



CROWDSTRIKE

Pivoting is Easy When You're Prepared

Modern Solutions & Success Stories

TINA THORSTENSON

Quick Bio



TINA THORSTENSON

VP, INDUSTRY BUSINESS UNIT
& EXECUTIVE STRATEGIST

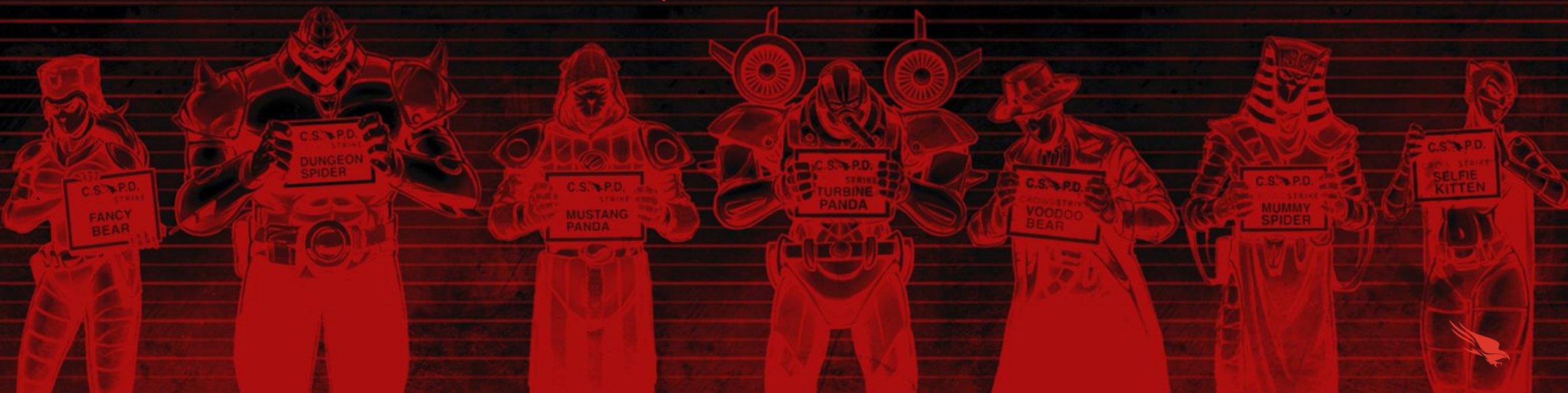
Tina Thorstenson leads a unit within CrowdStrike that provides strategic advisory services related to enterprise cybersecurity solutions. Tina has spent 30+ years running IT and security programs and 11 years holding the title of CISO.

Just prior to joining CrowdStrike, she most recently served as the Deputy CIO & Chief Information Security Officer for Arizona State University.



AGENDA

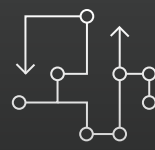
- SECURITY THEMES
- EXECUTIVE SUMMARY
- THE ADVERSARY OPERATIONS LIFECYCLE
- CYBER CRIME
- NATION-STATE REVIEW
- THE WAY FORWARD



