ZeroMQ

Vorlesung Betriebssysteme

Wintersemester 2016 / 2017

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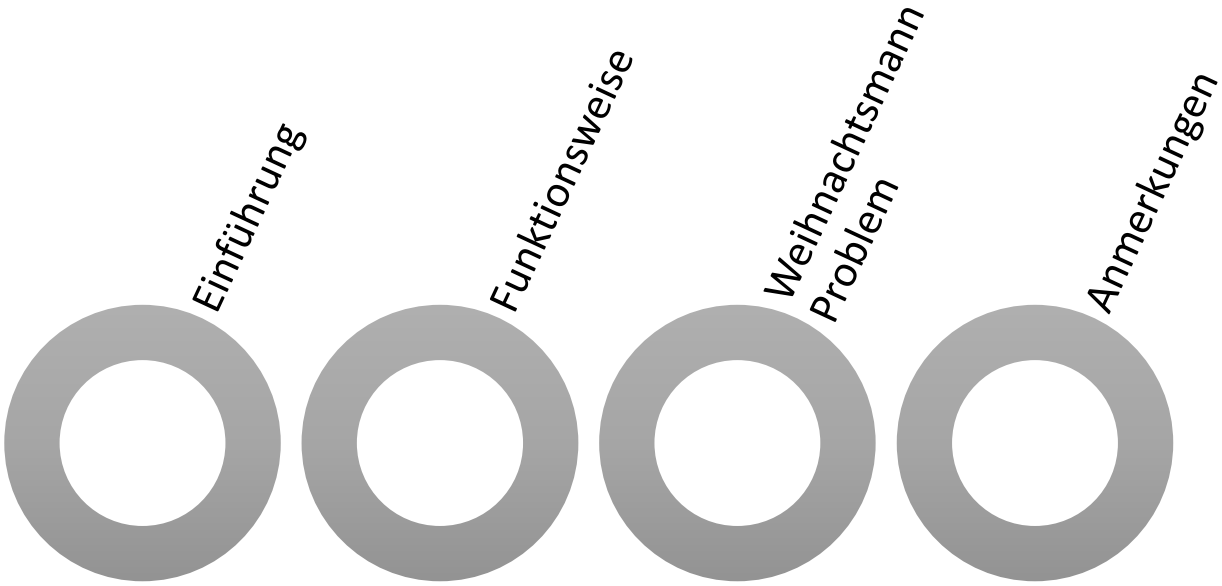
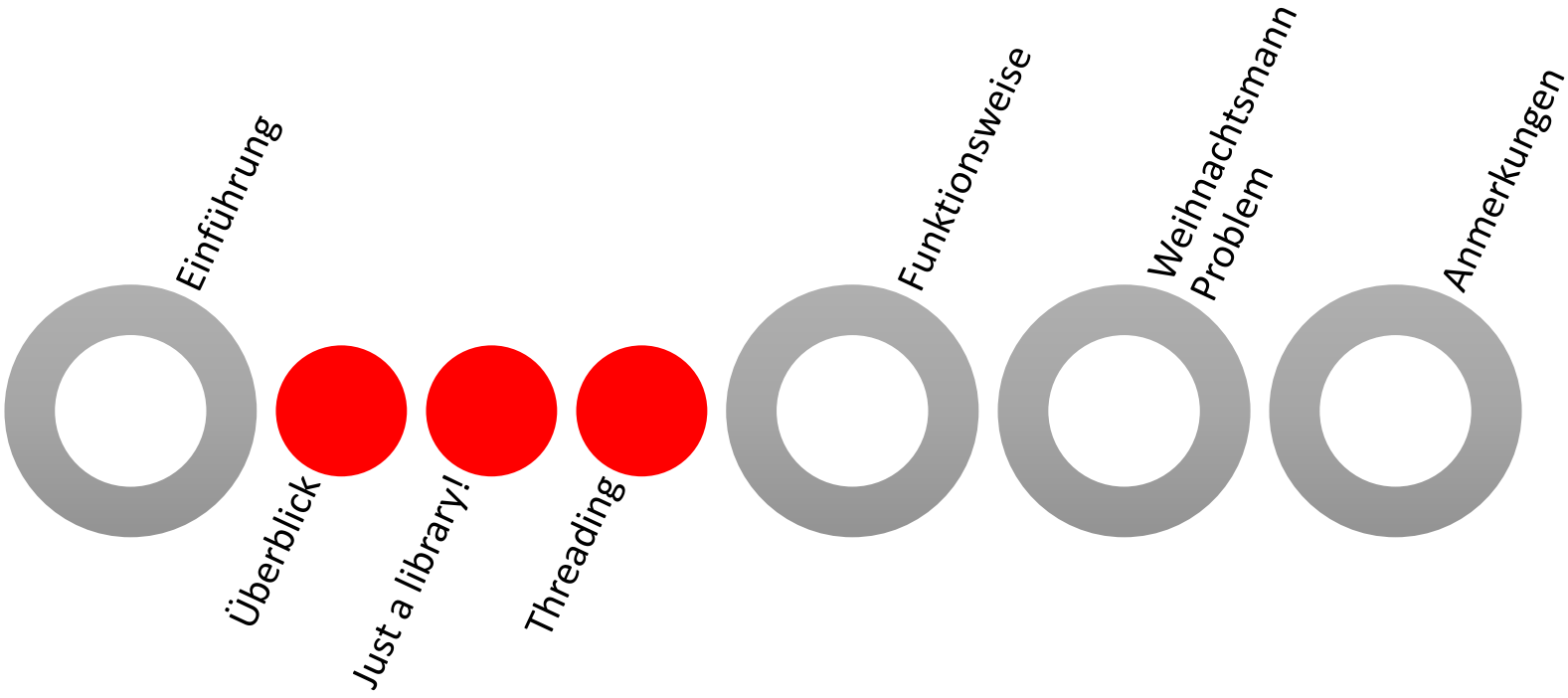


Präsentation & Code auf GitHub: lekoll.de/santa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Überblick

