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HUMAN ELEMENT

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# New Paradigms for the Next Era of Security

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# $whoami

Former Chief Security Scientist at Major Financial Institution

Mad Scientist → Make New Capabilities

Product Evaluator → Test Market Capabilities

Red Team Lead → Break Capabilities

# Cyber Defense Matrix

https://cyberdefensematrix.com

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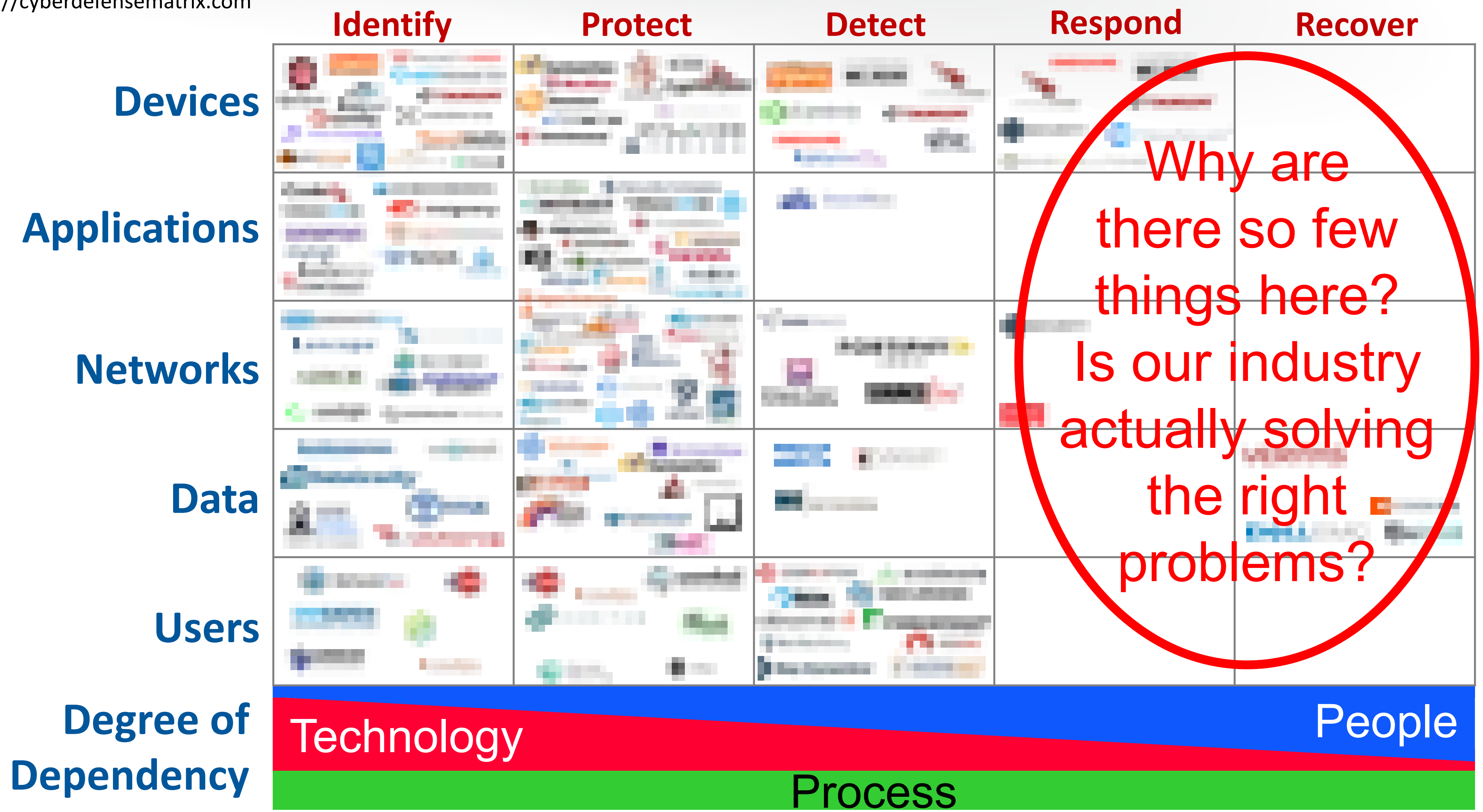
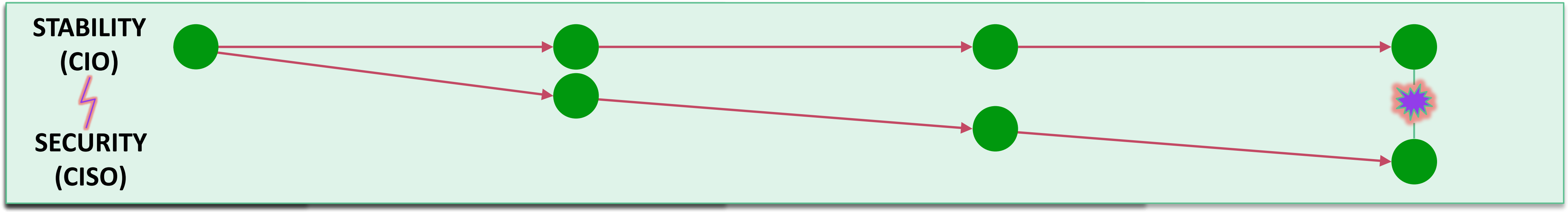


