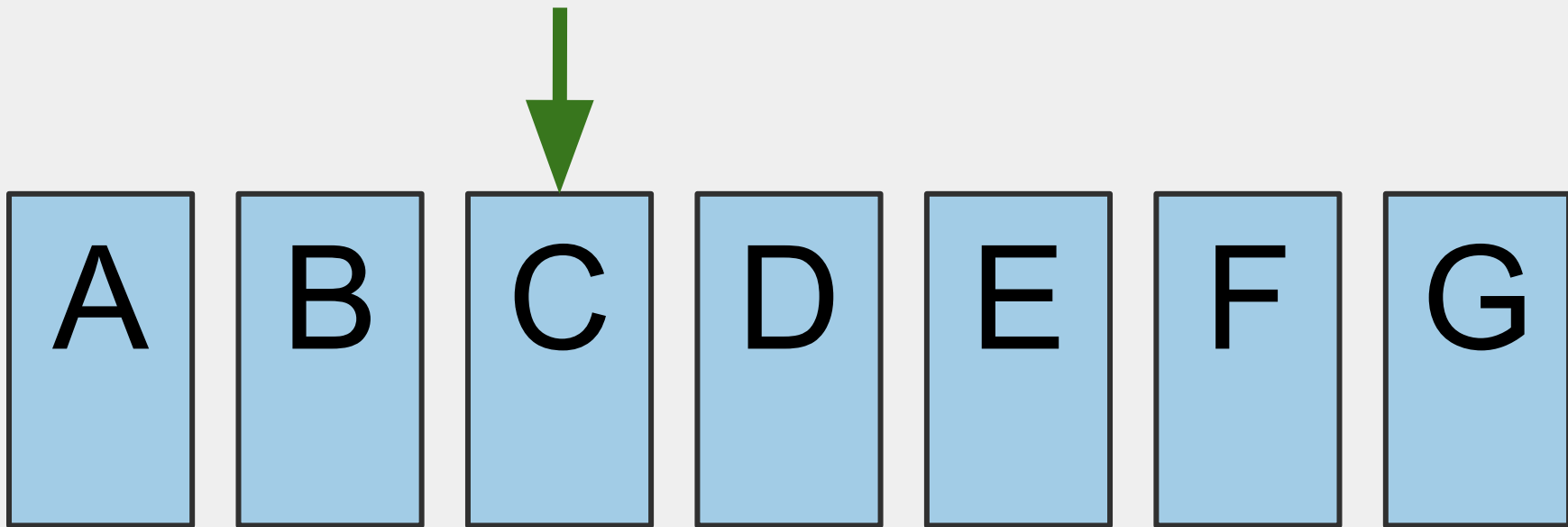
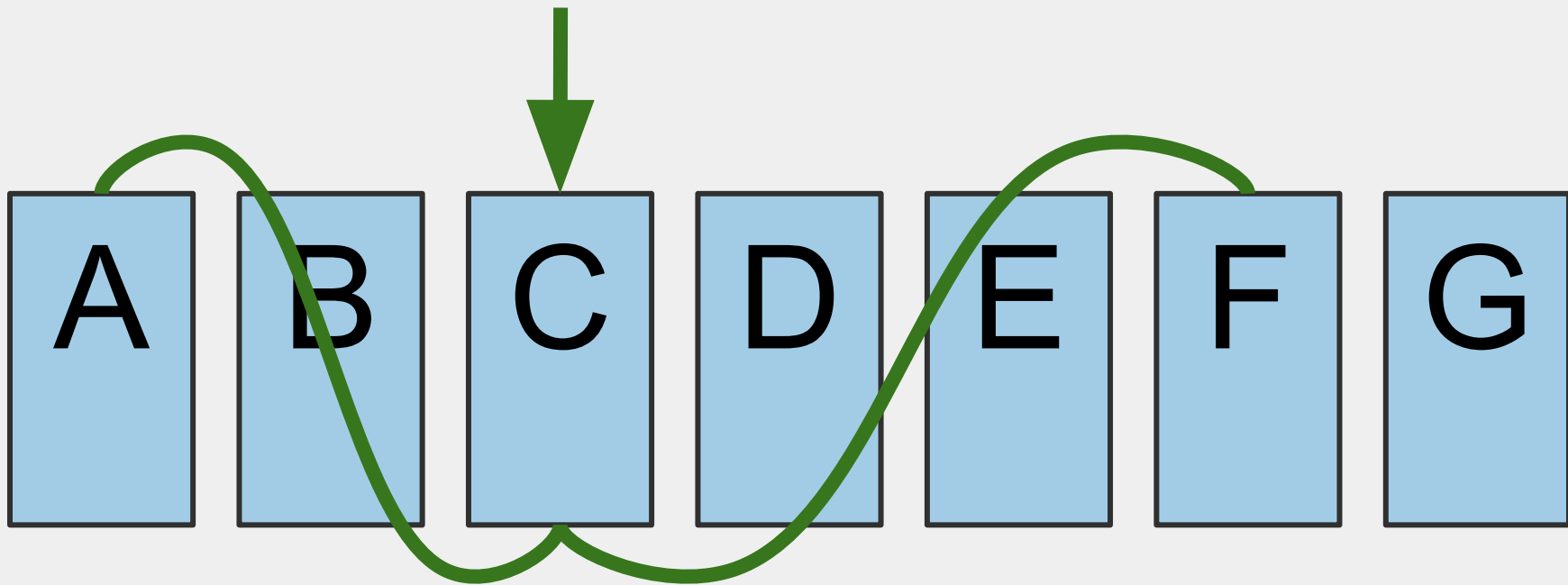
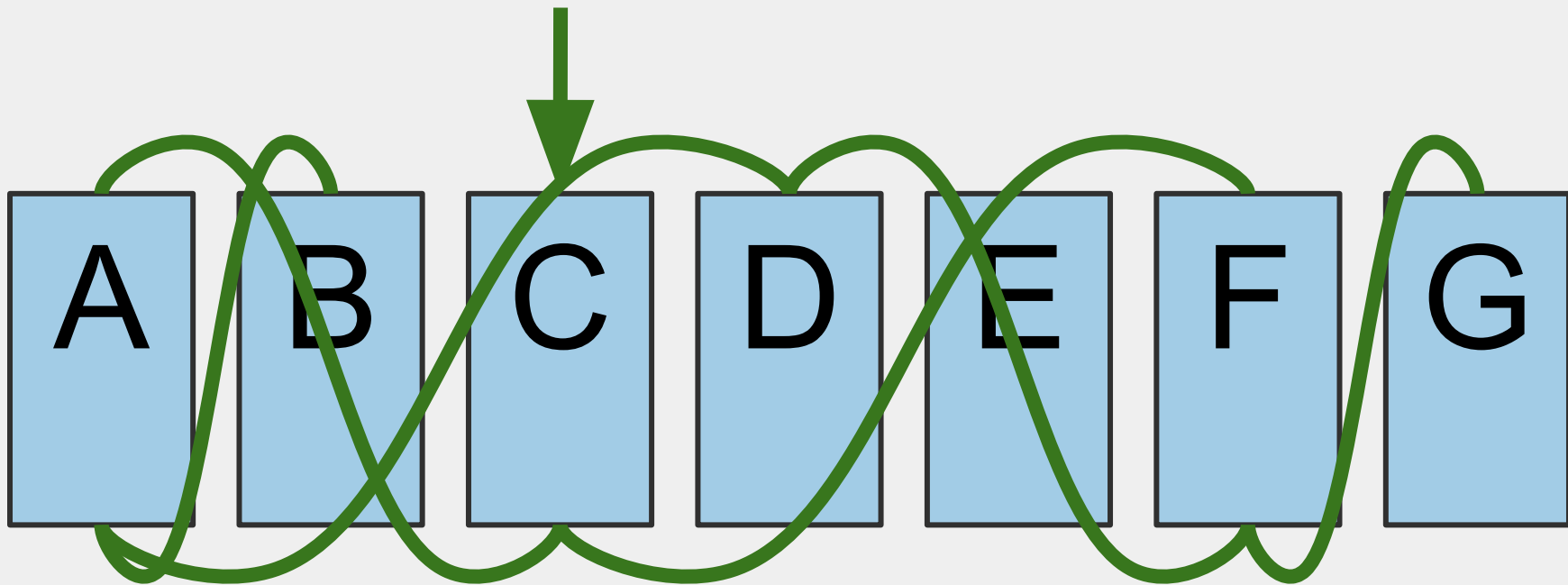