„Distributed Messaging“

Netzwerk

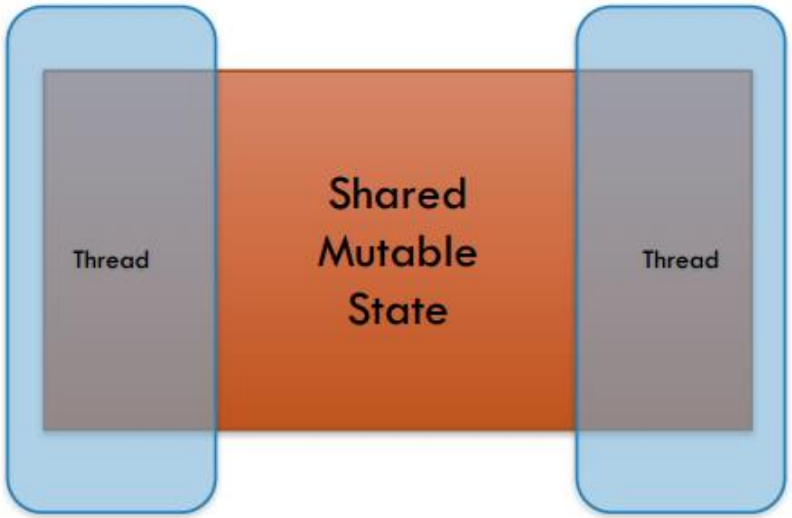
IPC

Threading

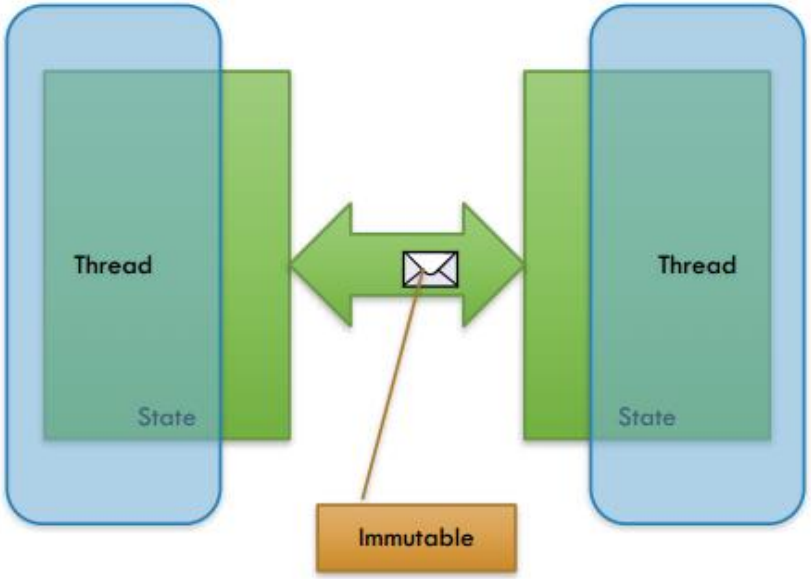
Just a library!

Threading

Grundproblematik



ZMQ Lösungsansatz



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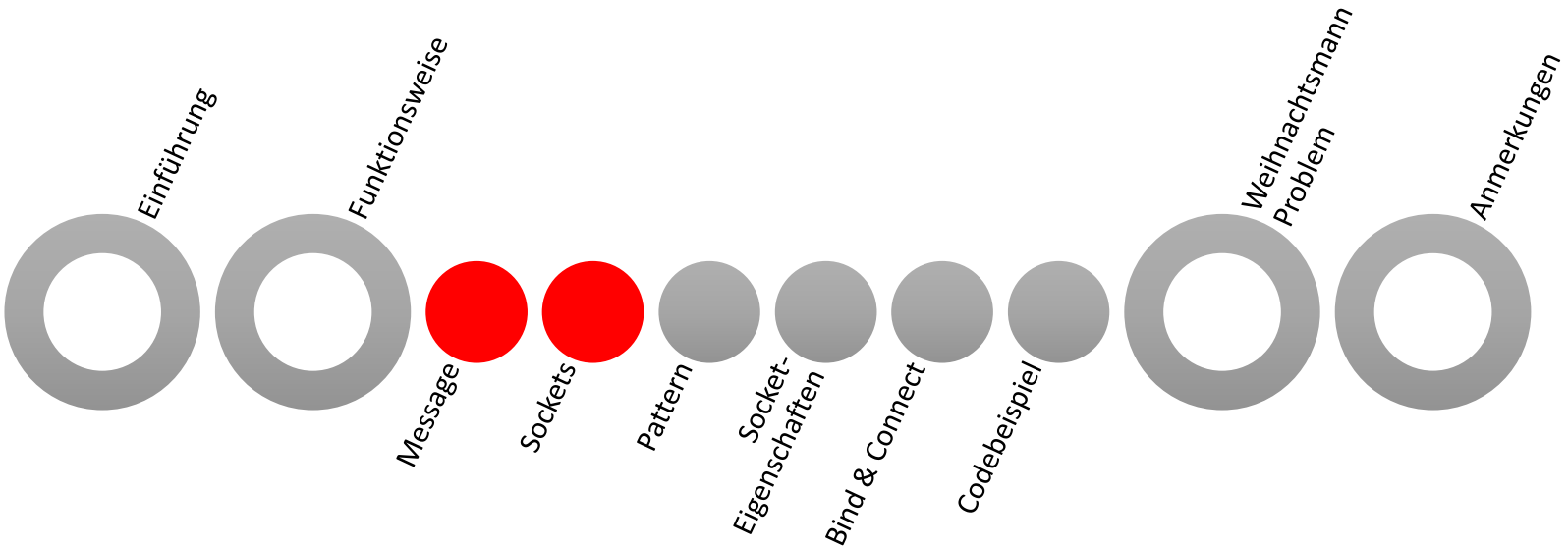
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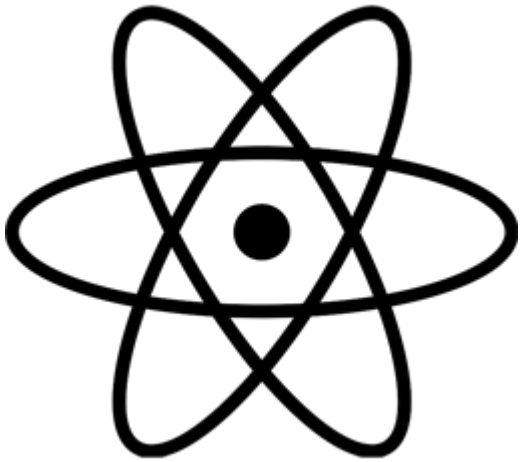
Message

```
2inR2aoDR4WXMQ12e5BX
2Qw1W1ptcPUbDjcQ5Mge
DYpyMph8SpzbpW5K7hS8
gCvCdBqYeWLTAKSvJWeS
FiA1PorymmKhaKns7zXr
h5vBmhX0EVtxErwL6HkB
fRwLksMvvWWBwDreKM03
j8Wl9QBd6P2yX45zPOH8
8migVgPTHLfwWyfoJ7qY
lXm1LYDypvvV6vFnp3tS
Afbtwdg3j9yX6H99RlzX
```