Why are there so few things here? Is our industry actually solving the right problems?

# A Quick History of IT and Security

| Era | 1980s | 1990s | 2000s | 2010s |
|---|---|---|---|---|
| Core Challenges | What did we buy and how does it support the biz? | Viruses, Server-side Attacks, Insecure Configs | Too many logs and alerts, Client-side attacks | Assume Breach, Raging Fires, Too Many Privileges |
| Solutions | Asset Mgt, Systems Mgt Tools | Anti-Virus, Firewalls, Secure Configs | IDS, SIEM | Incident Responders & IR Tools (EDR, SOAR) |
| IT / Security Tension |  | | | |
| Security Team Composition & Focus | None | Hobby Shop / Vulnerability Mgt | Sec Ops Center / Threat Mgt | Dedicated Biz Unit / Risk Mgt |

# Mapping to the NIST Cyber Security Framework

| Era | 1980s<br>IDENTIFY | 1990s<br>PROTECT | 2000s<br>DETECT | 2010s<br>RESPOND |
|---|---|---|---|---|
| Core Challenges | What did we buy and how does it support the biz? | Viruses, Server-side Attacks, Insecure Configs | Too many logs and alerts, Client-side attacks | Assume Breach, Raging Fires, Too Many Privileges |
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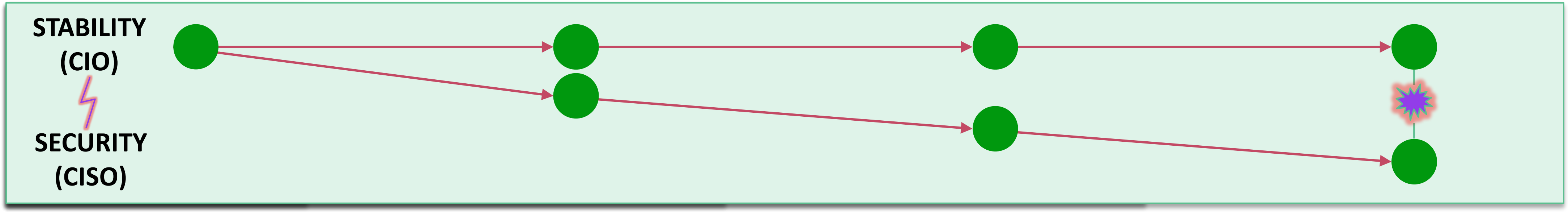
| IT / Security Tension |  | | | |
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# 2020s: Age of Recovery (or Resiliency)

What kind of attacks should we see in the 2020s that would challenge to our ability to RECOVER or cause irreversible harm?