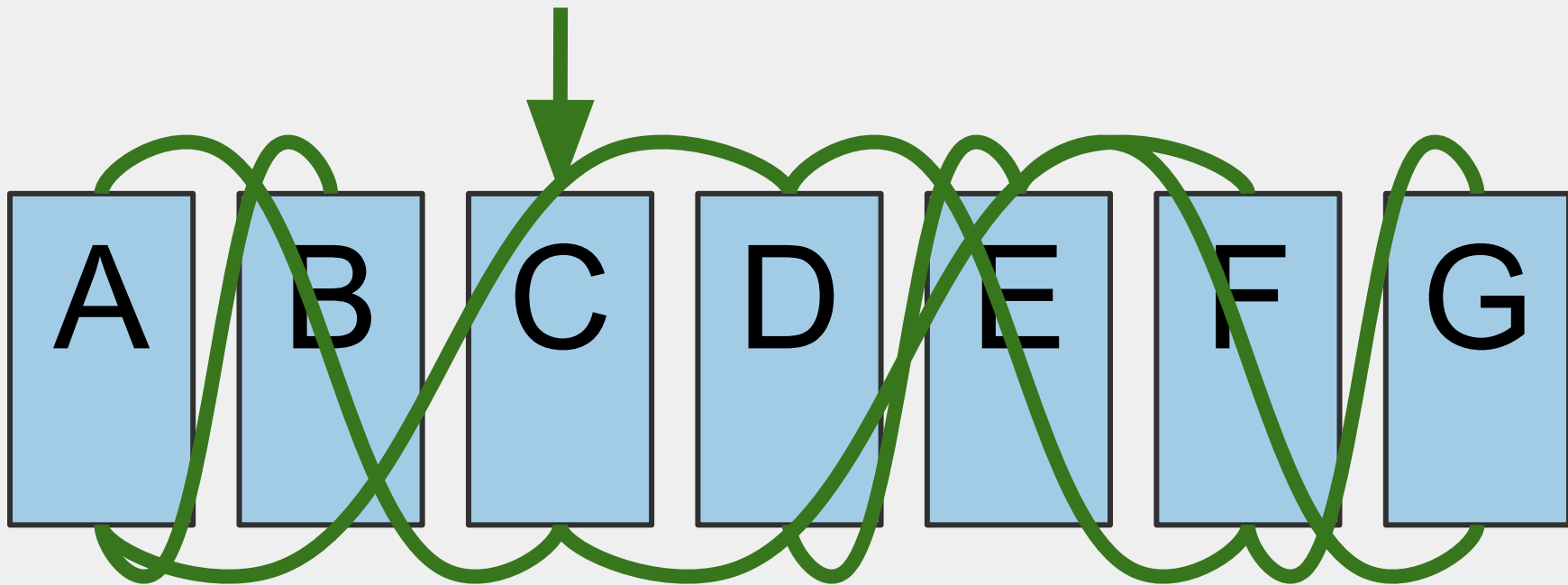
Deprecating Simplicity

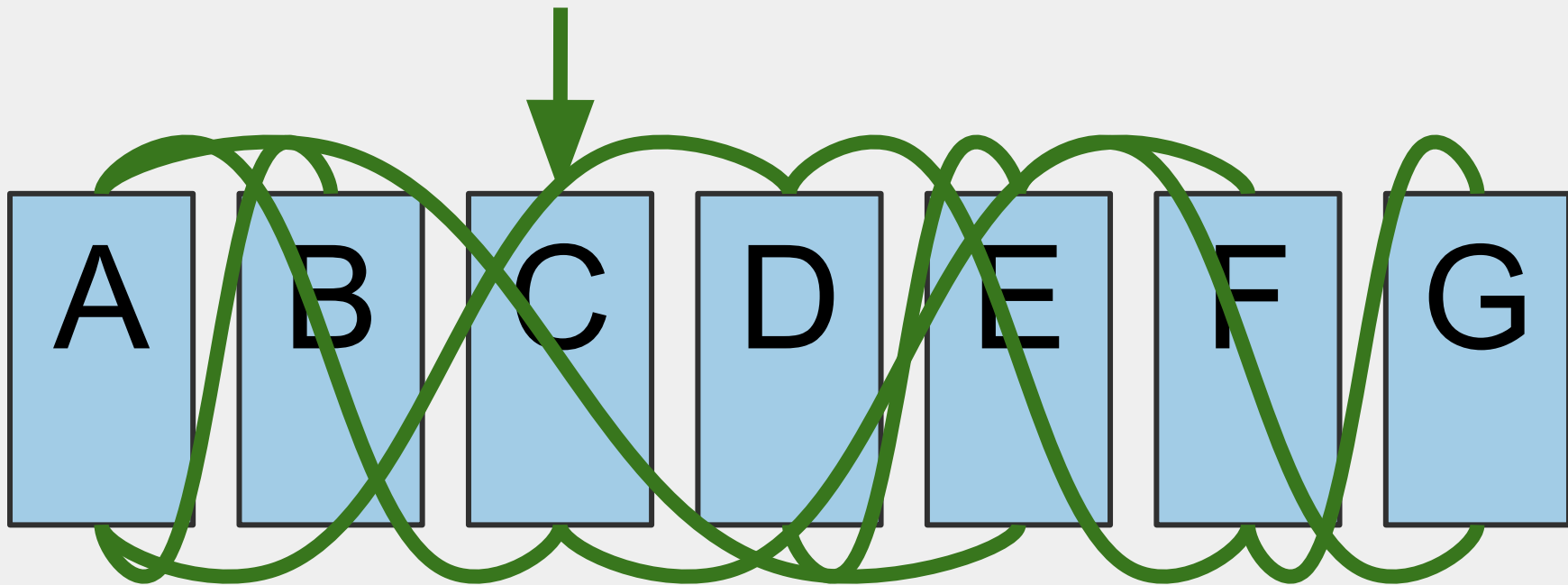
@CaseyRosenthal

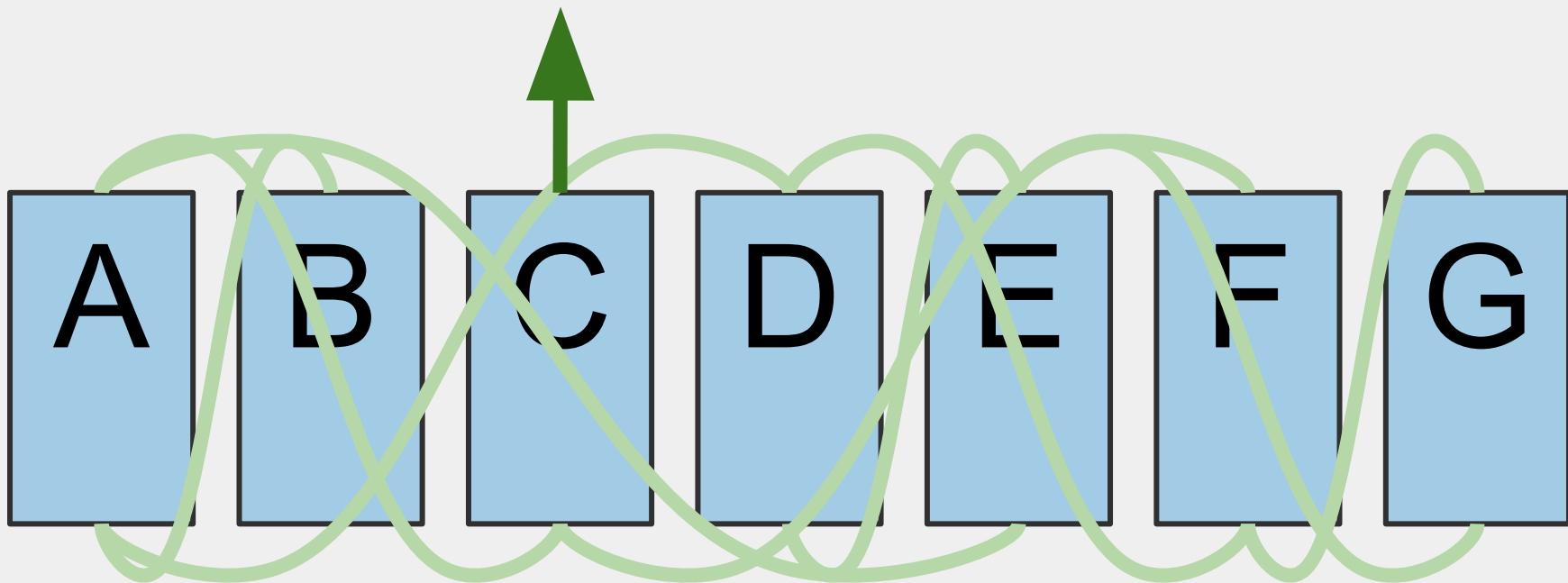


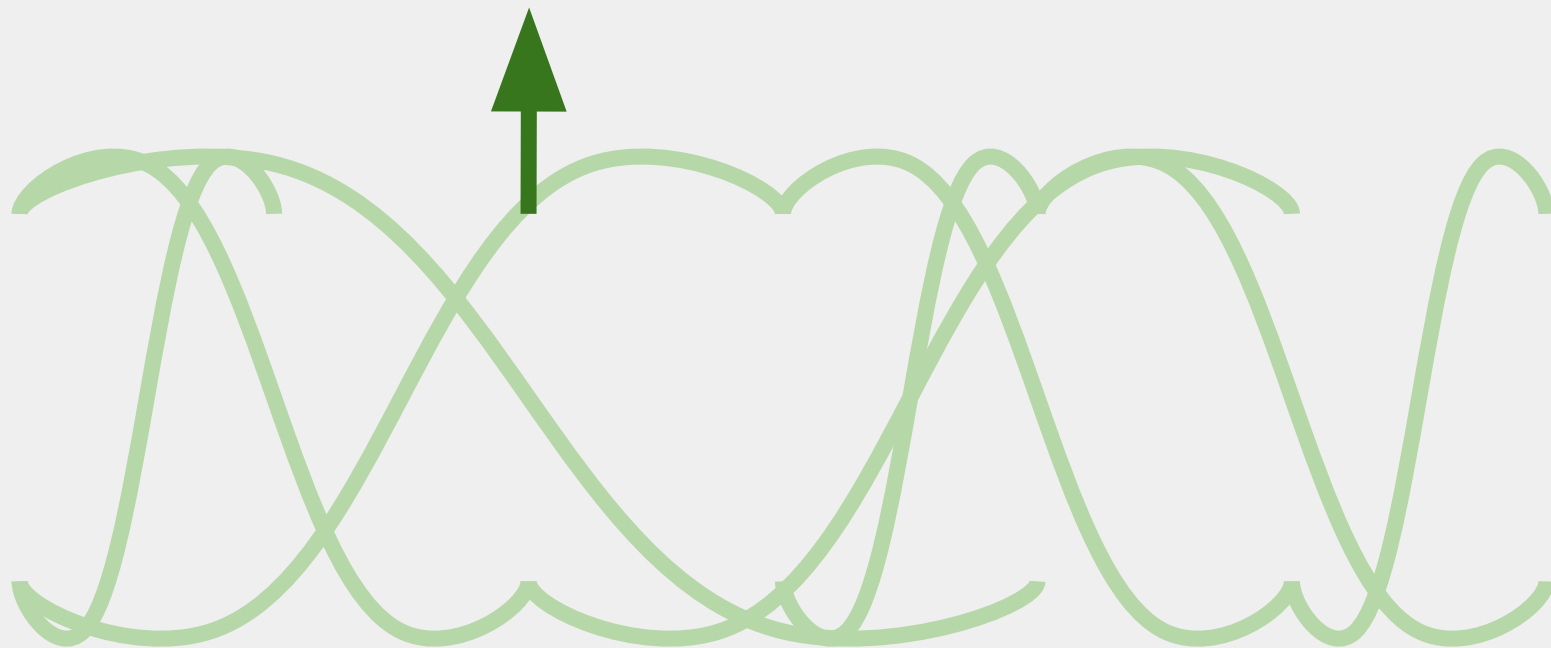