String

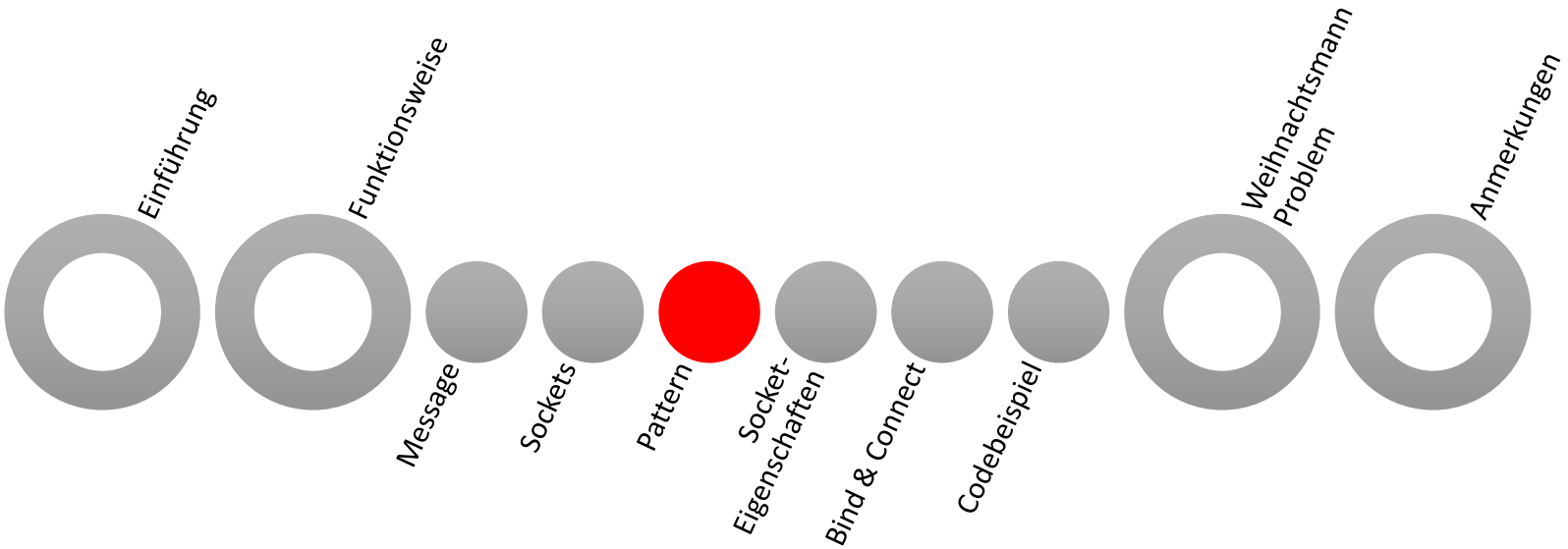


Atomic

Sockets

- ZMQ-Sockets != Netzwerksockets
- Bind & Connect

```
meinSocket = context.socket(zmq.PAIR)
meinSocket.bind("tcp://*:5555")
meinSocket.send_string("Hello World")
```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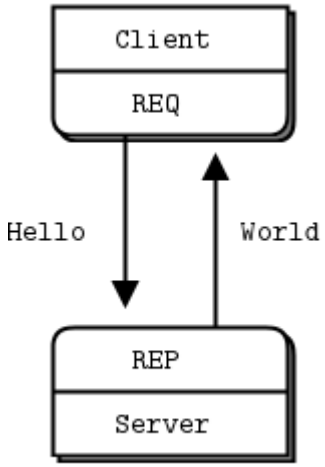
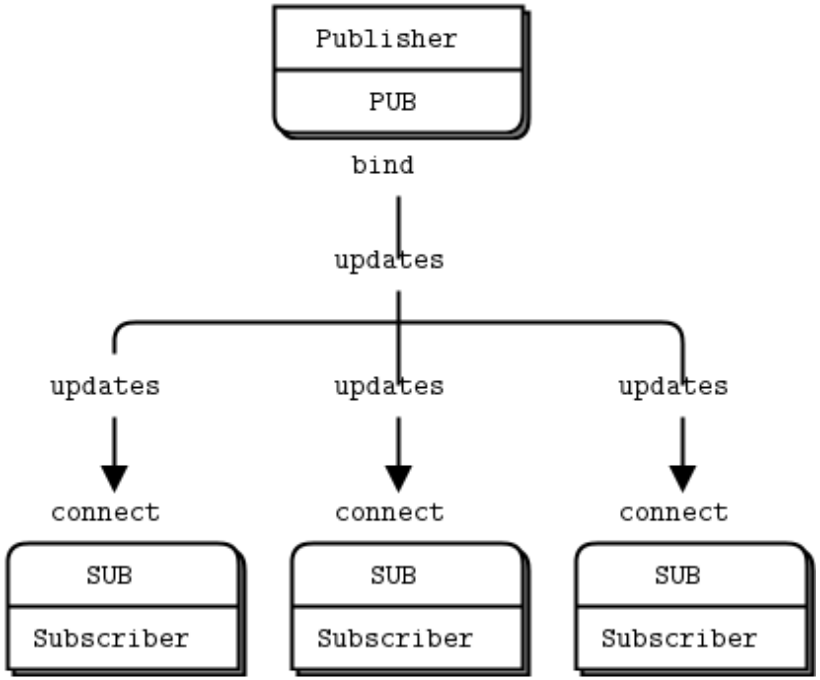
Pattern

