

OSINT Collection Plan to Address National Security in Cyberspace

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BLHV 2300 Introduction to Applied Intelligence

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Objective: This topic aims to examine the escalating threat of cyberattacks originating from state-actors, analyzing their tactics, motivations, and potential consequences for national security. Additionally, it explores how robust defense frameworks, coupled with open-source intelligence (OSINT), can enhance cybersecurity resilience, facilitate threat detection, and strengthen national security strategies against emerging cyber threats.

Background: Cybersecurity has become a defining challenge for national security, as digital threats from state-sponsored groups and independent cybercriminals continue to evolve in sophistication and scale. State actors often engage in cyber warfare, espionage, and critical infrastructure attacks to undermine national stability, while non-state actors including hacktivists, cybercriminal organizations, and terrorist networks leverage cyberattacks for financial gain, ideological influence, or disruption. Governments and intelligence agencies must implement advanced defense frameworks to counter these threats, integrating proactive cybersecurity measures and real-time intelligence gathering. Open-source intelligence (OSINT) plays a pivotal role in this effort, enabling analysts to monitor emerging cyber threats, identify adversary tactics, and anticipate potential vulnerabilities.

Relevance: By exploring the interplay between cyber threats, national security defense mechanisms, and OSINT-driven intelligence, this topic provides a strategic foundation for mitigating cyber risks, strengthening resilience, and ensuring national stability in an era of digital warfare.

Source	Type of Sources (1)	Tools and Technologies (2)	Timeline (3)	Potential Challenges (4)	Provide complete reference of sources (APA / URL, etc.)
MITRE Att&ck Framework	Public Records	A knowledgebase source that provides a comprehensive guide for understanding cyber tactics, techniques, and procedures (TTP). This includes understanding adversary behavior and mapping a critical infrastructure that can be targeted.	05/27/2025 – 05/28/2025	The Att&ck tool is valuable, but it does not address all threats to national security. Due to the constant evolution of the threat landscape, the framework is constantly updated which would require trained experts in threat intelligence to guide you through this entire framework.	https://attack.mitre.org/
NIST Framework NIST-SP-800-171	Public Records	A risk-based framework that offers a structured approach through five core functions: Identify, Protect, Detect,	05/27/2025 – 05/28/2025	NIST’s framework focuses on structured cybersecurity policies and best practices, but it does	https://www.nist.gov/cyber-framework

		Respond, and Recover. Various tools and technologies align with these functions to enhance security operations.		not provide real-time threat intelligence. National security requires continuous monitoring and adaptive threat detection.	
Cyber Kill Chain Model	Public Record	A widely used framework for analyzing cyberattacks. It outlines seven attack stages - Reconnaissance, Weaponization, Delivery, Exploitation, Installation, Command & Control (C2), and Actions on Objectives.	5/27/2025-05/28/2025	The Kill Chain is a retrospective model, meaning it analyzes attack phases after an incident occurs, rather than providing real-time defensive actions. The Cyber Kill Chain does not fully account for modern threats.	https://www.lockheedmartin.com/en-us/capabilities/cyber/cyber-kill-chain.html
“Significant Cyber Incidents” By: Center For Strategic & International Studies (CSIS)	Media Source	Google as a research tool. The CSIS website provides a most up-to-date timeline of significant cyber incidents from both state and non-state threat actors.	05/30/2025 – 05/31/2025	OSINT sources often present fragmented or unreliable data, leading to inconsistencies that complicate the validation of cyber incident timelines. The dynamic nature of cyber threats, coupled with the	https://www.csis.org/programs/strategic-technologies-program/significant-cyber-incidents

				potential for misinformation and gaps in reporting, makes it challenging to construct an accurate chronological sequence of events, requiring cross-referencing and advanced analytical methods to ensure credibility.	
'72% of cyber leaders say risks are rising. Here's how states and businesses are responding' By: The World Economic Forum	Media Source	Google as a research tool. The World Economic Forum press release based on research conducted by Harvard University.	05/30/2025 - 05/31/2025	The complexity of researching emerging threats is compounded by delayed reporting, as adversary tactics continuously evolve and adapt. Rapid shifts in threat behavior, including changes in attack methodologies and deceptive techniques, create challenges in maintaining up-to-date intelligence, making real-time analysis and proactive defense	https://www.weforum.org/stories/2025/05/cybersecurity-cyber-risk-national-policy/