global / us-west-2

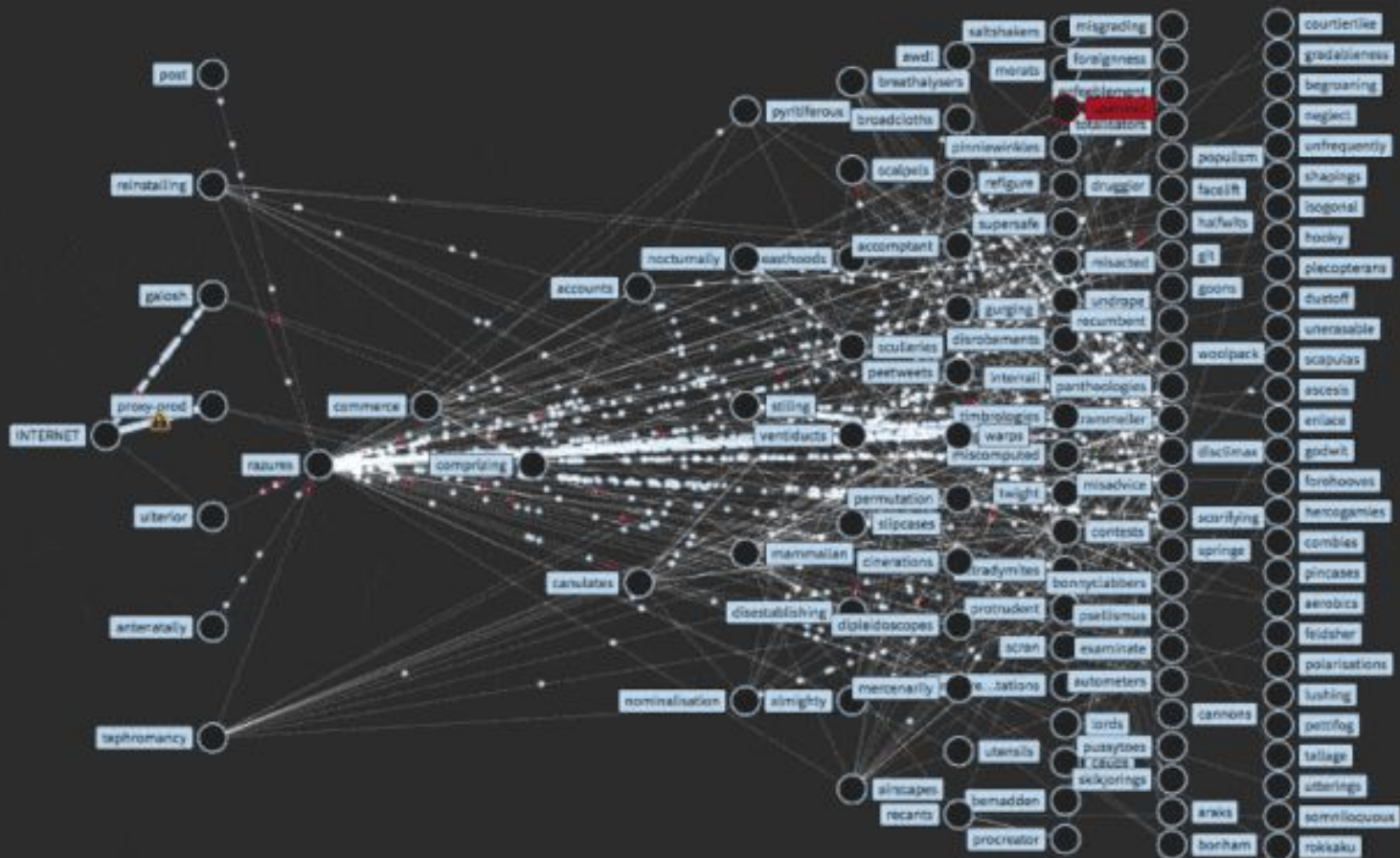
116 services / 0 filtered

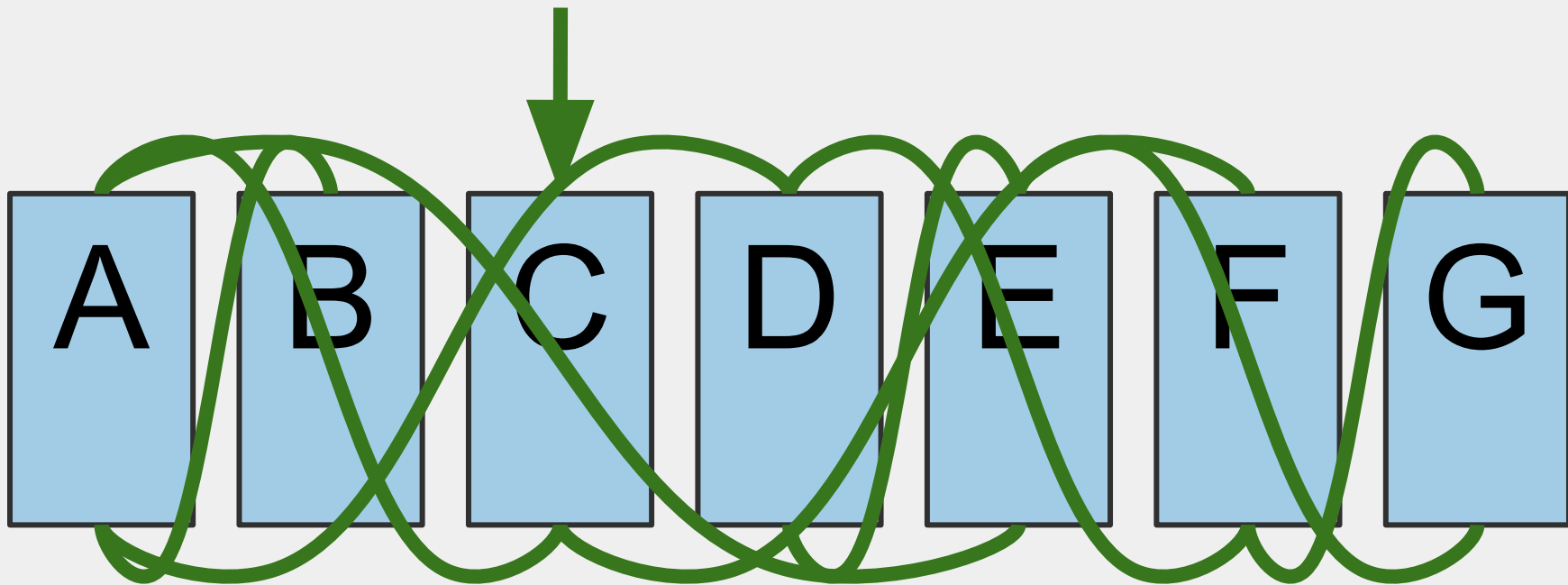
Locate Service

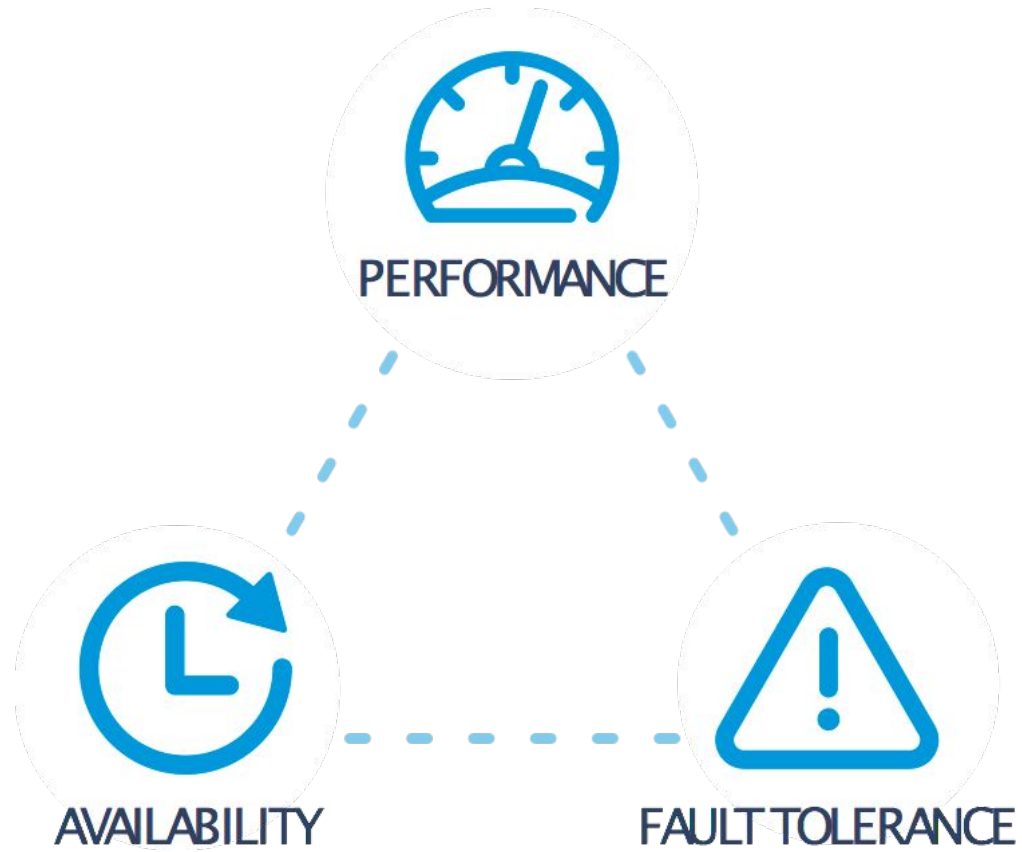


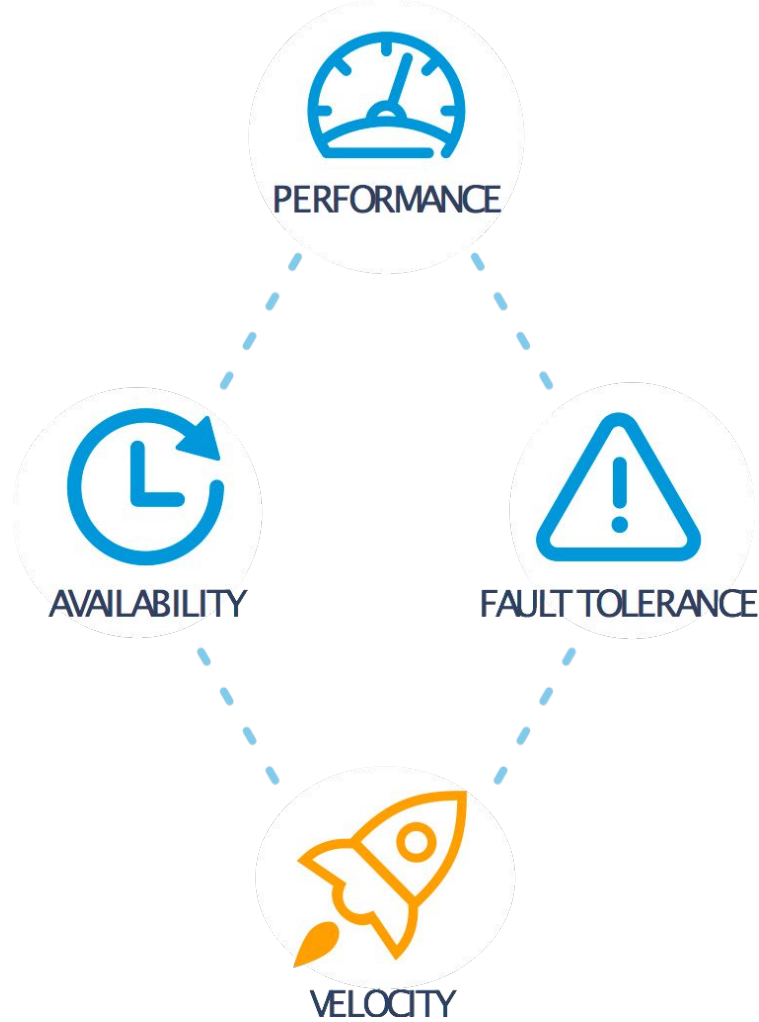