**Confidentiality**

↓

**Wikileaks**
**Doxxing**

**Integrity**

↓

**Ransomware**
**#fakenews**

**Availability**

↓

**PDoS, MBR Wiper,**
**Bricking Firmware**

# 2020s: Age of Recovery (or Resiliency)

What kind of solutions directly support our ability to RECOVER or be RESILIENT?

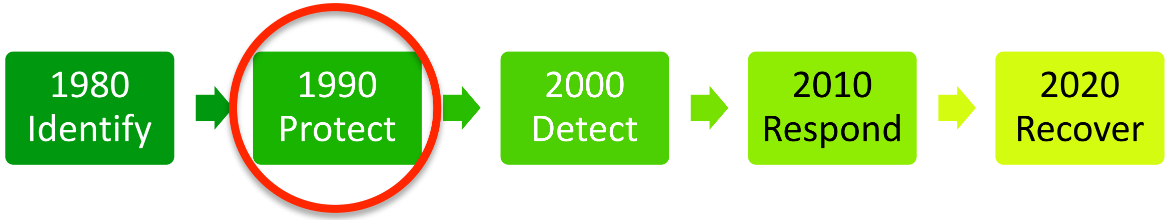
# Forging ahead or regressing back?

Recent advertising campaign from major vendor

DINOSAURS REACT.
PROFESSIONALS
PREVENT.
JOIN THE PREVENTION AGE
STOP CYBER BREACHES

JOIN THE **PREVENTION** AGE
STOP CYBER BREACHES

- A call to go back to the 1990s?



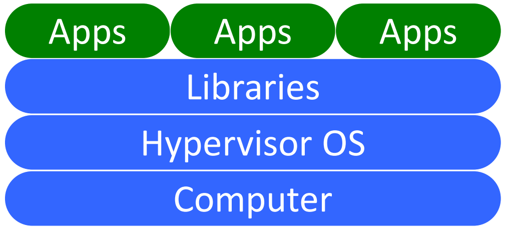
1980 Identify → 1990 Protect → 2000 Detect → 2010 Respond → 2020 Recover

- How will prevention mitigate the impact of ransomware?
  - Remember, we learned “assume breach” in the 2010s
  - Prevention minimizes the occurrences, **but does not address the impact or ability to recover**

