

Statement of qualifications Cybercrime

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Countering cyber threats and fraud

Cyber crimes are committed by a multitude of offenders with various motives: insiders behaving badly, competitors seeking an advantage, transnational criminal enterprises stealing for profit, foreign governments seeking an economic or military advantage, and terrorist organizations disrupting services. Organizations must be prepared to forensically investigate cyber intrusions, data theft, and insider malfeasance. With vast experience investigating cyber crimes, PwC can tailor its approach and methods to any situation and your specific needs.

Commitment

We have made a substantial investment to understand the cyber threats that impact your industry and to develop customized solutions that address the needs of our clients. Our global professionals have deep industry and subject matter experience and knowledge. Simply put, they **speak your language**.

PwC collaborates with clients to develop creative approaches to complex cyber-related matters. We combine computer forensics, data analysis, malware analysis, cyber surveillance, fraud, and crisis response experience to help our clients make sound and informed decisions that will withstand a myriad inquiries. For example, we can assist you with:

- Computer and network intrusions
- Privacy breaches
- Identity, intellectual property, and data theft
- Insider threats
- Anti-piracy
- Cyber security risk management
- Cyber security and forensic expert witness services
- Cyber intelligence

Our cybercrime services

Cybercrime services

PwC recognizes that organizations today face unprecedented cyber-related challenges. Companies must comply with existing and emerging regulations, identify and secure sensitive information that is constantly in motion, investigate breaches and data theft, manage the insider threat, and reduce the gamut of cyber security risks. PwC's international staff of cyber professionals can help clients address critical issues anywhere at anytime. Our cyber services include:

Malware forensics	Incident response
<ul style="list-style-type: none">• Analysis of malware to determine function and purpose	<ul style="list-style-type: none">• Global deployment of cyber investigative human and technical resources• Forensic investigation of cyber-based intrusions and data theft including APT• Industry-specific regulatory support management• Containment of intrusion• Remediation of security control weaknesses
Forensic interviews	
<ul style="list-style-type: none">• Strategically crafted interviews based on the situation at hand that will withstand judicial scrutiny	

Cybercrime services (continued)

Computer forensics	Data breach
<ul style="list-style-type: none">• Forensic preservation of digital evidence• Analysis of suspected or known compromised systems• Identification of protected data (PII, PCI, medical records, student records, etc.), intellectual property, or sensitive proprietary data	<ul style="list-style-type: none">• Location and identification of IP, trade secrets, protected and sensitive data in both structured and unstructured forms• Protected data mapping to regulatory compliance• Protected data loss analysis: quantifying unique instances of protected data elements on stolen/lost computers or storage media• Breach notification support
Volatile memory forensics	Breach indicator assessments
<ul style="list-style-type: none">• Forensic preservation of live memory• Analysis of memory to detect malicious code	<ul style="list-style-type: none">• Investigation of network traffic for malicious activity• Investigation of hosts for malicious activity

Cybercrime services (continued)

Insider threat investigations

- Network surveillance: social media data leakage; data theft; fraud; workplace violence; policy violations
- Computer surveillance: social media data leakage; data theft; fraud; workplace violence; policy violations
- Internet forensics: social media data mining for data leakage; policy violations
- Ongoing Limited Background Investigations: criminal & financial records for Insiders with access to sensitive data

Anti-piracy investigations

- Preservation of Internet sites distributing your stolen goods
- Analysis of collected files for hidden data to identify those involved in the creation of the site
- Analysis of stolen goods for additional leads
- Background investigation of individuals and organizations involved with the distribution sites
- Insider threat investigation to identify possible insider involvement
- Breach indicator assessment to identify possible network intrusion and data theft
- Penetration test to determine if an outsider could breach systems and steal data

Cyber intelligence

- Forensic collection of data that is publicly available on the Internet and websites
- Analysis of collected data for hidden information that will help connect the dots and further intelligence gathering
- Collection of data using a nonattributable cyber source

Cyber risk management

- Internet-based penetration testing
- Internal-based penetration testing
- Identification of rogue wireless access
- Identification of rogue dial-up access
- Web application security assessment

Representative past performances

Economic espionage

Oil & Gas client issue:

- **Law enforcement notification** The FBI advised our client that its global IT network was compromised by an Advanced Persistent Threat and data was being exfiltrated.
- **Computer/Network intrusion.** User systems were breached by way of spam and spear phishing.
- **Malware.** Unauthorized custom software was installed on internal systems, permitting persistent remote access, collection of Domain Admin passwords, and collection of economic intelligence related data related to international business deals.

PwC solutions

- **Computer forensics.** PwC preserved and analyzed systems identified by the FBI as being used for remote access and data exfiltration. The forensic analysis identified custom malware used to steal Domain Admin passwords and steal economic intelligence related data. The analysis also identified other compromised systems and identified the attackers movement through the network which was leveraged to block the activity.
- **Malware forensics.** Malware instances were analyzed to determine purpose, functionality, and capability including a data exfiltration technique that PwC leveraged to identify other compromised systems and block the technique.
- **PwC custom solution.** PwC led the development of a custom application to monitor user systems and signal an alert when the attackers gained access to the environment permitting real-time monitoring of the attacker's activity.
- **Cleared leaders.** PwC cybercrime leaders with Top Secret clearances were able to get briefed by the FBI on classified issues related to the cyber threat group.

Payment card data theft

Financial services client issue:

- **Global ATM fraud.** ATM cards were counterfeited and then used to withdraw millions of dollars across the globe. The track data used to counterfeit the ATM cards came from our client's IT infrastructure.
- **Network intrusion.** External-facing systems were breached, permitting access to back-end systems on the private network.
- **Malware.** Unauthorized custom software was installed on internal systems, permitting remote access, querying of databases containing identities and payment card data, and collection of data flowing through the network

PwC solutions

- **Computer forensics.** PwC preserved and analyzed more than 200 systems. The forensic analysis identified the initial point of intrusion and root cause, which systems had been compromised, malware installed on dozens of systems, and the how/where of undetected data exfiltration.
- **Malware analysis.** Twelve unprecedented malware instances were discovered and analyzed to determine purpose, functionality, and capability. This malware was unknown and undetected by anti-virus technology. The analysis also detected and neutralized an advanced persistent threat and was critical to making tactical security enhancements to the client's IT infrastructure and to containing the incident.
- **Network forensics.** PwC enhanced network monitoring for the client, collected network traffic, and analyzed collected traffic for indicators of malicious activity. PwC also analyzed historical network utilization data and identified the date of a mass data exfiltration.

Payment card data theft (continued)

Financial services client issue:

- **Data theft.** Payment card data was collected and exfiltrated to external hosts without detection.
- **Privacy breach.** Attacker access to a database exposed millions of instances of personally identifiable information.

PwC solutions

- **Data discovery.** To support the client's effort to determine the location of all data stores containing identity information, PwC launched its proprietary data discovery methodology which helped the client quantify the number of potentially exposed identities that would require privacy breach notification.
- **Law enforcement support.** The client requested that PwC present its findings to law enforcement. As a result, an international law enforcement operation was able to identify, locate, and arrest key subjects involved in the cyber crime.

Insider threat

Consumer products client issue:

- **Insider threat.** Disenchanted IT executives were suspected of exploiting their authorized access within the private cyber space to engage in malicious activity.
- **Fraud.** The IT executives had falsified written reports to internal auditors regarding a variety of mandated cyber security assessments.
- **Malware.** The CEO was concerned that the IT executives had established unauthorized remote access capabilities that would permit cyber sabotage upon termination of their employment.

PwC solutions

- **Forensic interviews.** PwC conducted the exit interviews of the IT executives.
- **Computer forensics.** PwC preserved all computing devices of terminated employees and analyzed them for malicious activity.
- **Perimeter hardening.** PwC enhanced security and monitoring of connectivity to the Internet, user access controls, and logging.
- **Investigation of rogue wireless access points.** PwC swept the wireless access spectrum and identified a previously unknown access point that was configured to permit access to private cyber space for the IT executives.
- **Network forensics.** PwC collected network traffic and analyzed collected traffic for indicators of malicious activity.
- **Investigation of vulnerabilities of external-facing systems.** PwC performed an Internet-born penetration test to assess the feasibility of whether terminated employees could breach the perimeter.

Insider Threat (continued)

Consumer products client issue:

- **Possible data theft and privacy breach.** The client's private cyber space stored credit card account data and identities.

PwC solutions

- **Breach indicator assessment.** PwC launched its proprietary methodology to investigate internal cyber space for indicators of unauthorized remote access software and other malicious activity.
- **Malware forensics.** PwC discovered and analyzed malware to determine its purpose, functionality, and capability. The analysis was critical to making tactical security enhancements to the client's IT infrastructure.

Cyber Attack

Financial services client issue:

- **Cyber attack threat.** Our client was notified by the FBI that a cyber attack was imminent and likely to occur within 48 hours.
- **Network intrusion.** The client's external-facing systems were in danger of being breached, permitting access to back-end systems on the private network.

PwC solutions

- **Perimeter hardening.** PwC enhanced security and monitoring of Internet connectivity, user access controls, and logging.
- **Network forensics.** PwC enhanced network monitoring for the client, collected network traffic, and analyzed collected traffic for indicators of malicious activity. Also, PwC analyzed historical network utilization data and identified the date of a mass data exfiltration.
- **Data discovery.** PwC launched its proprietary data discovery methodology to determine the storage locations of data that might interest attackers. This helped the client focus the investigation and its security enhancement efforts.

Cyber Attack (continued)

Financial services client issue:

- **Data theft and privacy breach.** Payment card data and personally identifiable information were stored in the client's private cyber space.
- **ATM fraud.** Theft of payment card data could facilitate massive fraudulent ATM withdrawals.
- **Wire transfer fraud.** Compromise of internal wire transfer systems would lead to devastating financial loss.

PwC solutions

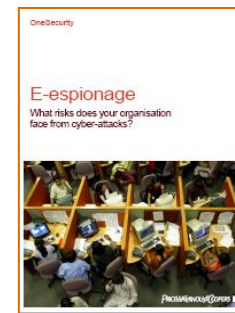
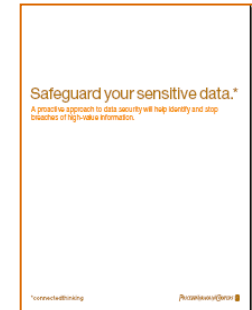
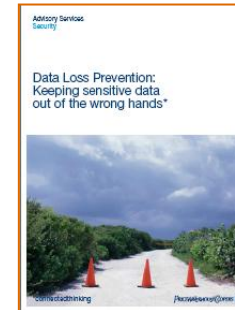
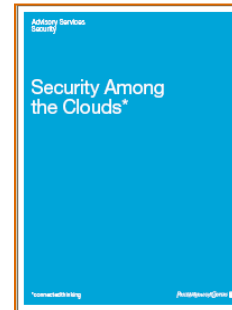
- **Breach indicator assessment.** PwC launched its proprietary methodology to investigate the client's internal cyber space for indicators of compromised systems. More than 500 indicators of compromise were identified.
- **Live memory forensics.** PwC preserved and analyzed volatile memory on systems it found that had indicators of malicious activity.
- **Computer forensics.** PwC professionals forensically preserved and analyzed relevant systems and discovered previously undetected malware that had been installed nearly three years earlier.
- **Malware forensics.** The malware discovered had been permitting remote access to the client's private cyber space.

Publications

Issues-focused publications

PwC invests in developing thought leadership on the significant and emerging issues affecting cyber security, cyber forensics, and data privacy. Recent publications include:

- Data Loss Prevention: Keeping sensitive data out of the wrong hands
- 10Minutes on Data and Identity Theft
- Focus on risk, and compliance will follow: Overcoming the challenges of Payment Card Industry requirements
- Security Among the Clouds
- Safeguard your sensitive data: A proactive approach to data security will help identify and stop breaches of high-value information
- E-espionage: What risks does your organization face from cyber-attacks



Issues-focused publications (continued)

PwC invests in developing thought leadership on the significant and emerging issues affecting cyber security, cyber forensics, and data privacy. Recent publications include:

- How to align security with your strategic business objectives
- Trial by fire: What global executives expect from information security
- Show me the money: Are cyber attacks damaging client trust to the breaking point?



About PwC Cybercrime

About PricewaterhouseCoopers

PwC's cybercrime professionals across the globe are ready to respond and assist you with countering cyber-related malfeasance. Our goal is to serve as your forensics, investigative, containment, remediation, and compliance resource. We can scale our team based on your needs and can provide industry-specific professionals to provide advice and business impact analysis that is specific to you.

Key elements of our program include:

- A global network comprising more than 3,000 cyber investigative, security, and risk services professionals, including Certified Information System Security Professionals (CISSP), Certified Information System Auditors (CISA), Encase Certified Examiners (EnCE), Electronic Records Management Masters (ERMm), Certified Fraud Examiners (CFE), Certified Anti-Money Laundering Specialists (CAMS), CPAs, MBAs, PhDs, former law enforcement agents, and former attorneys
- Cyber labs in 37 countries
- Methods and processes that withstand judicial scrutiny
- Substantial investment in training our professionals on the emerging technologies and the development of in-house propriety methodologies

Cyber threat groups are varied, complex, always evolving, and highly motivated. As such, these enterprises are becoming increasingly sophisticated at compromising private cyber space. Their breaches are not accidental, but cleverly planned and organized. They spend significant time and resources recruiting technical talent and targeting potential victim organizations. As they infiltrate a company's environment and learn what technology is in use, they develop custom malware on the fly and employ data egress techniques that fly under the radar of in-house technology.

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