Filters

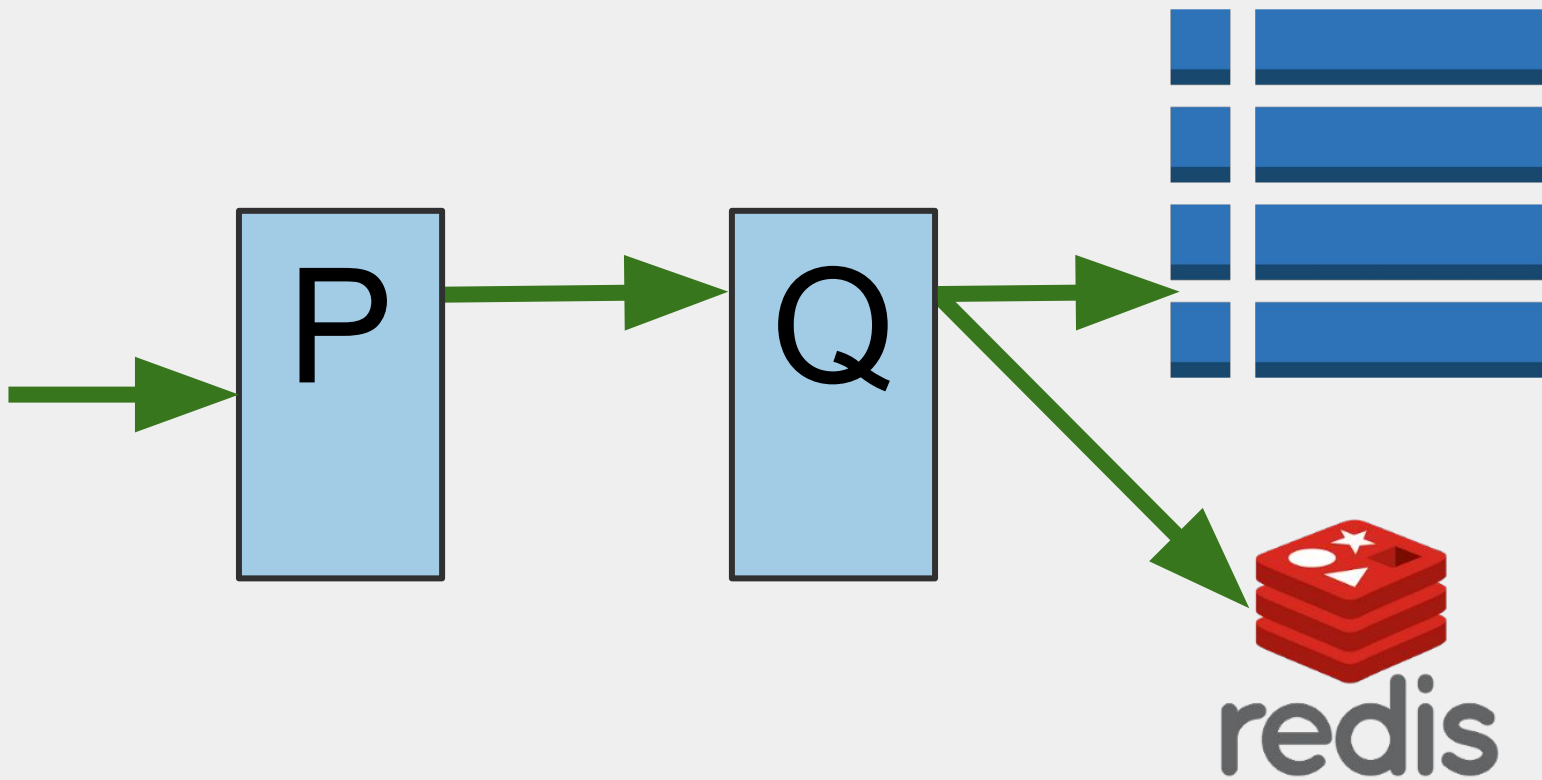
Display

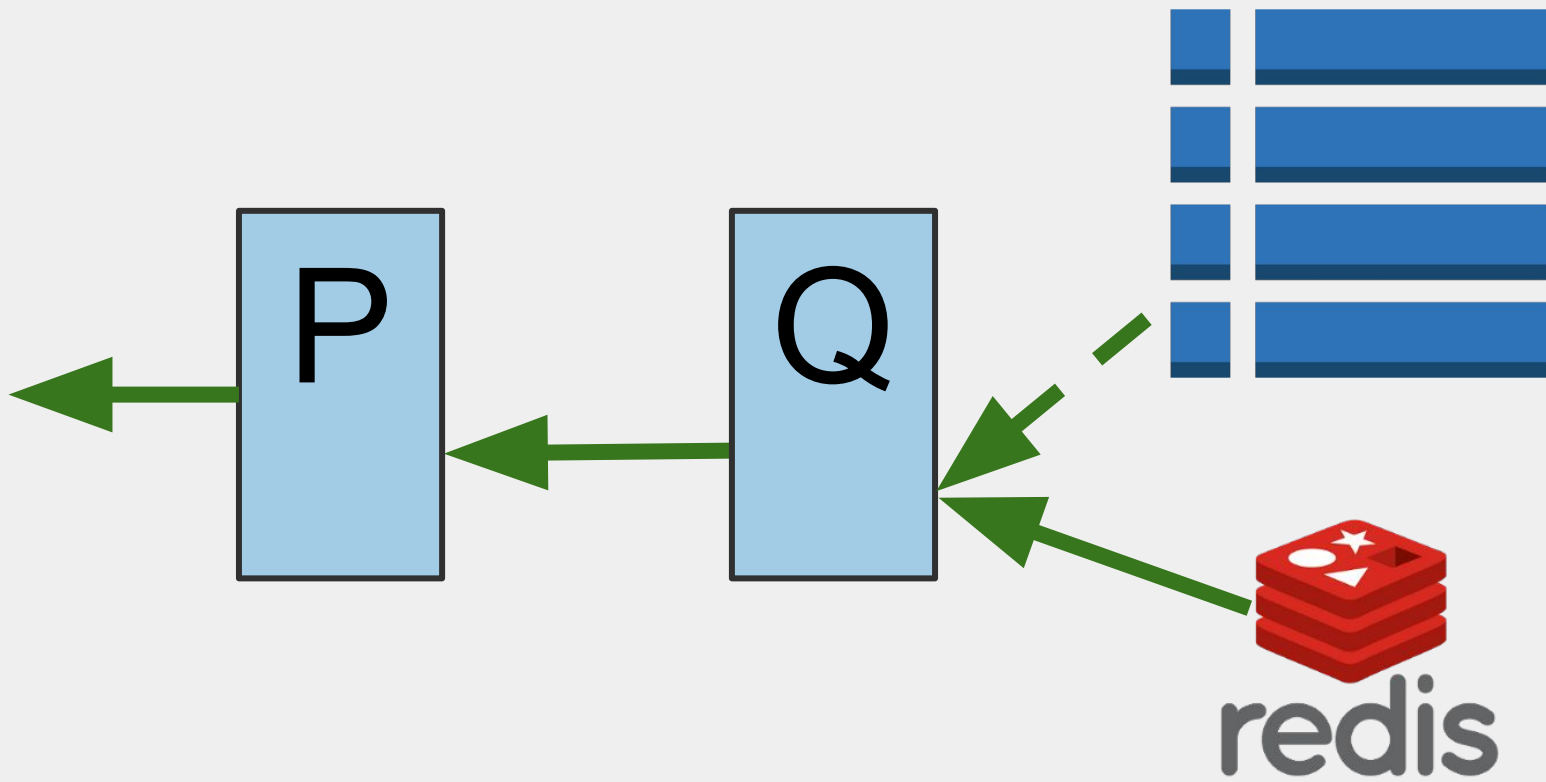


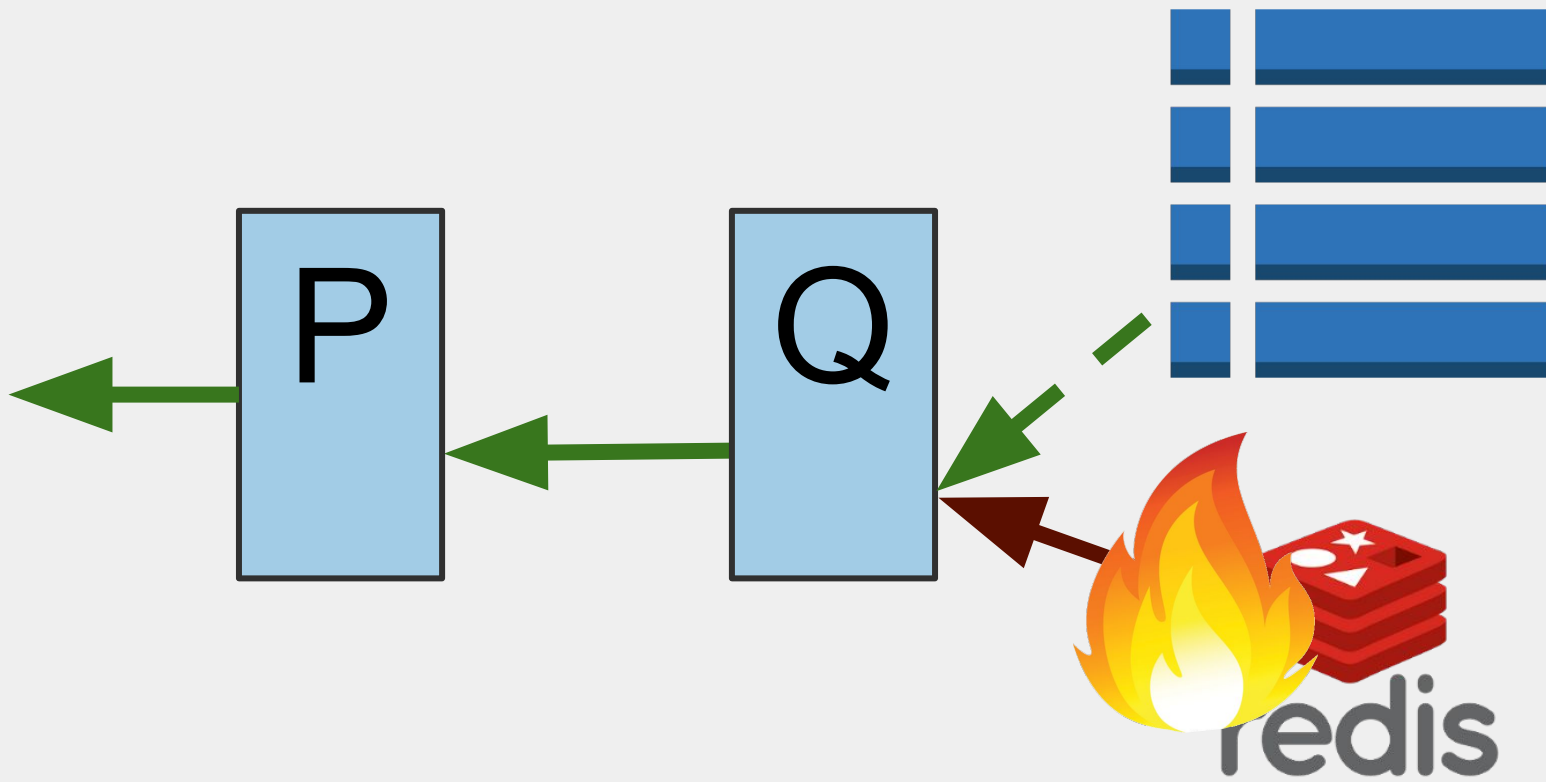


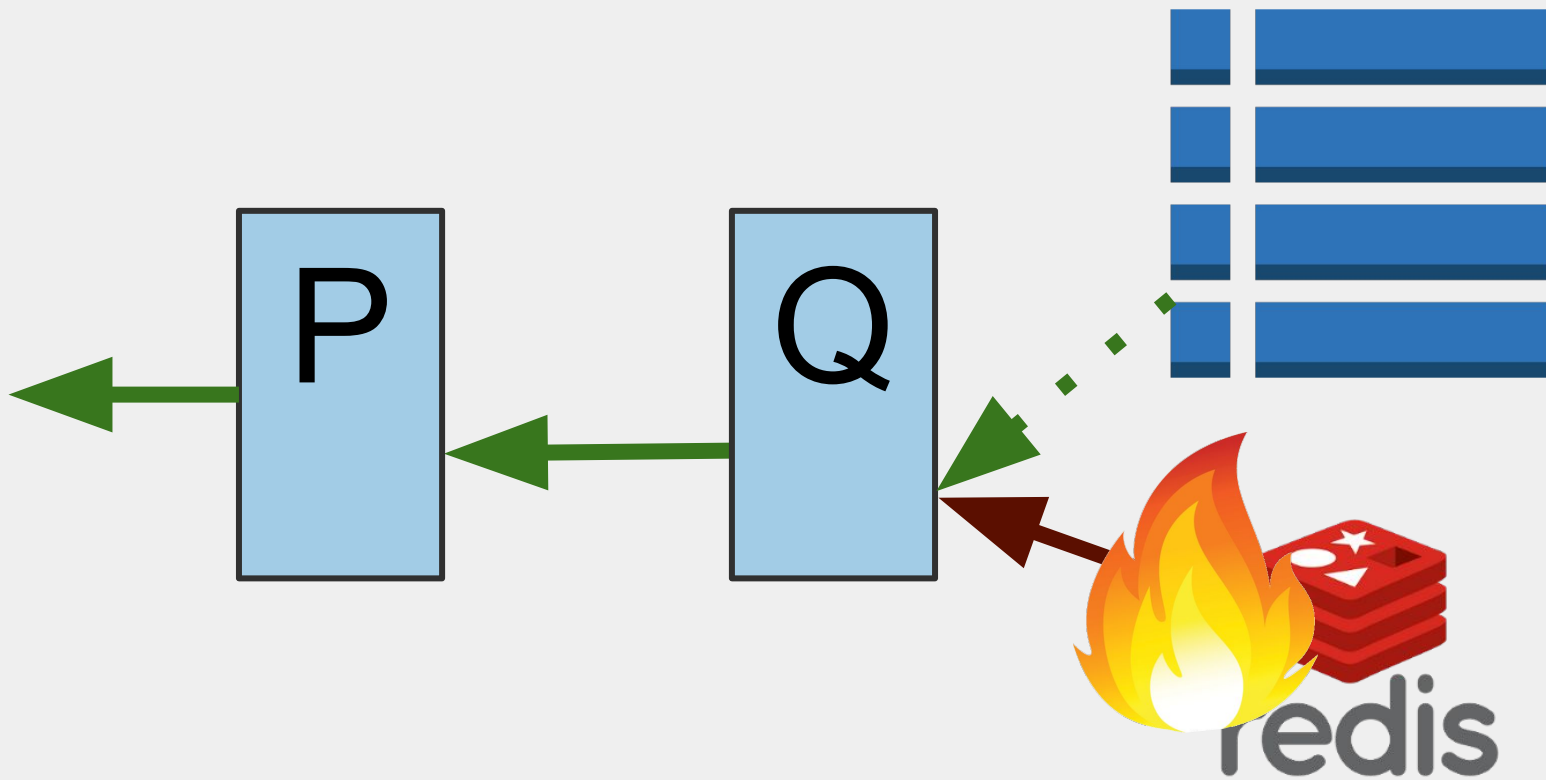


