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HUMAN ELEMENT

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# Using the Hacker Persona to Build Your DevSecOps Pipeline

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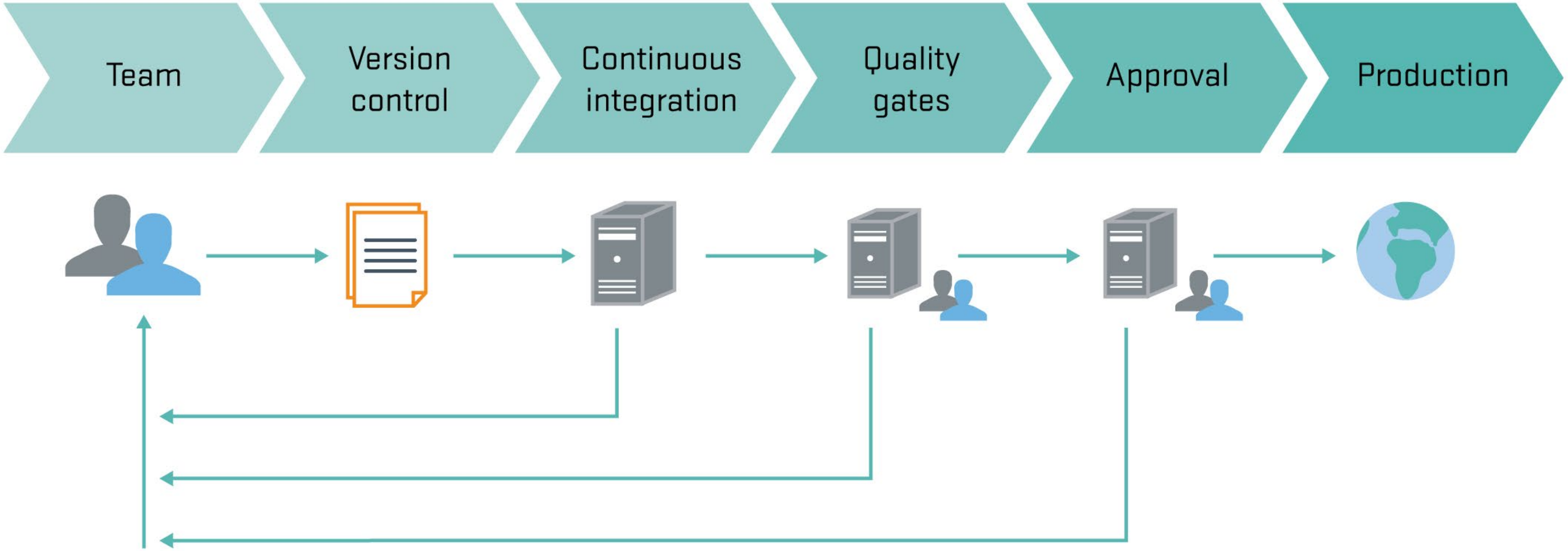
# Agenda

