

# RISE OF HUMAN OPERATED RANSOMWARE

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# PRESENTER

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# AGENDA

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- ☑ Introduction
- ☑ Current Landscape
- ☑ How They Get In
- ☑ What You Can Do
- ☑ Additional Resources
- ☑ Closing Remarks
- ☑ Q&A

Appendix: About Wolf & Company, P.C.







# INTRODUCTION

# RANSOMWARE TRANSFORMATION

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# CURRENT LANDSCAPE



## ADVERSARY ACTIVITY

70%

of incident response cases over the past twelve months were ransomware and business email compromise (BEC).

77%

of intrusions are suspected to be caused by three initial access vectors: phishing, exploitation of known software vulnerabilities and brute-force credential attacks—focused primarily on remote desktop protocol (RDP).

87%

of positively identified vulnerabilities fell into one of six major categories: ProxyShell, Log4j, SonicWall, ProxyLogon, Zoho ManageEngine ADSelfService Plus and Fortinet.

50%

of targeted organizations lacked multifactor authentication on key internet-facing systems such as corporate webmail, virtual private network (VPN) solutions and other remote access solutions.



# ADVERSARY ACTIVITY

**82%** increase in ransomware-related data leaks

- Attackers have and use additional strategies for financial gain. Threat actors have increasingly paired extortion with encryption (sometimes including added threats of informing customers or the press or conducting a distributed denial-of-service attack).
- Some attackers focus on extortion alone.

**28 Days** The median dwell time we observed for ransomware attacks – meaning the time threat actors spend in a targeted environment before being detected





# RANSOMWARE TACTICS

- Breakout Time: averages 1 hour 38 minutes
  - (Between Lateral movement and Payment, the median dwell time is 28 days)



INITIAL  
ACCESS



EXECUTION



CREDENTIAL  
ACCESS



LATERAL  
MOVEMENT



PAYLOAD

- Phishing
- Exploitation of Known Software Vulnerabilities
- Brute-Force Credential Attack

- "Living of the land" (LOTL): 62% of attacks were malware-free

## COST OF RANSOMWARE

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41%

Recovery Time: < 1 month

58%

Recovery Time: > 1 month

43%

Average payment of the initial ransom amount

58%

Organizations paid the ransom

14%

Organizations paid more than once

# RANSOMWARE TRENDS

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- Ecosystem
  - Ransomware as a Service (RaaS)
  - Marketplace to purchase initial access
- Multi-extortion techniques (known as double or triple extortion)
- Victim shaming on websites
- Recruiting insiders





# RANSOMWARE: IT'S A RACE



## INCIDENT RESPONSE TIMELINE





# WHAT YOU CAN DO

# USER AWARENESS

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- Think before clicking
  - Are there misspellings? Grammar issues?
  - Who is it coming from?
  - Is it a typical type of email you receive?
  - Hover over links: where do they really go?
  - Be suspicious if the email uses fear or the urgency to force action
- Incentivize good behavior
  - Create simple ways for users to report
  - Reward employees who report or catch such emails
  - Work towards higher reporting percentages
    - o Don't solely focus on click rate
    - o The higher or faster the reporting, the better chance for swift containment