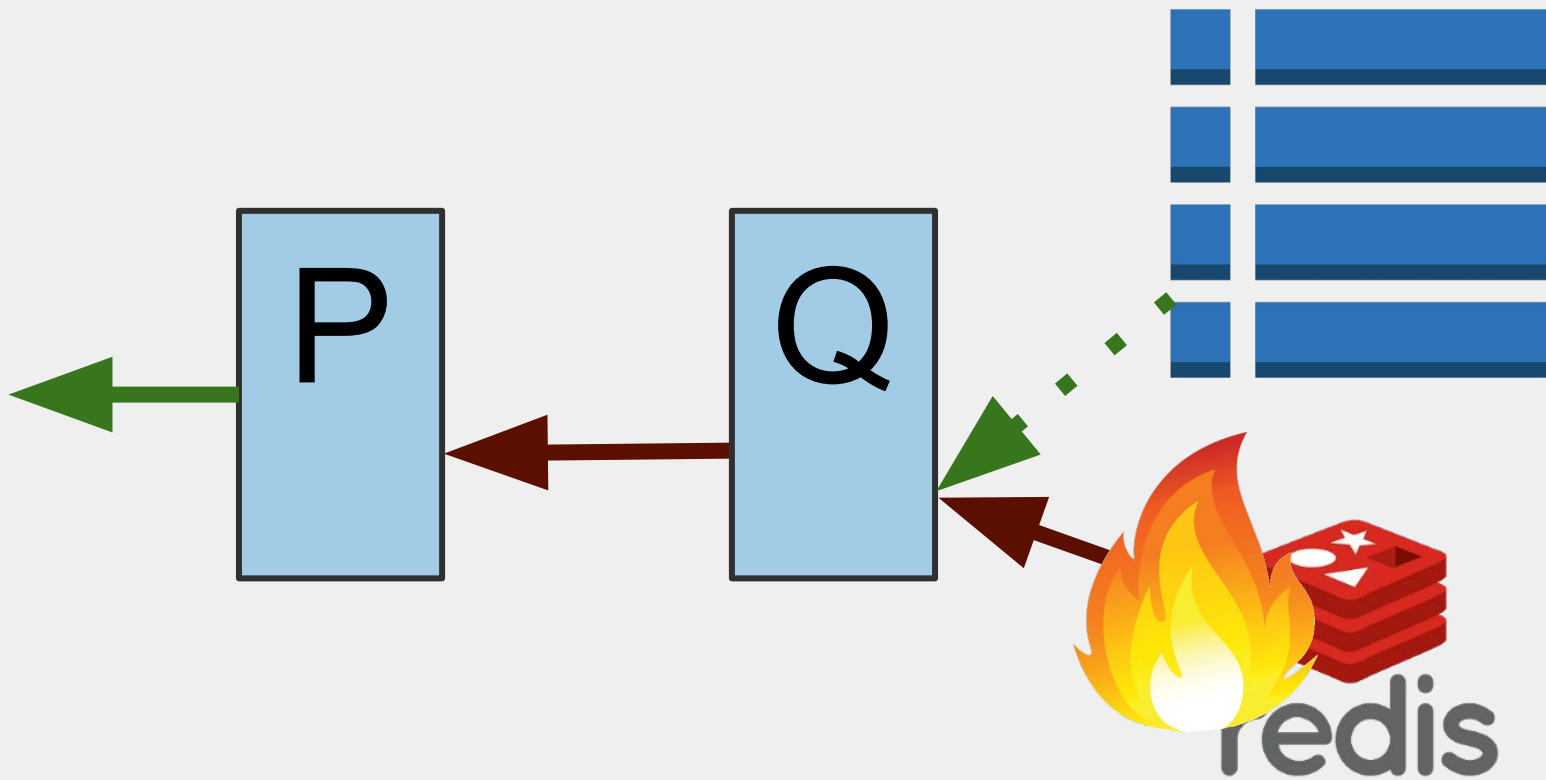


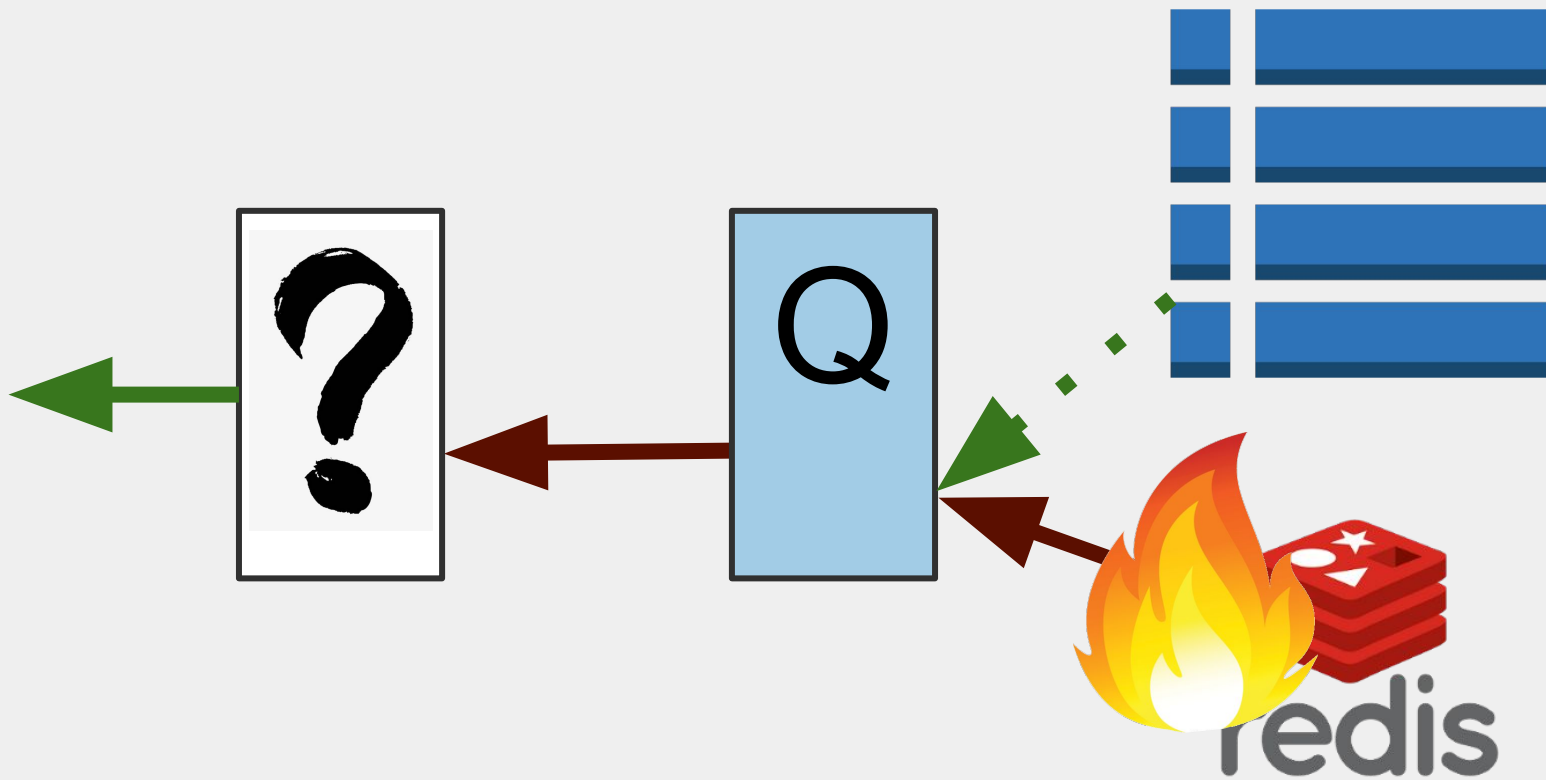


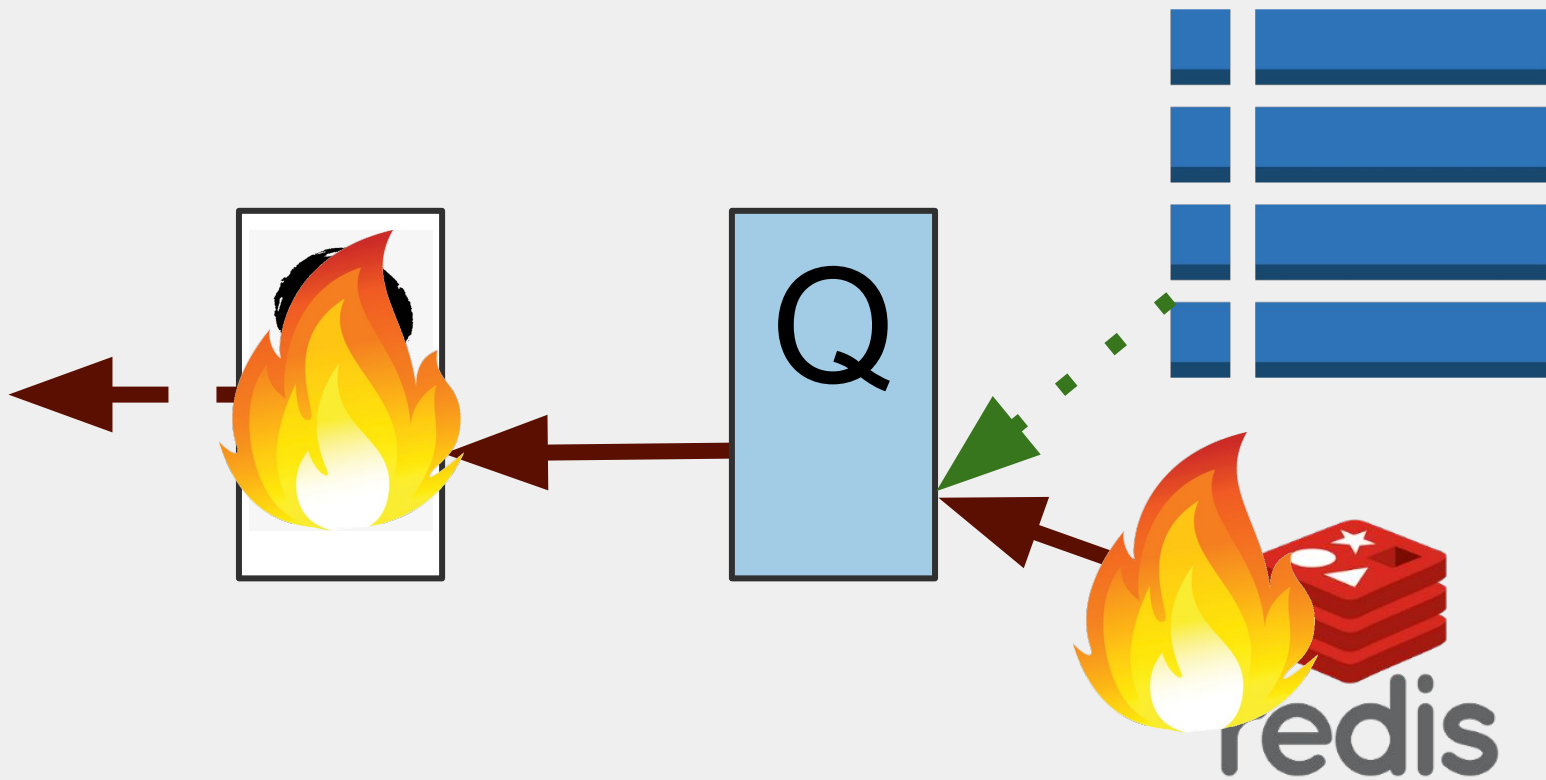












*All components could be
100% correct,
and yet the system exhibits
undesirable behavior.*

