Supervisor Workshop

https://github.com/bgmarx/elixirconf_workshop.git

Supervisor Workshop

Links, Monitors and Tasks

What is the state of the system?

Good State

Bad State

What is the state of the system?

What is the state of the system?

What is the state of the system?

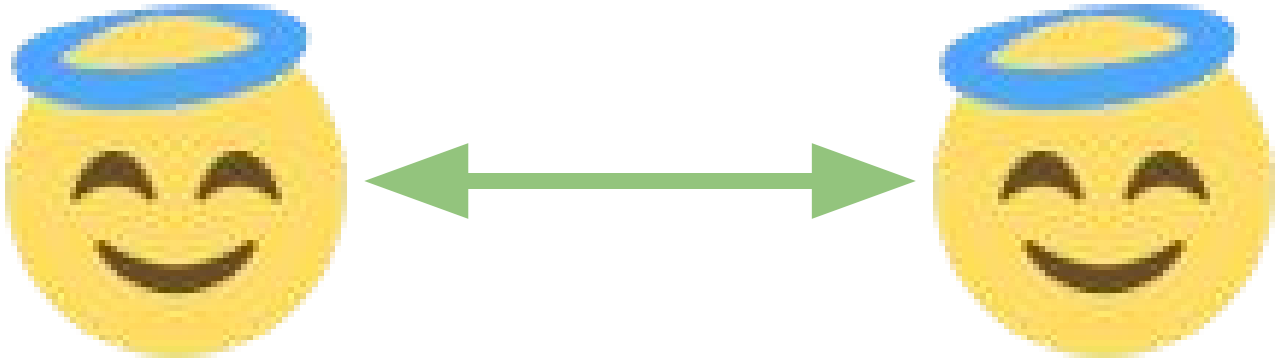
Let it crash

- ANY process can enter BAD state at ANY time
- ANY process can crash at ANY time
- ANY process depending on a crashed process can enter BAD state
- Crash ANY process in BAD state
- Restart ANY crashed process to GOOD state

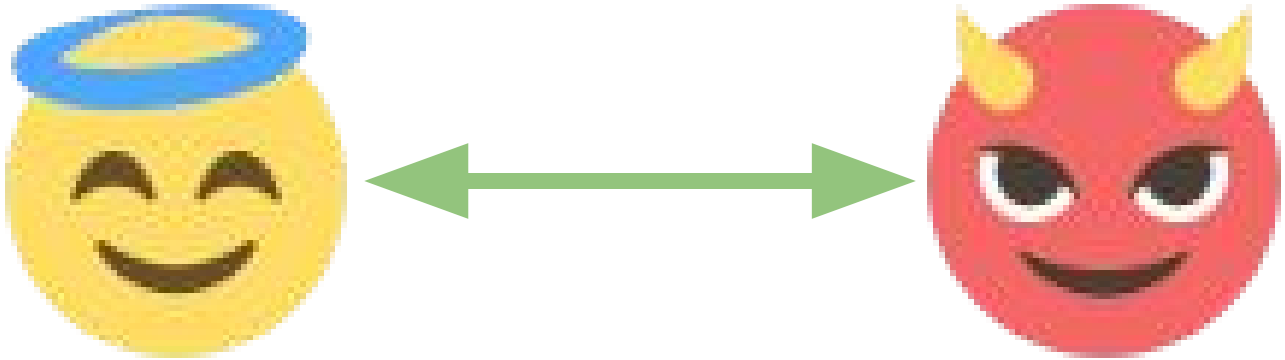
Links

- Bidirectional relationship between two processes
- spawn_link/1,3
- Process.link/1
- Process.unlink/1