Today's Security Themes



**Attack
Sophistication**



**Innovation While
Maintaining Siloed
Security Solutions**

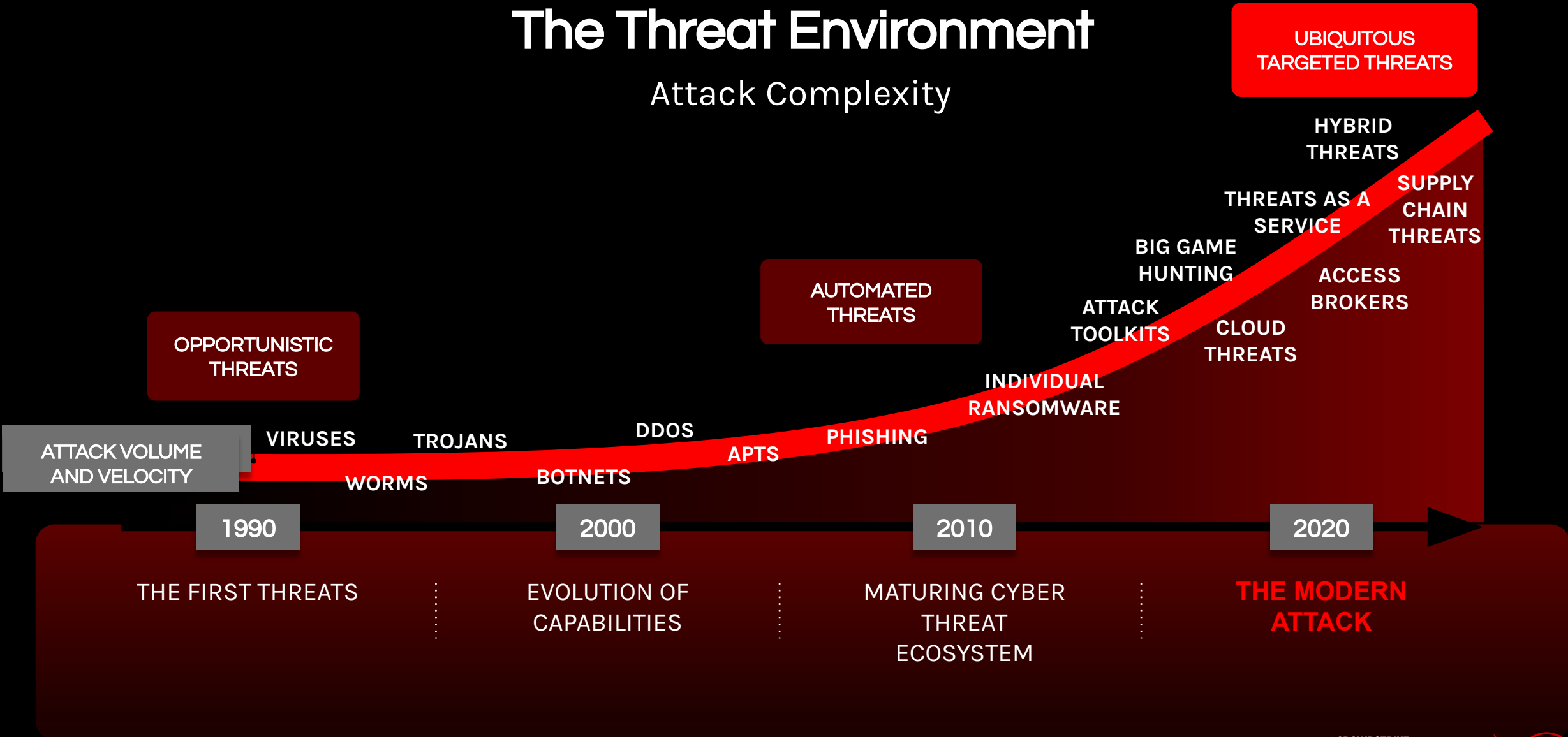


**Skill
Shortages**



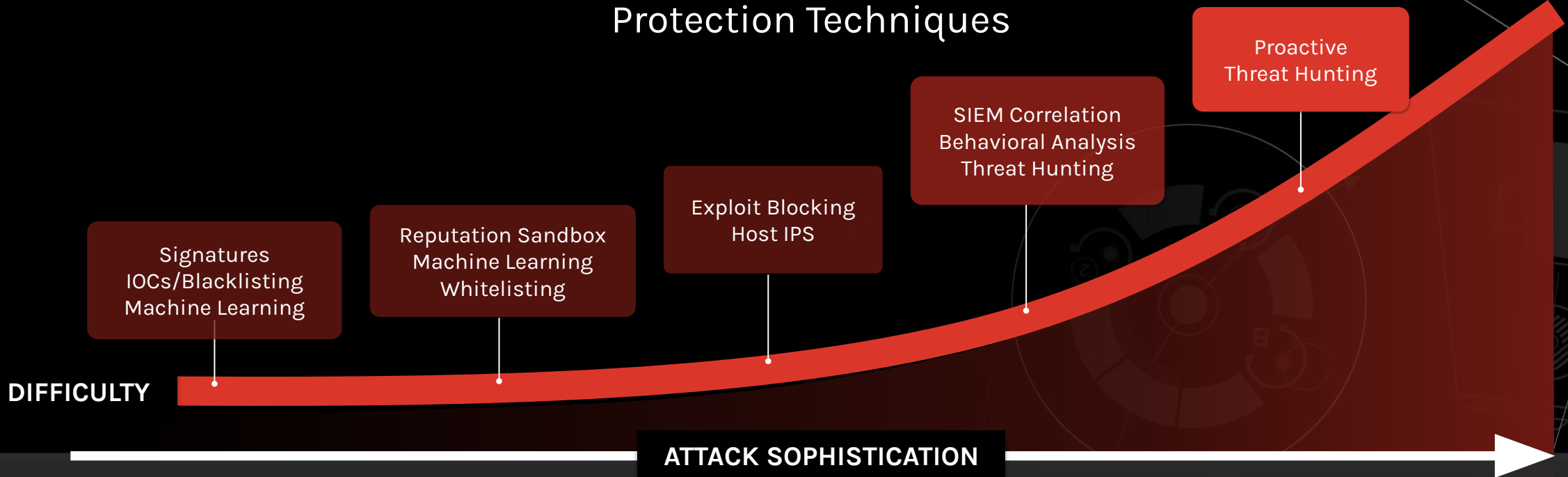
The Threat Environment

Attack Complexity



The Threat Environment

Protection Techniques



Signatures
IOCs/Blacklisting
Machine Learning

Reputation Sandbox
Machine Learning
Whitelisting

Exploit Blocking
Host IPS

SIEM Correlation
Behavioral Analysis
Threat Hunting

Proactive
Threat Hunting

FILE BASED MALWARE

Malware Zero-Day Malware

FILELESS AND EXPLOITS

Exploitation of vulnerabilities Zero-Day Malware Credential Theft

LIVE ATTACKER/INSIDER

Living off the land Hands-on keyboard



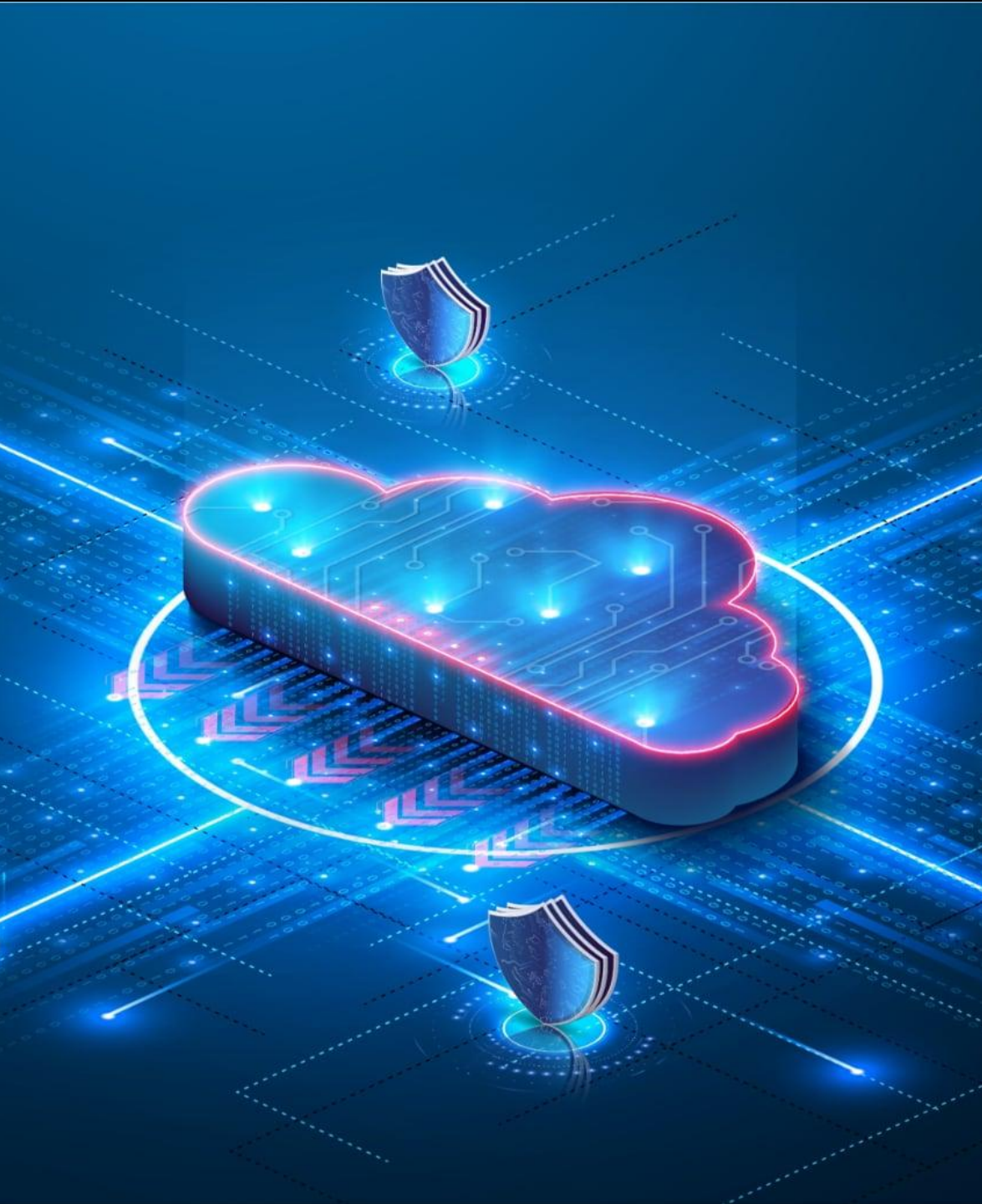
Cloud-Based Data

Recent Trends

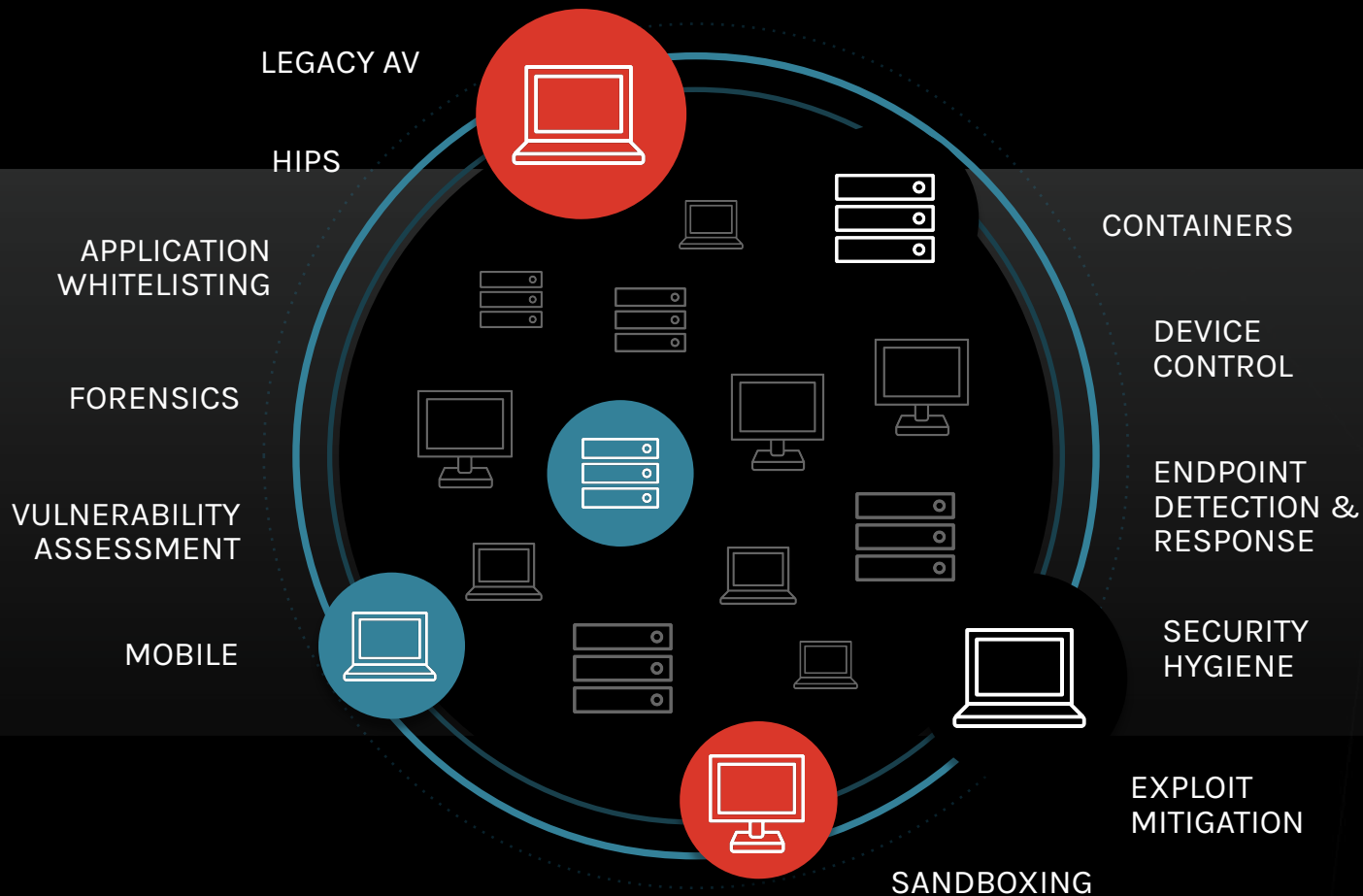
CLOUD ADOPTION CONTINUES TO RISE IN PREVALENCE AND ORGANIZATIONS CONTINUE TO **MOVE SENSITIVE**, ON-PREM **INFRASTRUCTURE EXTERNALLY**

CONSISTENT MIS-MANAGEMENT & EXTENSIVE TECHNOLOGY **VULNERABILITIES** MAKE CLOUD AN ATTRACTIVE TARGET

COMMON CLOUD HOSTED ENVIRONMENTS SUCH AS **EMAIL SERVICES** AND **ACTIVE DIRECTORY** SERVE AS JUMPING OFF POINTS FOR ADVERSARIES



Solution Complexity



COSTLY TO DEPLOY

DIFFICULT TO MAINTAIN

POOR USER EXPERIENCE

MINIMAL SECURITY EFFECTIVENESS



Lincoln College to Close, Hurt by Pandemic and Ransomware Attack

The predominantly Black college in Illinois will cease operations Friday after 157 years, having failed to raise millions to recover

Attackers Increasingly Target Linux in the Cloud

Insurance Journal

White House Warns of Hack of Microsoft's Outlook Email Program

Hacks of Microsoft Outlook Email Program Continue Despite Patch ... instead of cloud providers, possibly sparing many major companies and ... 15 hours ago



ars TECHNICA

SolarWinds hack that breached gov networks poses a "grave risk" to the nation

Nuclear weapons agency among those breached

DAN GOODIN - 12/17/2020, 3:56 PM

Kroger is latest victim of third-party software data breach

Kroger said it was product called FT 2 weeks ago



Mass Ransomware Hack Used IT Software Flaws, Researchers Say

By Jordan Robertson and William Turton
July 4, 2021, 11:38 AM PDT Updated on July 4, 2021

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Fortinet: 80% of Breaches Attributed to Cybersecurity Skills Gap

U.S.

Pipeline Shutdown Has East Coast Drivers Making Run on Gas

Some gas stations in Georgia, Virginia and the Carolinas are running dry; 'there is high a'

CISA Selects CrowdStrike to Protect Critical Endpoints and Workloads

By Homeland Security Today December 7, 2021

LIVE ON BLOO
Watch Live TV
Listen to Live R

Executive Summary

A Global Perspective on Adversarial Trends

Power of the Security Cloud

180+
Adversaries Tracked

1+ Trillion
Events/Day

135+ Million
Indicators of Attack
Decisions/Min

1.5+ Billion
Containers
Protected/Day



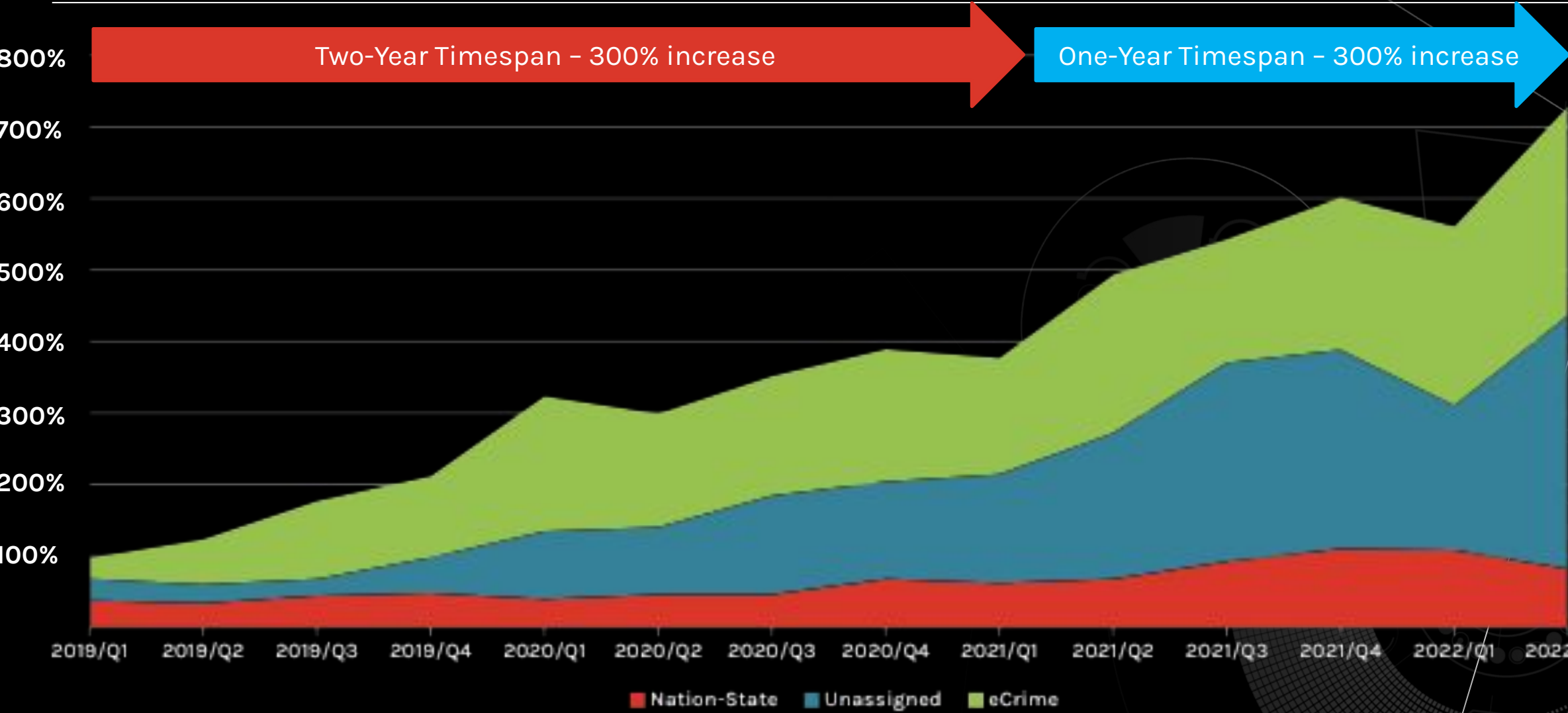
**CrowdStrike
Security
Cloud**

Asset Graph
IT Asset Context

Threat Graph
Threat Intelligence

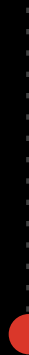
Intel Graph
Adversary Data

CrowdStrike Distinct & Sophisticated Intrusion Telemetry



eCrime Adversary Average Breakout Time

2018



9H 42M



2022



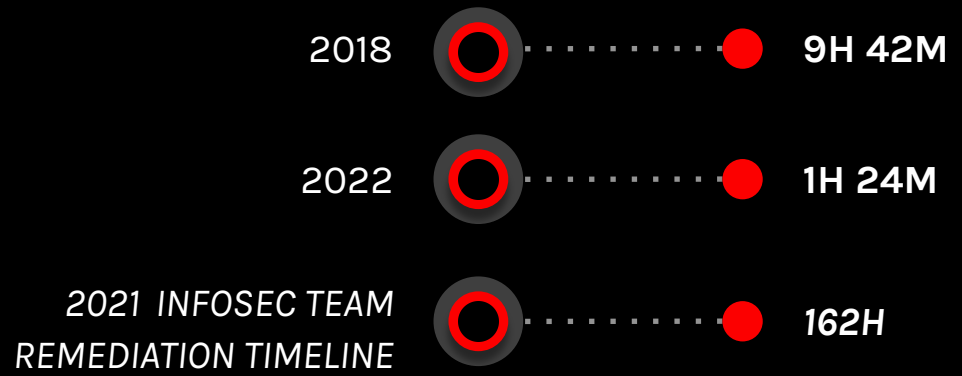
1H 24M





Components of the Advanced Modern Attack

ECRIME ADVERSARY EXPEDITED BREAKOUT TIME



2022 MALWARE vs MALWARE FREE ATTACKS



2022 Global Threat Hunting Report

Top 5 Findings

Top industries targeted by interactive intrusion activity included tech, telecom, healthcare, manufacturing and academia

1 hr and 24 minutes, average eCrime adversary breakout time

180+ adversaries tracked

50% increase in interactive intrusion activity

71 % of attacks were malware-free



Adversary Motivations



Nation State



eCrime



Hacktivist



CRIMINAL

Alchemist Spider
Aviator Spider
Bitwise Spider
Carbon Spider
Chariot Spider
Clockwork Spider
Cyborg Spider
Doppel Spider
Feral Spider
Graceful Spider
Hidden Spider
Hive Spider
Indrik Spider
Knockout Spider
Lunar Spider
Mallard Spider
Mummy Spider
Narwhal Spider
Night Spider
Outbreak Spider
Outlaw Spider
Percussion Spider
Pinchy Spider
Prophet Spider
Salty Spider
Samba Spider
Scully Spider
Slippy Spider

CHINA

Aquatic Panda
Circuit Panda
Emissary Panda
Karma Panda
Kryptonite Panda
Mustang Panda
Octane Panda
Pirate Panda
Puzzle Panda
Shattered Panda
Sunrise Panda
Vixen Panda
Wicked Panda

NORTH KOREA

Labyrinth Chollima
Ricochet Chollima
Silent Chollima
Stardust Chollima
Velvet Chollima

IRAN

Charming Kitten
Chrono Kitten
Haywire Kitten
Imperial Kitten
Nemesis Kitten
Pioneer Kitten
Refined Kitten
Spectral Kitten
Static Kitten
Tracer Kitten

INDIA

Hazy Tiger
Quilted Tiger
Razor Tiger
Viceroy Tiger

PAKISTAN

Mythic Leopard
Fringe Leopard

RUSSIA

Berserk Bear
Cozy Bear
Ember Bear
Fancy Bear
Primitive Bear
Venomous Bear
Voodoo Bear

VIETNAM

Ocean Buffalo

SOUTH KOREA

Shadow Crane

SYRIA

Deadeye Hawk

COLOMBIA

Galactic Ocelot

TURKEY

Cosmic Wolf

ACTIVIST

Curious Jackal
Frontline Jackal
Intrepid Jackal
Partisan Jackal
Regal Jackal
Renegade Jackal

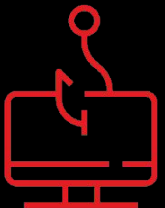
1 Services



Access brokers



Hardware for sale



Phishing kits



Ransomware



Credit/debit card testing services



Loaders



Malware packing services



Hosting & infrastructure



Webinject kits



DDoS attack tools



Anonymity and encryption



Crime-as-a-Service



Counter anti-virus service/checkers



Recruiting for criminal groups

eCrime enabling capabilities

2 Distribution



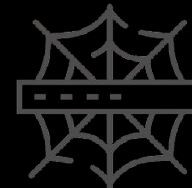
Social network and instant message spam



Exploit kit development



Spam email distribution



Purchasing traffic and/or traffic distribution systems (TDS)

Vehicles delivering capabilities to victims

The Criminal Ecosystem

3 Monetization

Methods to capitalize on successfully executed capabilities



Dump shops



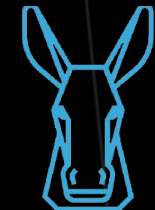
Collection and sale of payment card information



Money laundering



Ransom payments & extortion



Money mule and cashing services



Reshipping fraud networks



Wire fraud



Cryptocurrency services

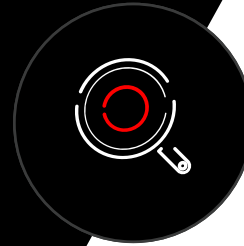


The Adversary Operations Lifecycle

How Advanced Adversaries Engage in Operations



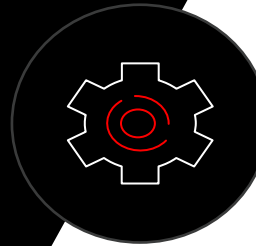
The Adversary Operations Lifecycle



Access Operations

How Adversaries gain access

- VALID CREDENTIALS
- SUPPLY CHAIN
- COMPROMISE
- O-DAY EXPLOITATION
- MFA BYPASS



Post Exploitation

How Adversaries remain stealthy

LIVING OFF THE LAND



Target Environments

What Adversaries are attacking

- DOMAIN CONTROLLERS
- CLOUD WORKLOADS
- EMAIL & DATA SERVERS
- DOWNSTREAM ACCESS



CROWDSTRIKE

Access Operations

How Adversaries Gain Access



The Problem

*“YOU DON’T HAVE A MALWARE PROBLEM. YOU
HAVE AN ADVERSARY PROBLEM”*



“Attackers don’t break in, they log in.”



Identity Threat Detection and Response is Crucial

80%

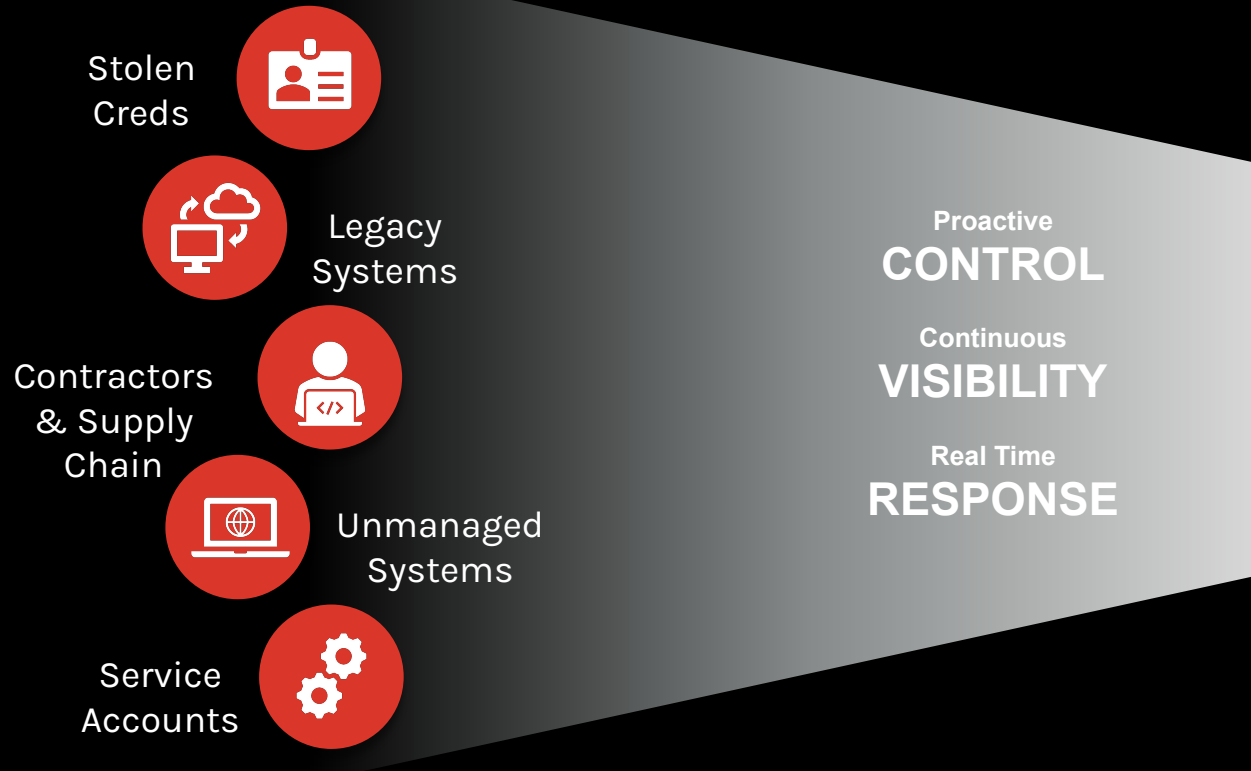
of data breaches have a connection to compromised privileged credentials

- Forrester Research

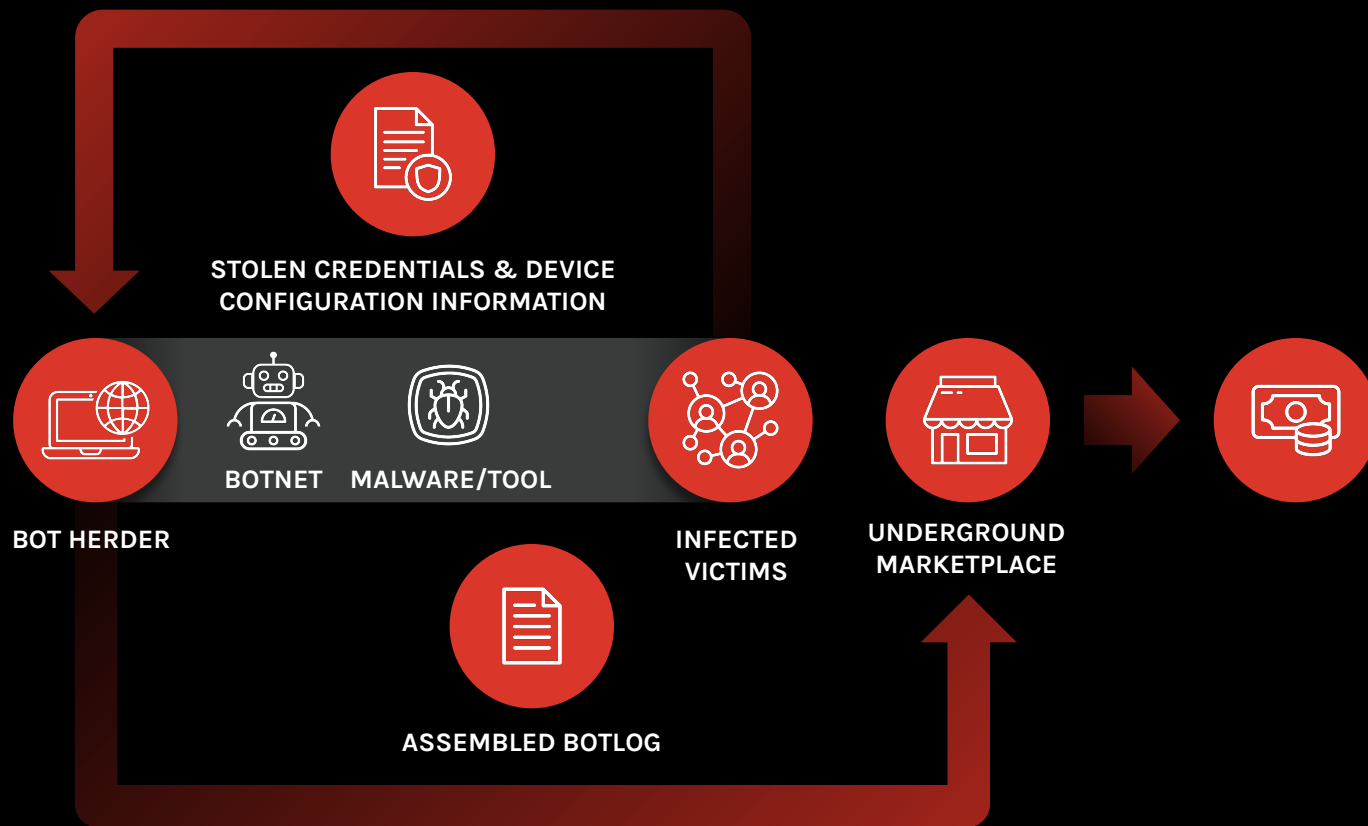
Breaches from stolen/compromised credentials took the longest to detect:

243 days

- IBM Cost of a Breach Report, 2022



Access brokers: vital role in the e-crime ecosystem



ACCESS BROKERS ARE THREAT ACTORS WITH A SIGNIFICANT HISTORY OF PROVIDING INITIAL ACCESS TO MULTIPLE ENTITIES

ACCESS BROKERS OFTEN PERFORM ADDITIONAL ROLES IN THE ECRIME ECOSYSTEM

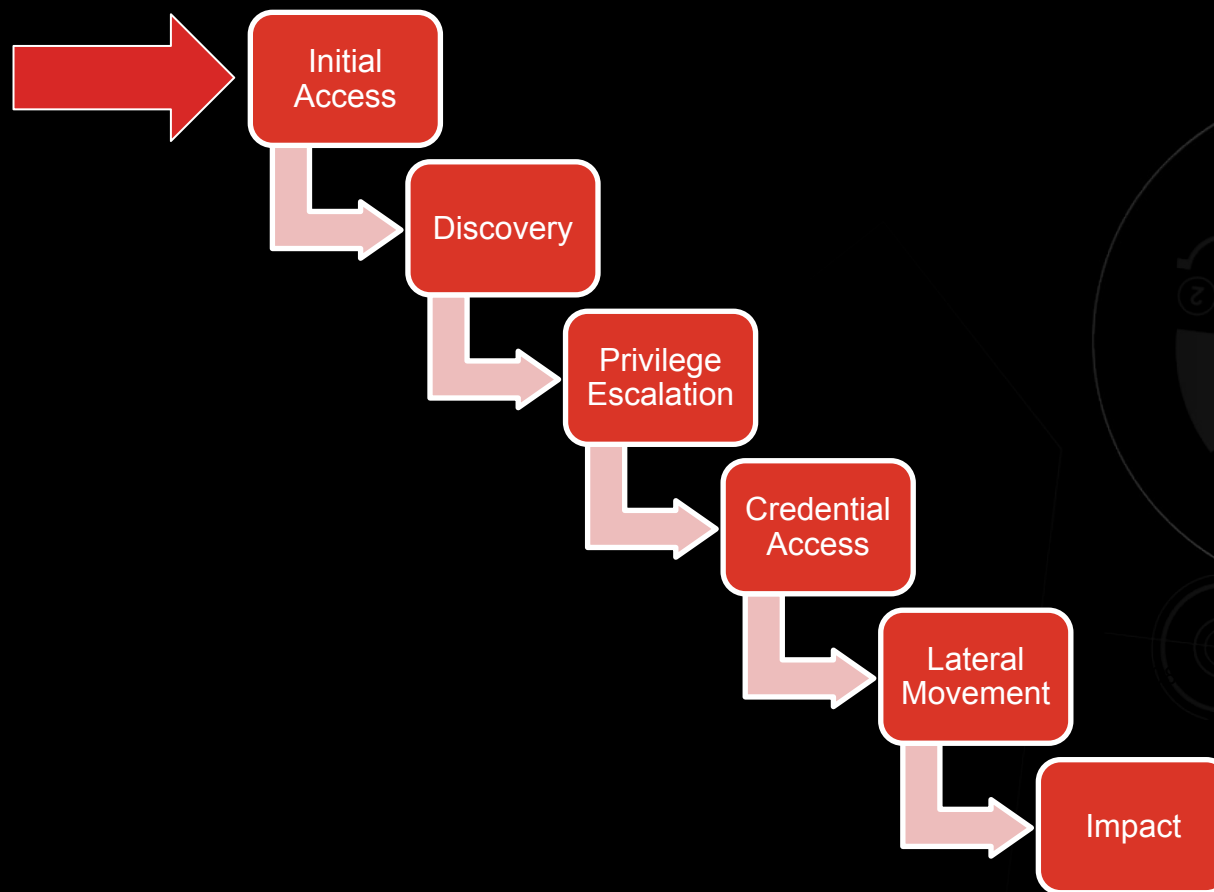


LOGIN CREDENTIALS

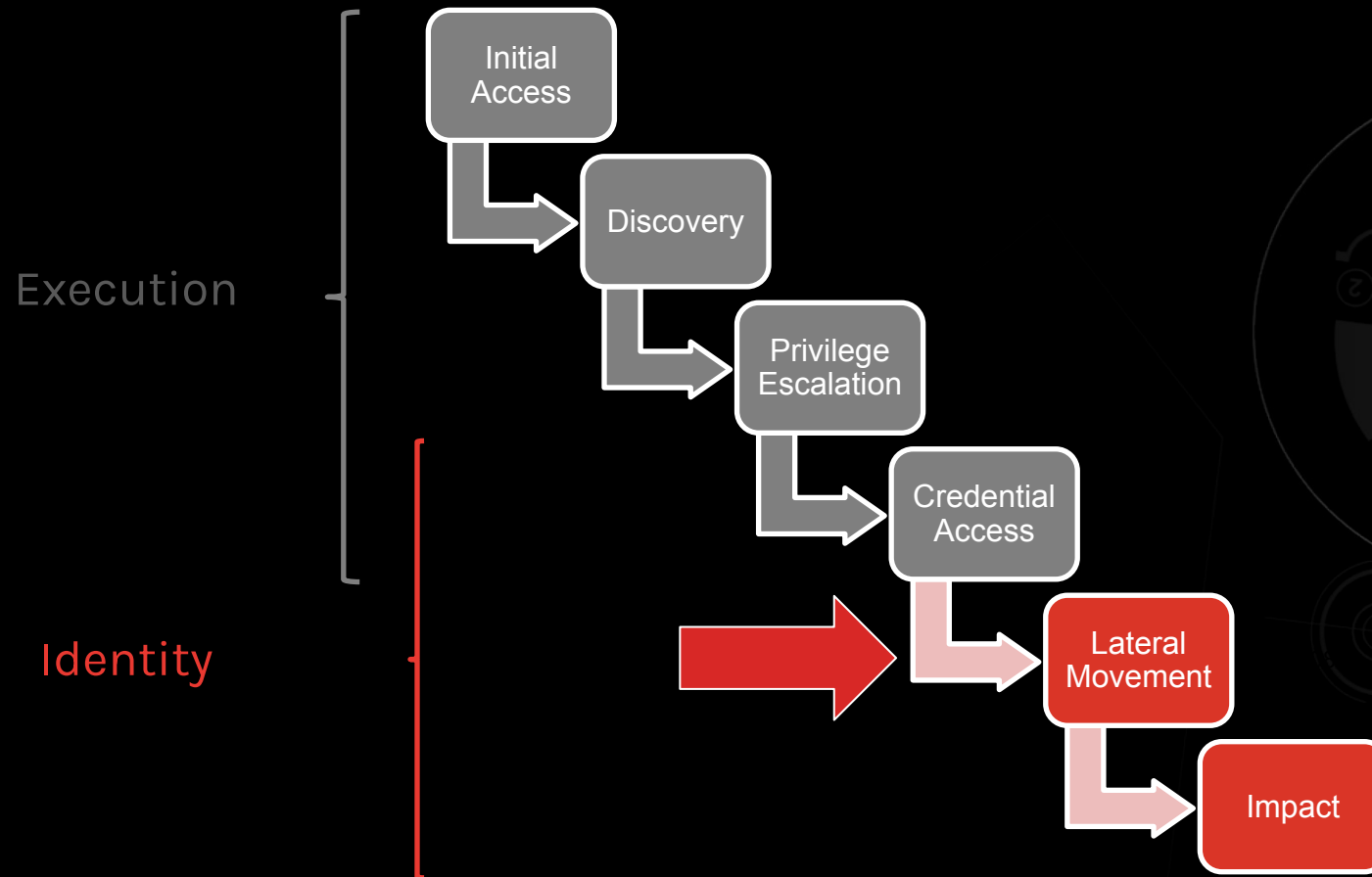


DEVICE CONFIGURATION DATA

Threat actors don't always start here



Often, threat actors start here



Post Exploitation

How Adversaries Remain Stealthy



Living-Off-The-Land

Recent Trends

USES NATIVE TOOLS PRESENT ON THE TARGET SYSTEM TO ACCOMPLISH THE ADVERSARIES' OBJECTIVE

ENABLES ADVERSARIES TO BLEND IN TARGET NETWORK AND HIDE THEIR ACTIVITY IN LEGITIMATE PROCESSES

| TOP LIVING OFF THE LAND TOOLS | | |
|-------------------------------|---------------------------|--------------------------------------|
| | NATIVE TO IT ENVIRONMENTS | NOT NATIVE BUT COMMON AND LEGITIMATE |
| 1 | PSEXEC | MIMIKATZ |
| 2 | PROCDUMP | GMER |
| 3 | POWERSHELL | PROCESS HACKER |
| 4 | WMI | TEAMVIEWER |
| 5 | VBSCRIPT | PUTTY |

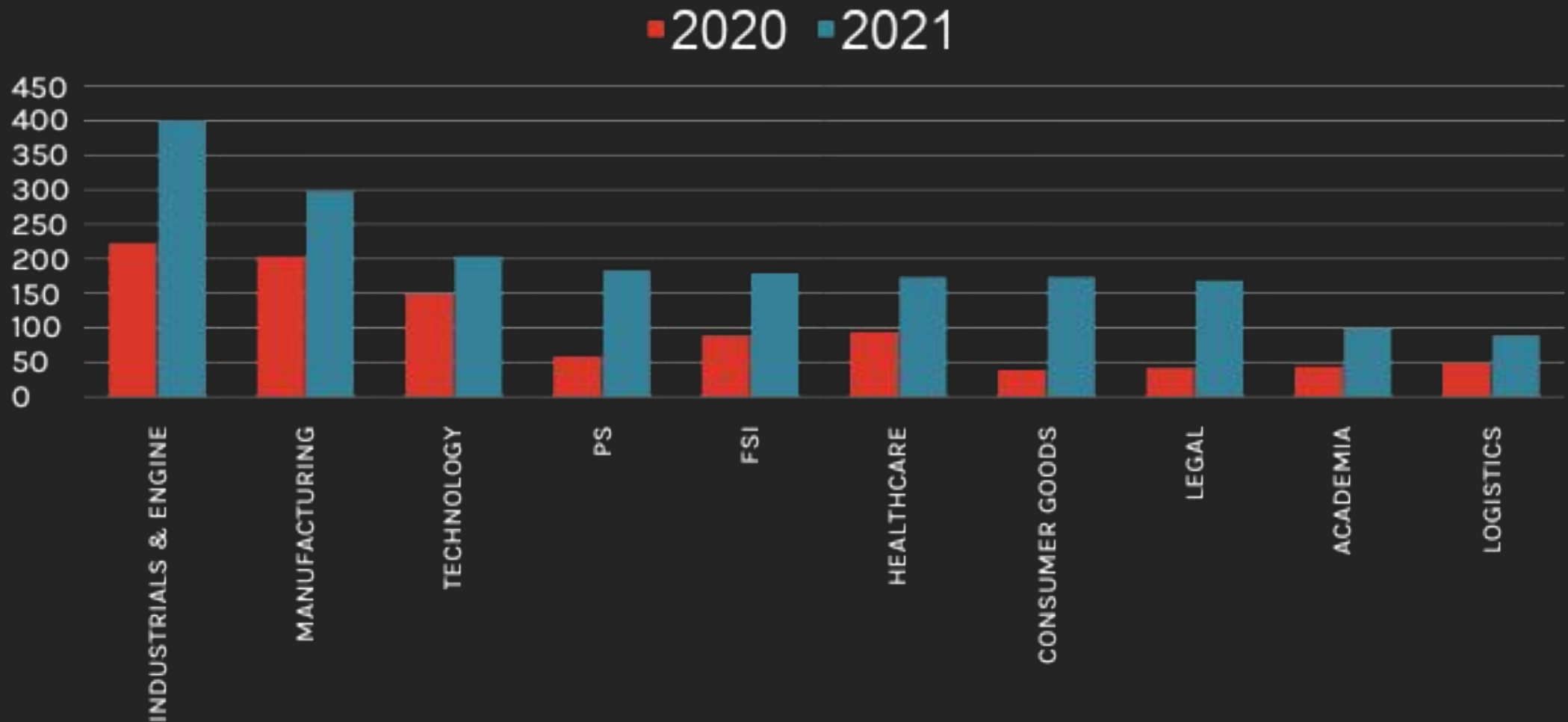


Target Environments

What Adversaries Want



Comparison of Ransomware-Based Data Leaks





Industries most impacted by LockBit include Retail, Healthcare, Transportation and Logistics, Academia, Manufacturing, Professional Services, Telecom, and Tech

BITWISE SPIDER BIG-GAME HUNTING RANSOMWARE

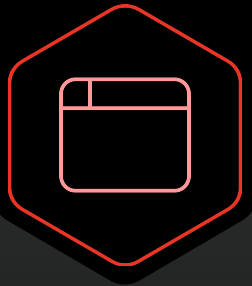
MOST PROLIFIC RANSOMWARE OPERATOR SINCE 2021

-  ACTIVE SINCE SEP 2019, RESPONSIBLE FOR LOCKBIT & LOCKBIT 2.0 RANSOMWARE PLUS STEALBIT INFO STEALER
-  GAINED POPULARITY WITH THE LAUNCH OF LOCKBIT 2.0 IN JUNE 2021 – AVERAGES 3-4 VICTIMS PER DAY, AND POSTS TO BITWISE SPIDER'S DATA LEAK SITE
-  VICTIMS COMPRISED 35 SECTORS ACROSS 74 COUNTRIES, BITWISE SPIDER AFFILIATES GAIN ACCESS BY BRUTE-FORCING INTERNET-FACING RDP or VPN SERVERS
-  RELEASED UPDATE IN OCT 2021 WITH FEATURES TO ENCRYPT VMWARE ESXi SERVERS
-  ANNOUNCED LOCKBIT 3.0 IN JUNE 2022 WITH TIERED OFFERING – CUSTOMIZATION FOR VIP AFFILIATES

CyberCrime

Data Leaks, Criminal Extortion, and Ransomware

Overarching eCrime Trends



EXTORTION &
DATA LEAKS



LIVING OFF
THE LAND



RANSOMWARE
AS-A-SERVICE



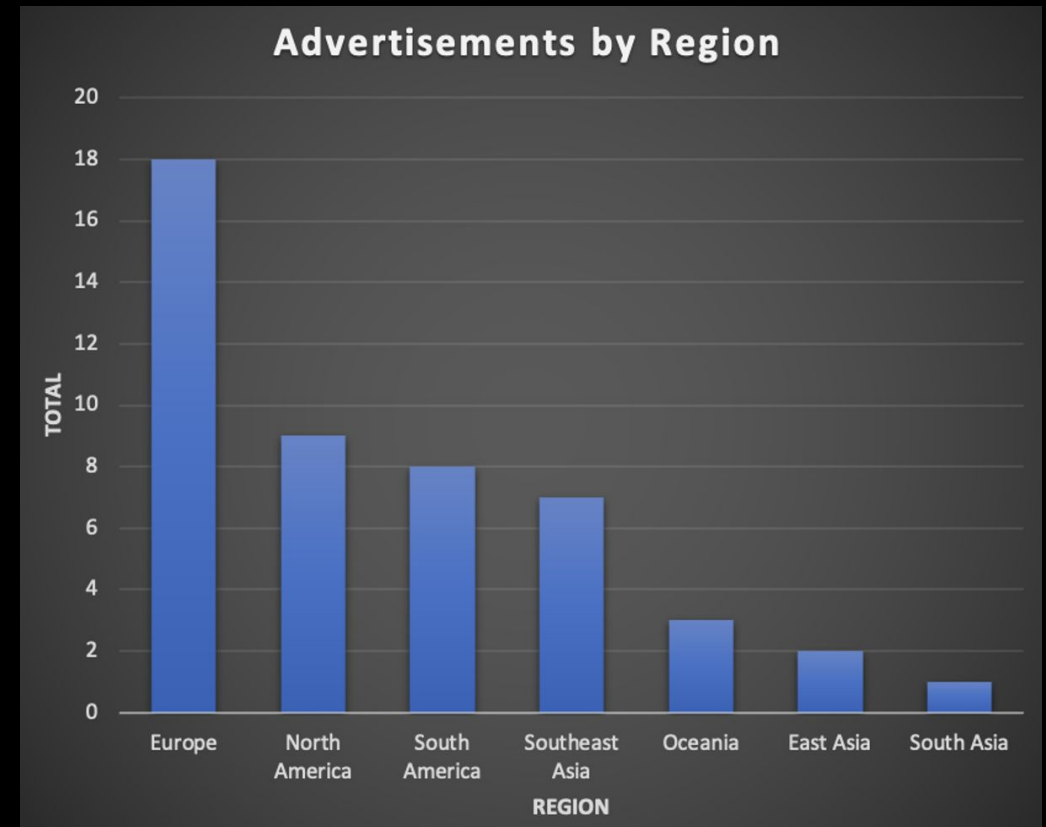
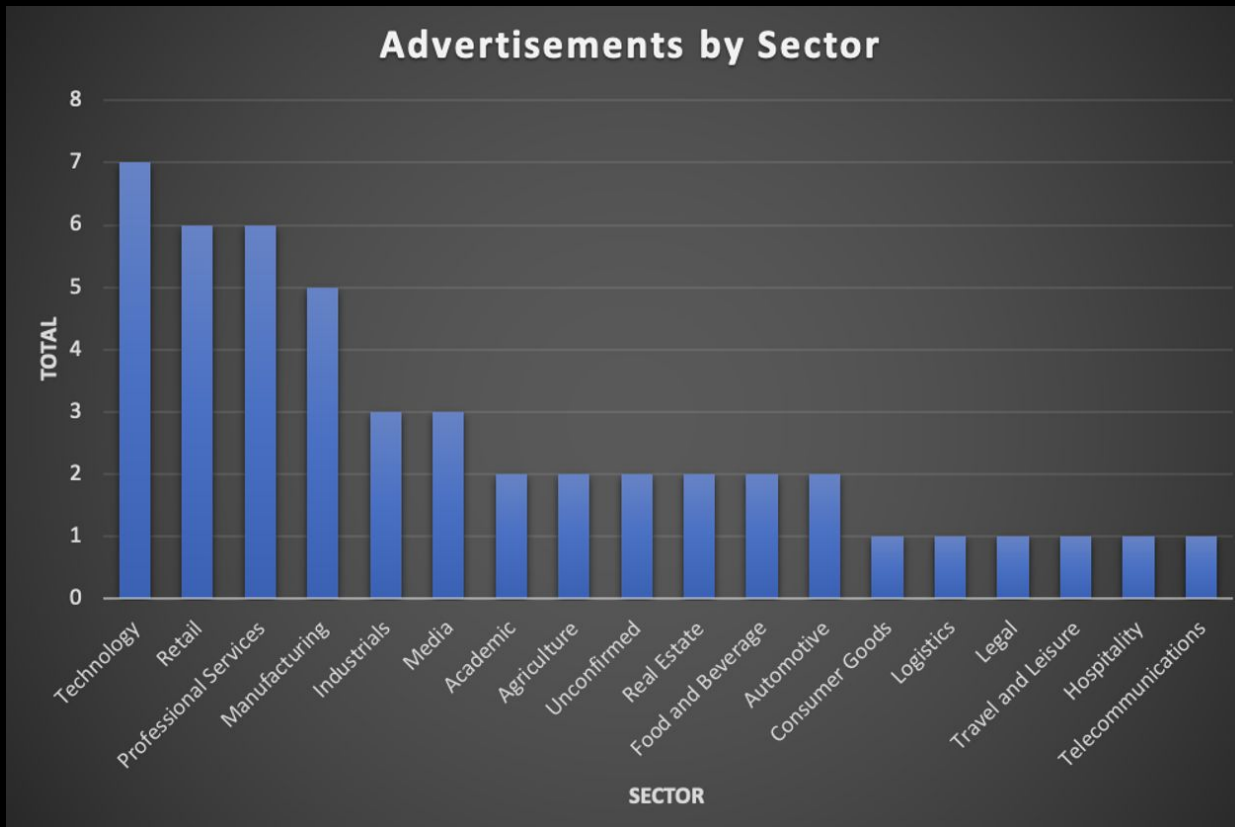
HIGH
SOPHISTICATION



ACCESS
BROKERS

ACCESS BROKER SEEKS COLLABORATIVE OPPORTUNITIES WITH RANSOMWARE OPERATORS; LIKELY TTPS EVIDENCED IN PREVIOUS FORUM ACTIVITIES

- An access broker who attempted to sell approximately 50 accesses has stated they wish to collaborate with ransomware operators on future intrusions.
- On 4 August 2022, an access broker posted to a popular eCrime forum, stating their desire for “joint work” as part of “a team” and offering to exchange knowledge and expertise.



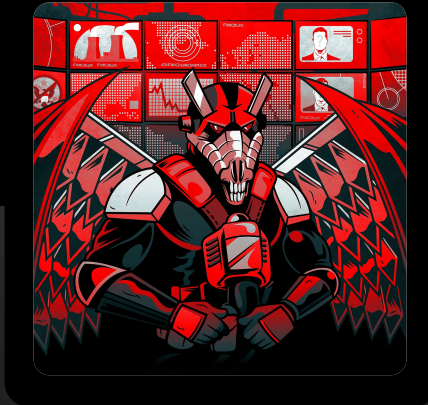
Nation-State Review

Espionage, Destructive Attacks, & Advanced Attacks

NATION STATE TRENDS



CHINA



DPRK



IRAN



RUSSIA



Chinese Intrusion Activity Acceleration over the past decade

DRIVEN BY THE STATE'S CORE INTERESTS

-  CHINA STATE-NEXUS ADVERSARIES CONTINUE TO BE THE MOST ACTIVE NATION STATE GROUPS
-  POLITICAL ESPIONAGE FOR GEOPOL INTELLIGENCE TO ACHIEVE REGIONAL PRIMACY AND GLOBAL INFLUENCE
-  INDUSTRIAL ESPIONAGE & INTELLECTUAL PROPERTY THEFT TO ACHIEVE TECHNOLOGICAL SUPERIORITY
-  INFLUENCE OPERATIONS & DOMESTIC SURVEILLANCE TO ENSURE REGIME STABILITY
-  WHOLE-OF-SOCIETY ECOSYSTEM TO DEVELOP AND SUSTAIN A FORMIDABLE CYBER CAPABILITY



| Date | Adversary | Target Sector |
|-----------|----------------------------------|---|
| 2018-2020 | CIRCUIT PANDA | Government Academic Critical Infrastructure |
| 2020-2022 | SPICY PANDA CIRCUIT PANDA | Technology Government Academic |
| 2020 | RegionalWave activity cluster | Technology |
| 2020-2021 | WICKED PANDA | Unspecified |
| 2020 | N/A | Government |
| 2020 | CIRCUIT PANDA | Media Electronics Finance |
| 2021 | ShadeStream (activity cluster) | Unspecified |
| 2021 | ClearVariable (activity cluster) | Government |
| 2021-2022 | AQUATIC PANDA | Multiple sectors |
| 2021-2022 | SUNRISE PANDA | Unspecified |

Observed Chinese Targeting of Hong Kong and Taiwan, 2020-2022

U.S. HOUSE SPEAKER NANCY PELOSI ARRIVES IN TAIWAN; DDOS ATTACKS AGAINST TAIWANESE PRESIDENTIAL OFFICE CONFIRMED, CHINA PLANS MAJOR MILITARY EXERCISES AROUND ISLAND



A U.S. delegation led by House Speaker **Nancy Pelosi** landed in Taiwan on **2 August 2022**, the first such visit in 25 years. In response, China's PLA Eastern Command announced it will **commence military exercises** in the sea east of Taiwan from 2 August 2022, and state media agency Xinhua separately declared the PLA will conduct **live-fire drills encircling the island between 4-7 August 2022**.



These military actions follow Beijing's ban of thousands of Taiwanese imports.



Taiwan's Presidential Office confirmed its website had been **hit by a distributed denial-of-service (DDoS)** attack at 5:15PM local time on 2 August 2022, hours before Pelosi's scheduled arrival. A government spokesperson confirmed the attack originated overseas, but did not specify if it came from China. The website was reportedly back online in 20 minutes.