# MULTI-FACTOR AUTHENTICATION

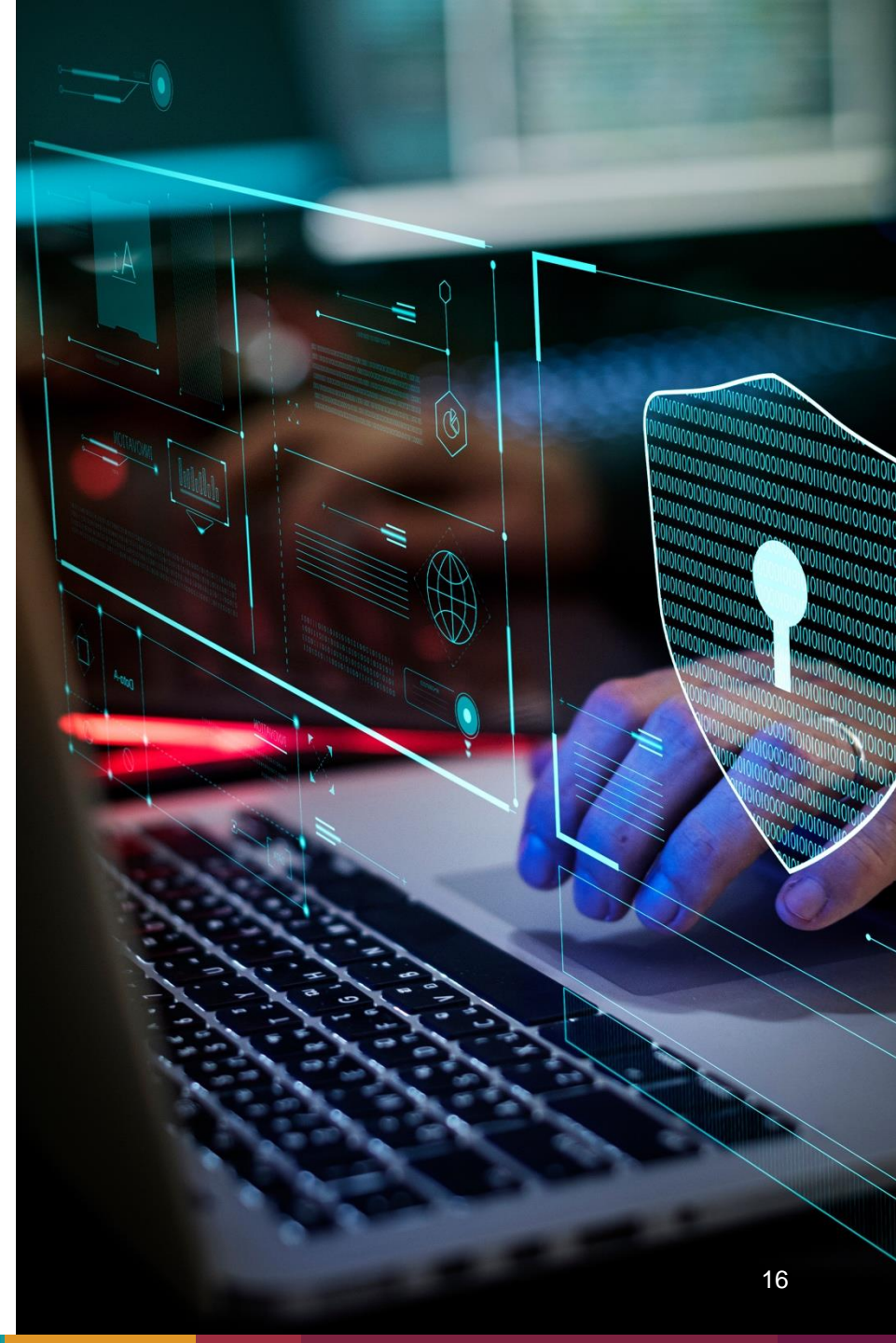
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- Educate users throughout the year
- Implement multifactor authentication
- All remote access to a network
- External systems hosted by third parties (i.e., Cloud environments)
- Admins (including internal RDP)



# ENDPOINT SECURITY CONTROLS

- Restrict local admin access
- Implement Microsoft Local Administer Password Protection (LAPS)
  - Prevents quick lateral movement
- Install endpoint security software (e.g. Carbon Black, CrowdStrike, Cylance) on all remote workstations
  - Signature-based detection alone isn't enough!
- Extend asset, patch, configuration, and vulnerability management processes to cover everything
  - Even if it's a toaster with an IP, count it!
  - Consider increasing the number of hosts being monitored for suspicious events
    - Do you know what's happening on your workstations?  
Just servers? A subset of servers?



# DATABASE & BACKUP SECURITY

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- Ensure your databases are secured with strong credentials
- Use the 3-2-1 rule:
  - 3 copies of data (1 primary and 2 backups)
  - 2 different storage media types
  - 1 copy stored off-site





# SECURITY MONITORING & INCIDENT RESPONSE —

- Monitor all nodes on your network
  - Consider increasing the number of hosts being monitored for suspicious events
    - Do you know what's happening on your workstations? Just servers? A subset of servers?
- Endpoint detection & response (EDR) is not enough!
  - There is other activity you need to log and analyze, implement managed detection & response (MDR)
  - Correlate all logs from your systems
- Implement playbooks for common attacks (like ransomware)
  - How do you contain and eradicate once you detect and understand the advisory?
  - Understand how your cyber insurance works