# 2020s: Age of Recovery (or Resiliency)

## What kind of solutions directly support our ability to RECOVER or be RESILIENT?

SERVERLESS ARCHITECTURE



Apps | Apps | Apps

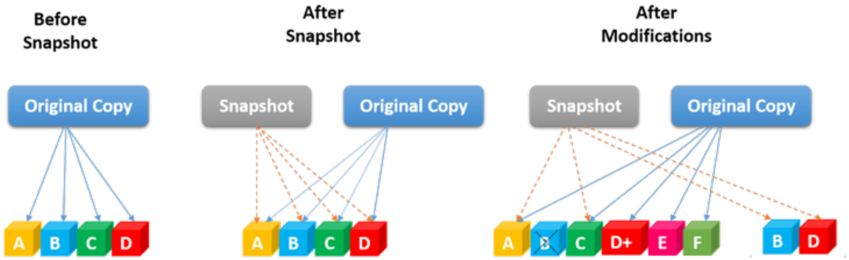
Libraries

Hypervisor OS

Computer

docker

Content Delivery Network

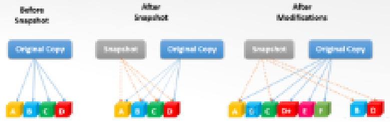


Copy on Write

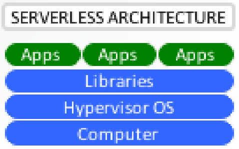
BLOCKCHAIN

# But wait! How are these “security” solutions?

BLOCKCHAIN



docker



## Distributed

**DDoS Resistant**

The best solution against a distributed attack is a distributed service