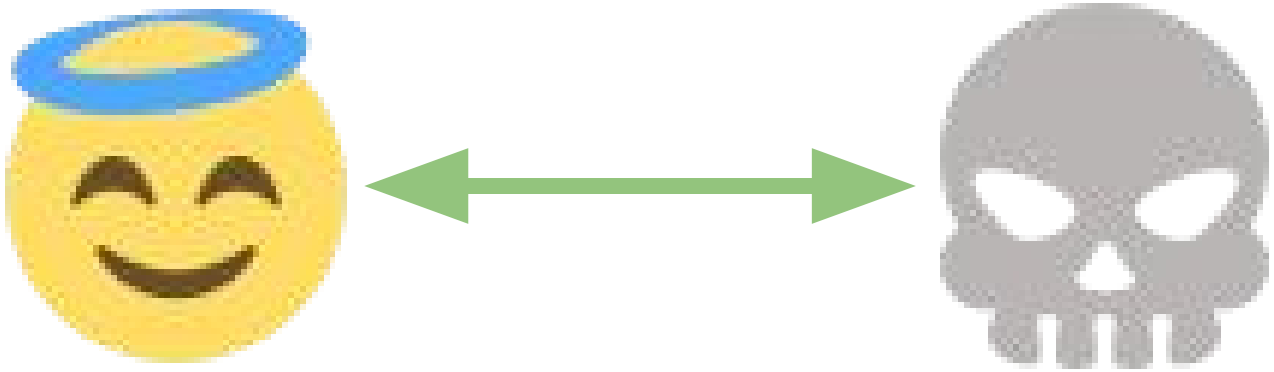
Links



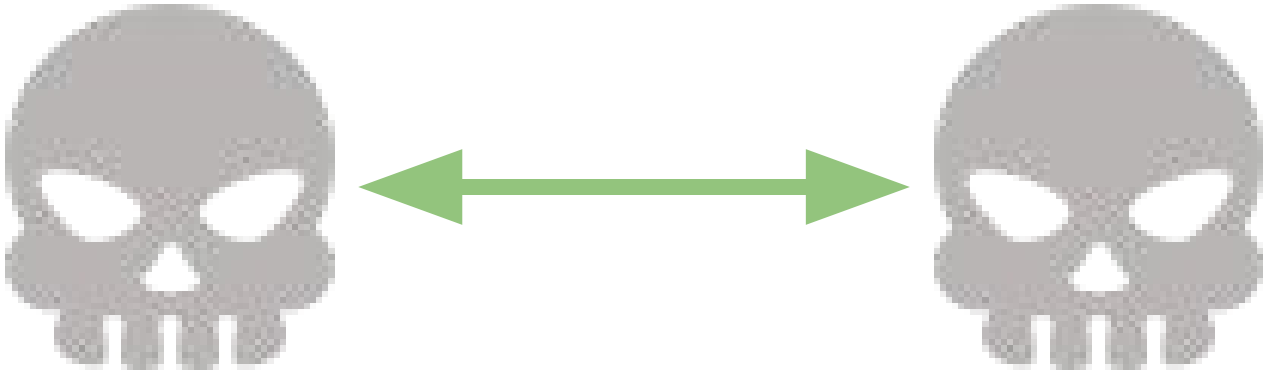
Links



Links



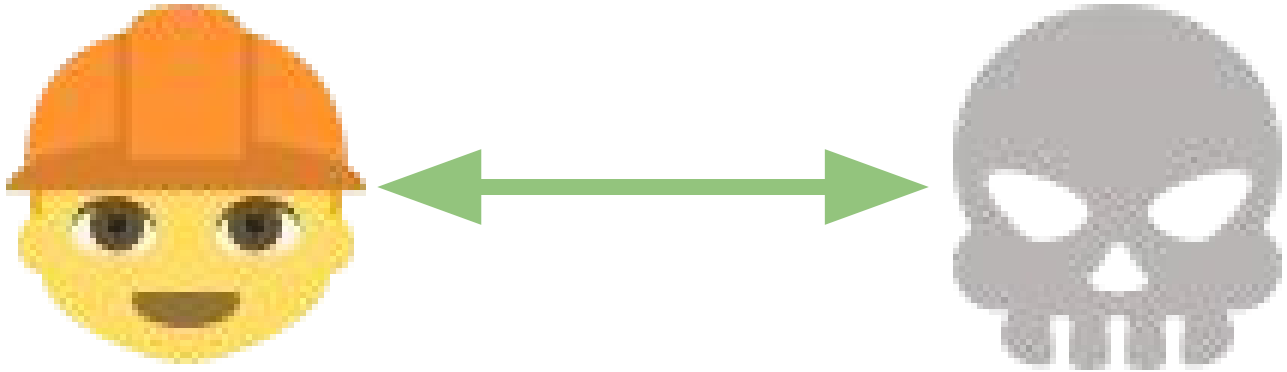
Links



Trapping exits

- Process.flag(:trap_exit, true)
- {:EXIT, pid, reason}
- Process.exit/2

Trapping exits



Trapping exits

Exit reasons

- :normal
- :killed (:kill)
- :shutdown or {:shutdown, reason}
- :noproc
- :noconnect
- {%exception{}, stacktrace}