- DevOps and Pipeline
- Securing the pipeline
- Apply the practices

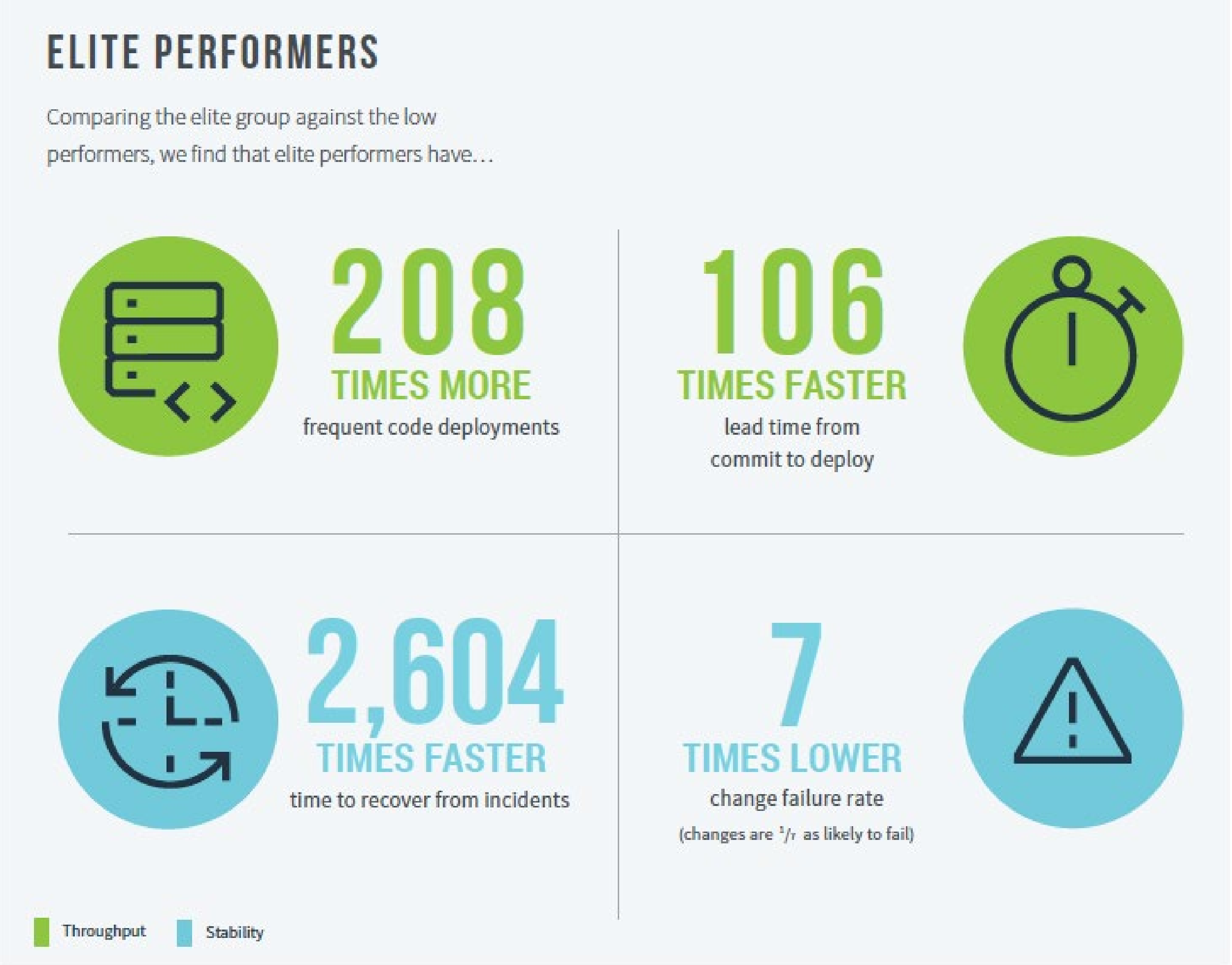
# DevOps and delivery pipeline

# DevOps

**DevOps is “a cross-disciplinary community of practice dedicated to the study of building, evolving and operating rapidly-changing resilient systems at scale.”**
**- [Jez Humble]**



# Why DevOps



## ELITE PERFORMERS

Comparing the elite group against the low performers, we find that elite performers have…

**208** TIMES MORE frequent code deployments

**106** TIMES FASTER lead time from commit to deploy

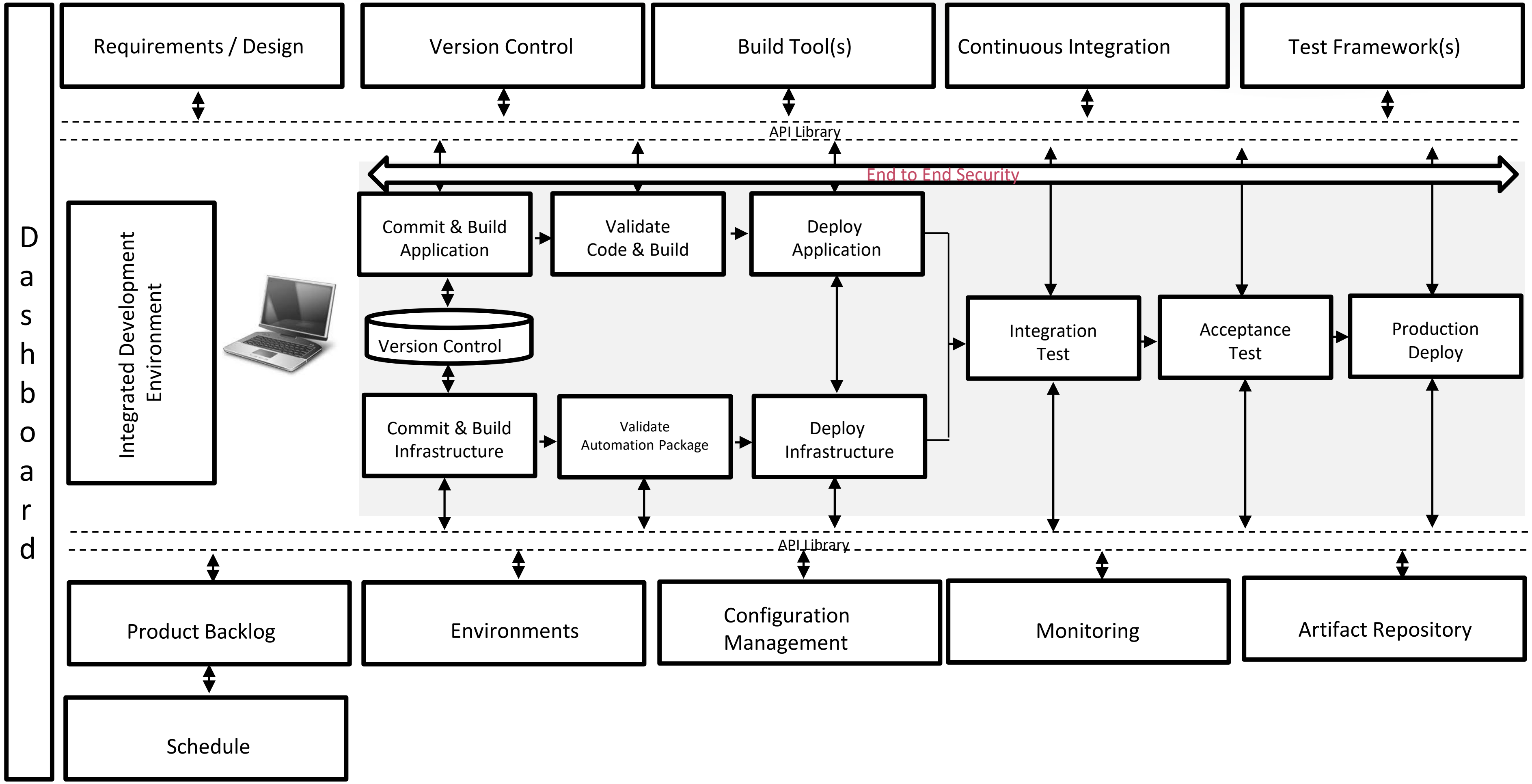
**2,604** TIMES FASTER time to recover from incidents