				strategies essential for accurate risk assessment.	
'FCC launches national security unit to counter state-linked threats to US telecoms' By: David Jones, Reporter for 'Cybersecurity Dive'	Media Source	Google as a research tool. Cybersecurity Dive is an online Cyber industry publishing.	05/30/2025 - 05/31/2025	Given the complexity of threats facing national security and critical infrastructure, anticipating the timing and scope of federal decision-making presents a significant challenge. The evolving nature of cyber risks, geopolitical tensions, and technological advancements adds layers of uncertainty, making it difficult to predict which policies will be enacted and when they will yield substantial impact on national resilience and defense strategies.	
'How Web Scraping Helps	Media Source	Google as a research tool. This article	05/30/2025 - 05/31/2025	Scraped data may be inconsistent or	

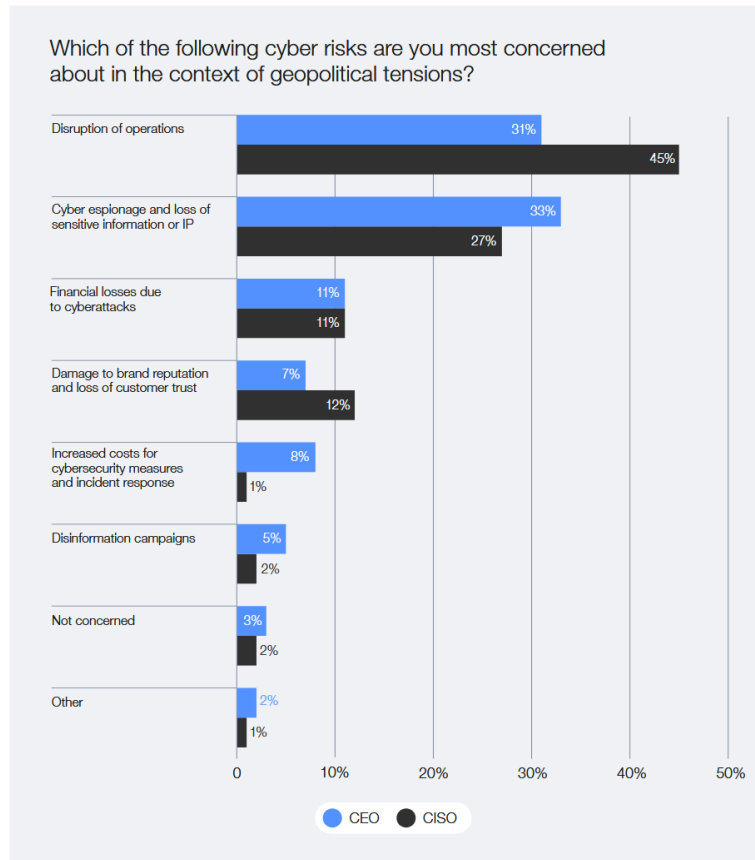
Protect Against Cyber Crimes’ By: Oleg Kulyk		presents how a technique used for data extraction can bolster cyber defenses.		manipulated by adversaries. Additionally, scraping can violate privacy laws when performed without permission.	
‘Leveraging Open-Source Intelligence (OSINT) Against the Cyber Kill Chain’ By: Rohitha Chowdary	Media Source	Google as a research tool. This article presents how mapping OSINT against the Cybersecurity Kill Chain framework can trace the steps of malicious actors and enhance organizations cyber defense efforts against their attack.	05/31/2025 – 06/01/2025	Cybersecurity frameworks provide a strong foundation for organizations to defend against cyber threats, and integrating Open-Source Intelligence (OSINT) can significantly enhance their security posture. However, these frameworks must remain flexible and adaptive, continuously evolving to incorporate real-time OSINT insights. As the threat landscape shifts and malicious actors refine their attack methods, organizations must	

				ensure their frameworks are responsive, leveraging OSINT to anticipate emerging threats and proactively strengthen their defenses.	