@CaseyRosenthal

*How do we survive
the undesirable effects
of complex systems?*

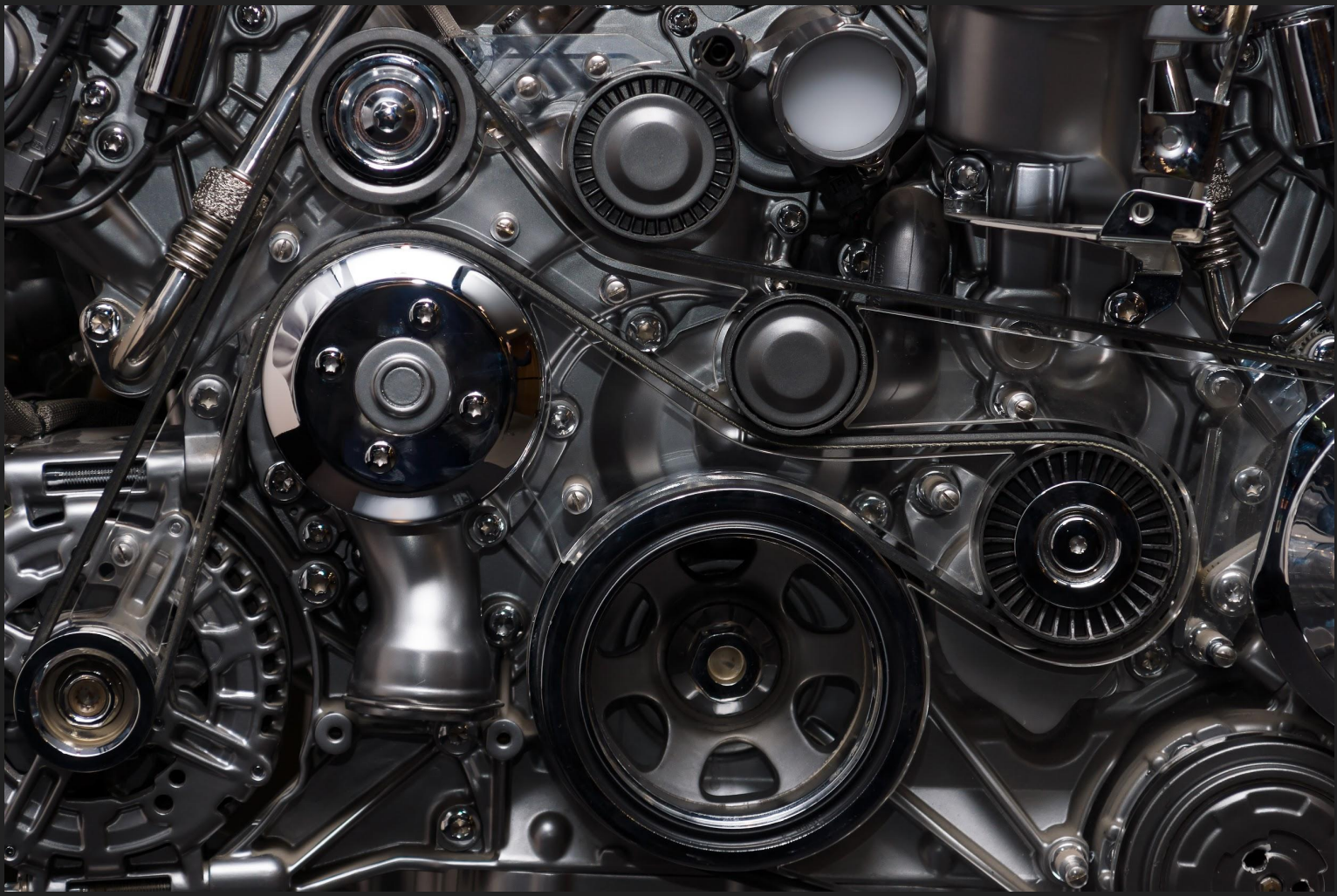
@CaseyRosenthal

Simplicity

@CaseyRosenthal



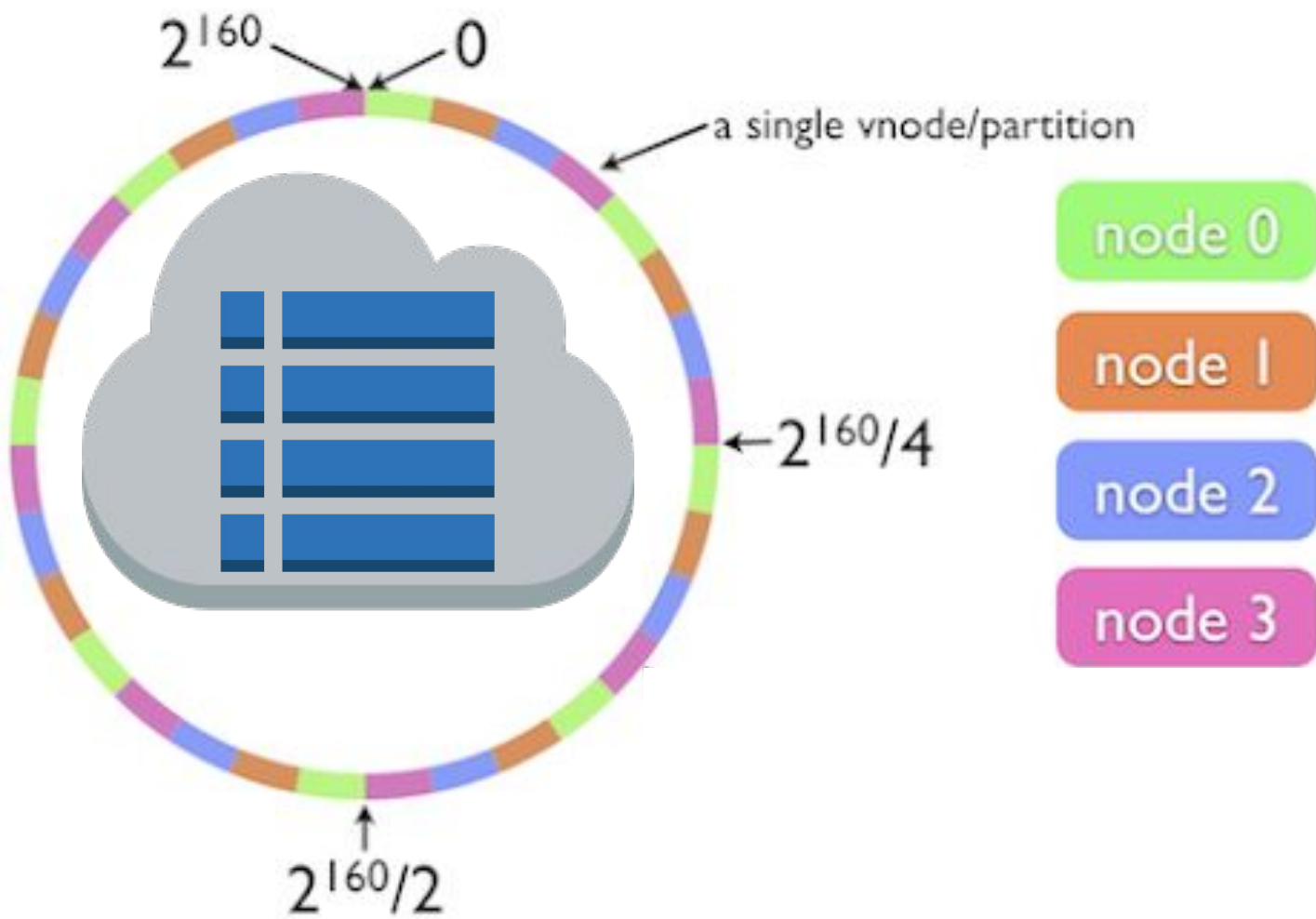
ACCIDENTAL

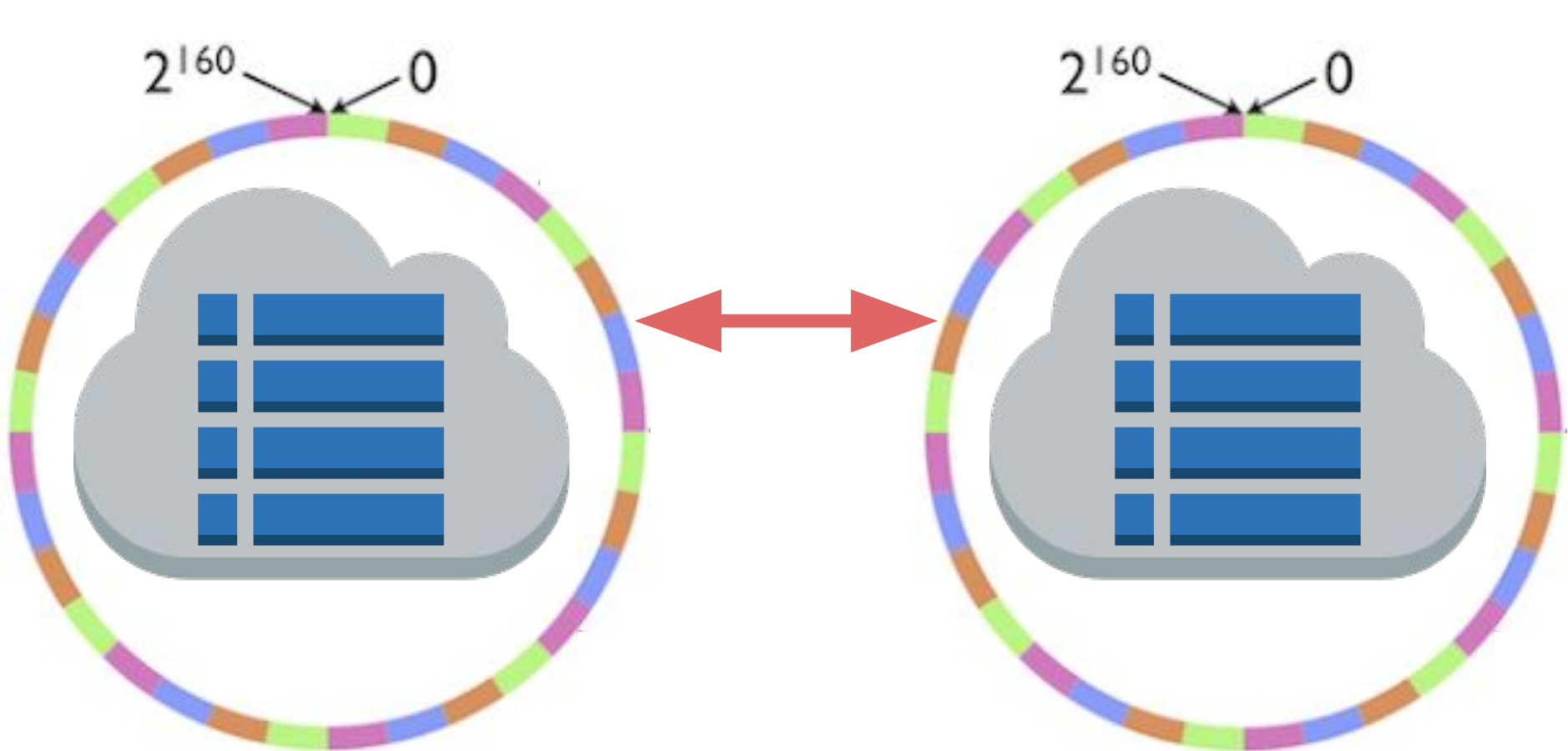