**Availability**

## Immutable

**Changes Easier to Detect and Reverse**

Unauthorized changes stand out and can be reverted to known good

**Integrity**

## Ephemeral

**Drives Value of Assets Closer to Zero**

Makes attacker persistence hard and reduces concern for assets at risk

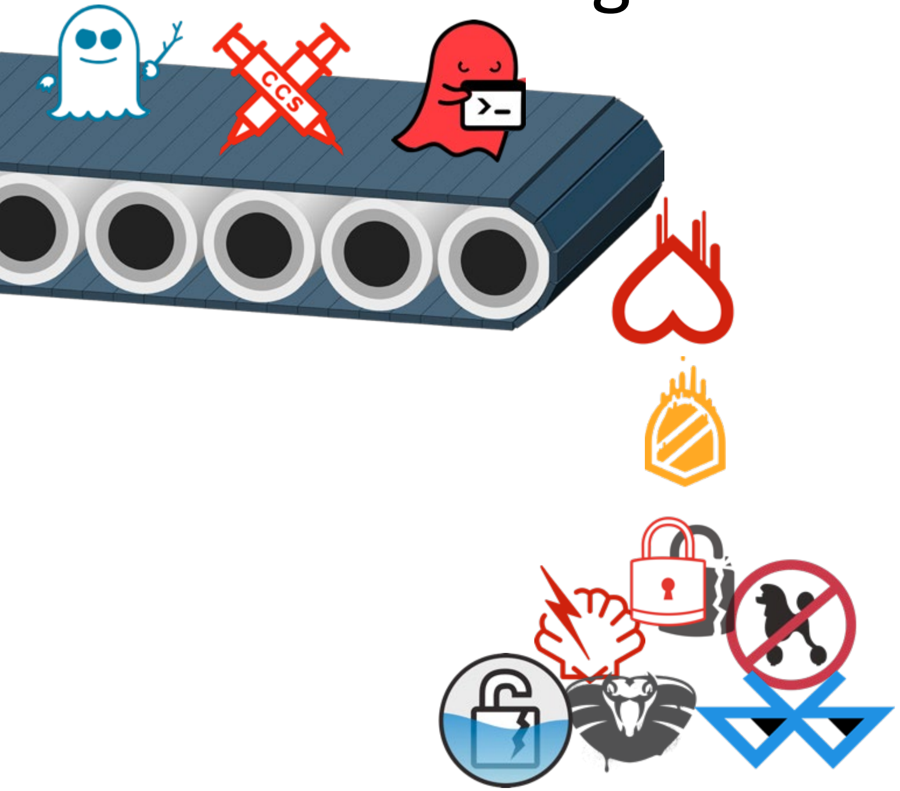
**Confidentiality**

# The Alternative:
# An Endless Conveyor Belt of Vulnerabilities and Threats

**Risk = Likelihood x Impact**

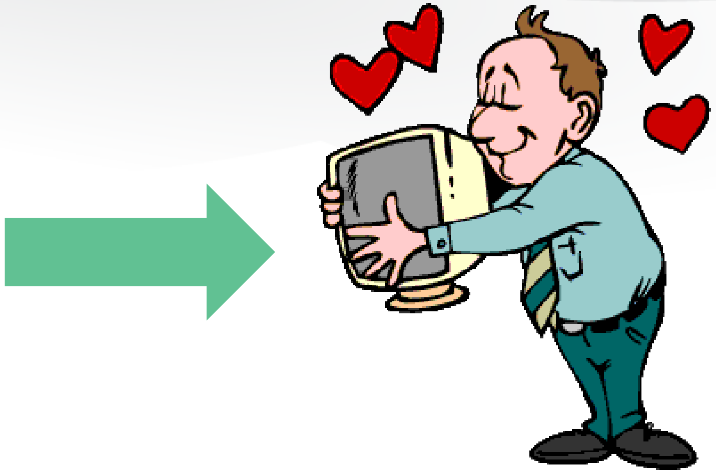
Never Ending Vulns

Never Ending Threats



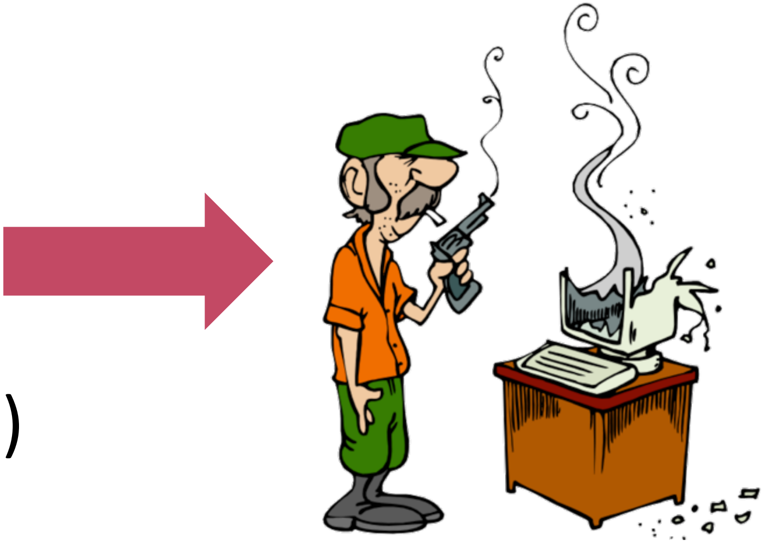
# Pets vs Cattle

- Given a familiar name
- Taken to the vet when sick
- Hugged



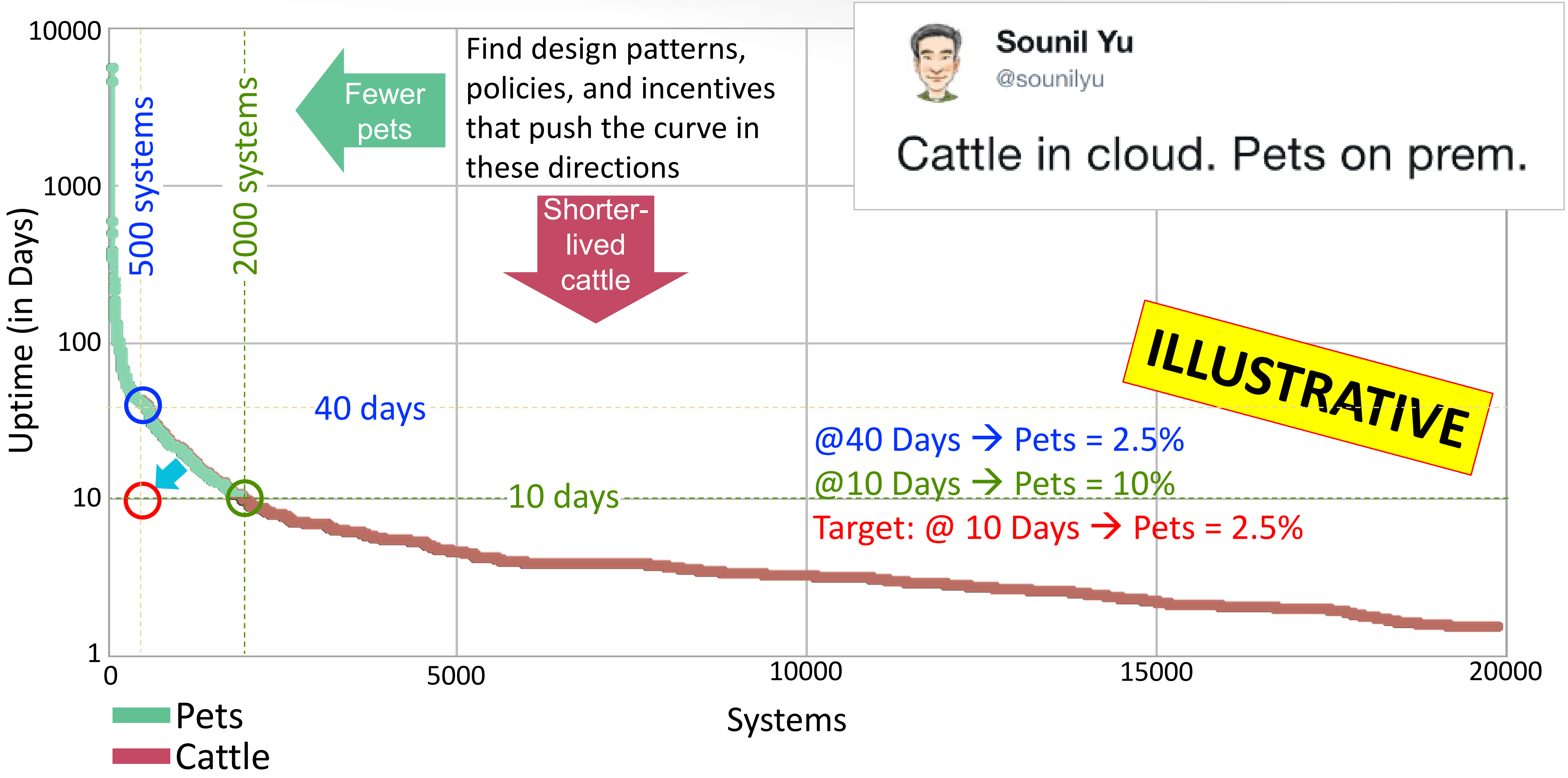
C.I.A.