The media sources used from federal press releases highlights the growing concerns of malicious state and non-state actors threatening government agencies and private organizations at a global level. The World Economic Forum’s Global Cybersecurity Outlook Survey shows that nearly 60% of organizations report that geopolitical tensions have directly influenced their cybersecurity strategy (Heiding 2025). The same survey revealed that 72% of its respondents reported an increase in organizational cyber risks, with ransomware remaining a top concern. In addition, nearly half of global organizations now cite the malicious use of generative AI as their top cybersecurity concern (Heiding 2025). Geopolitical tensions have led to a surge in cyberattacks by state-sponsored adversary groups from China, Russia, and North Korea, targeting both private-sector entities and federal agencies through cyber espionage. Recent survey reports highlight the increasing use of ransomware and adversarial AI technologies to compromise critical infrastructure, steal sensitive data, and exploit intellectual property. In response, organizational leaders and key stakeholders must

prioritize strengthening cyber defense strategies by investing in robust infrastructure, implementing advanced security measures, and promoting comprehensive awareness training to mitigate evolving threats.

The effects of geopolitical tensions on organizations' cybersecurity strategies



Reference: [World Economic Forum Global Cybersecurity Outlook 2025](#).

The Federal Communications Commission is launching its own national security unit in response to a series of attacks to U.S. telecom firms. Sophisticated hacks into U.S. telecom firms, which have been attributed to a China-linked threat group called ‘Salt Typhoon’, were seen as part of a larger espionage campaign against the U.S., where the state-linked hackers were able to gain access to calls and other sensitive data as well as intercept the communications of U.S. officials involved in sensitive political and diplomatic work (Jones 2025). Despite being recognized as one of the more mature and cyber-resilient infrastructures, a Chinese hacking group successfully penetrated its firewalls. This incident highlights the urgent need to reassess and fortify cybersecurity defenses against evolving threats. Establishing a dedicated cybersecurity council with a strong commitment to strategic protections for wired, wireless, and satellite networks is essential in safeguarding critical communications infrastructure.

The Center for Strategic & International Studies (CSIS) has documented a timeline of significant cyber incidents dating back to 2006. Over the past four years, my research has revealed that many of these incidents involve state-sponsored groups from adversarial nations, primarily China and Russia. Their cyber activities often align with espionage efforts, including the theft of sensitive data, disinformation campaigns, surveillance operations, and attempts to interfere in elections. These findings highlight the persistent and evolving nature of cyber threats posed by nation-state actors. Utilizing a well-curated list of cybersecurity sources for OSINT strengthens national security strategies in cyberspace by enabling proactive threat detection, intelligence gathering, and strategic decision-making. This intelligence supports incident response efforts, enhances cybersecurity policies, and fortifies critical

infrastructure protection against evolving threats. Additionally, OSINT aids in counterintelligence, allowing national security teams to anticipate adversarial tactics and disinformation campaigns. [Significant Cyber Incidents](#)

The rising threat landscape in cyberspace, driven by geopolitical tensions and the increasing sophistication of state-sponsored adversaries, underscores the critical need for enhanced cyber resilience and national security strategies. OSINT plays a vital role in this effort, providing actionable intelligence that enables organizations to detect, analyze, and respond to evolving cyber threats. By leveraging open-source intelligence, security professionals can gain insights into adversarial tactics, identify vulnerabilities, and proactively mitigate risks. As demonstrated by recent attacks on critical infrastructure including the U.S. telecom sector, the importance of continuous intelligence gathering, collaboration, and strategic cybersecurity investments cannot be overstated. Federal agencies such as the Cybersecurity & Infrastructure Security Agency (CISA) a component to the department of Homeland Security provides guidance for cybersecurity best practices for individuals and organizations to manage risks. [Cybersecurity & Infrastructure Security Agency](#).

Web scraping, when integrated with OSINT and cybersecurity, enhances national security by systematically collecting and analyzing publicly available data to identify emerging cyber threats, monitor adversary activities, and safeguard critical infrastructure.

By extracting intelligence from forums, social media, and dark web marketplaces, security agencies can gain real-time insights into cybercriminal operations, state-sponsored attacks, and vulnerabilities that could be exploited. This process involves the use of automated scripts or bots that navigate through web pages to collect information. In the context of cybersecurity, web scraping plays a significant role in identifying and mitigating potential threats by gathering intelligence on cybercriminal activities and vulnerabilities (Kulyk 2024). This proactive approach allows organizations to anticipate cyber threats, detect disinformation campaigns, and track breaches before they escalate. Moreover, web scraping helps security analysts monitor the use of adversarial AI in cyber warfare, ensuring that government institutions and private organizations remain resilient against evolving threats.

