

All
RPCs
Are
Bad

Daniel Bittman
(he/him)
@danielbittman

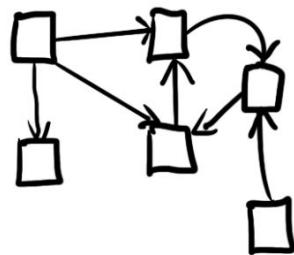
HPTS '22

All
RPCs
Are
Bad

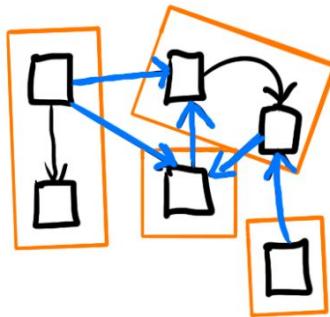
Daniel Bittman
(he/him)
@danielbittman

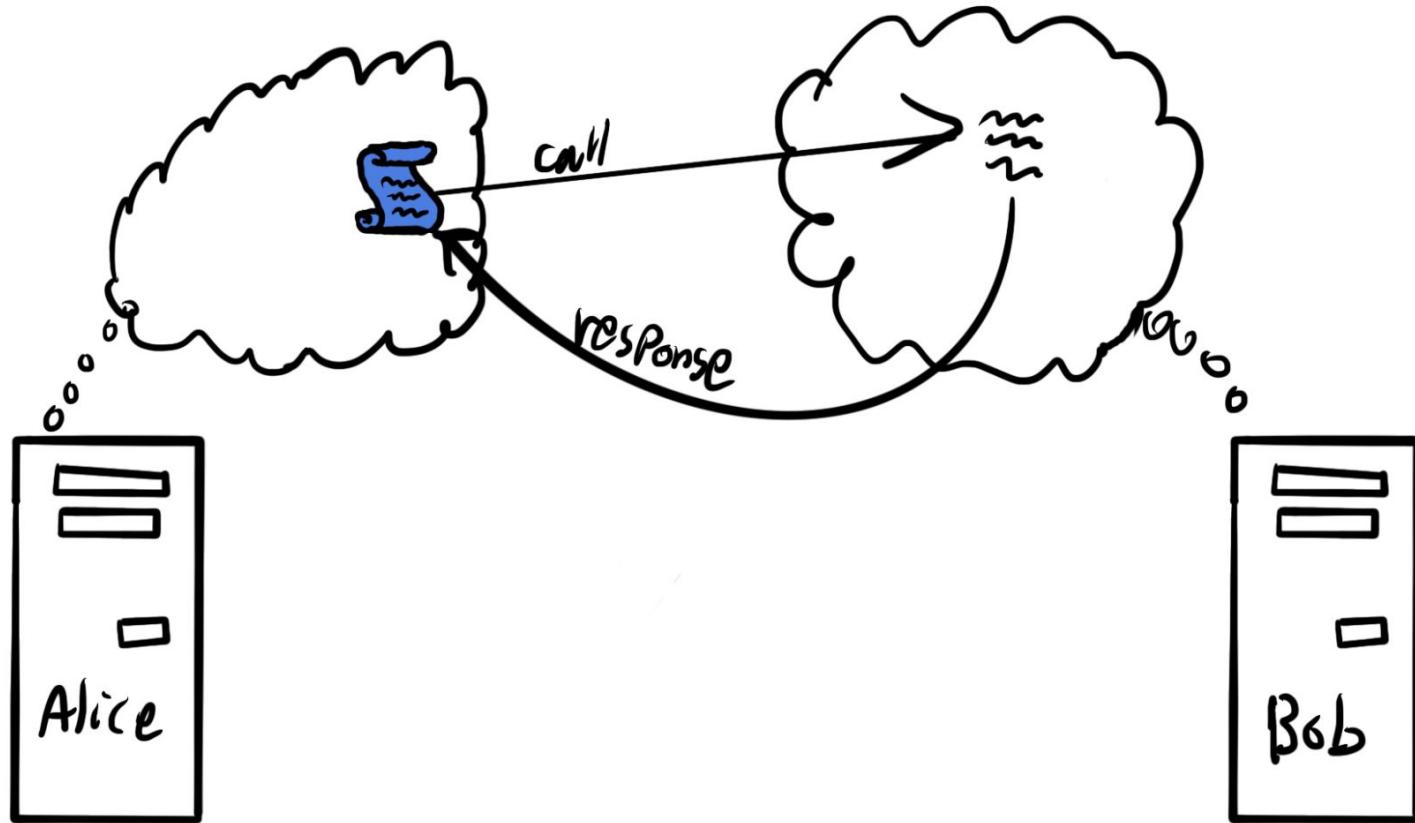
HPTS '22