- Branded with an obscure, unpronounceable name
- Shot when sick
- Eaten/Recycled (sorry PETA)



D.I.E.

# A New Measurement for a New Era: Pets vs Cattle Curve



Fewer pets

Find design patterns, policies, and incentives that push the curve in these directions

Shorter-lived cattle

ILLUSTRATIVE

@40 Days → Pets = 2.5%

@10 Days → Pets = 10%

Target: @ 10 Days → Pets = 2.5%

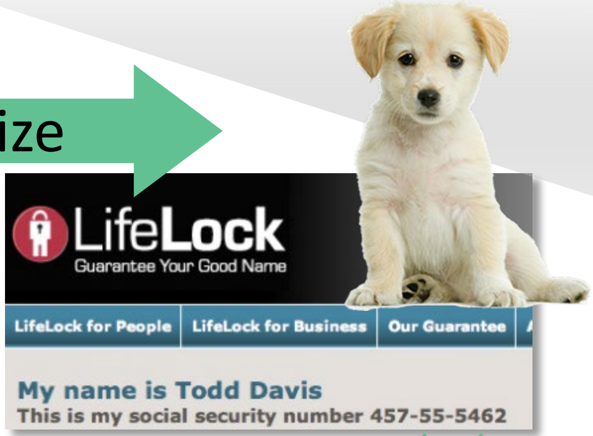
**Sounil Yu**
@sounilyu

Cattle in cloud. Pets on prem.

# Pets vs Cattle Controls

By signing this certificate I promise to give my puppy a lifetime of love, care, attention and fun! I promise to be their best friend forever.