# CYBERSECURITY TESTING & RESPONSE MATURITY

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VULNERABILITY  
MANAGEMENT



PENETRATION  
TESTING



PURPLE  
TEAM



RED TEAM



BLUE TEAM

# MITRE ATT&CK®

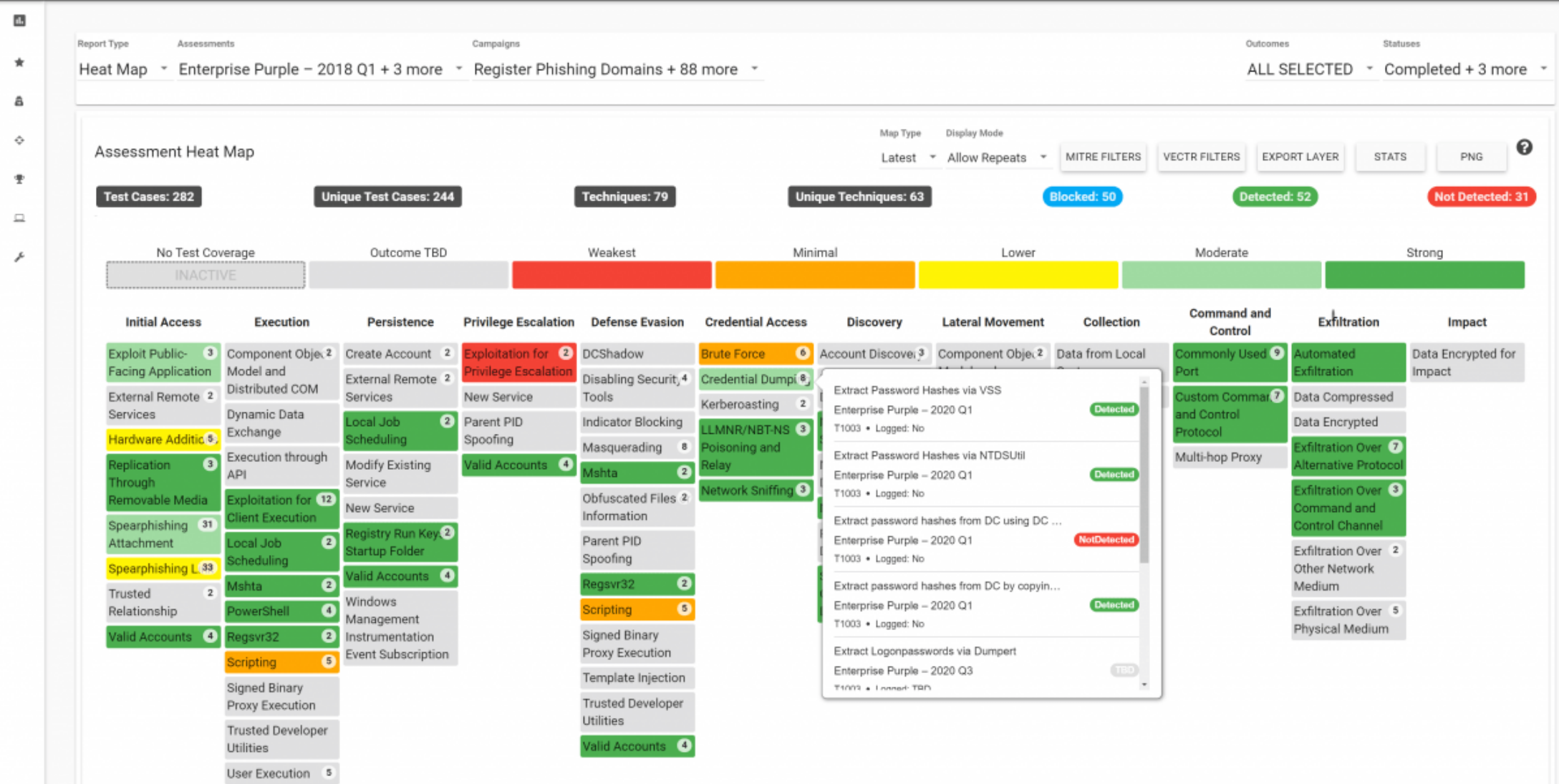
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MITRE ATT&CK® is a community-driven platform