- other_reason

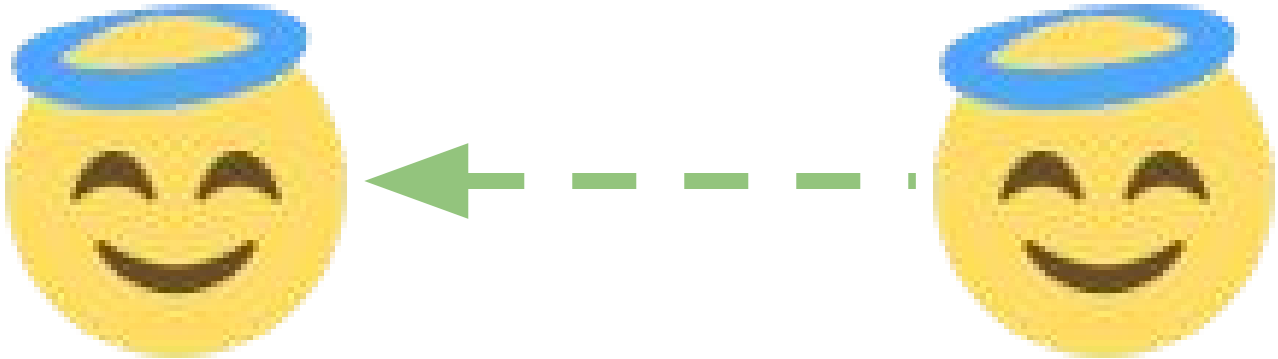
Exceptions

- RuntimeError
- MatchError
- FunctionClauseError
- UndefinedFunctionError
- CaseClauseError
- ArgumentError
- KeyError

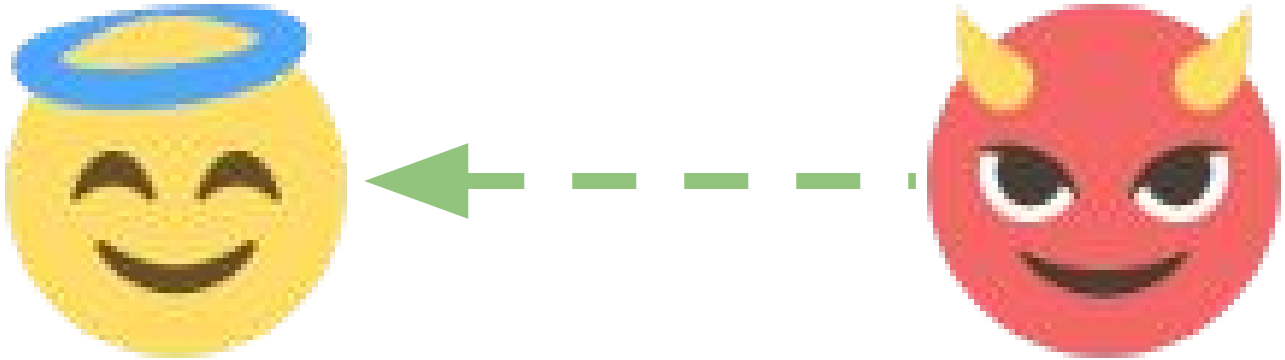
Monitors

- Unidirectional relationship between two processes
- spawn_monitor/1,3
- Process.monitor/1
- Process.demonitor/1,2
- {:DOWN, ^ref, :process, pid, reason}