The Way Forward

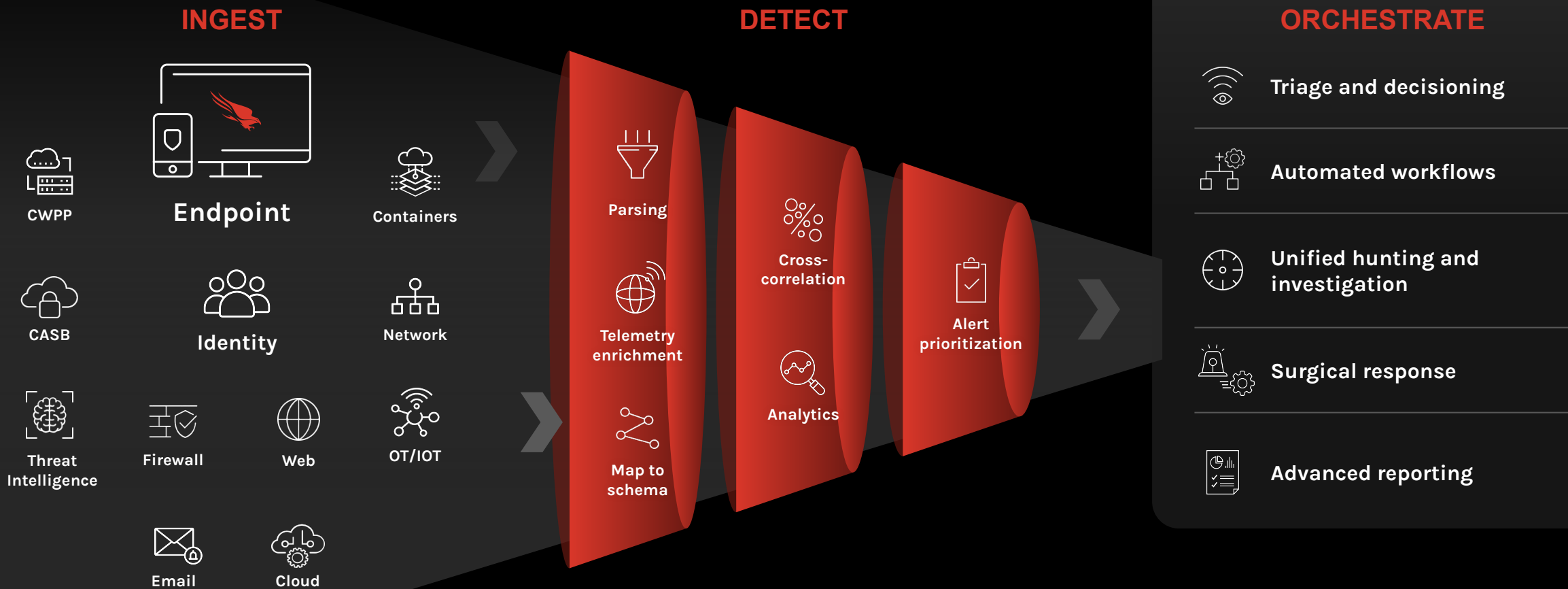
Innovative Protection Capabilities & Recommendations

Cyber Insurance Ready – Top 12 Controls

| Controls Requested by Insurers: | AXA XL | AIG | Beazley | Coalition | CNA |
|---------------------------------|--------|-----|---------|-----------|-----|
| MFA-Controlled Access | ✓ | ✓ | ✓ | ✓ | ✓ |
| Secured & Tested Backups | ✓ | ✓ | ✓ | ✓ | ✓ |
| Patched Systems & Applications | ✓ | ✓ | ✓ | ✓ | ✓ |
| Filtered Emails & Web Content | ✓ | ✓ | ✓ | ✓ | ✓ |
| Protected Privileged Accounts | ✓ | ✓ | ✓ | ✓ | ✓ |
| Protected Network | ✓ | ✓ | ✓ | ✓ | ✓ |
| Secured Endpoints | ✓ | ✓ | ✓ | ✓ | ✓ |
| Logged & Monitored Network | ✓ | ✓ | ✓ | ✓ | ✓ |
| Phishing-Aware Workforce | ✓ | ✓ | ✓ | | ✓ |
| Managed Vulnerabilities | ✓ | ✓ | ✓ | ✓ | |
| Hardened Device Configuration | ✓ | | ✓ | ✓ | |
| Prepared Incident Response | ✓ | ✓ | | | ✓ |



Falcon XDR A Platform Approach Extending Beyond The Endpoint



Falcon X Recon Intelligence

Digital Risk Monitoring

8+ BILLION
OBJECTS COLLECTED

1+ MILLION
UNIQUE SOURCES

500+ MILLION
DAILY SOCIAL MEDIA POSTS

55+ THOUSAND
UNIQUE DARK WEB SITES

42+ MILLION
INDICATORS OF
COMPROMISE



OPEN
WEB

BLOGS, GITHUB,
PASTEBIN, ETC



SOCIAL
MEDIA

TWITTER, REDDIT,
DISCORD, ETC



MESSAGING
APPS

TELEGRAM, QQ,
IRC, ETC



CRIMINAL
FORUMS

BLACKHAT, RAID,
EXPLOIT, XSS, ETC



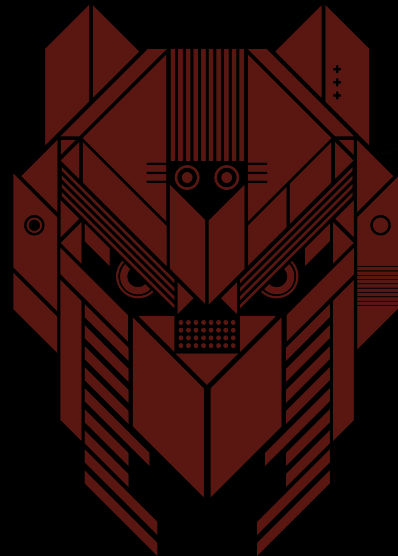
CRIMINAL
MARKETS

DARKMARKET,
GENESIS, ETC



ADVERSARY
INFRASTRUCTURE

C2, BOTNETS,
DDOS, ETC



Falcon Platform Coverage of Tradecraft

Top Adversary ATT&CK Tactics in 2022... Thus far

| Actor Class | Initial Access | Execution | Persistence | Privilege Escalation | Defense Evasion | Credential Access | Discovery | Lateral Movement | Collection | Command and Control | Exfiltration | Impact |
|-------------|----------------|-----------|----------------|----------------------|-----------------|-----------------------|-----------|------------------|------------|---------------------|--------------|--------|
| eCrime | Valid Accounts | | Valid Accounts | Valid Accounts | Valid Accounts | OS Credential Dumping | | Remote Services | | | | |
| Targeted | Valid Accounts | | Valid Accounts | Valid Accounts | Valid Accounts | OS Credential Dumping | | Remote Services | | | | |

Identity

| Actor Class | Initial Access | Execution | Persistence | Privilege Escalation | Defense Evasion | Credential Access | Discovery | Lateral Movement | Collection | Command and Control | Exfiltration | Impact |
|-------------|----------------|-----------------------|-------------|----------------------|-----------------|-----------------------|-----------------------------|------------------|------------------------|-----------------------|--|--------------|
| eCrime | | Command and Scripting | | | | OS Credential Dumping | System Owner/User Discovery | | Archive Collected Data | Ingress Tool Transfer | Exfiltration Over Alternative Protocol | Service Stop |
| Targeted | | Command and Scripting | | | | OS Credential Dumping | System Owner/User Discovery | | Archive Collected Data | Ingress Tool Transfer | Exfiltration Over Alternative Protocol | Service Stop |

Endpoint

| Actor Class | Initial Access | Execution | Persistence | Privilege Escalation | Defense Evasion | Credential Access | Discovery | Lateral Movement | Collection | Command and Control | Exfiltration | Impact |
|-------------|----------------|-----------------------|----------------|----------------------|-----------------|-----------------------|-----------------------------|------------------|------------------------|-----------------------|--|--------------|
| eCrime | Valid Accounts | Command and Scripting | Valid Accounts | Valid Accounts | Valid Accounts | OS Credential Dumping | System Owner/User Discovery | Remote Services | Archive Collected Data | Ingress Tool Transfer | Exfiltration Over Alternative Protocol | Service Stop |
| Targeted | Valid Accounts | Command and Scripting | Valid Accounts | Valid Accounts | Valid Accounts | OS Credential Dumping | System Owner/User Discovery | Remote Services | Archive Collected Data | Ingress Tool Transfer | Exfiltration Over Alternative Protocol | Service Stop |

Identity
+
Endpoint



TOP RECOMMENDATIONS



CULTURE OF CYBERSECURITY

Community awareness and practice are key to healthy cybersecurity; Engage your execs & board in a risk-based cyber program



ROLL IT OUT, TURN IT ON

Select tech partners who are strategic. Secure all of your tech infrastructure; Enable prevention capabilities, properly integrate



BE VIGILANT & READY TO ACT

Beyond technology, match defenders and adversaries 24x7x365, leveraging 1-10-60 rule



PROTECT YOUR IDENTITY

Use multi-factor for all accounts, protect service and admin accounts, adopt zero trust approach



CONTROL REMOTE ACCESS

Refrain from exposing SMB and RDP ports to the internet, restrict remote access tools