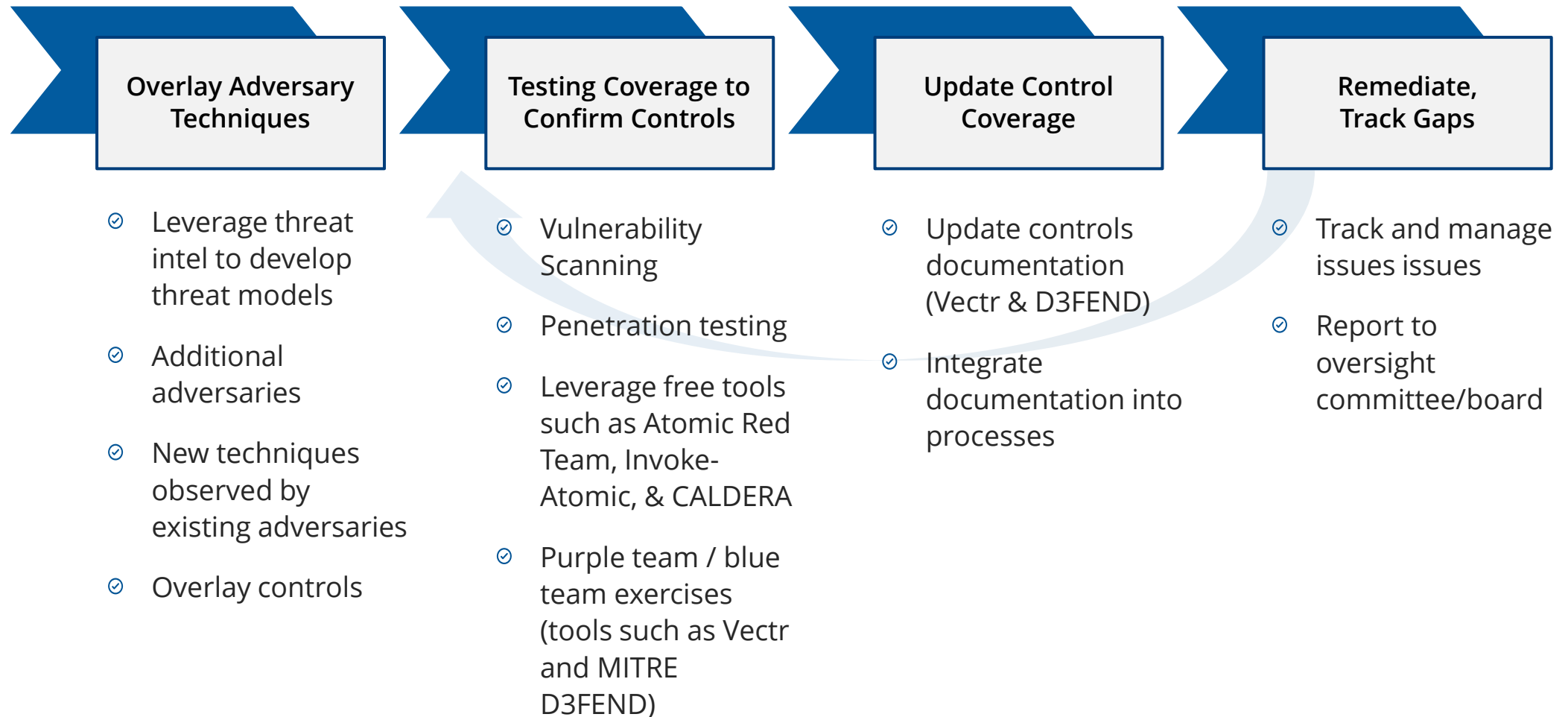
- Tracks threat actors through observable data
- Tactics, Techniques, and Procedures (TTPs)
- Post-compromise focus
- 14 Tactics, 222 Techniques, 350+ Sub-Techniques, and growing







# KEEP YOUR THREAT MODELS UP TO DATE





# ADDITIONAL RESOURCES

## ADDITIONAL RESOURCES

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- [MITRE ATT&CK Framework](#)
- [Microsoft: Plan a Conditional Access Deployment](#)
- [Microsoft: What is Conditional Access?](#)
- [Verizon Data Breach Investigations Report \(DBIR\) 2022](#)
- [US-CERT: Data Backup Options](#)
- [CrowdStrike Services 2022 Cyber Front Lines Report](#)
- [2022 Unit 42 Incident Response Report](#)
- [2022 Unit 42 Ransomware Threat Report](#)



The background of the slide is a blurred image of a computer screen displaying code. The code is in a light blue color on a dark background. Visible snippets include 'if(parameters.com', 'hql +=', 'createQuery(hql, pe', 'TypedQuery', and 'toString()'.