Despite its benefits, web scraping for cybersecurity and OSINT presents several challenges. Legal and ethical constraints can limit the collection of certain online data, requiring compliance with privacy regulations and ethical guidelines. The sheer volume of scraped information introduces difficulties in filtering false positives, demanding sophisticated verification methods to ensure intelligence accuracy. Additionally, cyber adversaries often deploy countermeasures such as encryption, anonymization, and misinformation tactics to evade OSINT tracking, making detection efforts more complex. Specialized tools such as web crawlers, automated data parsers, and sentiment analysis software help security teams efficiently process and categorize scraped data.

MITRE Att&ck Framework

Reconnaissance	Resource Development	Initial Access	Execution	Persistence	Privilege Escalation	Defense Evasion	Credential Access	Discovery	Lateral Movement	Collection	Command and Control	Exfiltration	Impact
10 techniques	8 techniques	11 techniques	16 techniques	23 techniques	14 techniques	45 techniques	17 techniques	33 techniques	9 techniques	17 techniques	18 techniques	9 techniques	15 techniques
II Active Scanning (3) II Gather Victim Host Information (4) II Gather Victim Identity Information (3) II Gather Victim Network Information (6) II Gather Victim Org Information (4) II Phishing for Information (4) II Search Closed Sources (2) II Search Open Technical Databases (5) II Search Open Websites/ Domains (3) Search Victim-Owned Websites	II Acquire Access II Acquire Infrastructure (8) II Compromise Accounts (3) II Compromise Infrastructure (8) II Develop Capabilities (4) II Establish Accounts (3) II Obtain Capabilities (7) II Stage Capabilities (6)	Content Injection Drive-by Compromise Exploit Public-Facing Application External Remote Services Hardware Additions II Phishing (4) Replication Through Removable Media II Supply Chain Compromise (3) Trusted Relationship II Valid Accounts (4) Wi-Fi Networks	Cloud Administration Command II Command and Scripting Interpreter (12) Container Administration Command Deploy Container ESXi Administration Command Exploitation for Client Execution Input Injection II Inter-Process Communication (3) Native API II Scheduled Task/ Job (5) Serverless Execution Shared Modules External Remote Services Software Deployment Tools II System Services (3) II User Execution (4) Windows Management Instrumentation Modify Registry II Office Application Startup (6) Power Settings II Pre-OS Boot (5) II Scheduled Task/ Job (5) II Server Software Component (6) Software	II Account Manipulation (7) BITS Jobs II Boot or Logon Autostart Execution (14) II Boot or Logon Initialization Scripts (5) Cloud Application Integration Compromise Host Software Binary Create Account (3) Create or Modify System Process (5) Domain or Tenant Policy Modification (2) Event Triggered Execution (17) Exclusive Control Hijack Execution Flow (12) Implant Internal Image Modify Authentication Process (9) Modify Registry II Office Application Startup (6) Power Settings II Pre-OS Boot (5) II Scheduled Task/ Job (5) II Server Software Component (6) Software	Abuse Elevation Control Mechanism (6) Access Token Manipulation (5) Account Manipulation (7) Boot or Logon Autostart Execution (14) Boot or Logon Initialization Scripts (5) Create or Modify System Process (5) Domain or Tenant Policy Modification (2) Escape to Host Event Triggered Execution (17) Exploitation for Privilege Escalation Hijack Execution