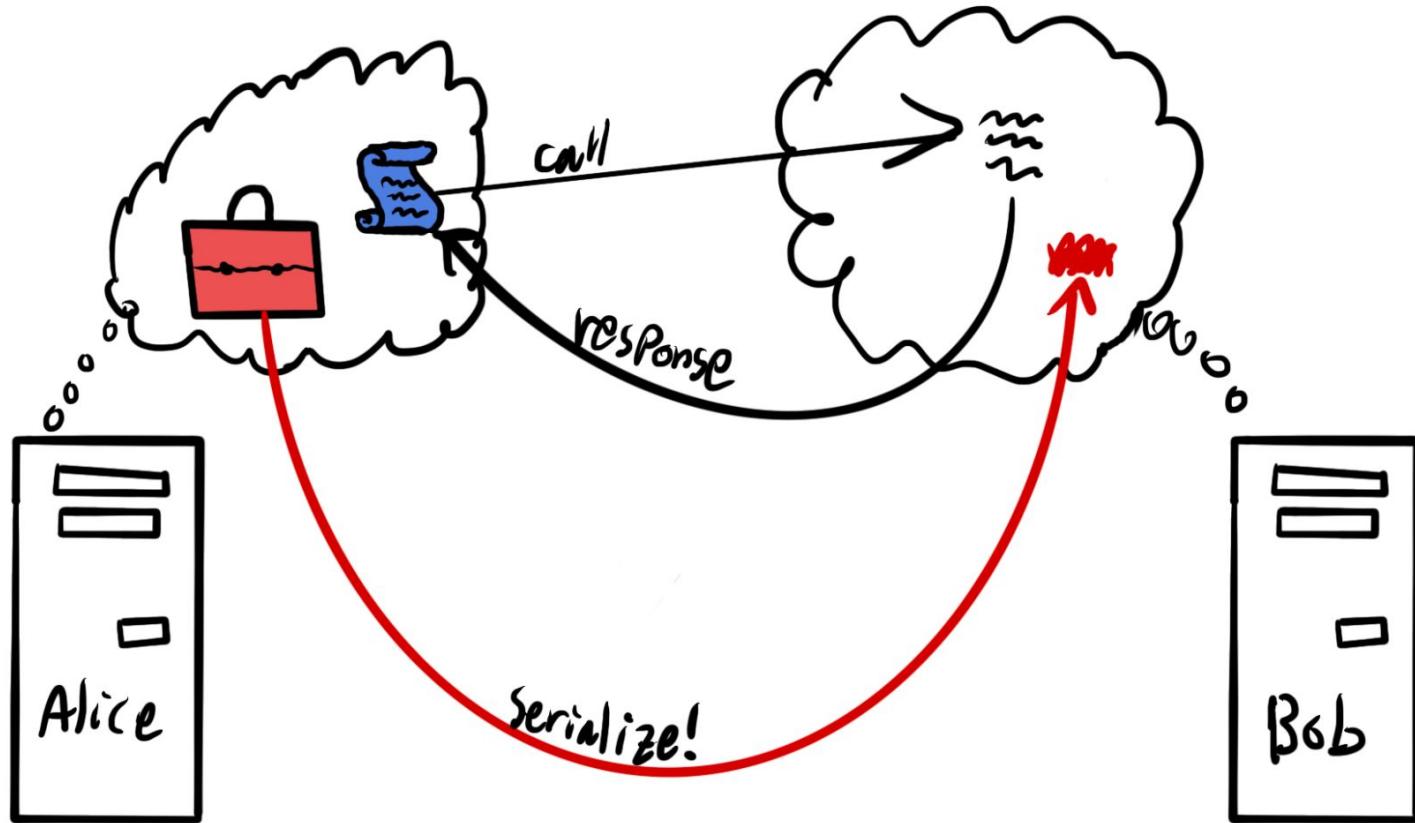
Building Complex Systems
is Hard



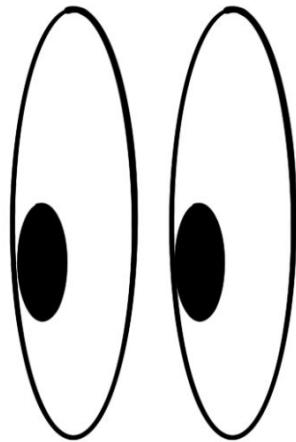
Building Complex Systems
is Hard

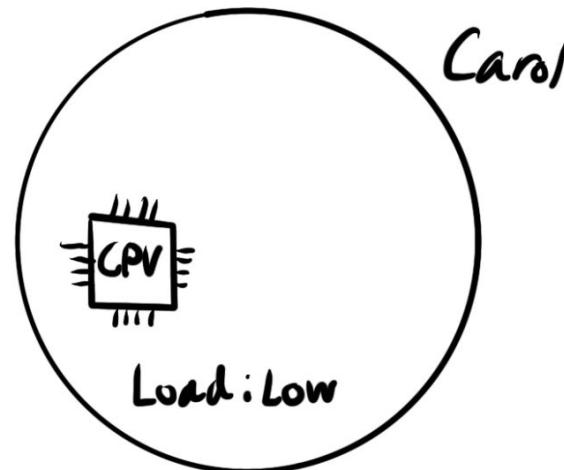
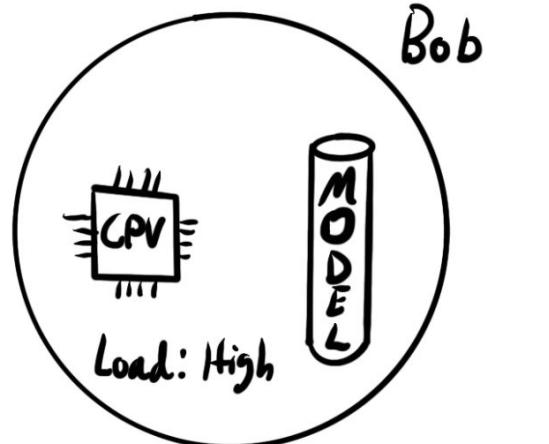
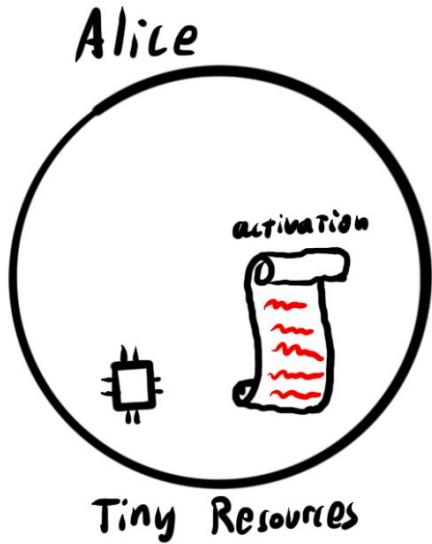