**7** TIMES LOWER change failure rate (changes are 1/7 as likely to fail)

🟩 Throughput 🟦 Stability

Forsgren, Nicole. “DevOps Solutions | Google Cloud.” *Google*, Google, 22 Aug. 2019, https://cloud.google.com/devops/state-of-devops/.

# DevOps Pipeline



# Securing the delivery pipeline

# Threat Modeling

- Using IDDIL-ATC Methodology
  - Gain understanding
  - Assess risk
  - Justify security controls

- **I**dentify Assets
- **D**efine the Attack Surface
- **D**ecompose the System
- **I**dentify Attack Vectors
- **L**ist Threat Actors

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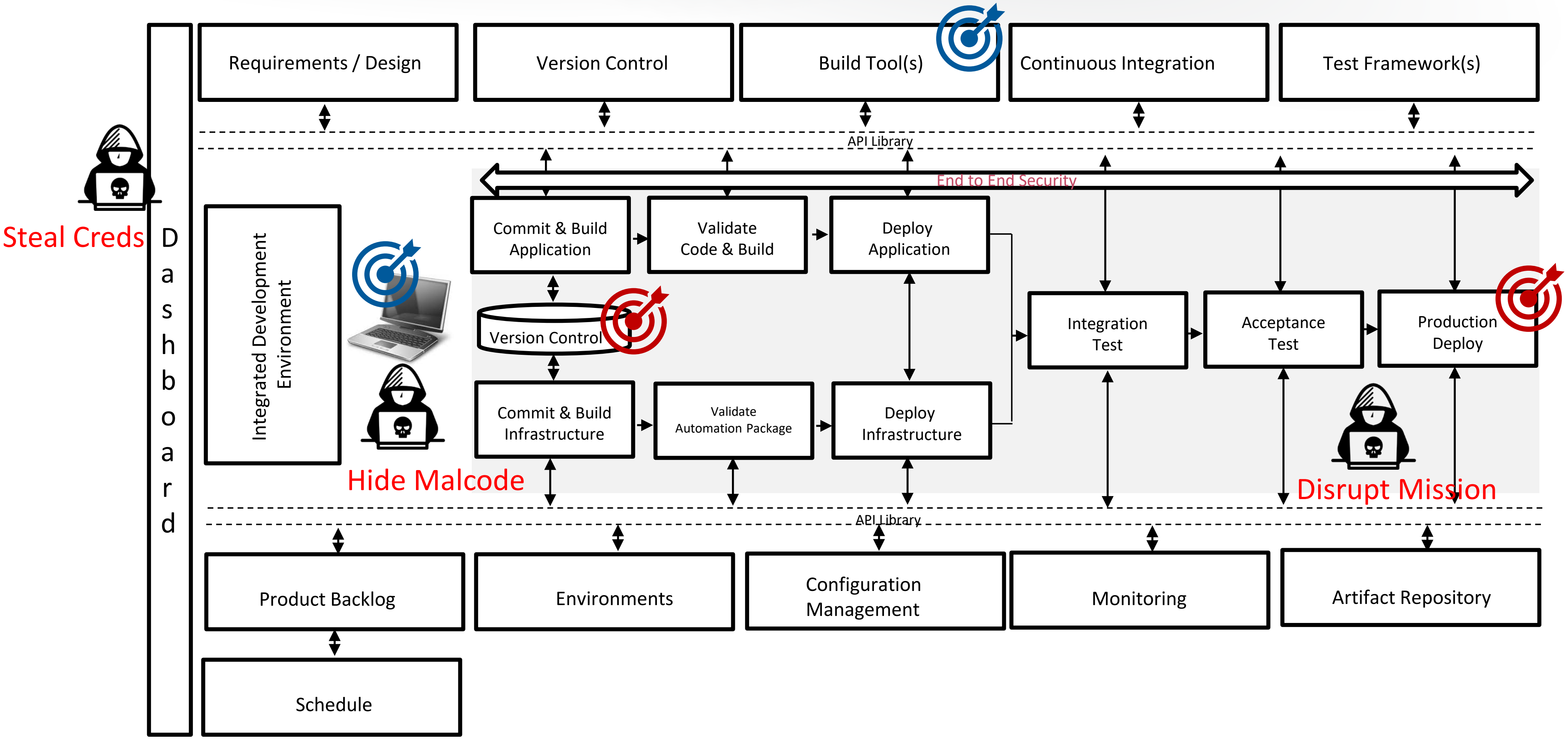
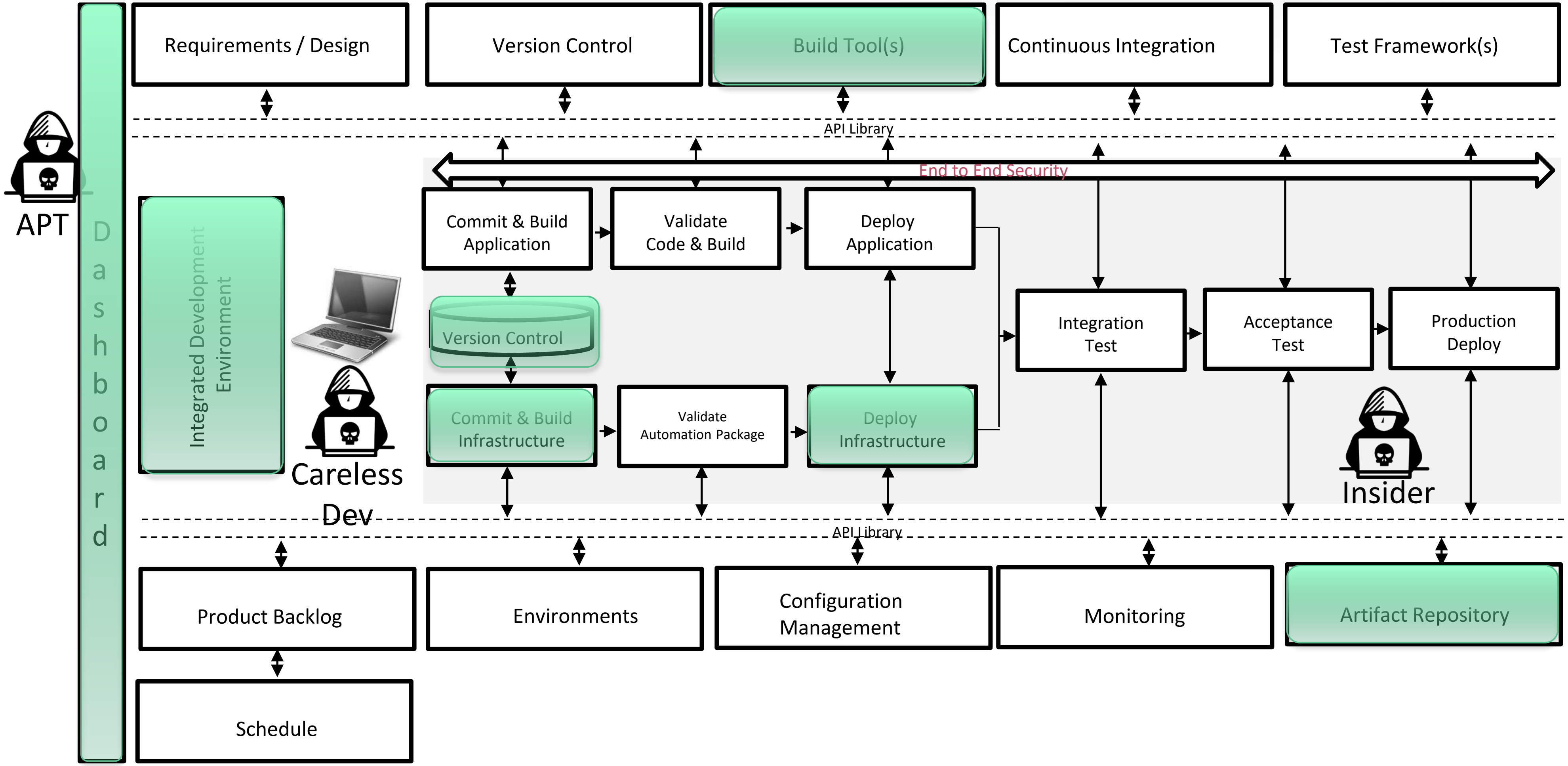
- **A**nalysis & Assessment
- **T**riage
- **C**ontrols

# DevOps Pipeline Threat Model

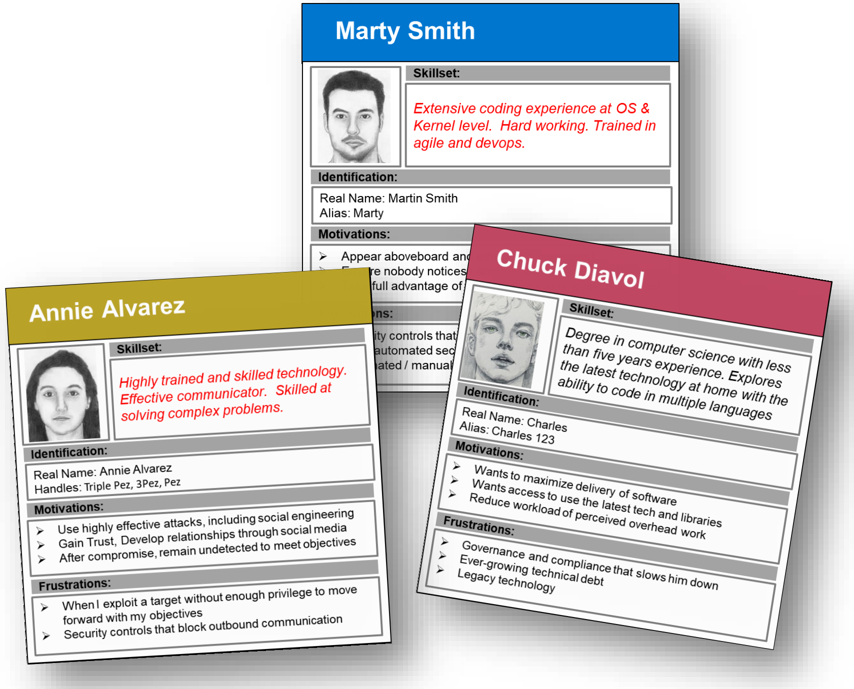


# Attack Surfaces in the pipeline



# Defining Persona's

- Alan Cooper's the *Inmates are Running the Asylum*
  - Hypothetical Archetypes
  - Precise & Specific Description of the User
  - Define user's objectives
- Lene Nielson's 4 Perspectives
  - Goal Directed
  - Role-based
  - Engaging
  - Fictional



**Marty Smith**

Skillset:

*Extensive coding experience at OS & Kernel level. Hard working. Trained in agile and devops.*

Identification:

Real Name: Martin Smith
Alias: Marty

Motivations:

- Appear aboveboard and
- E re nobody notices
- full advantage of

ns:

- ity controls that
- automated sec
- ated / manual

**Annie Alvarez**

Skillset:

*Highly trained and skilled technology. Effective communicator. Skilled at solving complex problems.*

Identification:

Real Name: Annie Alvarez
Handles: Triple Pez, 3Pez, Pez

Motivations:

- Use highly effective attacks, including social engineering
- Gain Trust, Develop relationships through social media
- After compromise, remain undetected to meet objectives

Frustrations:

- When I exploit a target without enough privilege to move forward with my objectives
- Security controls that block outbound communication

**Chuck Diavol**

Skillset:

*Degree in computer science with less than five years experience. Explores the latest technology at home with the ability to code in multiple languages*

Identification:

Real Name: Charles
Alias: Charles 123

Motivations:

- Wants to maximize delivery of software
- Wants access to use the latest tech and libraries
- Reduce workload of perceived overhead work

Frustrations:

- Governance and compliance that slows him down
- Ever-growing technical debt
- Legacy technology

# Why Hacker Personas?

- Culture & Awareness. Understand adversary tactics & drivers
- Prioritize security risks
- Communicate generalized attacker profiles that identify common black hat hacker motives and desires
  - What does the attacker like to see – identifies exploitable weaknesses
- Justify Security Control Selection
  - What does the attacker not like to see – identifies effective security controls

# How do we “discover” hacker personas?

Threat Types (analogous to User Roles)

- Advanced Attackers (APTs, Military, Industrial)
  - Comment Crew, Lazarus Group, Oilrig
- Hacktivists
  - Anonymous, Chaos Computer Club, LulzSec, OurMine
- Insider
  - Spy, Compromised employee, disgruntled employee
- Lone Wolf
  - Iceman, Robert Morris, Julian Assange, Edward Snowden

Sources: anonymous, attack.mitre.org, apt.threattracking.com

# Intelligence Sources

Near Range Threats:

- Internal Intelligence
- Partner Intelligence

Mid Range Threats:

- Open Source Intelligence (OSINT)
- Industry Intelligence

Long Range Threats:

- Homeland Intelligence
- Ally Intelligence

Global attacks require global intelligence

# FBI cyber most wanted

Ministry of State Security (MSS)

People's Liberation Army (PLA)

Main Directorate of the General Staff of the Armed Forces of the Russian Federation (GRU)

## JSSD

Zhang Zhang-Gui
Zha Rong
Chai Meng

## CVNX (APT10)

ZHU HUA

ZHANG SHILONG

## 2PLA

Su Bin

## VMTHR (APT3)

Wu Yingzhuo
Dong Hao
Xia Lei

## APT1

Huang Zhenyu

Wen Xinyu

Sun Kailiang

Gu Chunhui

Wang Dong

## RUSSIAN INTERFERENCE IN 2016 U.S. ELECTIONS

Boris Alekseyevich Antonov

Dmitriy Sergeyevich Badin

Anatoliy Sergeyevich Kovalev

Nikolay Yuryevich Kozachek

Aleksey Viktorovich Lukashev

Artem Andreyevich Malyshev

Sergey Aleksandrovich Morgachev

Aleksandr Vladimirovich Osadchuk

Aleksey Aleksandrovich Potemkin

Ivan Sergeyevich Yermakov

Pavel Vyacheslavovich Yershov

## DPRK

Park Jin Hyok

Public name: Lazarus Group

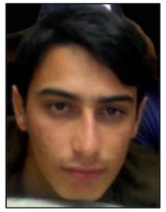
## IRANIAN DDoS

Ahmad Fathi

Hamid Firoozi

Amin Shokohi

Mohammad Sadegh Ahmadzadegan

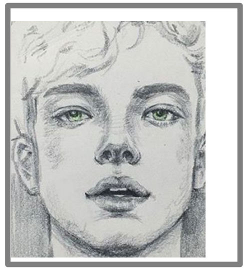

Omid Ghaffarinia

Sina Keissar

# Hacker Persona Examples

# Careless Developer

## Chuck Careless Developer



**Skillset:**

*Degree in computer science with less than five years experience. Explores the latest technology at home with the ability to code in multiple languages*

**Identification:**

Real Name: Charles Diavol
Alias: Charles 123

**Motivations:**

- Wants to maximize delivery of software
- Wants access to use the latest tech and libraries
- Reduce workload of perceived overhead work

**Frustrations:**

- Governance and compliance that slows him down
- Ever-growing technical debt
- Legacy technology

*As a Developer I want check-in features quickly so that I can go move on to something else.*

*As a Developer I want avoid administrative work so that I can code which is more fun!*

*As a Developer I want try the latest technology available so that I can keep my skills current.*

# Malicious Developer

## Marty Malicious Developer

**Skillset:**

*Extensive coding experience at OS & Kernel level. Develops cyber attack tools. Wants to get paid by his employer as well as his dark web associates.*

**Identification:**

Real Name: Martin Smith
Handles: KRNL KON

**Motivations:**

- Appear aboveboard and ethical ( follows rules)
- Ensure nobody notices I am injecting malicious logic
- Take full advantage of weak process to remain undetected

**Frustrations:**

- Security controls that limit, block or monitor code changes
- Inline automated security tools that detect malicious code
- Automated / manual testing that discover malicious code

*As a Malicious Developer I want inject malicious code so that I can see what happens.*

*As a Malicious Developer I want increasing privilege so that I can view data that has not been shared with me.*

*As a Malicious Developer I want crash the server so that I can deny service to my co-workers.*

# Advanced Persistent Threat (APT)

## Annie APT

**Skillset:**

*Highly trained and skilled in cyber attacks of all kinds. Effective social engineer. Skilled at evading detection.*

**Identification:**

Real Name: Annie Alvarez
Handles: Triple Pez, 3Pez, Pez

**Motivations:**

- ➢ Use highly effective attacks, including social engineering
- ➢ Gain Trust, Develop relationships through social media
- ➢ After compromise, remain undetected to meet objectives

**Frustrations:**

- ➢ When I exploit a target without enough privilege to move forward with my objectives
- ➢ Security controls that block outbound communication

*As a Annie APT I want to eavesdrop on company X and obtain sensitive information that can be sold.*

*As a Annie APT I want to upload malware on your computer so that I can obtain personal information.*

*As a Annie APT I want to upload ransomware so that I can extort victims to further my political agenda.*

# Application & Benefits

# USING PERSONAS

Annie

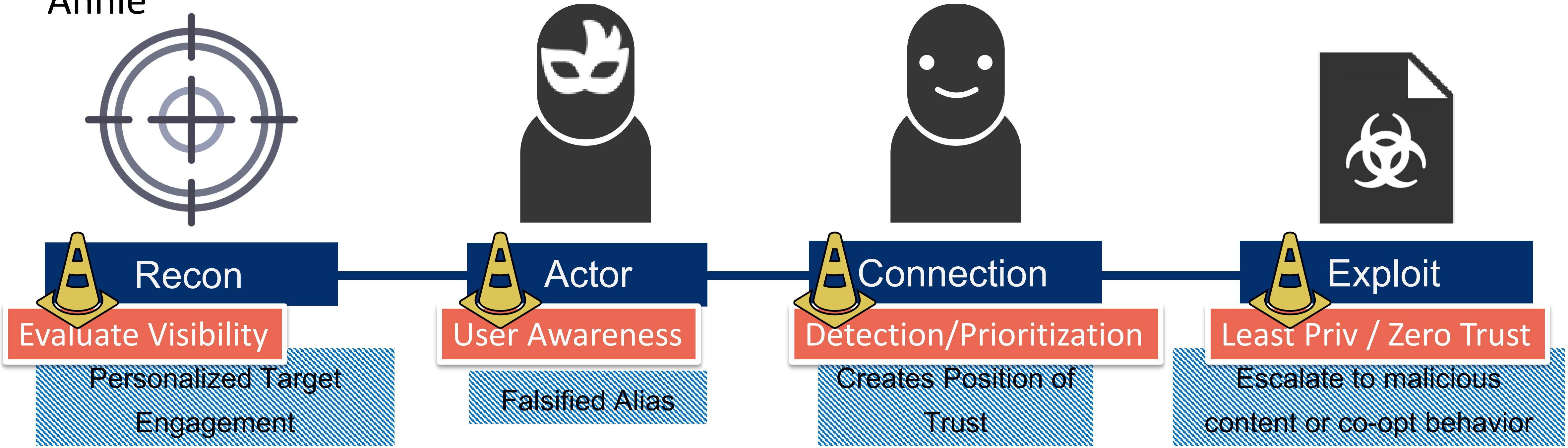
How does Annie benefit?

What does Annie want?

What frustrates Annie?

Is Annie capable?

How do I stop Annie?



Recon

Evaluate Visibility

Personalized Target Engagement

Actor

User Awareness

Falsified Alias

Connection

Detection/Prioritization

Creates Position of Trust

Exploit

Least Priv / Zero Trust

Escalate to malicious content or co-opt behavior

# Hacker Persona Benefits

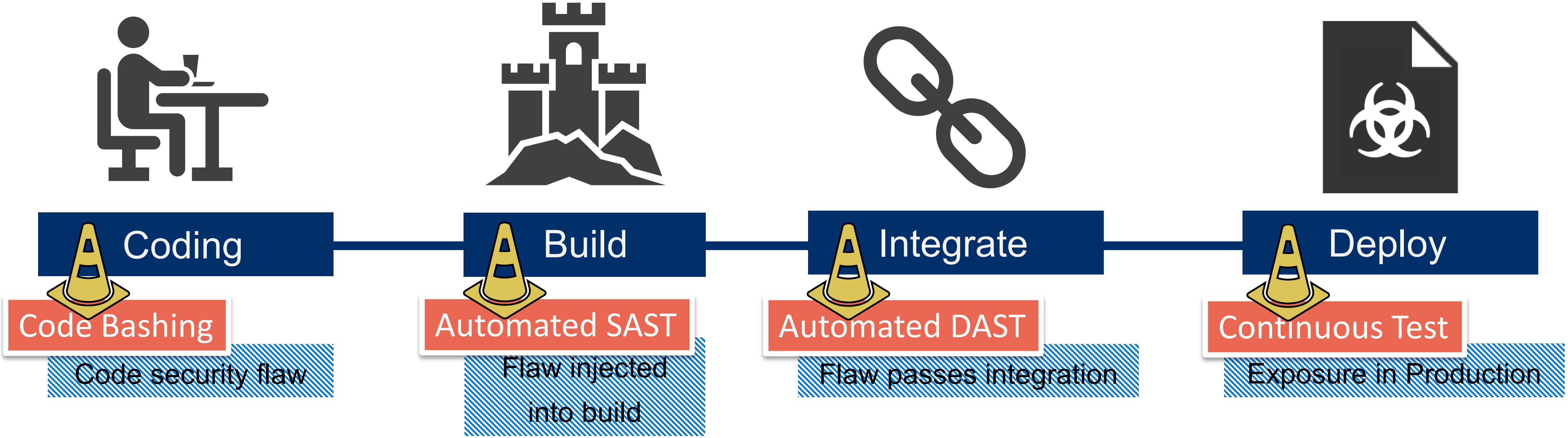
Chuck

“Spatial” (visual) Understanding

Identify effective countermeasures

Prioritize defenses

Measure effectiveness



Coding

Code Bashing

Code security flaw

Build

Automated SAST

Flaw injected into build

Integrate

Automated DAST

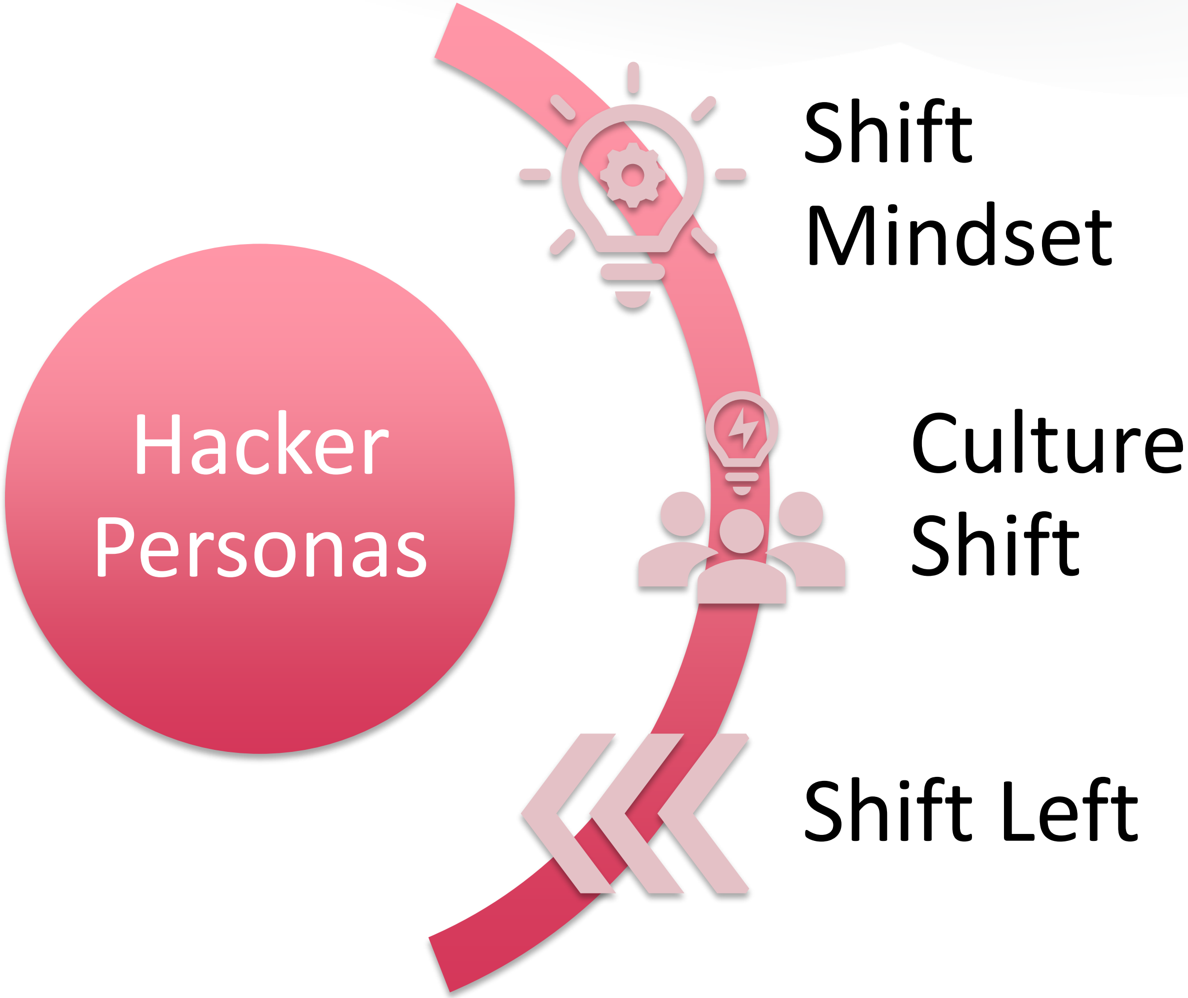
Flaw passes integration

Deploy

Continuous Test

Exposure in Production

# Positive Shifts



Hacker Personas

Shift Mindset

Culture Shift

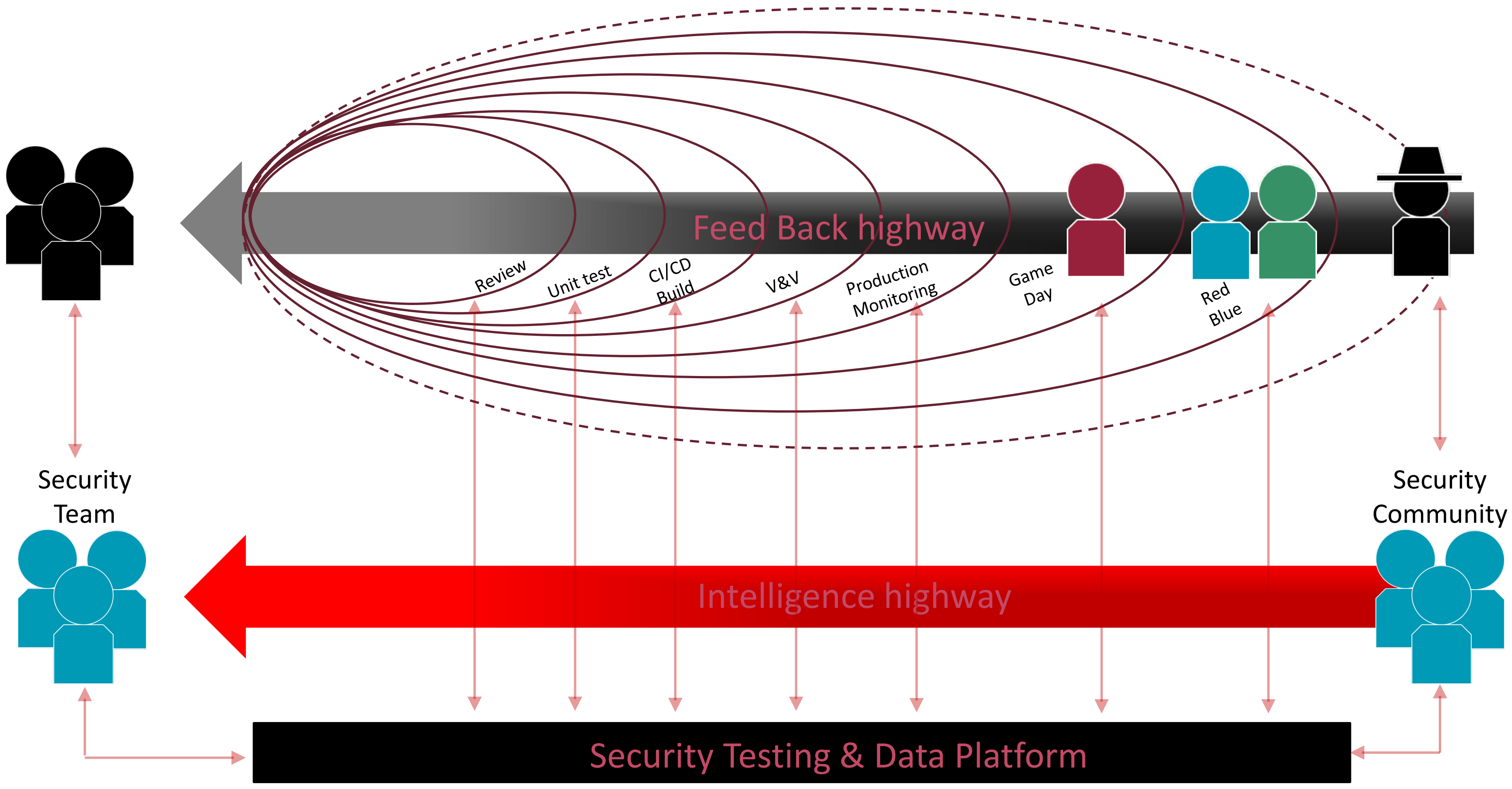
Shift Left

# “Lessons” on Personas

- Change culture “Put on the Black Hoodie”
- Build and Socialize Personas
- Agile Security Game – Shostack
- The Phantom Hacker

# Future

DevOpsSec: Seamlessly integrate security into the implementation pipeline; ensuring everyone takes responsibility while continuing to shorten feedback loops


Feed Back highway
Review
Unit test
CI/CD Build
V&V
Production Monitoring
Game Day
Red
Blue
Security Team
Security Community
Intelligence highway
Security Testing & Data Platform