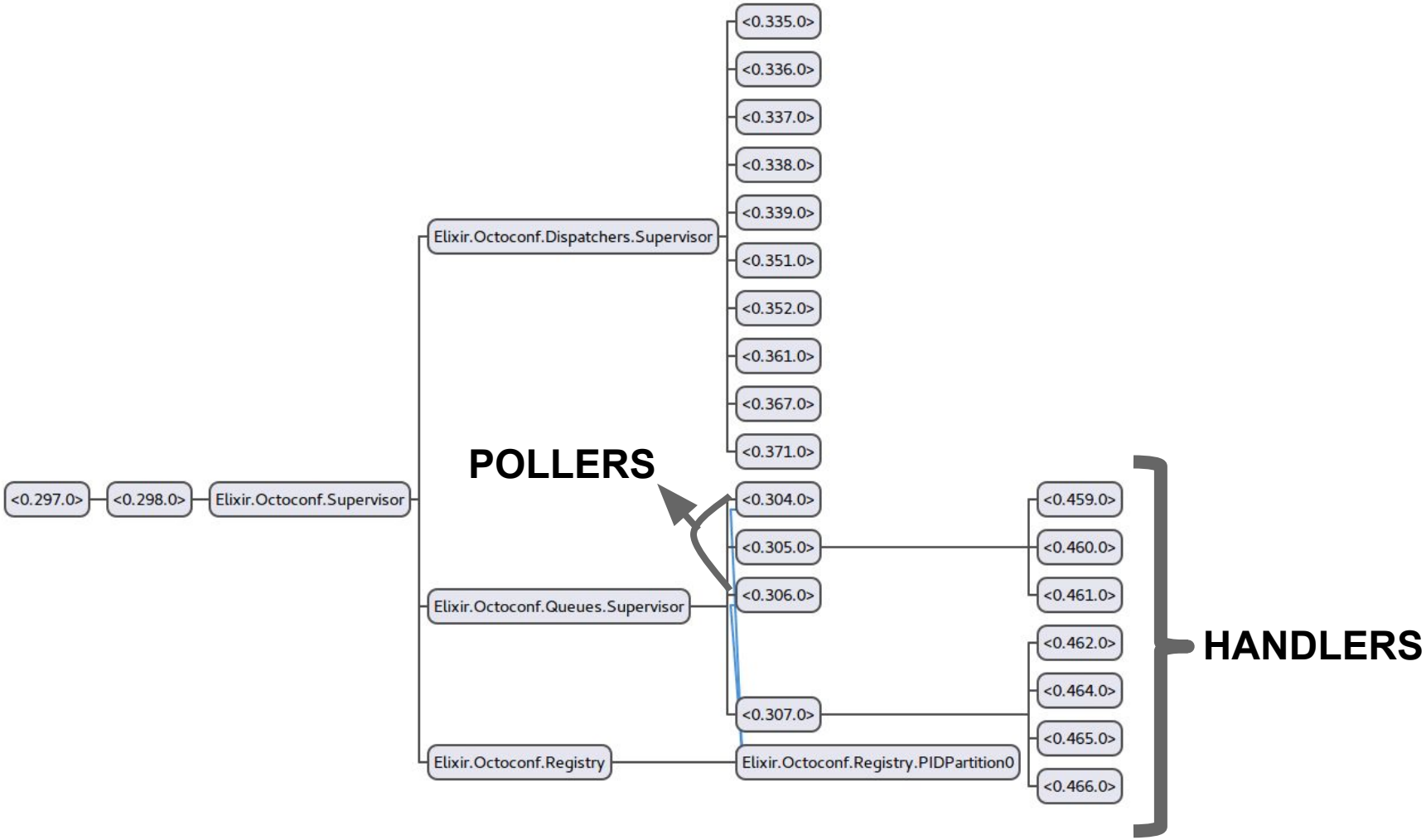
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