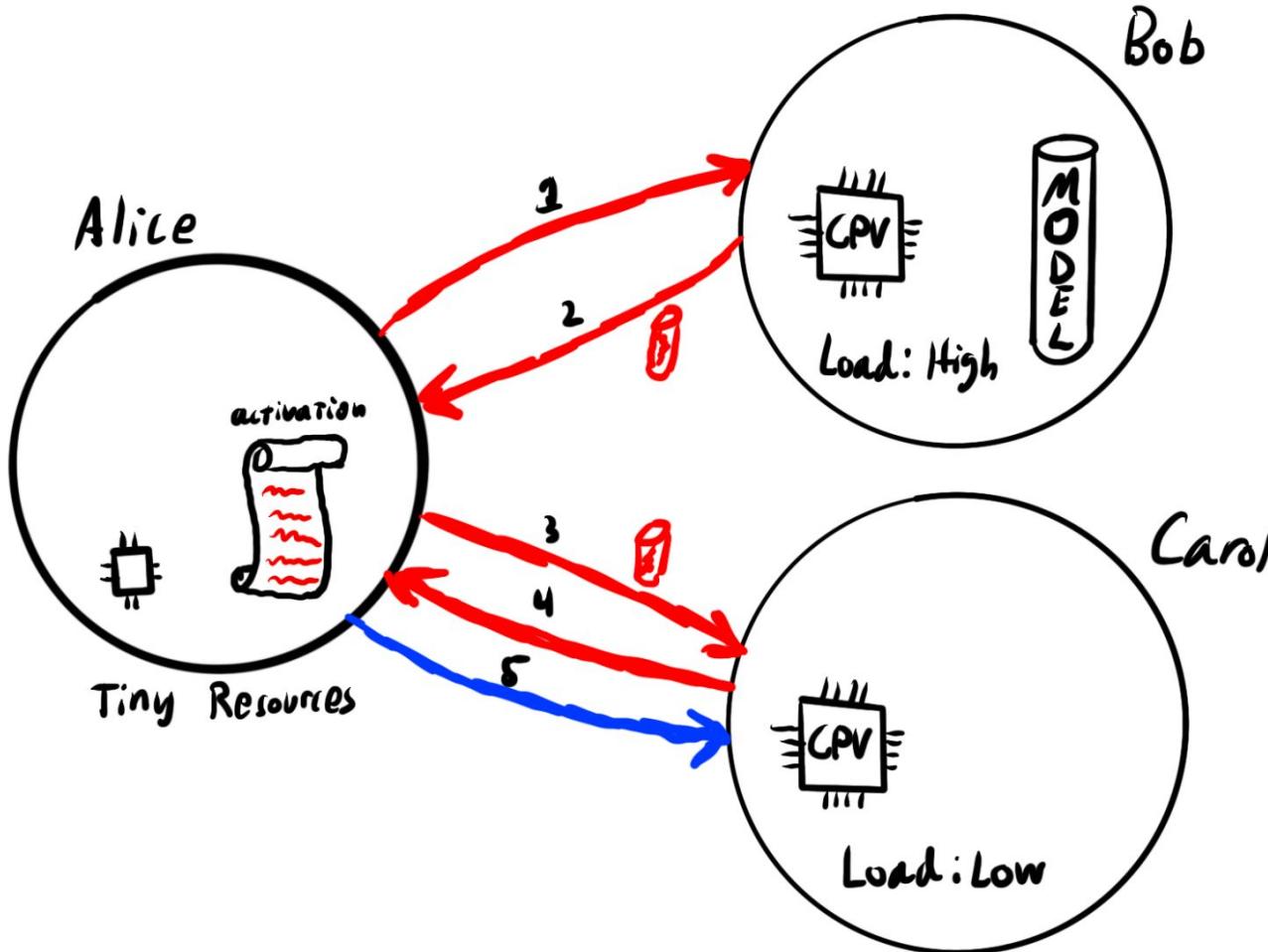


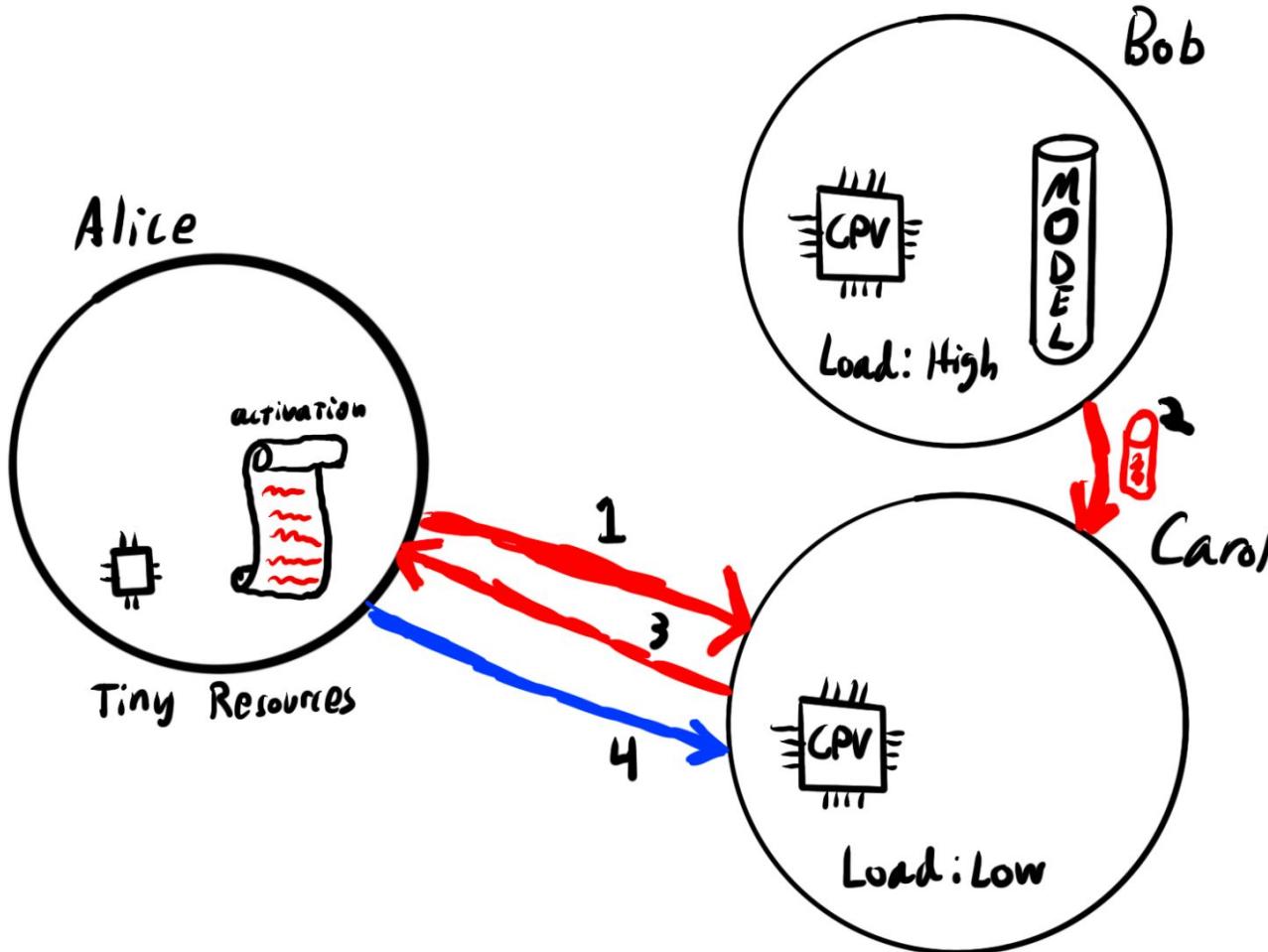


Distributed
Shared
Memory ?







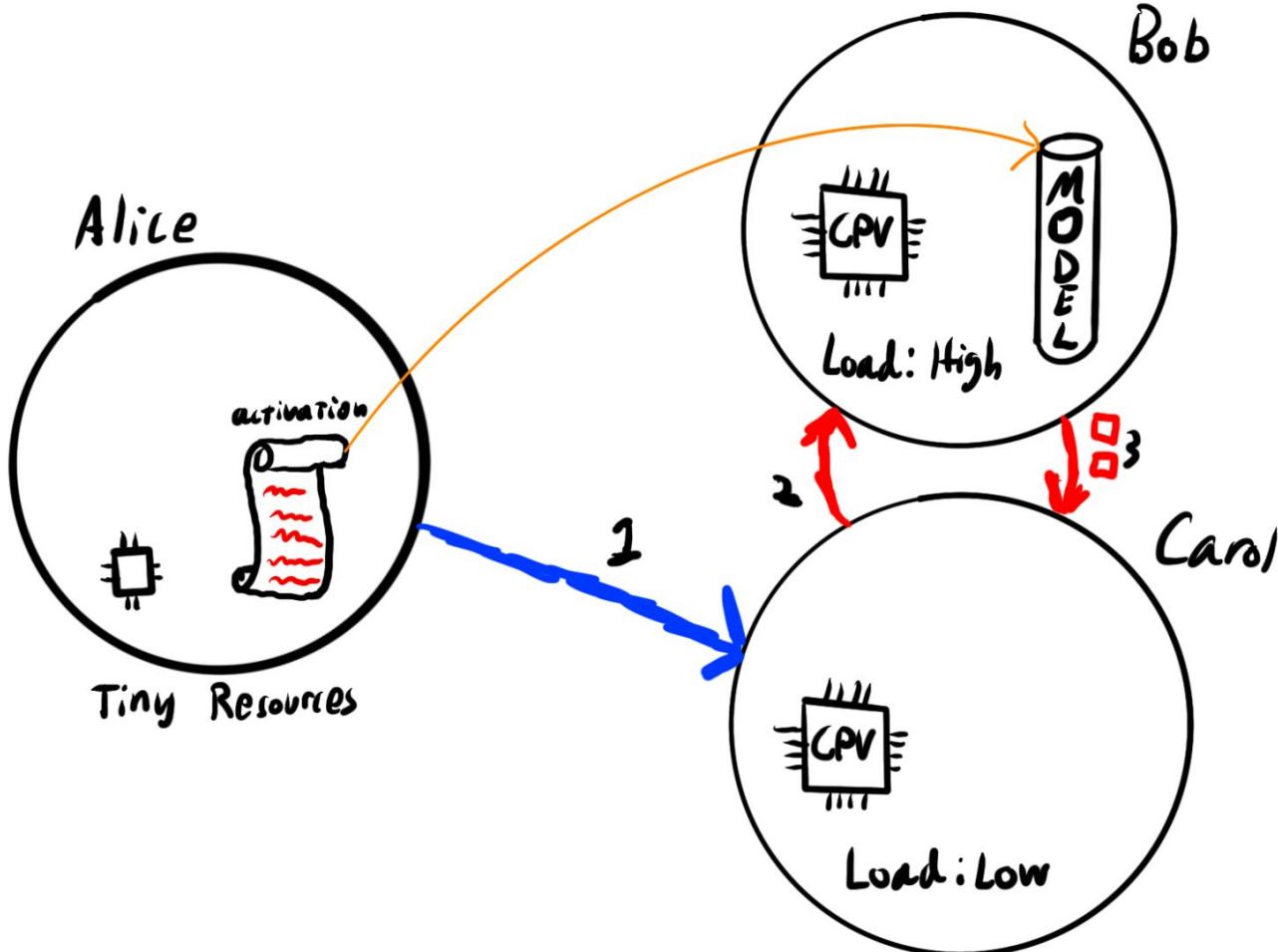


We Need a more Flexible
and Effective method for

Decoupling

in

Distributed Systems



Code mobility + data mobility =



Code mobility + data mobility = 

Operating System + Network = 

but a much
Scarier kind
of 

(Imfao)

(Imfao)

(oh god oh no)