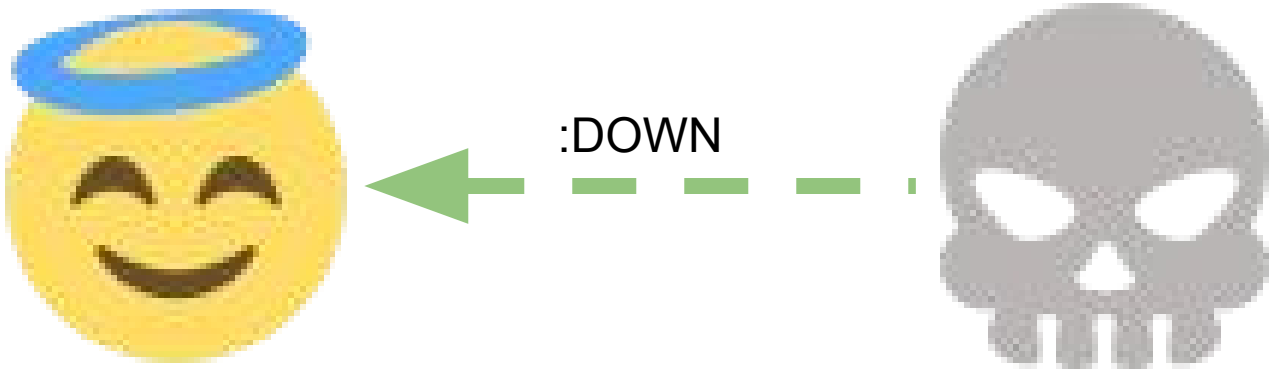
Monitors



Monitors



Monitors



Monitors

Process.demonitor(ref, [option, …])

- [:flush] - guarantees :DOWN message won’t be delivered
- [:info] - information about whether monitor existed
- [:flush, :info] - guarantees no :DOWN and whether :flush required

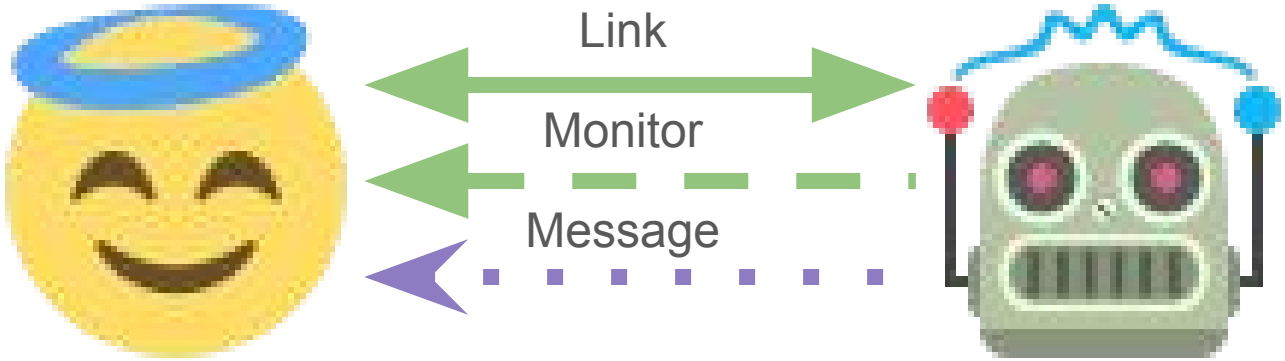
Task

- Task.start/1,3
- Task.start_link/1,3
- Task.async/1,3
- Task.await/1,2
- Task.yield/1,2
- Task.async_stream/3,5
- iex --logger-sasl-reports true