ESSENTIAL











*How do we survive
the undesirable effects
of complex systems?*

@CaseyRosenthal

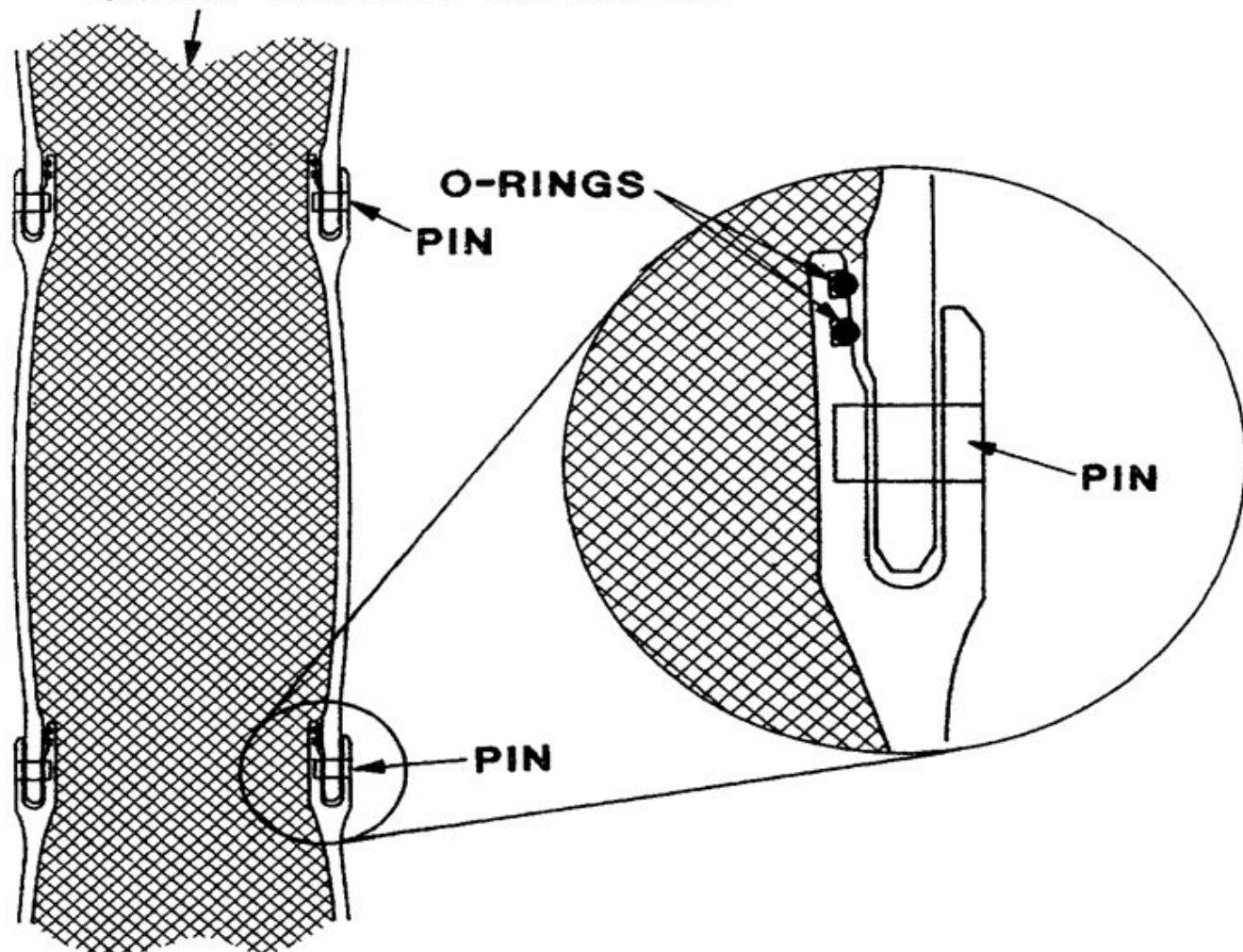
Redundancy

@CaseyRosenthal

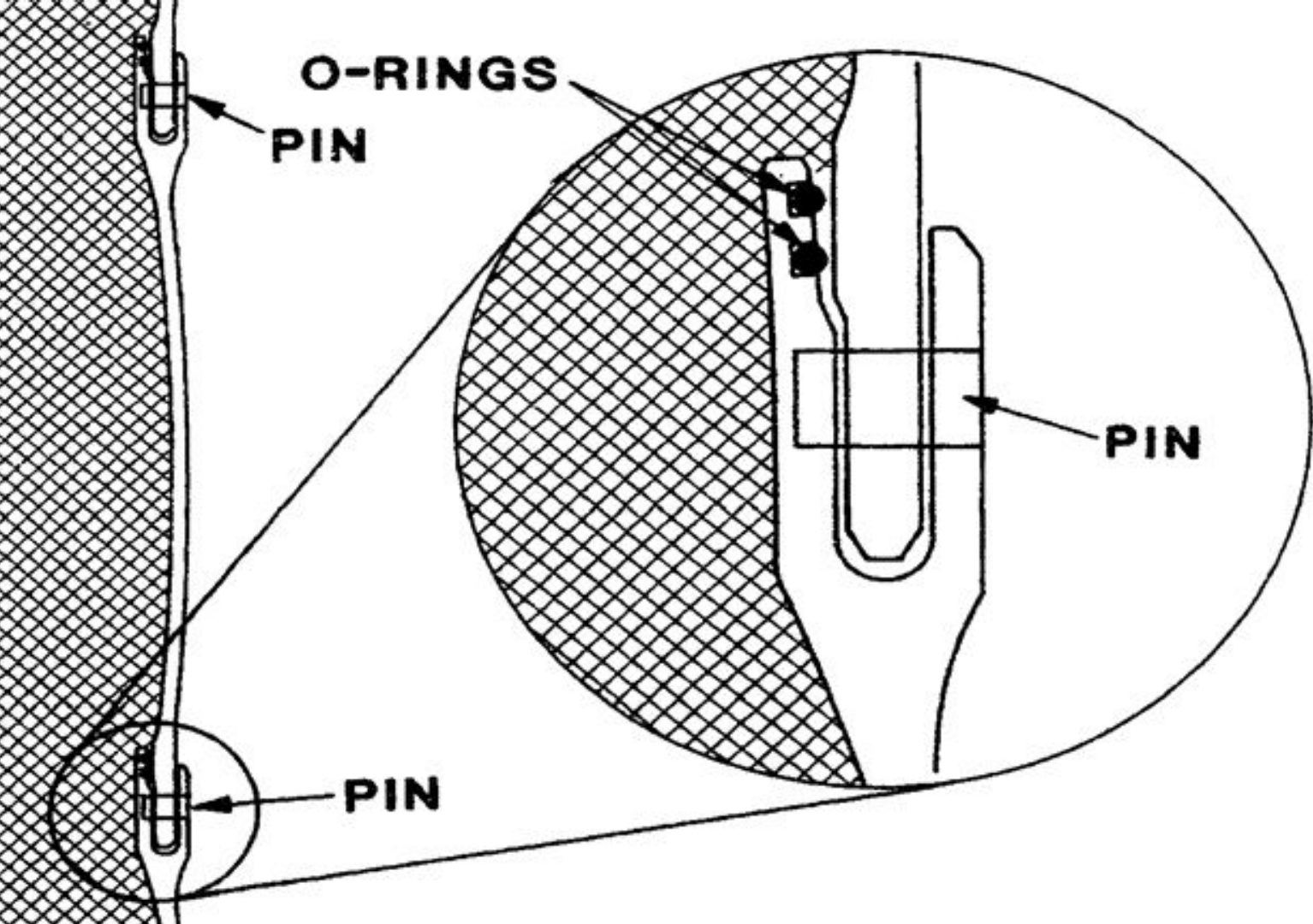




SOLID ROCKET BOOSTER









- Functionality has redundancy.