Twizzler is a new OS

Twizzler is a new OS

That can provide this model with a

Global Address Space

and

Invariant References

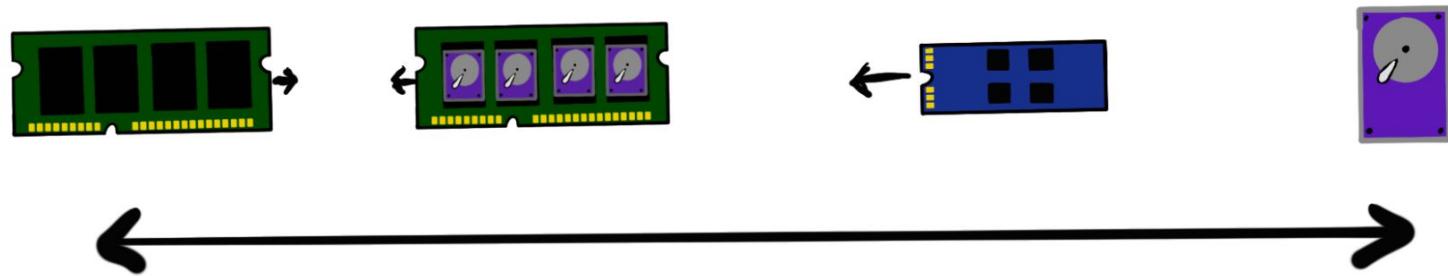


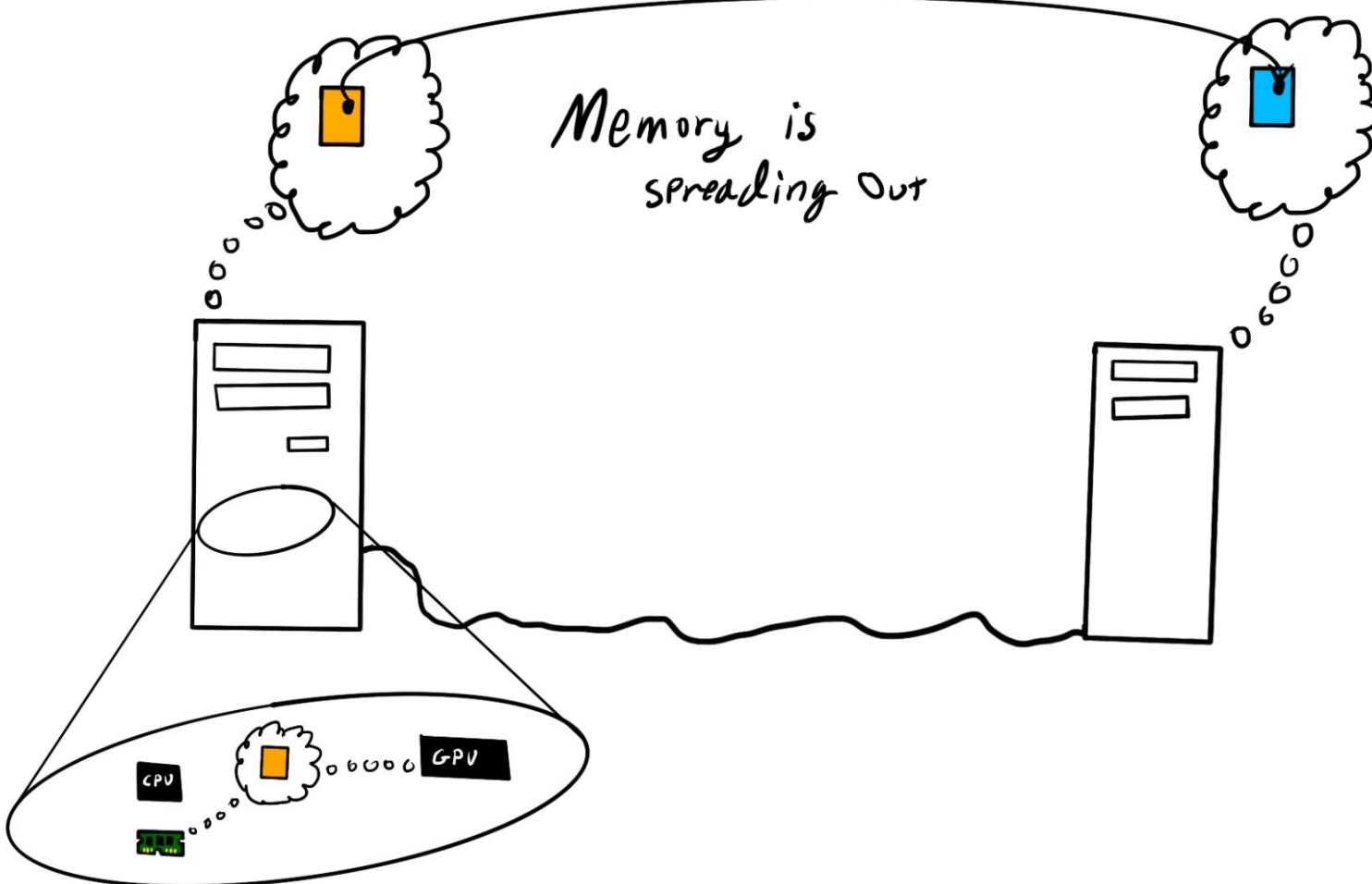
Pushing Enhanced Understanding
of Data and Application Semantics Downward
and Pushing Modern Hardware Patterns Upward

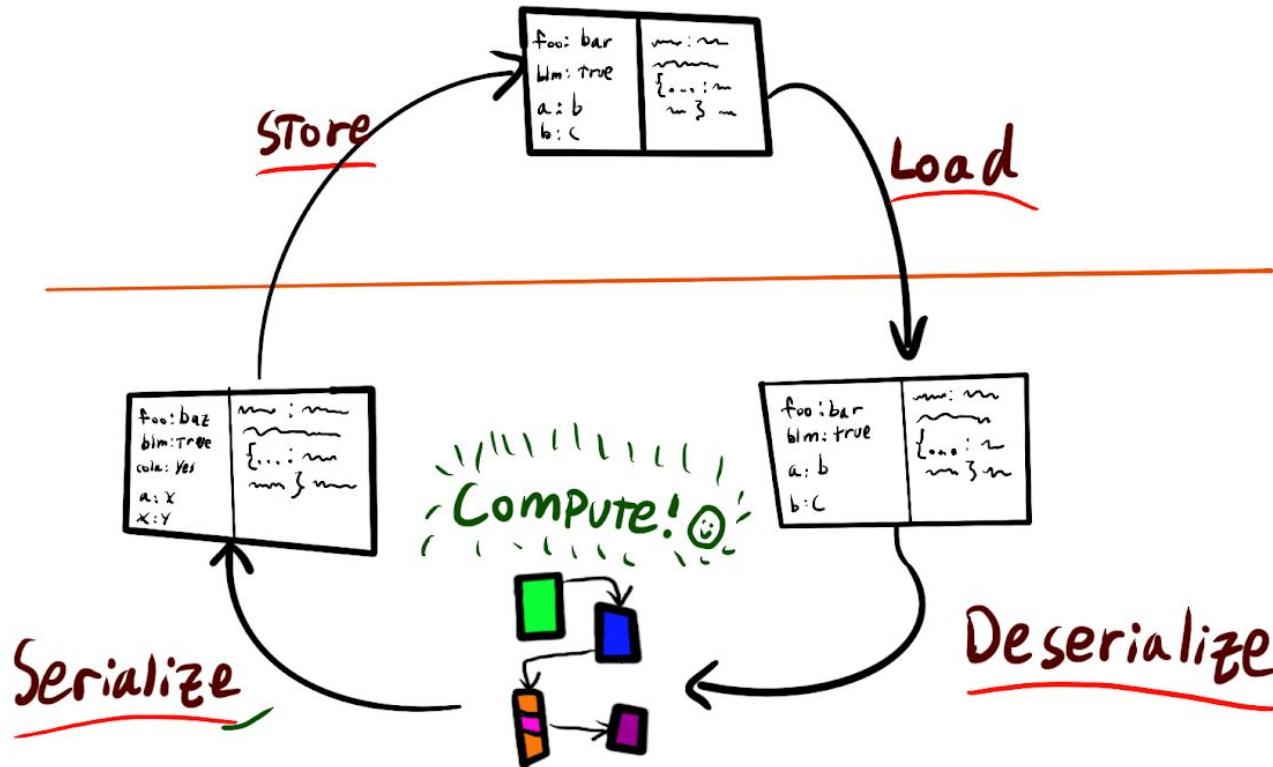
Pushing Enhanced Understanding
of Data and Application Semantics Downward

and Pushing Modern Hardware Patterns Upward

Persistence is getting closer





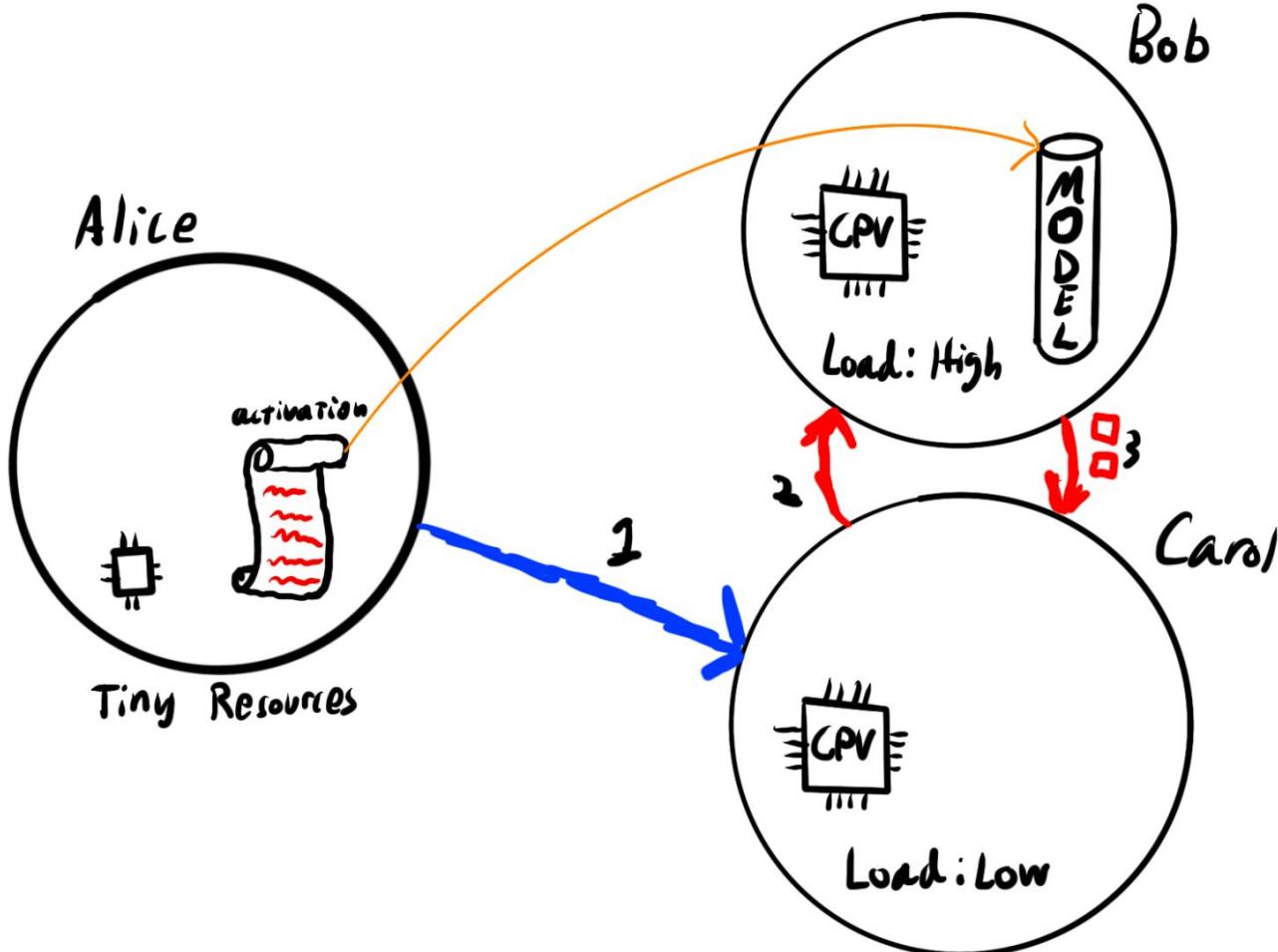


Direct, Memory-style access to in-memory data structures

- ✓ Reduce serialization overhead
- ✓ Reduce kernel involvement
- ✓ Disconnect Data lifetime from ephemera

Pushing Enhanced Understanding
of Data and Application Semantics Downward

and Pushing Modern Hardware Patterns Upward



Immutability

is for the

Weak



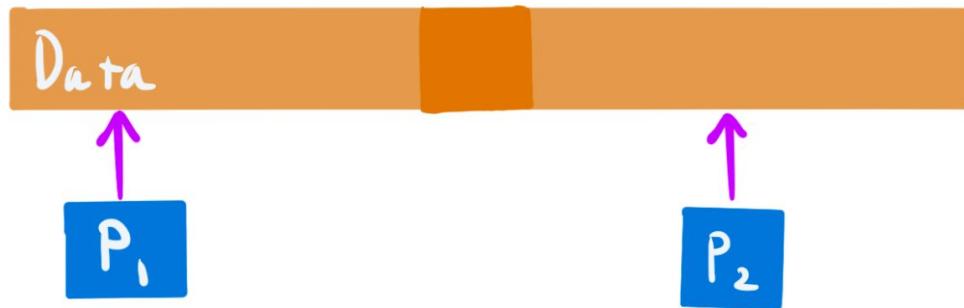
Broke : Mutability !