Flow (12) Process Injection (12) Scheduled Task/ Job (5) Valid Accounts (4) Impersonation II Indicator Removal (10) Indirect Command Execution II Masquerading (11) Modify Authentication Process (9) Modify Cloud	Abuse Elevation Control Mechanism (6) Access Token Manipulation (5) BITS Jobs Build Image on Host Debugger Evasion Deobfuscate/Decode Files or Information Deploy Container Direct Volume Access Domain or Tenant Policy Modification (2) Email Spoofing Execution Guardrails (2) Exploitation for Defense Evasion File and Directory Permissions Modification (2) Hide Artifacts (14) Hijack Execution Flow (12) Impair Defenses (11) Impersonation II Indicator Removal (10) Indirect Command Execution II Masquerading (11) Modify Authentication Process (9) Modify Cloud	II Adversary-in-the-Middle (4) Brute Force (4) Credentials from Password Stores (6) Exploitation for Credential Access Forced Authentication II Forge Web Credentials (2) Input Capture (4) Modify Authentication Process (9) Multi-Factor Authentication Interception Multi-Factor Authentication Request Generation Network Sniffing II OS Credential Dumping (8) Steal Application Access Token Steal or Forge Authentication Certificates Steal or Forge Kerberos Tickets (5) Steal Web Session Cookie Unsecured Credentials (8)	II Account Discovery (4) Application Window Discovery Browser Information Discovery Cloud Infrastructure Discovery Cloud Service Dashboard Cloud Service Discovery Cloud Storage Object Discovery Container and Resource Discovery Debugger Evasion Device Driver Discovery Domain Trust Discovery File and Directory Discovery Group Policy Discovery Log Enumeration Network Service Discovery Network Share Discovery Network Sniffing Password Policy Discovery Peripheral Device Discovery Permission Groups	Exploitation of Remote Services Internal Spearphishing Lateral Tool Transfer Remote Service Session Hijacking (2) Remote Services (8) Replication Through Removable Media Software Deployment Tools Taint Shared Content Use Alternate Authentication Material (4)	II Adversary-in-the-Middle (4) Archive Collected Data (3) Audio Capture Automated Collection Browser Session Hijacking Clipboard Data Data from Cloud Storage Data from Configuration Repository (2) Data from Information Repositories (5) Data from Local System Data from Network Shared Drive Data from Removable Media II Data Staged (2) II Email Collection (3) II Input Capture (4) Screen Capture Video Capture	II Application Layer Protocol (5) Communication Through Removable Media Content Injection Data Encoding (2) Data Obfuscation (3) Dynamic Resolution (3) Encrypted Channel (2) Fallback Channels Hide Infrastructure Ingress Tool Transfer Multi-Stage Channels Non-Application Layer Protocol Non-Standard Port Protocol Tunneling II Proxy (4) Remote Access Tools (3) Traffic Signaling (2) II Web Service (3)	II Automated Exfiltration (1) Data Transfer Size Limits Exfiltration Over Alternative Protocol (3) Exfiltration Over C2 Channel Exfiltration Over Other Network Medium (1) Exfiltration Over Physical Medium (1) Exfiltration Over Web Service (4) Scheduled Transfer Transfer Data to Cloud Account Resource Hijacking (4) Service Stop System Shutdown/ Reboot	Account Access Removal Data Destruction (1) Data Encrypted for Impact Data Manipulation (3) Defacement (2) Disk Wipe (2) Email Bombing Endpoint Denial of Service (4) Financial Theft Firmware Corruption Inhibit System Recovery Network Denial of Service (2) Resource Hijacking (4) Service Stop System Shutdown/ Reboot