@CaseyRosenthal

- Functionality has redundancy.
- Deviation is within experience base.

@CaseyRosenthal

- Functionality has redundancy.
- Deviation is within experience base.
- Issue is self-limiting.

@CaseyRosenthal

“Despite designers’ best intentions, redundancy can unwittingly increase the chances of an accident by encouraging operators to push safety limits well beyond where they would have, had such redundancies not been installed.”

-Snook, 2002

*How do we survive
the undesirable effects
of complex systems?*

@CaseyRosenthal

Avoiding Risk

@CaseyRosenthal







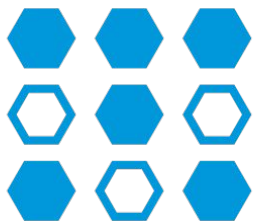




*How do we survive
the undesirable effects
of complex systems?*

@CaseyRosenthal

Economic Pillars of Complexity



STATES



RELATIONSHIPS



ENVIRONMENT



REVERSIBILITY

“The chief merit of **bureaucracy is its technical efficiency, with a premium placed on precision, speed, expert control, continuity, discretion, and optimal returns on input.”**

-Merton

s/bureaucracy/software engineering/

“The chief merit of [software engineering] is its technical efficiency, with a premium placed on precision, speed, expert control, continuity, discretion, and optimal returns on input.”

-Merton

Software Engineering: the Bureaucratic Profession

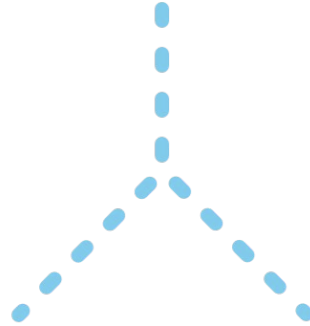
@CaseyRosenthal

*How do we survive
the undesirable effects
of complex systems?*

@CaseyRosenthal



ECONOMICS



WORKLOAD

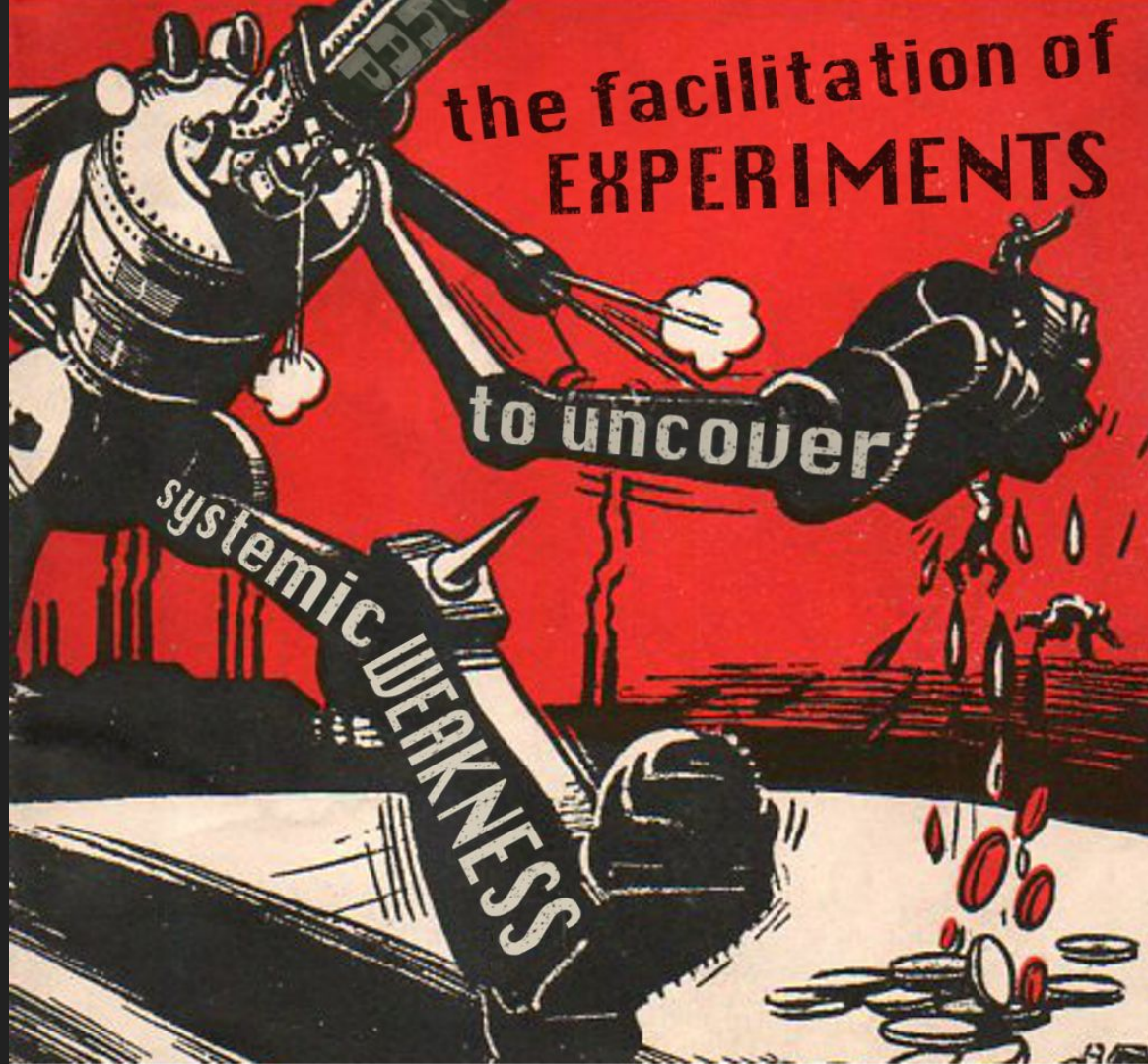


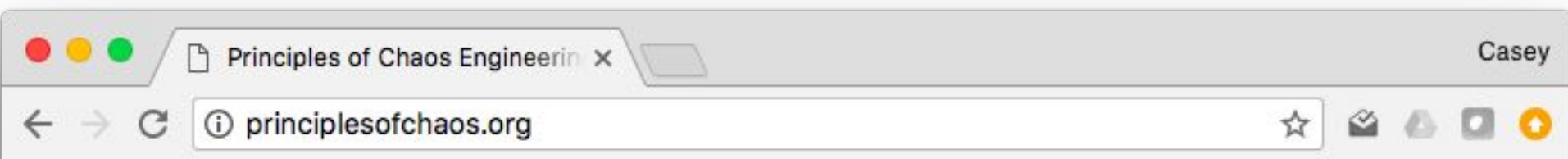
SAFETY

the facilitation of
EXPERIMENTS

to uncover

systemic **WEAKNESS**





PRINCIPLES OF CHAOS ENGINEERING

Last Update: 2017 April

Chaos Engineering is the discipline of experimenting on a distributed system in order to build confidence in the system's capability to withstand turbulent conditions in production.



ECONOMICS



WORKLOAD



SAFETY

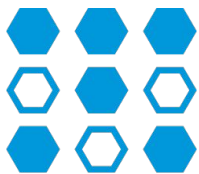
*How do we survive
the undesirable effects
of complex systems?*

@CaseyRosenthal

“The requirements for design conflict and cannot be reconciled. All designs for devices are in some degree failures... because they are compromises, and compromise implies a degree of failure.

It is quite impossible for any design to be ‘the logical outcome of the requirements’ simply because, the requirements being in conflict, their logical outcome is an impossibility.”

-David Pye



STATES



WORKLOAD



SAFETY



ENVIRONMENT



AVAILABILITY

RELATIONSHIPS



PERFORMANCE



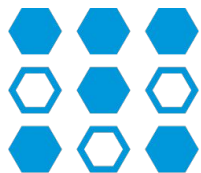
FAULT TOLERANCE



ECONOMICS



REVERSIBILITY



STATES



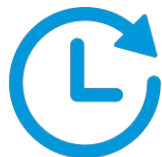
WORKLOAD



SAFETY

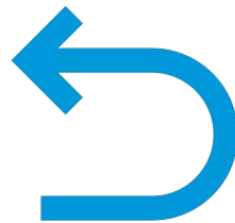


ENVIRONMENT



AVAILABILITY

RELATIONSHIPS



REVERSIBILITY



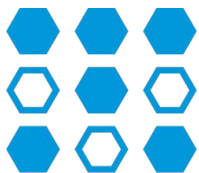
PERFORMANCE



FAULT TOLERANCE



ECONOMICS



STATES



WORKLOAD



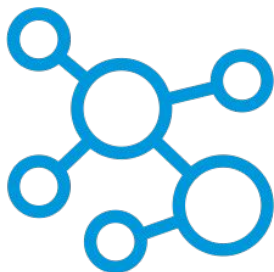
SAFETY



ENVIRONMENT



AVAILABILITY



RELATIONSHIPS



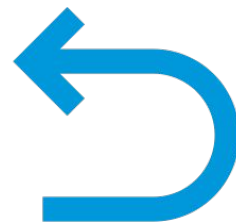
PERFORMANCE



FAULT TOLERANCE



ECONOMICS



REVERSIBILITY

*How do we survive
the undesirable effects
of complex systems?*

@CaseyRosenthal

Think of a well-run kitchen.

@CaseyRosenthal

- Embrace complexity and navigate it.

@CaseyRosenthal

- Embrace complexity and navigate it.
- Provide opportunities for teams to practice working together.

@CaseyRosenthal

- Embrace complexity and navigate it.
- Provide opportunities for teams to practice working together.
- Tolerate inefficiencies.

@CaseyRosenthal

- Embrace complexity and navigate it.
- Provide opportunities for teams to practice working together.
- Tolerate inefficiencies.
- Communicate the safety margin.

@CaseyRosenthal

*Tools don't create resilience.
Humans do.*

@CaseyRosenthal

O'REILLY®

Compliments of
NETFLIX

Chaos Engineering

Building Confidence in System Behavior
through Experiments



@caseyroenthal