Discourage / Disincentivize



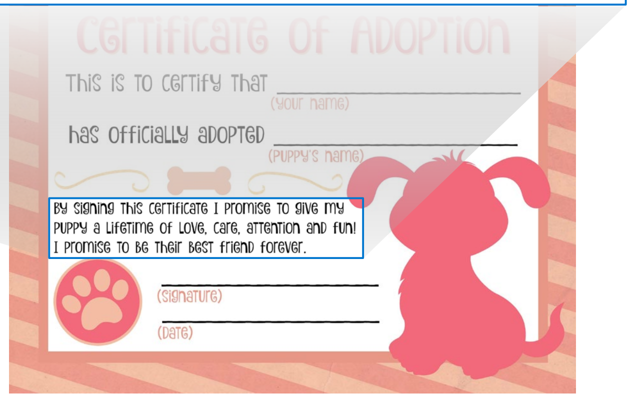
LifeLock

Guarantee Your Good Name

LifeLock for People | LifeLock for Business | Our Guarantee

My name is Todd Davis

This is my social security number 457-55-5462



Certificate of Adoption

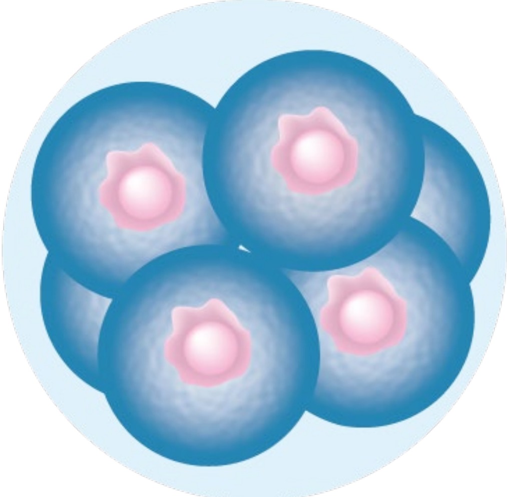
This is to certify that ____________ (your name)

has officially adopted ____________ (puppy's name)

By signing this certificate I promise to give my puppy a lifetime of love, care, attention and fun! I promise to be their best friend forever.

____________ (signature)

____________ (date)



- decommissioning
- creative destruction
- rebooting/reimaging

- ssh'ing into a container
- letting an asset live longer than needed
- patching in place

Encourage / Incentivize

# Completing the NIST Cyber Security Framework

| Era | 1980<br>Identify | 1990<br>Protect | 2000<br>Detect | 2010<br>Respond | 2020<br>Recover |
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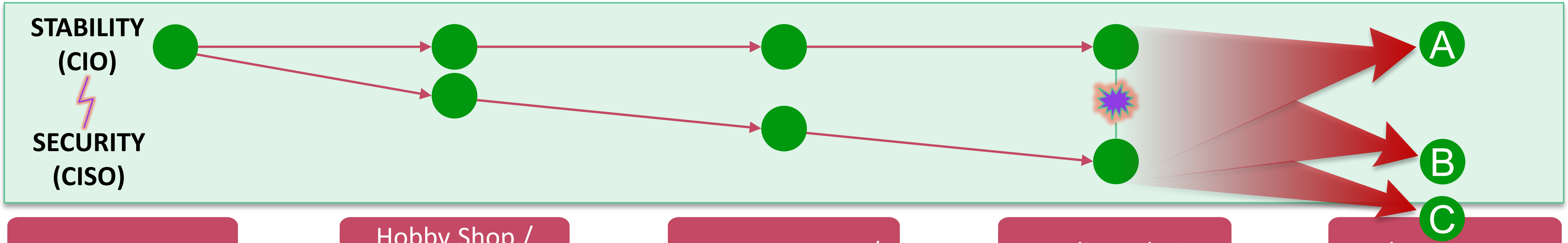
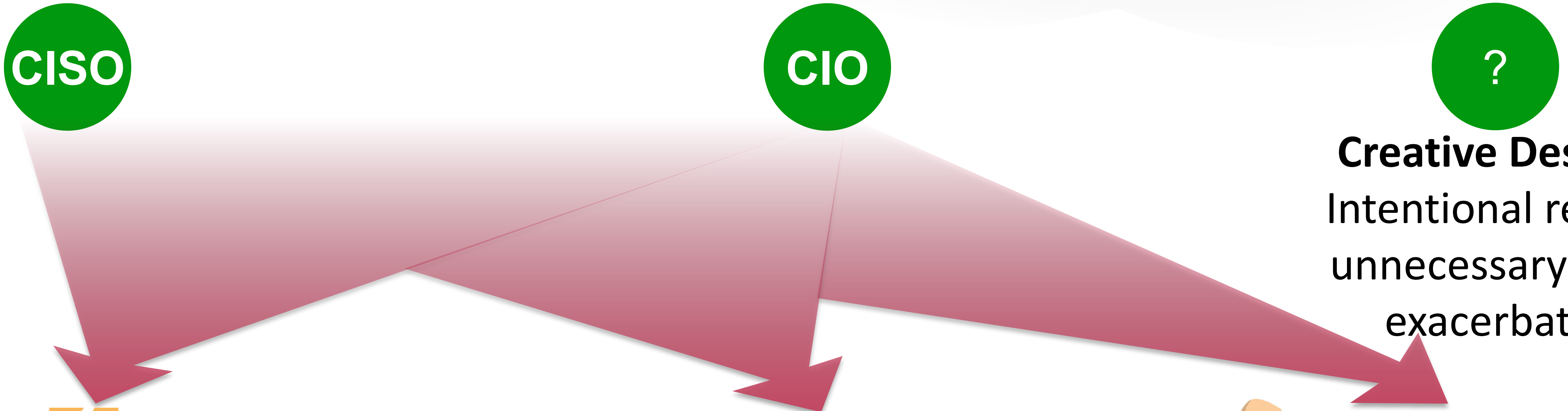
| Core Challenges | What did we buy and how does it support the biz? | Viruses, Server-side Attacks, Insecure Configs | Too many logs and alerts, Client-side attacks | Assume Breach, Raging Fires, Too Many Privileges | Ransomware, MBR Wiper, DDoS, Firmware Bricking |
| Solutions | Asset Mgt, Systems Mgt Tools | Anti-Virus, Firewalls, Secure Configs | IDS, SIEM | Incident Responders & IR Tools (EDR, SOAR) | Distributed, Immutable, Ephemeral (DIE!!!) Systems |