# CLOSING REMARKS



# QUESTIONS

# THANK YOU!

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# Appendix: About Wolf & Company, P.C.



# ABOUT WOLF & COMPANY, P.C.

## 111

### YEARS IN BUSINESS

- ⊙ Established in 1911
- ⊙ Built on quality and integrity
- ⊙ Succession strategy to remain independent allows us to be with you throughout your business lifecycle

## 300+

### EXPERIENCED, HIGHLY TRAINED PROFESSIONALS

- ⊙ Lower-than-industry-average staff turnover means a consistent team structure year after year
- ⊙ Niche team dedicated to your industry



### RESOURCES TO LEARN MORE

- ⊙ [Cultures & Values](#)
- ⊙ [Social Responsibility](#)
- ⊙ [Inclusion & Diversity](#)
- ⊙ [Thought Leadership](#)
- ⊙ [Our History](#)
- ⊙ [Wolf Global](#)



Wolf & Company ranked 2020  
**#2 BEST LARGE FIRM  
TO WORK FOR**  
nationwide

**accountingTODAY**

# CURRENT PROFESSIONAL CERTIFICATIONS

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- ✓ Anti-Money Laundering Professional (AMLP)
- ✓ Certified Anti-Money Laundering Specialist (CAMS)
- ✓ Certified Blockchain Security Professional (CBSP)
- ✓ Certified Business Continuity Professional (CBCP)
- ✓ Certified Cloud Security Professional (CCSP)
- ✓ Certified Common Security Framework Practitioner (CCSFP)
- ✓ Certified Cryptocurrency Risk Specialist (CCRS)
- ✓ Certified Data Privacy Solutions Engineer (CDPSE)
- ✓ Certified Enterprise Risk Professional (CERP)
- ✓ Certified Fraud Examiner (CFE)
- ✓ Certified HITRUST Quality Professional (CHQP)
- ✓ Certified in the Governance of Enterprise IT (CGEIT)
- ✓ Certified Information Privacy Manager (CIPM)
- ✓ Certified Information Security Manager (CISM)
- ✓ Certified Information Systems Auditor (CISA)
- ✓ Certified Information Systems Security Professional (CISSP)
- ✓ Certified Internal Auditor (CIA)
- ✓ Certified Public Accountant (CPA)
- ✓ Certified Smart Contract Developer (CSCD)
- ✓ Certified Regulatory Compliance Manager (CRCM)
- ✓ CompTIA Security+

# CURRENT PROFESSIONAL CERTIFICATIONS

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- ✓ GIAC Certified Incident Handler (GCIH)
- ✓ GIAC Certified Intrusion Analyst (GCIA)
- ✓ GIAC Certified Project Manager (GCPM)
- ✓ GIAC Certified Windows Security Administrator (GCWN)
- ✓ GIAC Certified UNIX Security Administrator (GCUX)
- ✓ GIAC Cloud Penetration Tester (GCPN)
- ✓ GIAC Critical Controls Certification (GCCC)
- ✓ GIAC Defending Advanced Threats (GDAT)
- ✓ GIAC Mobile Device Security Analyst (GMOB)
- ✓ GIAC Penetration Tester (GPEN)
- ✓ Certified Regulatory Vendor Program Manager
- ✓ GIAC Security Essentials Certification (GSEC)
- ✓ GIAC Security Expert (GSE)
- ✓ GIAC Web Application Penetration Tester (GWAPT)
- ✓ Juris Doctor (JD)
- ✓ NAFCU Certified Risk Manager (NCRM)
- ✓ Master Business Continuity Professional (MBCP)
- ✓ Offensive Security Certified Professional (OSCP)
- ✓ Payment Card Industry Professional (PCIP)
- ✓ Qualified Security Assessor (QSA)

# WOLF & COMPANY ACCOLADES

Wolf is pleased to have received recognition from a variety of sources for our efforts at providing responsive client service and development of our professionals. Examples of this recognition include:

**INSIDE** Public Accounting

**TOP 100**  
Accounting Firms

**accountingTODAY**

**#2 BEST LARGE FIRM** to  
Work For Nationwide

**TOP FIRMS:**  
New England

**BOSTON**  
**BUSINESS JOURNAL**

- ☉ Area’s Best Places to Work
- ☉ Area’s Most Admired Companies
- ☉ Area’s Fastest Growing Private Companies
- ☉ Area’s Largest I.T. Consulting Firms

**Forbes**

**America’s Best**  
Tax and Accounting  
Firms of 2021



# SERVICES WE OFFER

Our specialists are well trained, subject matter experts in banking operations, cybersecurity and IT, regulatory compliance, corporate governance, accounting and tax processes. Our people are well versed in FFIEC, FDIC, and CFPB standards and industry leading practices. They would collaborate with your management team to evaluate risks and suggest control enhancements.



## Internal Audit

- Operational & Financial Audits
- Internal Audit Department
- Advisory



## Information Technology Assurance

- IT Audit
- Advisory
- Cybersecurity
- Model Risk Management



## Regulatory Compliance

- Compliance Audits
- Fair Credit Reporting & CRA
- Compliance Program



## Strategic Management Services

- Business Continuity Planning (BCP)
- Virtual Vendor Management
- Virtual Chief Privacy Officer (vCPO)
- Virtual Chief Risk Officer (vCRO)



## Assurance

- Financial Statements
- Secondary CPA Services



## Tax

- Advisory

## Other Services



## WOLFPAC

Integrated risk management SaaS suite



## DENSECURE

Advanced cyber threat experts

# INTERNAL AUDIT SERVICES



## Operational & Financial Audits

### Personal Banking

- ✓ ATM/Debit Cards
- ✓ Credit Cards
- ✓ Deposits
- ✓ Home Equity Line of Credit
- ✓ Indirect Lending
- ✓ Mobile and Online Banking
- ✓ Mortgages
- ✓ Non-deposit Investment Products
- ✓ Overdraft Line of Credit
- ✓ Personal Loans

### Commercial Banking

- ✓ Asset Based Lending
- ✓ Commercial Real Estate
- ✓ Commercial Vehicle Lending
- ✓ Commercial & Industrial Lending
- ✓ Foreign Exchange
- ✓ Global Banking
- ✓ Government Banking
- ✓ Hedging and Derivatives
- ✓ International Trade Finance
- ✓ Syndicated Lending
- ✓ Treasury Management (Cash Management)

### Business Banking

- ✓ ATM/Debit Cards
- ✓ Business Loans, including Equipment Finance
- ✓ Commercial Mortgages
- ✓ Deposits
- ✓ International Services
- ✓ Merchant Services
- ✓ Mobile and Online Banking
- ✓ Payments & Processing (Cash Management)
- ✓ Small Business Administration Loans

# INTERNAL AUDIT SERVICES (continued)



## Accounting

- ✓ Accounts Payable & Purchasing
- ✓ Asset/Liability Management
- ✓ Bank Owned Life Insurance
- ✓ Borrower-in-Custody
- ✓ Borrowings
- ✓ Call Report
- ✓ Employee Expenses
- ✓ Financial Reporting
- ✓ Fixed Assets
- ✓ General Ledger
- ✓ Insurance
- ✓ Interbank Liabilities
- ✓ Interest Rate Risk
- ✓ Liquidity and Funds Management
- ✓ Treasury, including Investments

## Corporate Services

- ✓ Collections
- ✓ Loan Operations
- ✓ Automated Clearing House
- ✓ Branch Administration
- ✓ Branches
- ✓ Call Center
- ✓ Corporate Governance
- ✓ Enterprise Risk Management
- ✓ Fiduciary Services (Trust)
- ✓ Human Resources and Payroll
- ✓ Marketing and Advertising
- ✓ Model Risk Management
- ✓ Subsidiaries
- ✓ Wires Transfers

## Internal Audit Department & Advisory

We know running an internal audit department is hard work. From keeping up with IIA standards, to assisting the first and second lines of defense, we can help your internal audit function with the following:

- ✓ Control Identification and Flow Charting
- ✓ Digital Transformation
- ✓ External Quality Assessment Review
- ✓ FinTech Relationship Monitoring
- ✓ Internal Audit Department Optimization
- ✓ Internal Audit Organizational Chart and Headcount Analysis
- ✓ Internal Audit Policies and Procedures Review
- ✓ Internal Audit Risk Assessment
- ✓ Data Analysis
- ✓ Quality Assessment Review

# INFORMATION TECHNOLOGY ADVISORY SERVICES



## IT Audit

- ☑ IT General Controls
- ☑ Application Security
- ☑ Electronic Banking Systems
- ☑ Network Infrastructure Security Assessments
- ☑ Gramm-Leach-Bliley Act Customer Data Privacy and Security

## Advisory

We offer specialized advisory services to assist organizations with enhancing their information risk management practices:

- ☑ Business continuity planning and tests
- ☑ Incident response planning and tests
- ☑ Virtual Chief Information Security Officer (vCISO)

## Cybersecurity

Our dedicated cybersecurity experts supplement the capabilities of our IT Assurance personnel. We can provide detailed technical analysis of your systems to identify weaknesses in the security posture that might otherwise go unnoticed.

Services include:

- ☑ Cloud security
- ☑ Network security
- ☑ Vulnerability assessment
- ☑ Payment Card Industry Data Security Standard (PCI DSS)
- ☑ Cybersecurity frameworks (FFIEC CAT, ISO 27001+27002, CIS Controls, NIST, COBIT 2019, and other frameworks)

## Model Risk Management

Our model risk management reviews are built with examiner expectations in mind by addressing the key components of the interagency guidelines relating to model risk management. Services include:

- ☑ Model risk management reviews
- ☑ Model validations, including:
  - Cybersecurity defenses (i.e., ransomware)
  - Bank Secrecy Act/Anti-Money Laundering
  - Allowance for Loan and Lease Loss/Current Expected Credit Loss
  - Asset Liability Management



# DENSECURE

Wolf & Company's team of cybersecurity experts, DenSecure™, brings together extensive technical knowledge and industry experience with internationally-recognized frameworks to develop strong cybersecurity programs.



## ADVANCED SECURITY ASSESSMENT

A comprehensive, customized attack methodology combining all the following services into the most relevant tactics, techniques, and procedures (TTPs) used by real-world adversaries against organizations like yours.



## APPLICATION PENETRATION TESTING

Testing specifically designed to uncover flaws in your web- or mobile-based application that could lead to critical exposures.



## NETWORK PENETRATION TESTING

Practical, hands-on testing of your internal, external, and cloud network security to identify and prove the impact of security risks.



## SOCIAL ENGINEERING

Testing designed to target your employees and physical infrastructure, alone or in combination with technical attacks.



## THREAT EMULATION

A collaborative simulation of the documented attack patterns of real-world attackers, as cataloged by MITRE ATT&CK®, to evaluate your blue team capabilities.

**WOLF**  
& COMPANY, P.C.

den  
secure  
by wolf & company, p.c.

**WOLF**  
& COMPANY, P.C.

# REGULATORY COMPLIANCE SERVICES



## Compliance Audit

### Operations

- ✓ Advertising Compliance
- ✓ Bank Secrecy Act, USA PATRIOT Act, OFAC
- ✓ Complaint Management
- ✓ Compliance Management System
- ✓ ESIGN Act
- ✓ Fair Credit Reporting Act
- ✓ Identity Theft Red Flags
- ✓ Online Account Opening
- ✓ Privacy Notice/Regulation P
- ✓ Regulation R
- ✓ Unlawful Internet Gambling Enforcement Act
- ✓ Website Compliance

### Lending

- ✓ Collections Compliance
- ✓ Commercial Lending Compliance
- ✓ Community Reinvestment Act  
Technical rules
- ✓ Consumer Lending Compliance
- ✓ Credit Card Compliance
- ✓ Flood Insurance
- ✓ Home Mortgage Disclosure Act
- ✓ Indirect Lending Compliance
- ✓ Insider Lending
- ✓ Loan Servicing
- ✓ Military Lending Act and  
Servicemembers Civil Relief Act
- ✓ Residential Lending Compliance
- ✓ Risk Based Pricing
- ✓ SAFE Act
- ✓ Student Lending Compliance
- ✓ Truth in Lending/RESPA (TRID)