Woke : Immutability every where !

Bespoke : Mutability is a Spectrum

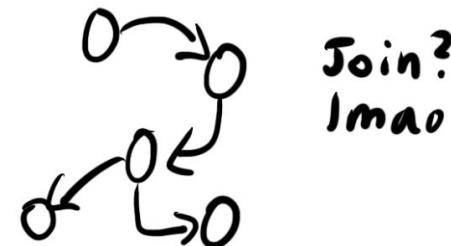
A natural model

time →



A natural model

time →

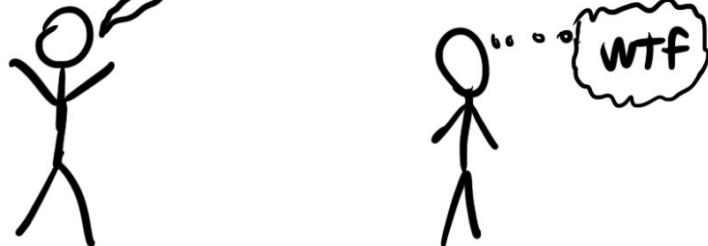


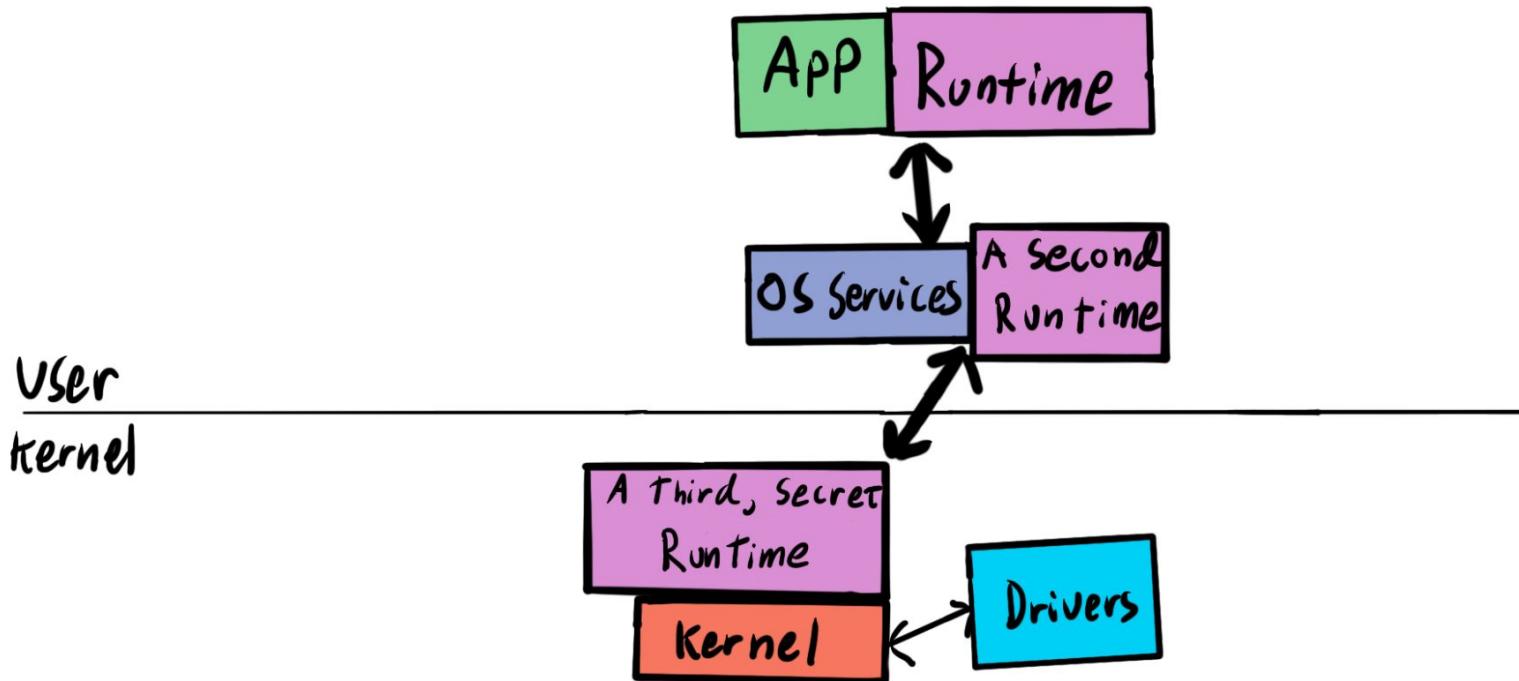
Pushing Enhanced Understanding
of Data and Application Semantics Downward