IT / Security Tension



| Security Team Composition & Focus | None | Hobby Shop / Vulnerability Mgt | Sec Ops Center / Threat Mgt | Dedicated Biz Unit / Risk Mgt | Choose Your Own Destiny |
|---|---|---|---|---|---|

# Fragility vs Resilience vs Anti-Fragility



CISO

CIO

?

**Creative Destruction**: Intentional removal of unnecessary pets that exacerbate fragility

## Fragile

C.I.A.

Volatility causes compounding patchwork and workarounds that create greater fragility

## Resilient

D.I.E.

Volatility results in destruction but no change in configuration

## Antifragile

D.I.E. + Creative Destruction
= Chaos Engineering

Volatility drives changes in configuration that make it even more DIE-like

Icons made by Nhor Phai and FreePik

# Thoughts and Considerations

- Do our workforce shortage challenges stem more from having too many pets or having too few qualified workers?
- Should cyber pet ownership require licensed cyber veterinarians?
- What factors that result in the creation of more pets and how can that be discouraged?
  - AI/ML creates more data pets
  - GDPR/CCPA punishes for the negligence of data pets

- The more we thinking about securing something, the less we think about how we can live without it
- The security industry is incentivized to have us create more pets

# Summary

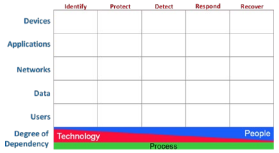
- The next era in IT and Security will manifest **more irreversible attacks** that challenge and undermine our ability to RECOVER
- Better PROTECT, DETECT, and RESPOND capabilities may reduce occurrences of malicious events but are **insufficient against well-executed destructive/irreversible scenarios**
- Our best countermeasure is to **avoid pet creation** (that requires CIA) and **promote cattle creation** (built to DIE)

**Death to CIA! Long live DIE!**

# Applying D.I.E.

- Next week you should:
  - Get uptime measurements and create your own Pets vs Cattle curve
- In the first three months following this presentation you should:
  - Track weekly movement of Pets vs Cattle curve
  - Catalog pet-like and cattle-like design patterns in use within your org
- Within six months you should:
  - Create policies and disincentives that discourage pet creation
  - Create triggers to bring awareness to potential pet owners
  - Discover and provide alternatives to pet-like design patterns

# Questions?



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