The MITRE ATT&CK framework is a powerful tool for understanding and mitigating cyber threats, particularly in national security contexts. It provides a comprehensive, structured repository of adversary tactics, techniques, and procedures (TTPs), helping security teams anticipate, detect, and respond to cyber threats effectively. Combining MITRE ATT&CK with OSINT can be powerful in national security strategies, it is imperative to navigate challenges carefully to ensure accurate and actionable intelligence.

MITRE ATT&CK Benefits:

- It can be used to perform threat intelligence and profiling for analysts to understand adversary behavior. Understanding their motives to Cyber espionage attacks allow for proactive defense.
- The Att&ck framework is globally recognized so organizations across military, intelligence, and government sectors can share threat intelligence more efficiently.
- With the use of the intelligence, 'Red Team' simulations can be conducted to improve cyber defenses on infrastructure.

MITRE ATT&CK Challenges:

- The vast amount of available information makes filtering out false or misleading intelligence difficult.
- Legal and ethics boundaries to which government agencies must balance national security needs with privacy concerns and legal restrictions on data collection.
- Aligning raw OSINT findings with ATT&CK's structured framework, as cybercriminals constantly evolve their methods. Continuous OSINT feeds will be necessary for the framework to adapt.



NIST Cybersecurity Framework v2.0

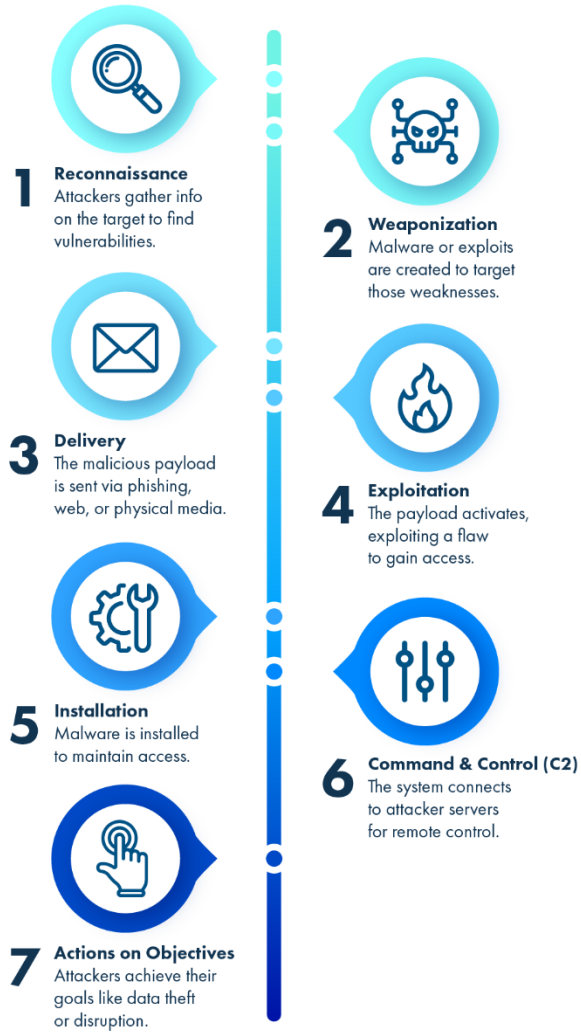
With its emphasis on governance, risk management, and threat detection, the framework helps national security teams integrate OSINT into proactive cybersecurity strategies. By leveraging open-source intelligence, organizations can align their threat analysis with NIST's core functions—**Identify, Protect, Detect, Respond, and Recover**, enabling more effective monitoring of cyber adversaries, data breaches, and disinformation campaigns.

Adversaries continuously evolve their tactics, employing encryption, obfuscation, and deceptive narratives to evade OSINT tracking, complicating attribution efforts. Legal and ethical concerns surrounding data collection can also pose constraints, requiring

compliance with privacy regulations and responsible intelligence gathering practices. Furthermore, aligning raw OSINT findings with the structured risk management framework demands advanced analytics and AI-driven processing to maintain efficiency. Overcoming these challenges requires strong collaboration between government agencies, cybersecurity professionals, and private-sector stakeholders to ensure that OSINT remains a valuable tool in national security and cyber defense.

Cyber Kill Chain

The 7 Stages of a Cyber Attack



The Cyber Kill Chain framework 2.0 enhances OSINT capabilities in cybersecurity and national security by providing a structured methodology for identifying, analyzing, and mitigating cyber threats. The framework, originally developed by Lockheed Martin, outlines the various stages of a cyberattack, from reconnaissance to data exfiltration, allowing security teams to use OSINT to track adversarial activities before, during, and after an attack. By leveraging open-source intelligence, analysts can detect early indicators of compromise, assess adversary tactics, and correlate findings with Cyber Kill Chain stages to predict potential attack vectors. This integration enables proactive threat intelligence, strengthening national security efforts against cyber espionage, ransomware, and AI-driven attacks.

The Cyber kill chain has similar limitations comparable to the NIST and the MITRE Att&ck frameworks involving the risk of the validation of the data and privacy breach laws. Another limitation is the dynamic nature of cyberattacks, where threat actors may bypass traditional kill chain stages by using advanced techniques like zero-day exploits and AI-powered attacks, requiring security teams to continuously refine OSINT methodologies. Deep threat intelligence platforms, advanced analytics technologies, and cross-functional efforts by Cybersecurity professionals and government agencies will be critical to ensure resilience and national security posture.

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