Synchrones Request/Response

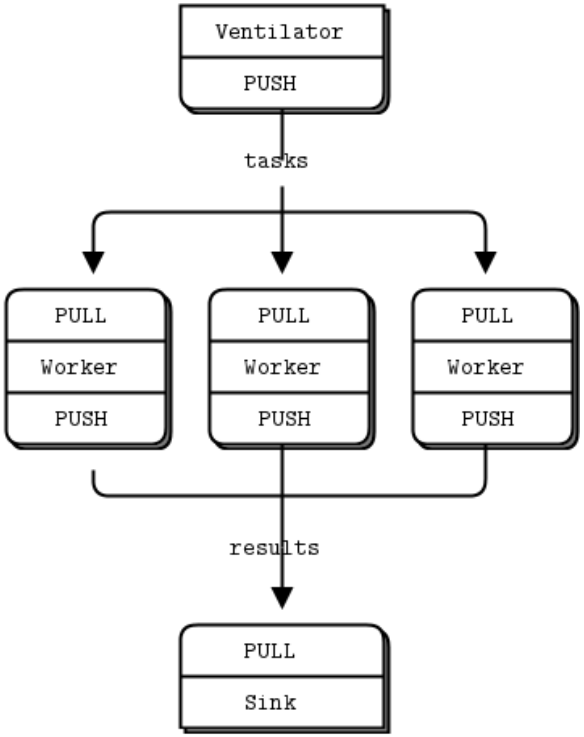


Publish/Subscribe

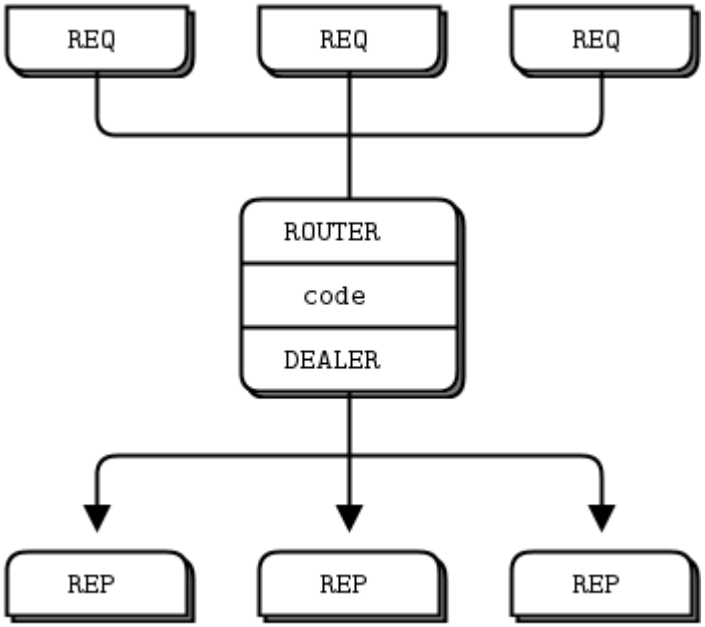


Pattern

Push/Pull

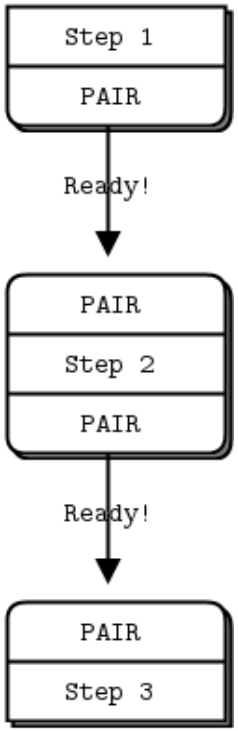


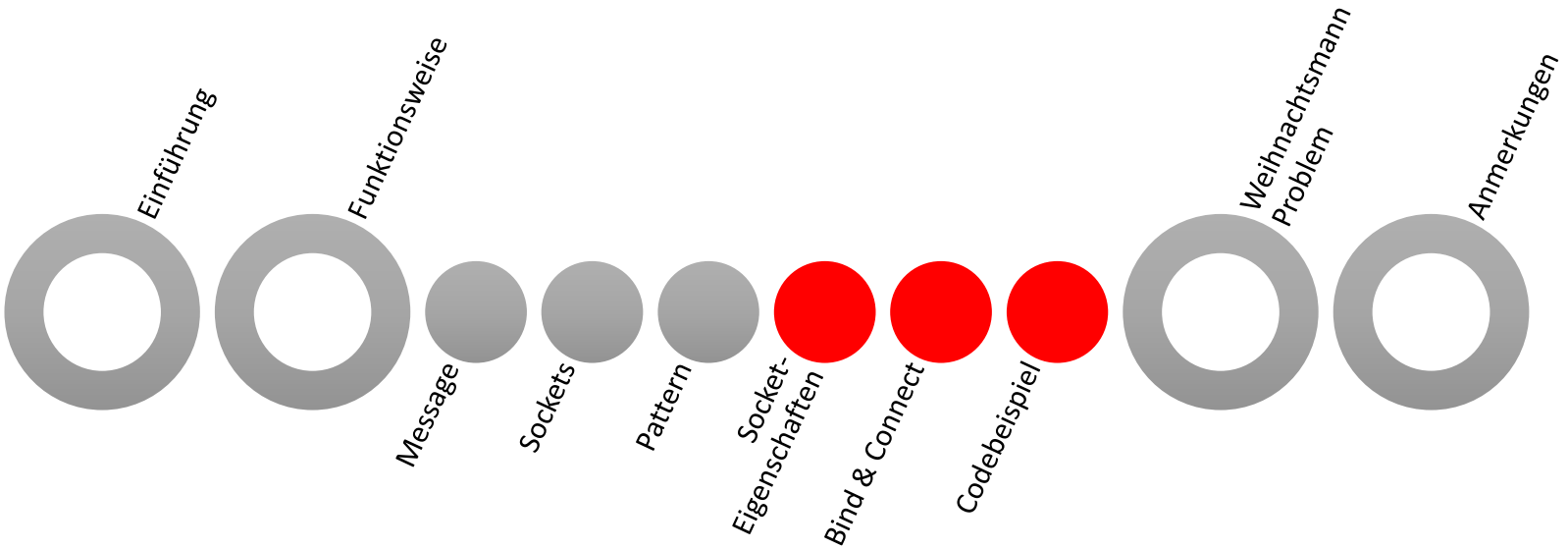
Asynchrones Request/Response



Pattern

Pair

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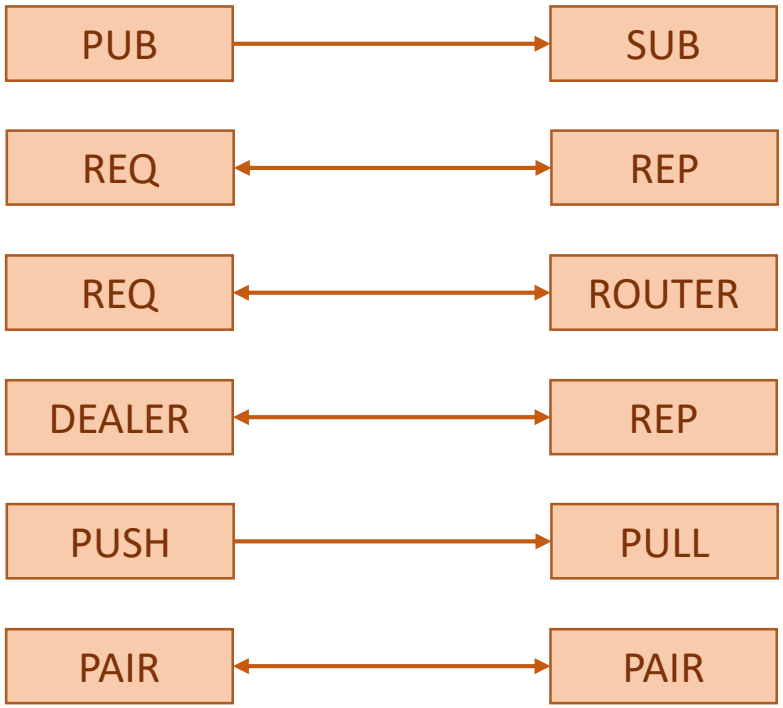
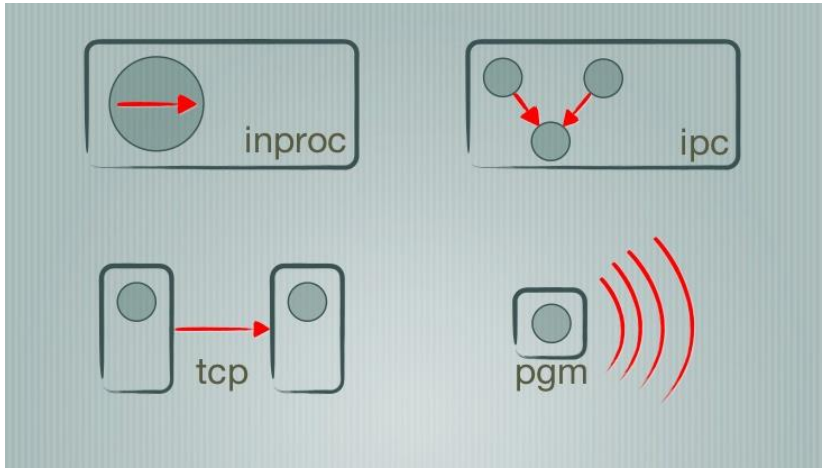
Socket-Eigenschaften

Typen



Protokolle



Bind & Connect

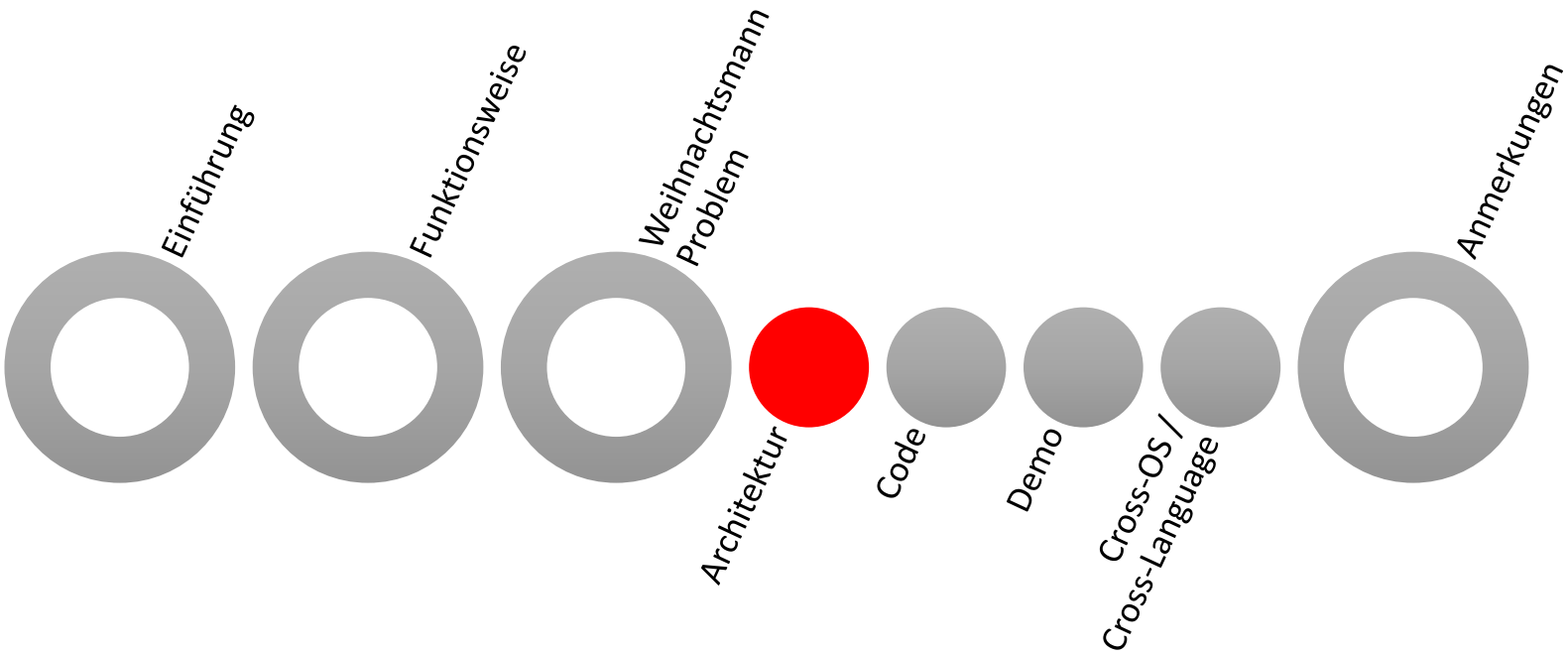
“with ZeroMQ sockets,
it does not matter which end connects and which end binds.”

“think in terms of ‘servers’ as static parts
[…]
and ‘clients’ as dynamic parts”

(zguide.zeromq.org)

Codebeispiel

```
5   def sender (context):
6       senderSocket = context.socket(zmq.PAIR)
7       #senderSocket.bind("tcp://*:5555")
8       senderSocket.bind("inproc://meinKanal")
9       senderSocket.send_string("Hello World")
10
11  def receiver (context):
12      recvSocket = context.socket(zmq.PAIR)
13      #recvSocket.connect("tcp://localhost:5555")
14      recvSocket.connect("inproc://meinKanal")
15      print(recvSocket.recv())
16
17  zmqContext = zmq.Context.instance()
18
19  sThread = threading.Thread(target=sender, args=(zmqContext,))
20  sThread.start()
21  rThread = threading.Thread(target=receiver, args=(zmqContext,))
22  rThread.start()
```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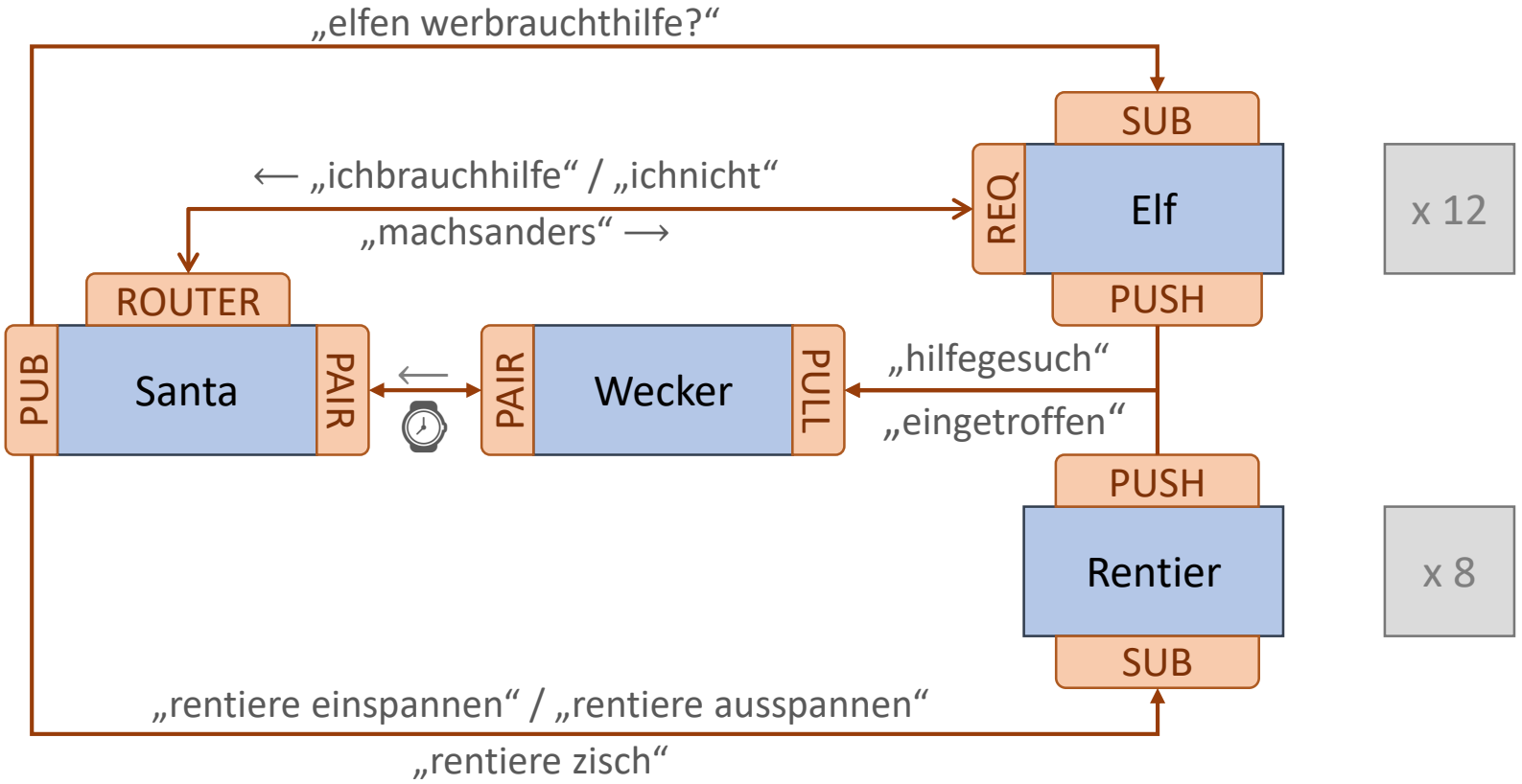

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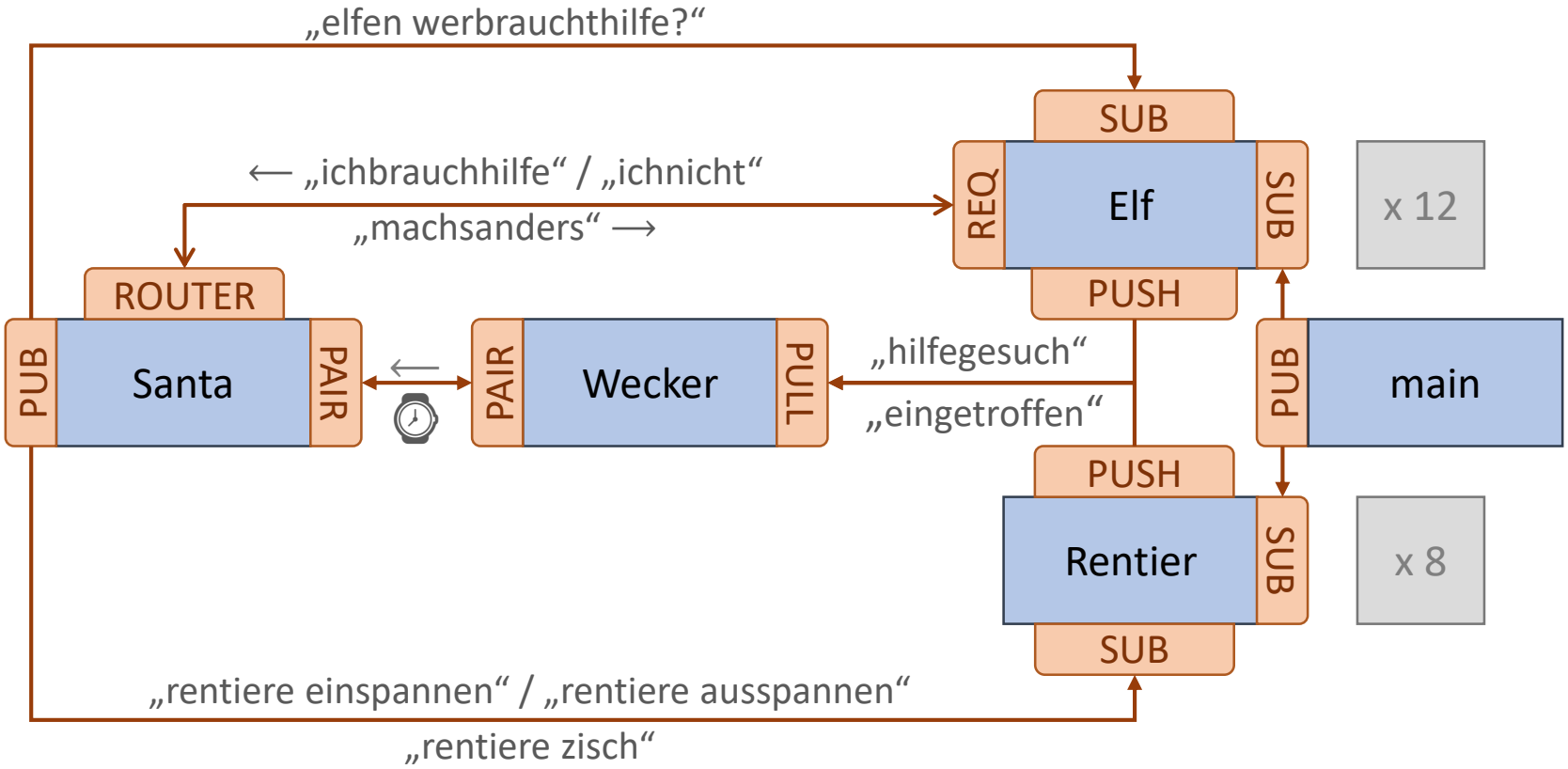

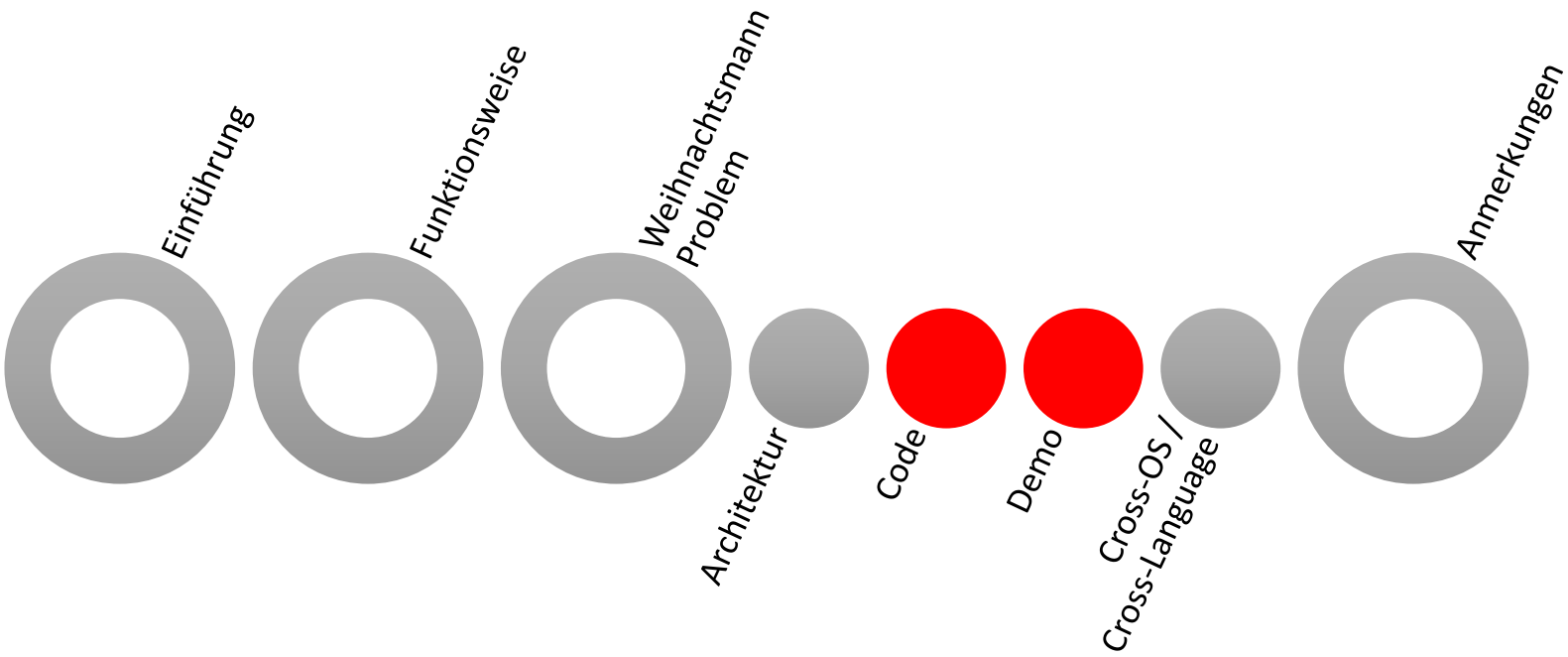
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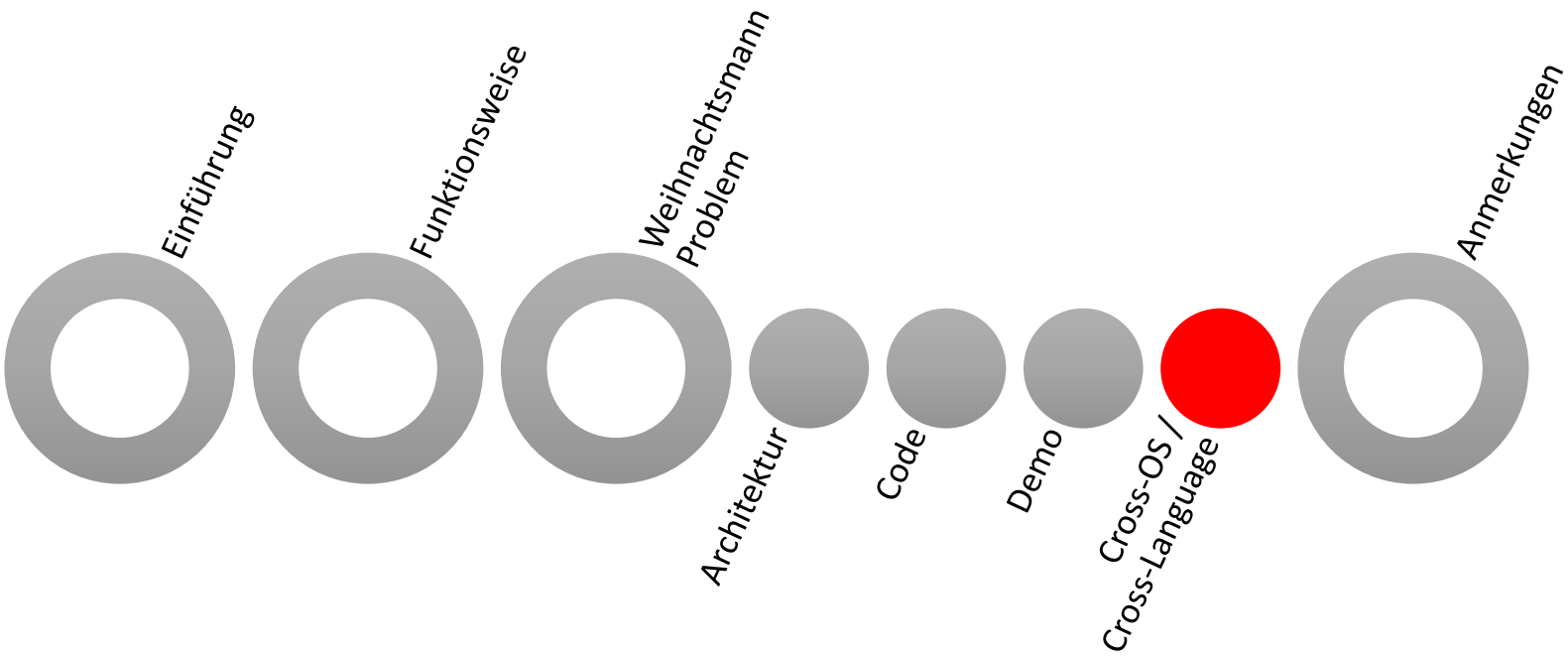
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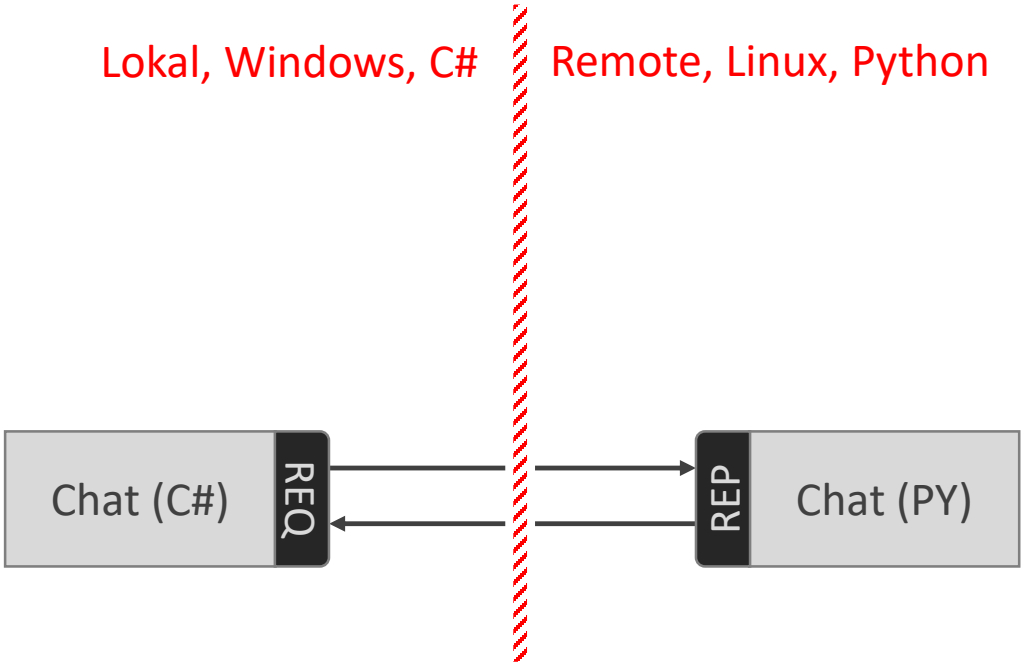

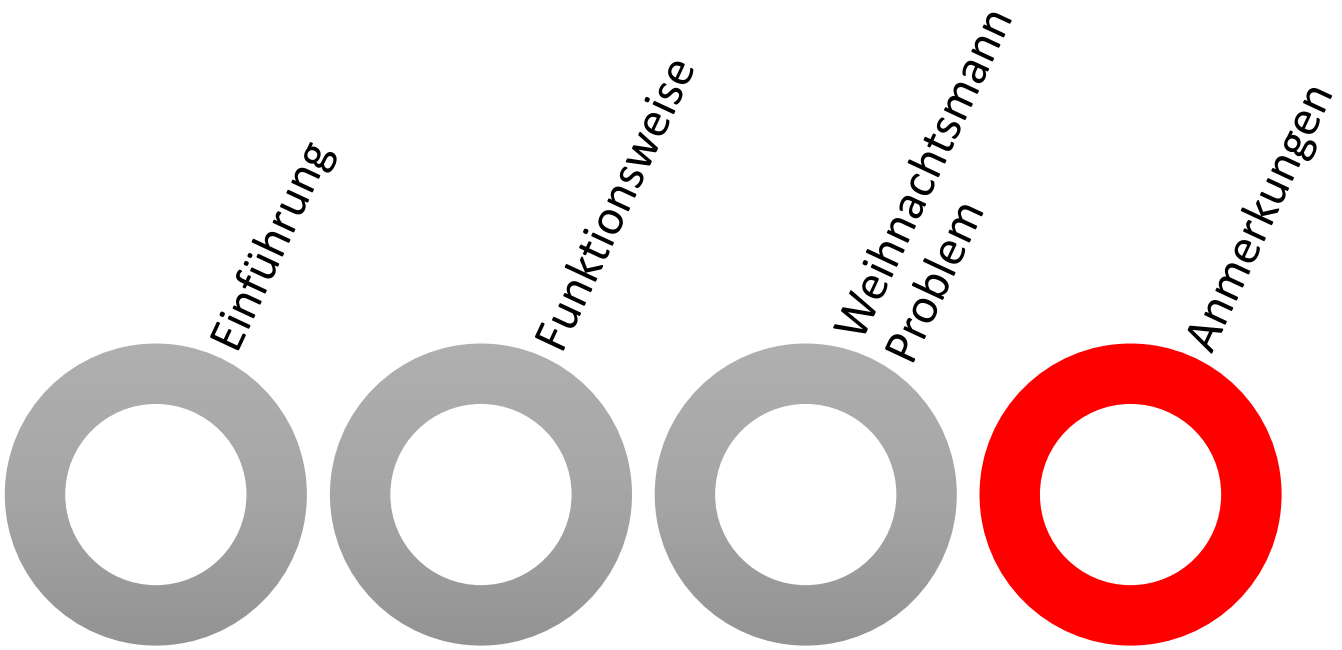
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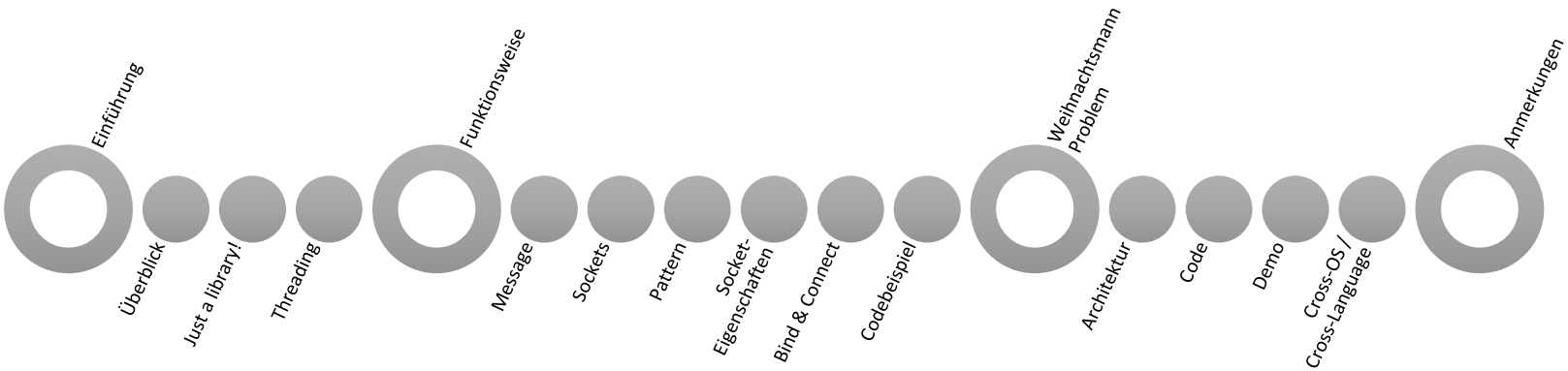
Anmerkungen

- Für Inproc nur bedingt geeignet
  - Serialisierung
- Schnelles Setup von leistungsstarkem Messaging
  - Cross-OS / Cross-Language
  - Performant
  - Abstraktion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Quellen

- Vortrag "ZeroMQ is the Answer“ by Ian Barber at the PHP UK Conference 2011 (https://vimeo.com/20605470)
- Offizielle Website (http://zeromq.org/)
- “A quick and dirty Einführungduction to ZeroMQ”, Scott Logic Ltd. (http://blog.scottlogic.com/2015/03/20/ZeroMQ-Quick-Einführung.html)