### Deposits

- ✓ Electronic Fund Transfers Act
- ✓ Expedited Funds Availability Act
- ✓ Garnishment of Federal Benefit  
Payments
- ✓ Overdraft Protection Program
- ✓ Right to Financial Privacy Act
- ✓ Truth in Savings Act

# REGULATORY COMPLIANCE SERVICES (continued)



## Fair Lending and CRA

Our compliance experts can perform a variety of specialty services to ensure the company complies with Fair Lending and CRA requirements:

- ✓ Fair Lending
  - ✓ Gap Assessment
  - ✓ Risk Assessment
  - ✓ Data and Trend Analysis
- ✓ CRA
  - ✓ Self-evaluation (internal performance evaluation)
  - ✓ Mapping

## Compliance Program

Additional services we offer include:

- ✓ Compliance Monitoring
- ✓ Compliance Training
  - ✓ Board
  - ✓ Management
  - ✓ Staff
  - ✓ Compliance Officer
- ✓ Risk Assessment Creation or Review
- ✓ Bank Secrecy Act Automated Software Rules Reasonableness Validation
- ✓ Research Retainer
- ✓ Compliance Program Services:
  - ✓ Gap Analysis
  - ✓ Policy/Procedure Review
  - ✓ Audit Program Review
  - ✓ Compliance Program Development
- ✓ Examination Remediation Analysis
- ✓ Marijuana Banking Program Analysis
- ✓ Special Projects

# OUR PEOPLE: HIRING & EMPLOYEE RETENTION

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- ☑ We are devoted to the belief that our people, our customers and our communities come first.
- ☑ Our Chief People Officer (CPO) leads Wolf's People Services Team. This position drives cultural transformation within the Firm and aligns cultural programs with our overall strategic plan. Focusing on employee engagement, development, and growth, our CPO aims to refine Wolf's People Strategy and unite all People Programs to support the Firm's continued success. Additionally, we have an active Inclusion & Diversity Committee. The mission of the Inclusion & Diversity Committee is to encourage a diverse workforce where all members of the Wolf community embrace differences, model Wolf values, and contribute fully to the Firm's mission.
- ☑ Selection process for new hires includes candidate resume review, multi-step interview process, background checks, and offer. Background checks include employment references and criminal background checks. Potential candidates go through a two-to-three-round interview process.
- ☑ Employees are hired based on education and experience commensurate with the specific role requirements. We offer 40 hours of continued professional education annually. For elevation or consideration for a management position, certifications (CPA, CIA, CISA, etc.) are required.
- ☑ Auditors are assigned to specific audits based on the skills required for the job, and the specific geographic location of both the auditor and client.



# WOLF GIVES BACK

We are deeply involved in supporting the communities we serve through the Wolf & Company Charitable Foundation, our Philanthropy Committee, and our staff’s involvement in local charities.



## MISSION

Create Firm awareness of needs within our communities and increase employee involvement within the organizations that serve those needs.

## PHILANTHROPY COMMITTEE

Our employee-led group identifies and organizes volunteer activities for the Firm. To further support these efforts, all employees are given an additional day off each year to volunteer their services. During the most recent year, Wolf employees volunteered their services for over 2,000 hours.

## WOLF SERVICE AWARD RECIPIENTS

Employees achieving a tenure milestone with the Firm are provided with the opportunity to direct a donation from the Wolf & Company Charitable Foundation to a charity of their choice. The amount of each donation is dependent on the number of years the employee has worked at Wolf.

## GIVING BACK

In addition to volunteering time and talent, the Wolf Charitable Foundation made significant contributions to various organizations.

## REPRESENTATIVE ORGANIZATIONS SUPPORTED BY THE FIRM AND OUR EMPLOYEES

- American Cancer Society
- American Diabetes Association
- Be Like Brit
- Big Brothers Big Sisters
- Cradles to Crayons
- Dana Farber Cancer Institute
- Dream Big
- St. Jude Children’s Research Hospital
- Wounded Warrior Project



## SUMMARY

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- Client-centered approach designed for your objectives
- Experience and expertise in the matters that are important to you
- 100+ year reputation of unparalleled guidance
- Deep bench of experts
- Proven track record of delivering superior client service through proactive and collaborative relationships

We're enthusiastic about the opportunity to collaborate, and we're committed to delivering high quality services in a timely manner.





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