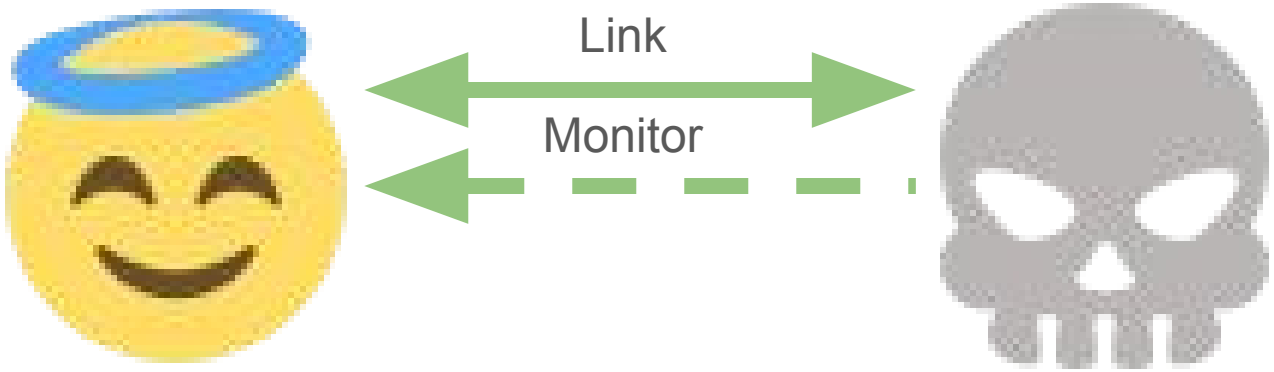
Task.async/1,3

- %Task{pid: pid, ref: ref} = Task.async(fn() -> … end)
- Spawn with link and monitor
- {^ref, result}
- {:DOWN, ^ref, :process, pid, reason}

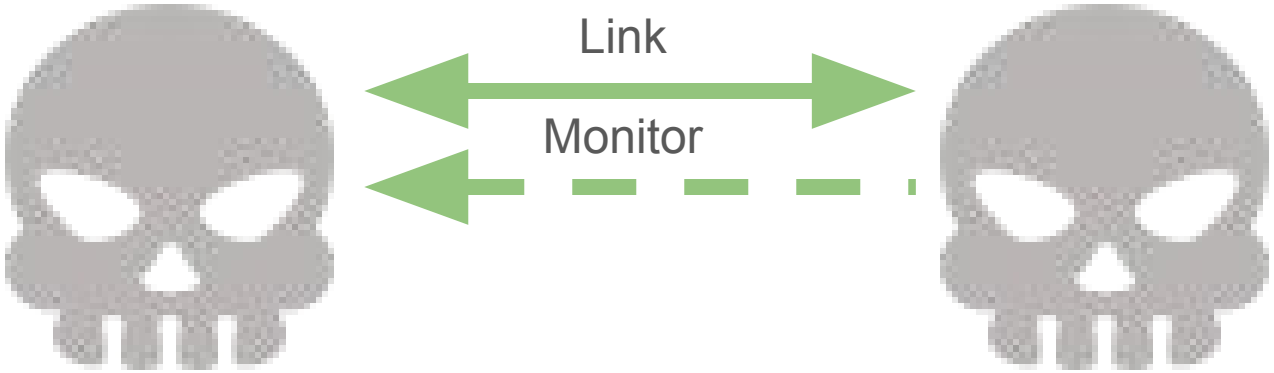
Task.async/1,3



Task.async/1,3



Task.async/1,3



Task.await/1,2

- Task.await(%Task{ref: ref}, timeout)
- Process.demonitor(ref, [:flush])
- On timeout: {:timeout, {Task, :await, [%Task{ref: ref}, timeout]}}
- On crash: {reason, {Task, :await, [%Task{ref: ref}, timeout]}}

Task.yield/1,2

- Task.yield(%Task{ref: ref}, timeout)
- Does not call Process.demonitor/1,2 on timeout
- On result: {:ok, result}
- On timeout: nil
- On crash: {:exit, reason}

Task.async_stream/2,3,4,5

- Limits concurrency
- Task.async_stream(enum, fn -> … end)
- Spawns process per element and links
- Maintains order by default
- Returns Stream of {:ok, value} or {:exit, reason}

Task problems