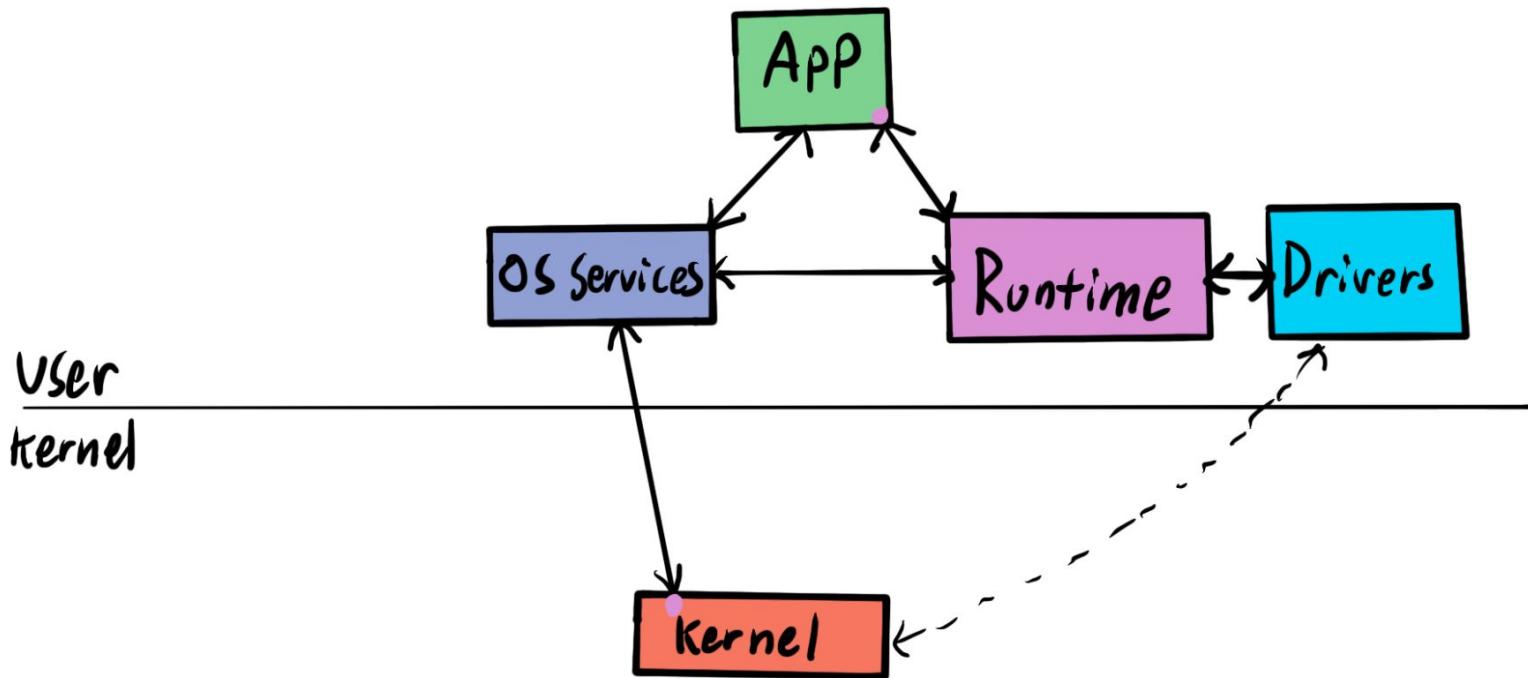
and Pushing Modern Hardware Patterns Upward

JUST USE

- Futex + Priority inversion avoidance
- io-uring
- epoll
- n:m Threading
- A better language
- DAX mmap
- SPDK + DPDK
- Specific flags







We Need a more Flexible
and Effective method for

Decoupling

in

Distributed Systems

Pushing Enhanced Understanding
of Data and Application Semantics Downward
and Pushing Modern Hardware Patterns Upward

Twizzler is a new OS

That can provide this model with a

Global Address Space

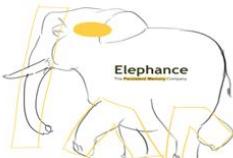
and

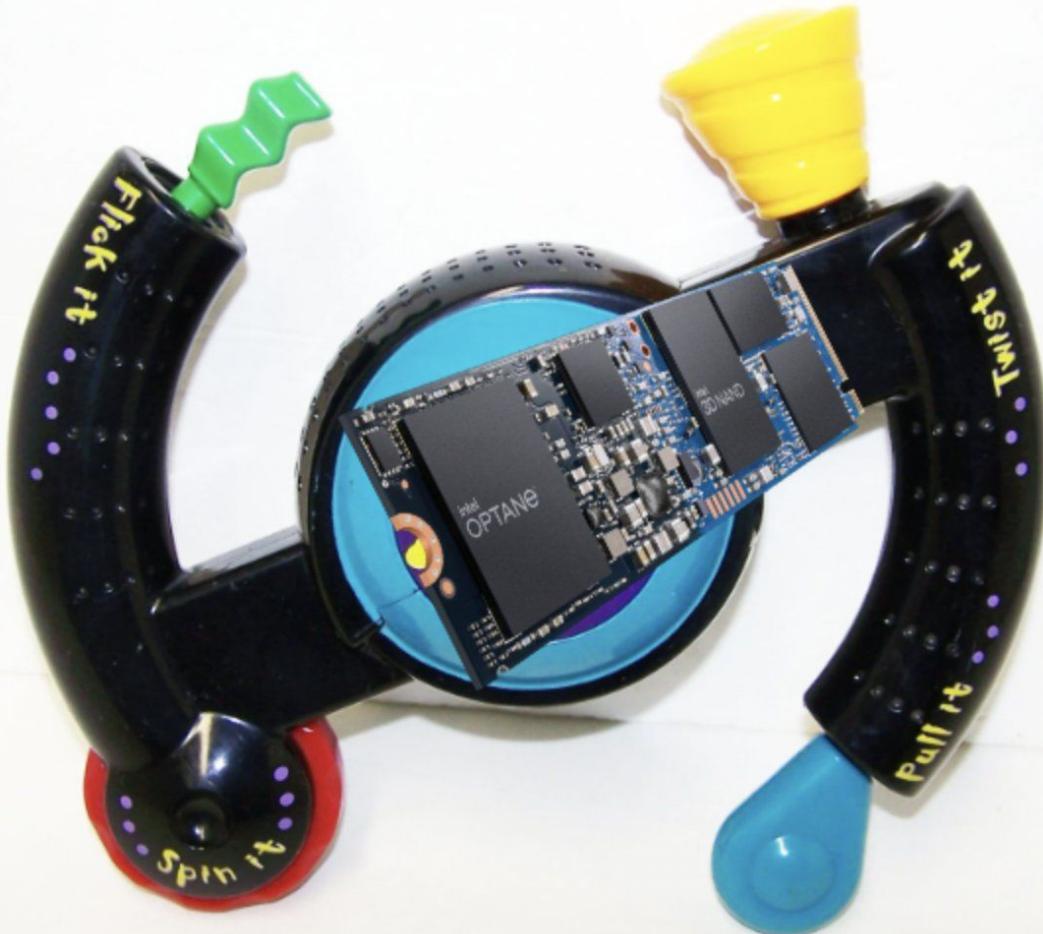
Invariant References

Thank you,
Any Questions?

Twizzler.io
dbittman.com

Daniel Bittman (he/him)
@daniel_bittman





safety and performance? why not both?