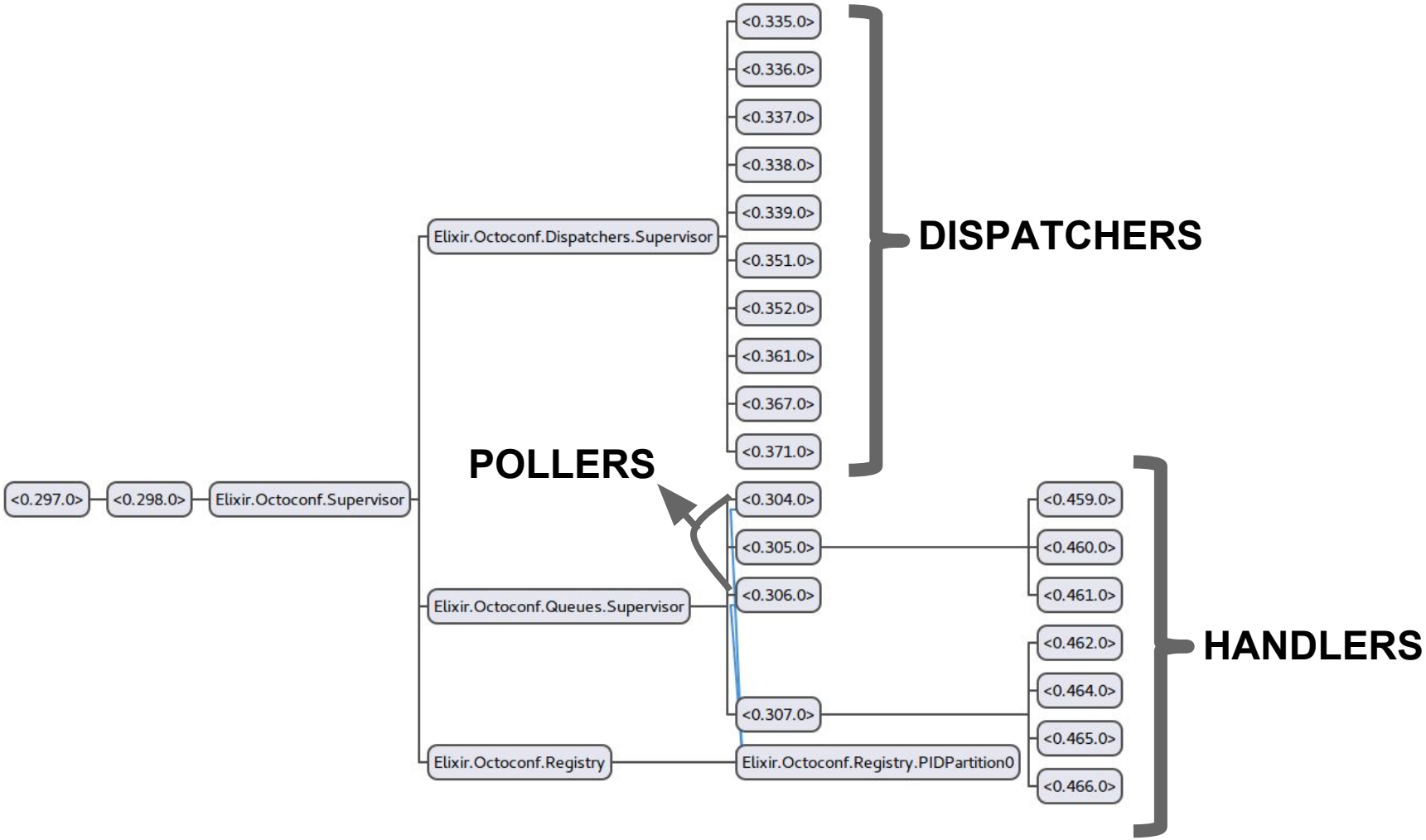
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HANDLERS