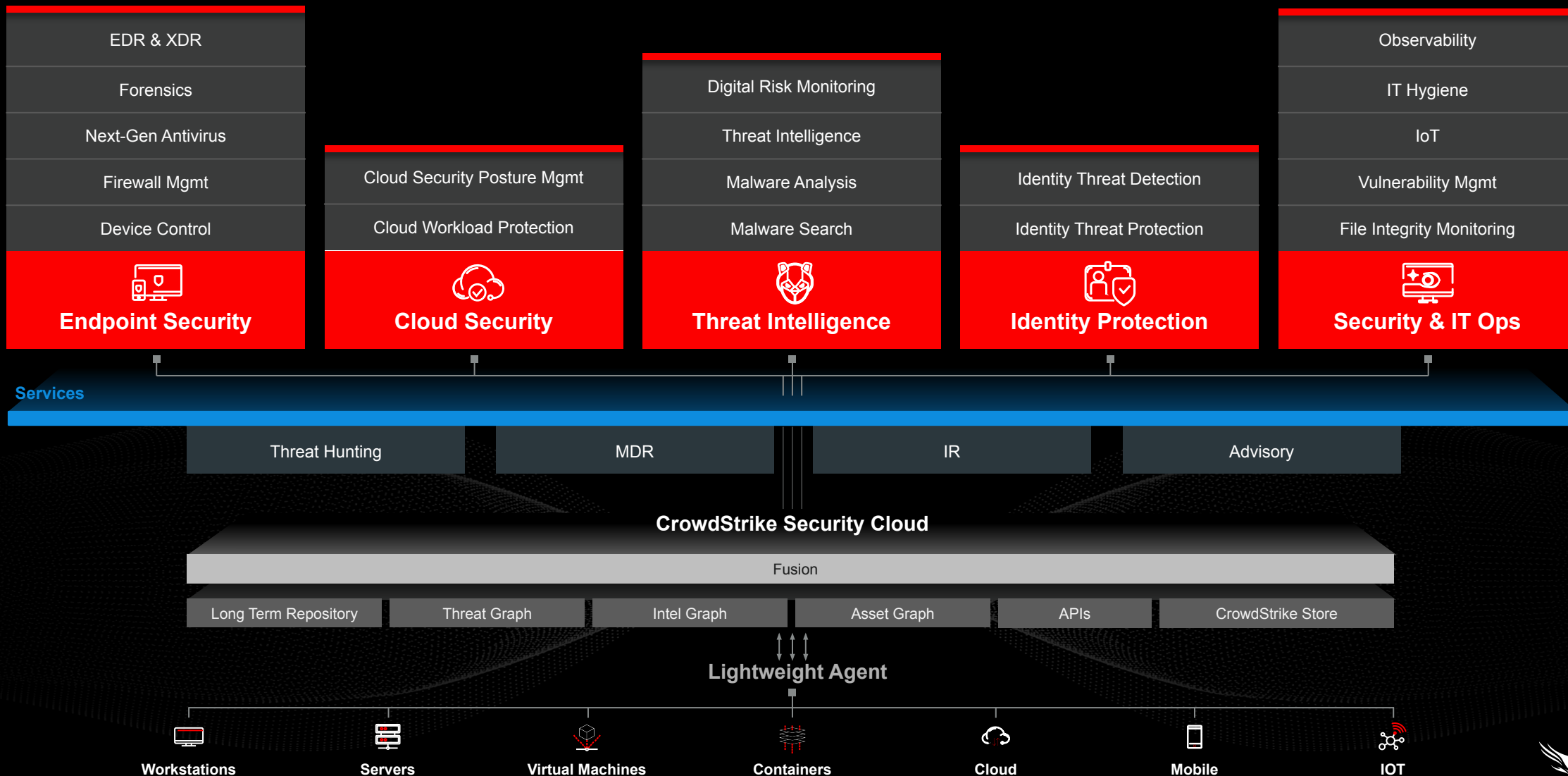


PRACTICE GOOD HYGIENE

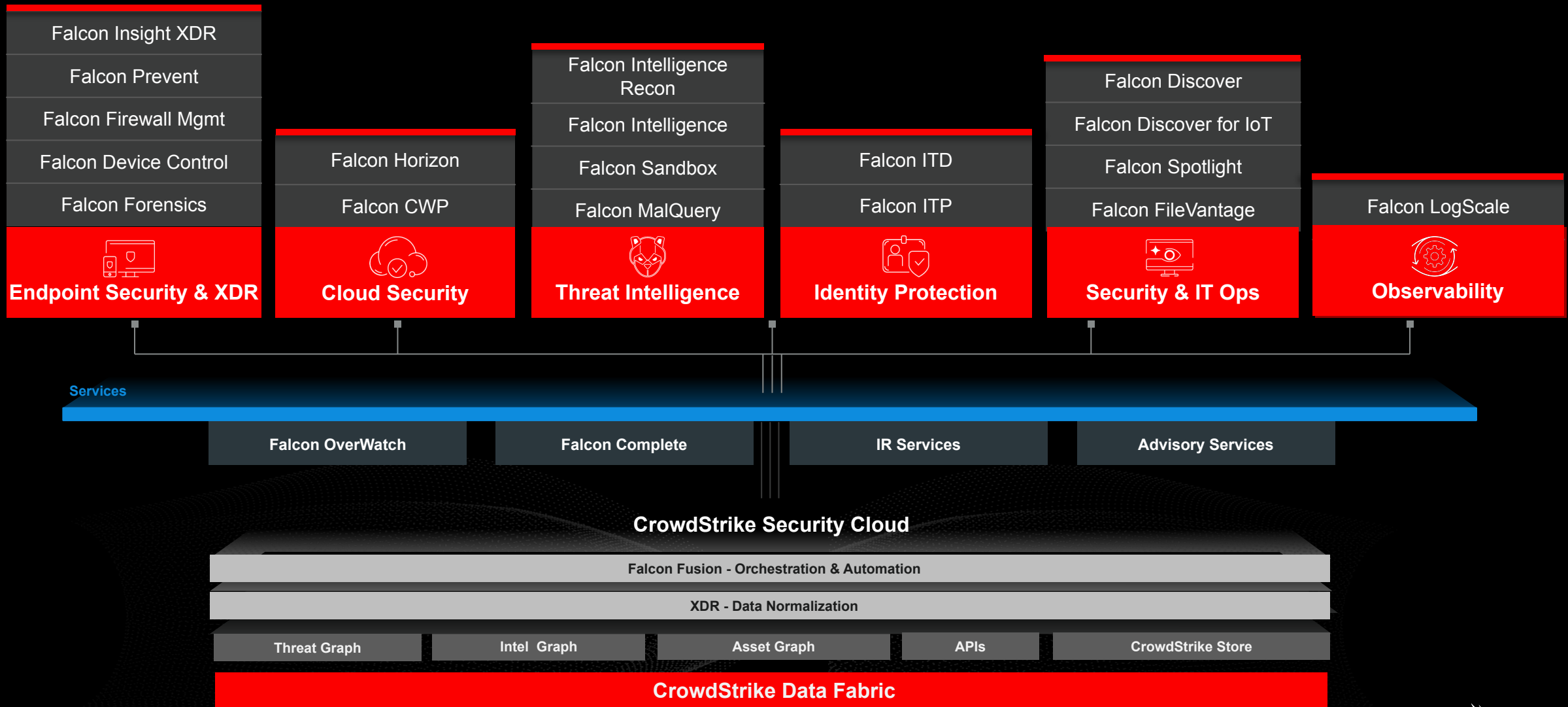
Control software, eliminating unneeded software, keep up-to-date with latest patches



The Falcon Platform



The Falcon Platform



Top Business Cases for Proactive Security

- 1) Real Time Response (EDR)
- 2) Immediate Remediation Reports (Falcon Complete Emails)
- 3) Corral Unmanaged Hardware and Software Assets (Discover > Unmanaged/Application Usage)
- 4) Get Authenticated Vulnerability Scans (Spotlight)
- 5) Executive-Level Key Metrics
- 6) Powerful Policies and Analytics (View Policies for RDP, Compromised PWs, Stale Accounts)
- 7) Stop Malicious Authentications (Challenge RDP, Force MFA on Compromised PWs, Block Stale Accounts)
- 8) Alert System Admins to Critical Issues (VIP Account Policies)
- 9) Track Down Behavior and Hygiene Issues (The Ghost Employee RDP)
- 10) Inspire Account and Password Cleanup (Policy Alerts > Create Reports)
- 11) Measure Cleanup Progress (Events Analysis)
- 12) Enforce Cleanup (New Policy for PW Reset or Block Stale Accounts)
- 13) Eliminate Attack Paths to Critical Accounts (Monitor > Attack Path)
- 14) Gain Awareness of Azure AD Incidents (Cred Scan/PW Spray Incidents)
- 15) Verify Lockouts are Actually Malicious
- 16) Correlate Endpoint and Identity Activity (EDR > ITP)

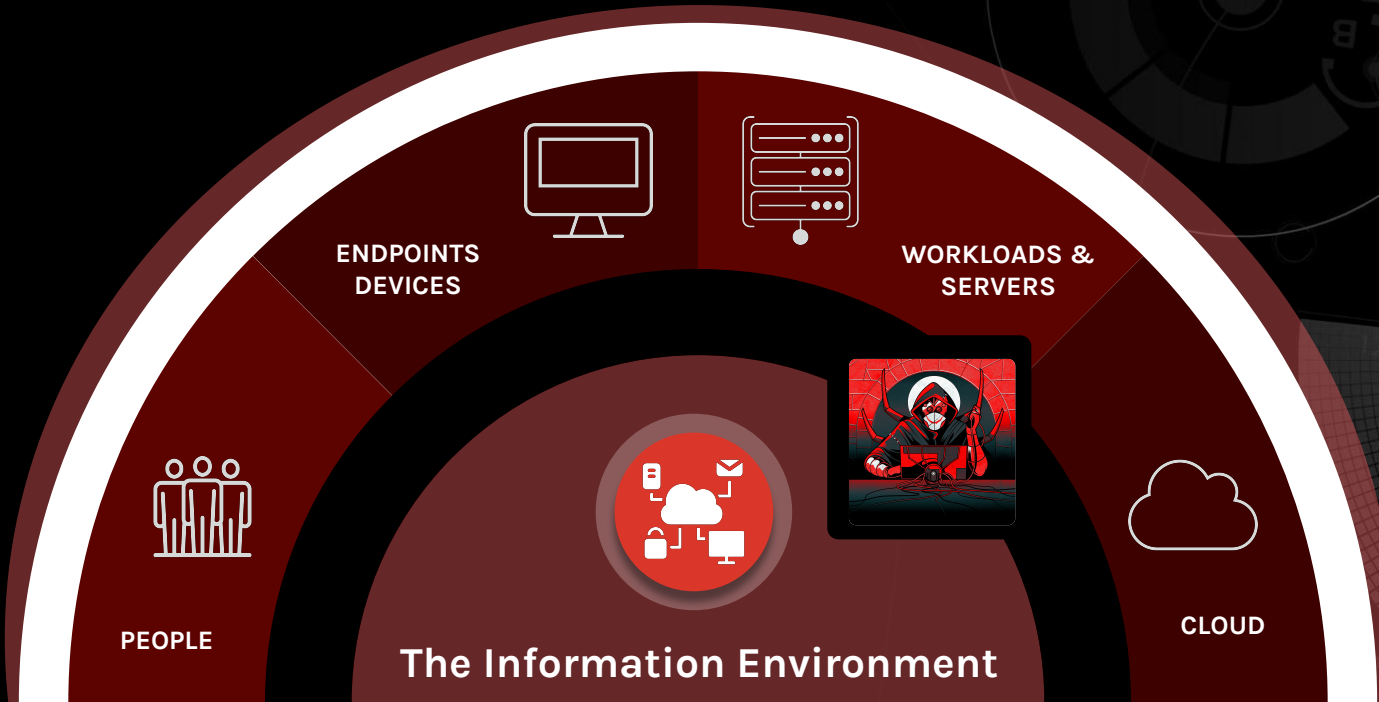


YOUR ABILITY TO **DEFEAT** ADVANCED CYBER
THREATS RESTS ALMOST ENTIRELY ON YOUR
UNDERSTANDING OF THE PROBLEM



CrowdStrike's Layered Defense Zero Trust Strategy

- SECURE AUTHENTICATION**
IDENTITY PROTECTION
- AUTHORIZATION**
IDENTITY PROTECTION
- VULNERABILITY MANAGEMENT**
SPOTLIGHT
- PREVENTION & VISIBILITY**
PREVENT & INSIGHT
- CLOUD SECURITY**
CLOUD PROTECTION
- DATA AGGREGATION & XDR**
HUMIO
- FILE INTEGRITY MONITORING**
FILEVANTAGE



- THREAT INTELLIGENCE**
FALCON X
- 24/7/365 THREAT HUNTING**
OVERWATCH
- PROFESSIONAL SERVICES**
CROWDSTRIKE SERVICES
- MDR SERVICES**
FALCON COMPLETE





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