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# Purple Is the New Red - Providing the Most Value from Offensive Security



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# Agenda



- About Me – relevant projects
- What is a Purple Team?
- Offensive Security Maturity Model
- Purple Team Exercise
- Operationalized Purple Teaming
- Purple Team Maturity Model
- “Apply” Slide

# T1033 – User Discovery: Jorge Orchilles



- SANS Principal Instructor and Author of SEC565: Red Team Operations and Adversary Emulation
- Director – Vulnerability Management, Pen Test, Red Team, Breach and Attack Simulation, Purple Team, and Adversary Emulation
- Creator of Purple Team Exercise Framework and C2 Matrix
- Contributor to ATT&CK, Atomic Red Team, CVSSv3, and others
- ISSA Fellow, NSI Technologist Fellow
- Soccer/Football Fan: HALA MADRID

# What is a Purple Team?



- A **collaboration** between various cyber security skill sets
- A **virtual**, **functional** team working together to test, measure and improve defensive security posture: people, process, and technology
  - Cyber Threat Intelligence - research and provide adversary behaviors or tactics, techniques, and procedures (TTPs)
  - Red Team - offensive team in charge of emulating adversary behaviors or TTPs
  - Blue Team - the defenders: Security Operations Center (SOC), Threat Hunting, Digital Forensics and Incident Response (DFIR), etc.

# Offensive Security Maturity Model

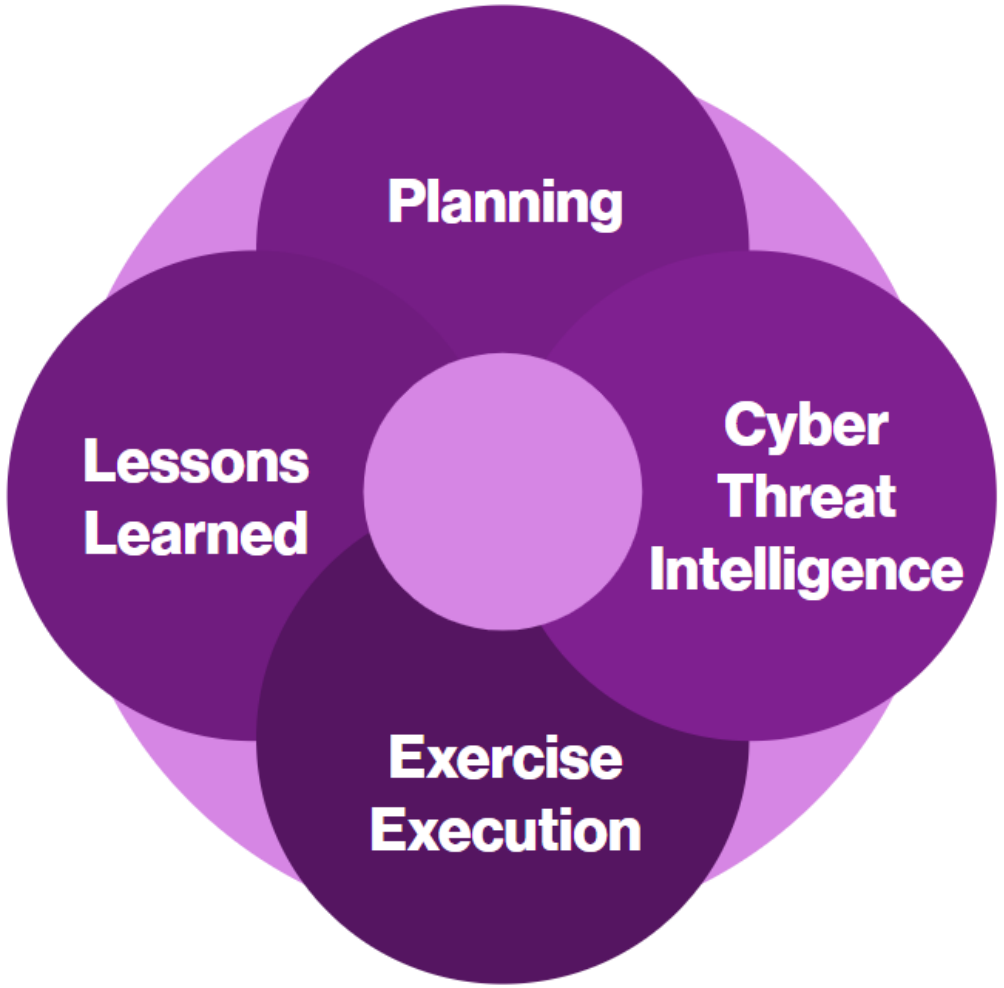


- If asked to build an internal red team, I'd start with Purple first


https://www.sans.org/blog/building-internal-red-team-go-purple-first/

# Start with a Purple Team Exercise (PTX)

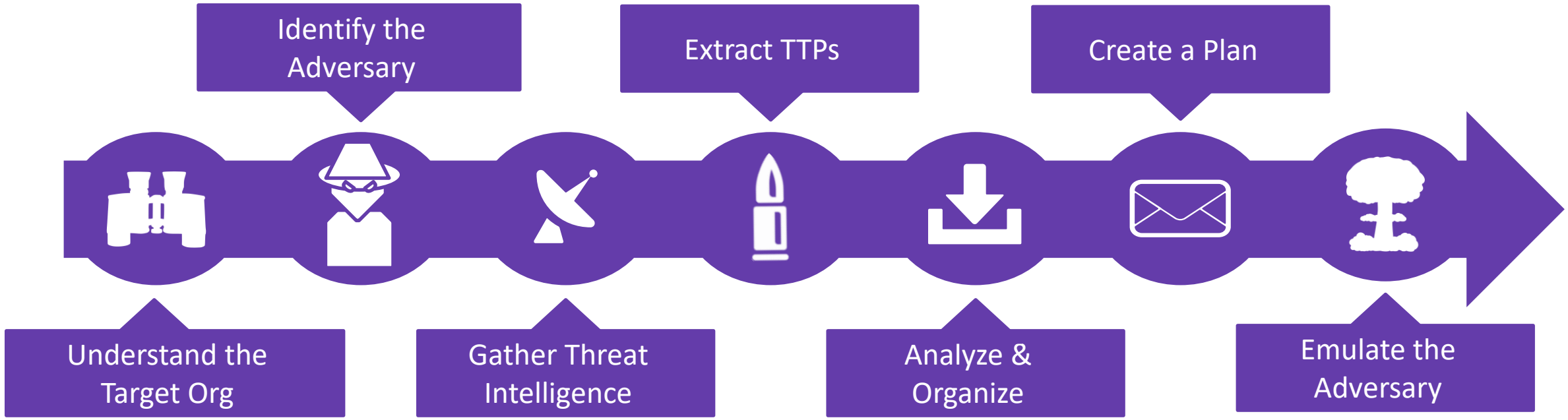





https://github.com/scythe-io/purple-team-exercise-framework

# PTX: CTI for Adversary Emulation





# TTP Pyramid



## Procedures

How the technique was carried out. For example, the attacker used *procdump -ma lsass.exe lsass_dump*

## Techniques

Techniques represent the tactical goal of the procedure. For example, T1003.001 - OS Credential Dumping: LSASS Memory.

## Tactics

Tactics represent the strategic goal of the adversary. For example, TA006 - Credential Access


@SecurePeacock

https://www.scythe.io/library/summiting-the-pyramid-of-pain-the-ttp-pyramid

# PTX: Preparation



## Planning Meetings

- Logistics
  - Location
  - Screen Sharing
- Attack Infrastructure
- Target Systems
  - Security tools
  - Accounts
- Blue Team visibility confirmation

## Metrics

- Data Sources
- Detection
  - Telemetry
  - Alerts
- Response
  - Time to Detect
  - Time to Investigate
  - Time to Remediate

# Purple Team Exercise Flow



**Exercise Coordinator**

Introduction of people and exercise process including adversary behaviors/TTPs

**TableTop**

Everyone tabletops the TTP to determine preventive and detective controls and/or possible results

**Red Team**

Emulates the adversary behaviors while sharing screen for everyone to see

**Blue Team**

Follow process to identify alerts or telemetry of emulated behavior

**Detection Engineering**

Build detections by ensuring telemetry and alerts are implemented and tuned.

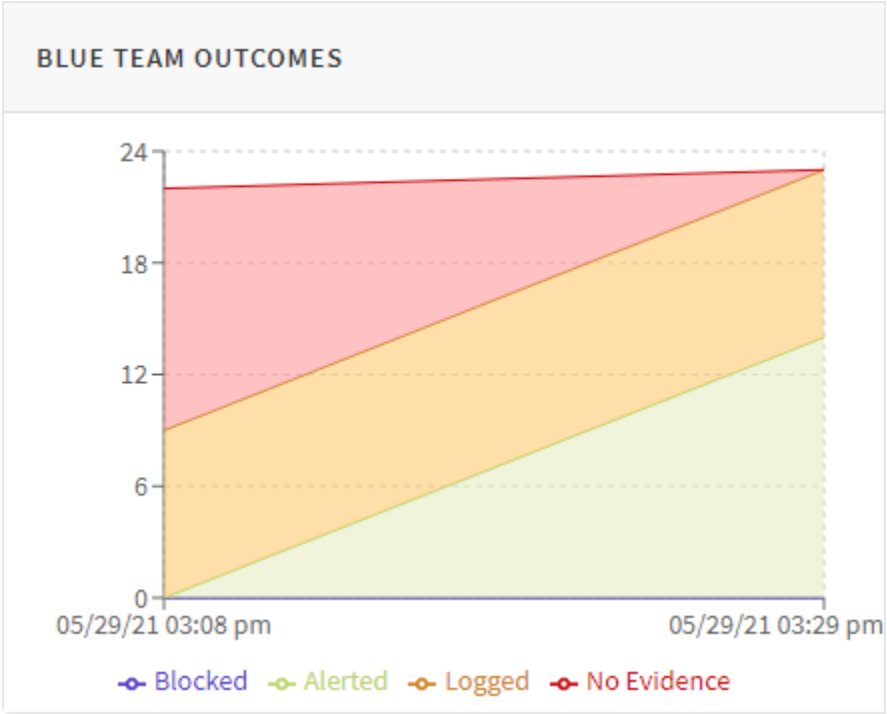
**All**

Learn about the TTP and respond next time it is observed in organization. Repeat for next set of TTPs.

# PTX: Lessons Learned and Action Plan



- Document and show the value
- Track TTPs that were performed, expected result, and actual result
- Track Action Items for further improvement
- PlexTrac (shown) or VECTR

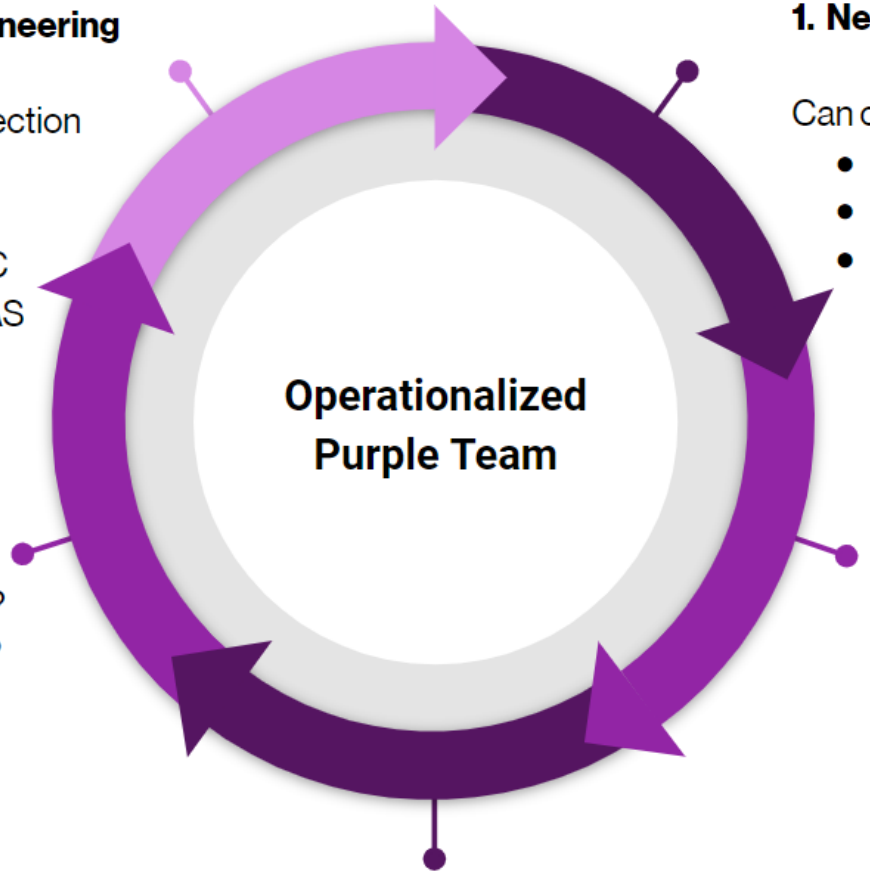


# Success! What next?



# Operationalized Purple Team Process






**1. New Adversary Behavior/TTP**

Can come from anyone:

- CTI
- Red Team
- Blue Team

**2. Analyze & Organize**

- Extract TTPs
- Were these already tested?
- Is there coverage?

**3. Red Team Emulation**

Do the TTPs work here?

**4. Blue Team Result**

- Was there an Alert?
- Is there Telemetry?
- Can we Threat Hunt?

**5. Detection Engineering**

- Build Detection
- Deploy
- Tune
- Train SOC
- Add to BAS

# Step 1: New Adversary Behavior/TTP



- CTI, Red Team, or Blue Team can discover and share new intel or TTPs
- Notification to virtual Purple Team (via new ticket/tracking)
- Assign relevant stakeholders as part of mini-purple team for this item
  - Self assigned or manager assigned

# Step 2: Analyze & Organize the TTPs



- Extract TTPs
- Map to MITRE ATT&CK
- Correlate with previous tests
  - Requires a decent tracking system
  - Excel or Google Sheets as MVP
  - PlexTrac or VECTR
- Hold a tabletop discussion

# Step 3: Emulate TTPs



- Red Team focuses on emulating TTPs
- Sets up attack infrastructure or uses dedicated Purple Team infrastructure
  - Target systems and accounts
  - Standard security tools
- Shares how to emulate with others in purple team
- Does the TTP work in our environment?

# Step 4: Blue Team Results



- Document Blue Team visibility
- Was there an alert?
- Was there telemetry?
  - Are the data sources required being collected?
  - Processing of data sources for queries?
- Can we Threat Hunt?

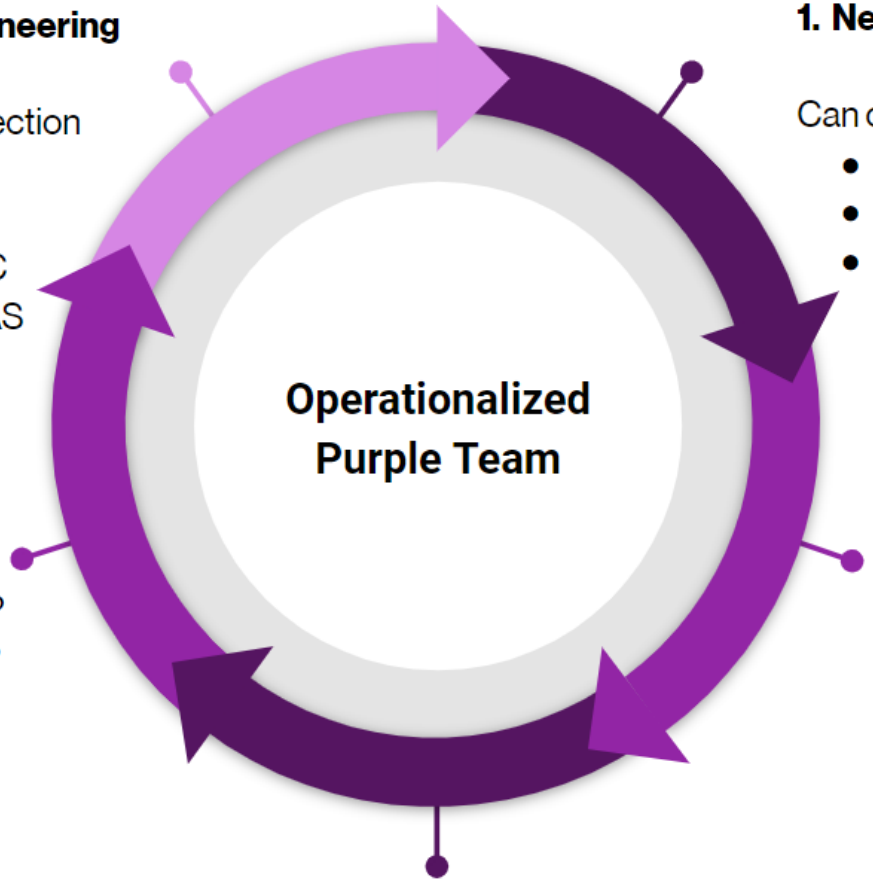
# Step 5: Detection Engineering



- If there are gaps that can be addressed:
  - Build detection
  - Deploy
  - Tune
- Re-run emulation and testing to train the rest of the team
- Add use case to Breach and Attack Simulation solution
  - Only get alerts if real attack or if alerts no longer work

# Continuous Process



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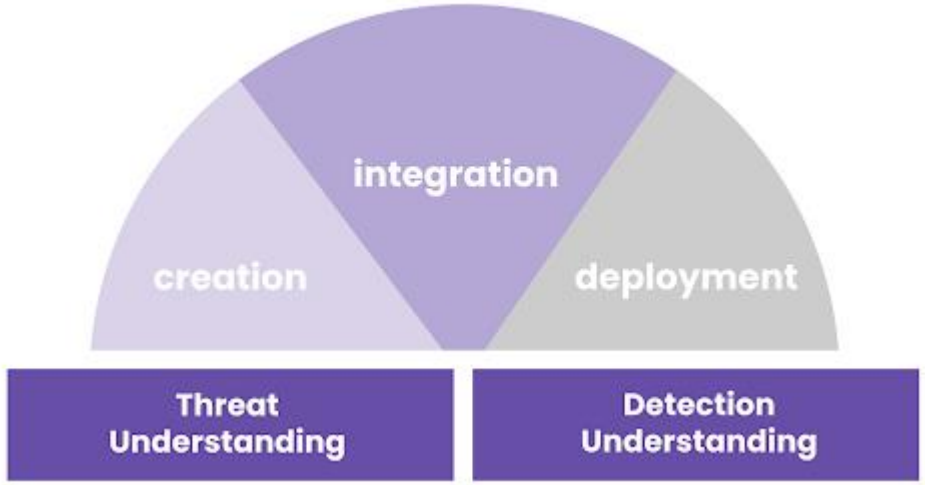
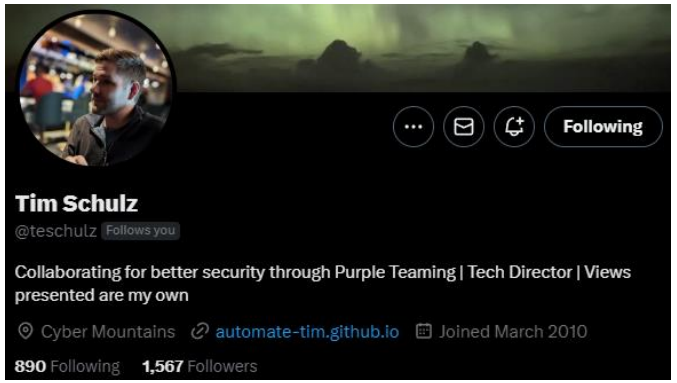
# Purple Team Maturity Model



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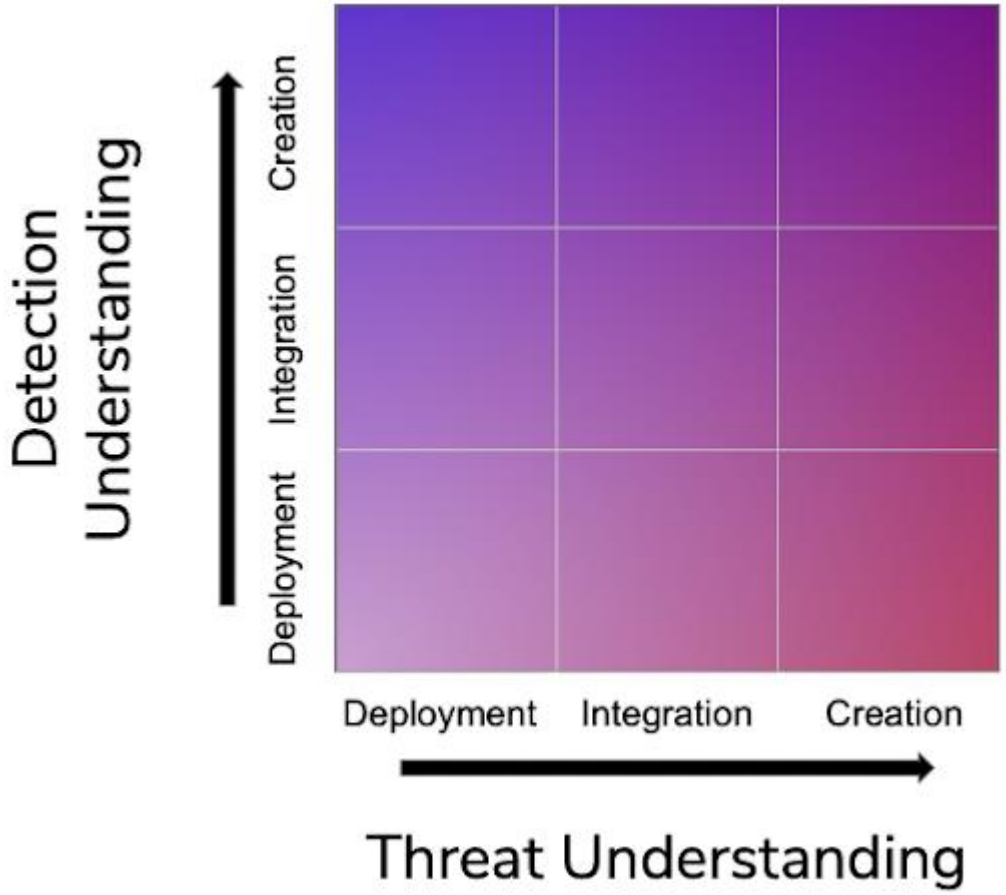

# “Apply” Slide



- Next week you should:
  - Identify where your organization is in the Offensive Security Maturity Model
- In the first three months following this presentation you should:
  - Run a Purple Team Exercise by collaborating with multiple cybersecurity functions
- Within six months you should:
  - Establish an Operationalized Purple Team process
  - Plan a stealth, end-to-end Red Team engagement

# More Resources



- SANS Purple Team: https://www.sans.org/purple-team/
- Blogs: https://www.sans.org/blog/?focus-area=purple-team
- Purple Team Emulation Plans: https://github.com/scythe-io/community-threats
- SANS Courses
  - SEC565: Red Team Operations and Adversary Emulation
  - SEC599: Defeating Advanced Adversaries - Purple Team Tactics & Kill Chain Defenses
  - SEC699: Purple Team Tactics - Adversary Emulation for Breach Prevention & Detection

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# Thank You!

**Any questions?**