STATS

~ 17M msg/day

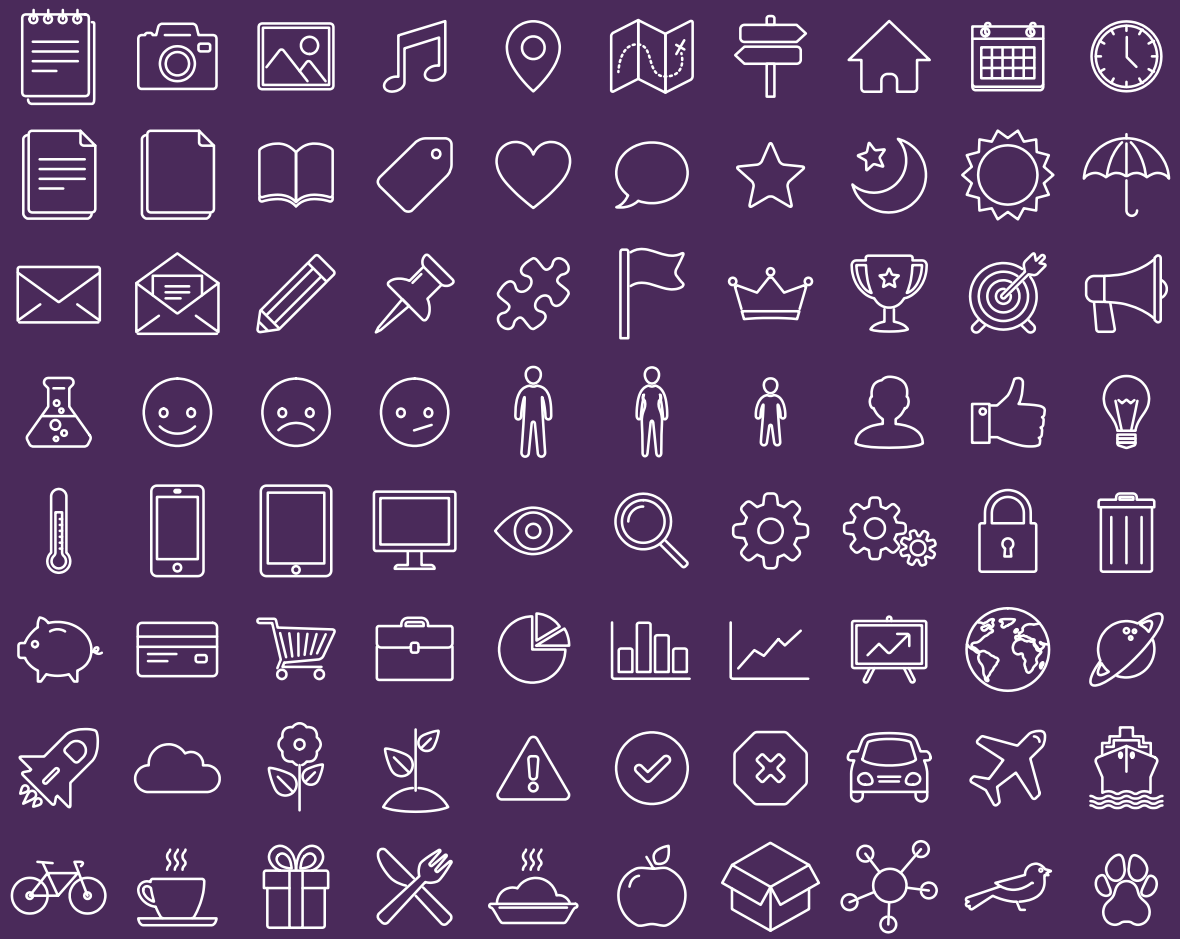
~ 19.3M req/day

~ 2.9K buckets

Obrigad☺

https://github.com/dojusa/octoconf

@dojusa



SlidesCarnival icons are editable shapes.

This means that you can:

- Resize them without losing quality.
- Change line color, width and style.

Isn't that nice? :)

Examples: