SANS | Research Program

Survey

SANS 2024 Threat Hunting Survey: Hunting for Normal Within Chaos

Written by Mathias Fuchs and Josh Lemon

March 2024

Executive Summary/Introduction

This is SANS's ninth year of conducting our annual Threat Hunting Survey, where we go out to organizations around the globe to understand how they have conducted threat hunting over the last year and try to gain some insight into what challenges they may face and how they may adapt in the year to come. As authors who also work in the field of threat hunting and incident response, we try to take the raw data from respondents and interpret it as best as possible while providing a little color and guidance for others in the field still trying to mature their threat hunting methodologies.

This year, we kept some of our longer-running key questions so we could better see trend information across multiple years, while also adding a few new questions about how threat hunters source information to shape what they go hunting for. As we analyzed the state of threat hunting within organizations in 2024, it became clear that these skills have become central to an organization's cybersecurity strategy. The survey revealed that half of the organizations now have formally defined threat hunting methodologies, which is a notable increase from the 35% reported in the previous year. This indicates a maturity in the industry and a push toward standardized processes for better threat detection and incident response. However, this progress is not without its challenges; the lack of skilled staff, although reduced from 73% in 2023 to 50% in 2024, remains the top barrier, followed by data quality issues and tool limitations.

The survey also highlighted a shift in how organizations stay updated with the newest attacker techniques. Vendor blogs and papers (59%) and independent blogs (59%) are the primary sources, with commercial intelligence providers also playing a significant role (55%). Interestingly, 50% of respondents stated that their organization conducted its "own research," underscoring the importance that threat hunters currently put on performing independent threat intelligence for their specific organizational needs. This emphasis on diverse intelligence sources demonstrates a comprehensive approach to maintaining a current threat landscape perspective.

Despite the strides in methodology adoption, a concerning trend is the increase in organizations outsourcing their threat hunting—37% in 2024. Outsourcing can introduce challenges, such as a potential disconnect between the organization's unique systems and the nuanced threat landscape, along with risks in data governance and continuity in a cybersecurity strategy. Organizations that outsource increasingly allow third-party providers to determine the hunting ground and outcomes (34% in 2024), raising concerns about the efficacy and alignment of outsourced threat hunting with the organization's goals.

On a positive note, there is an increase in organizations measuring the success and effectiveness of their threat hunting efforts, up from 34% in 2023 to 64% in 2024. This indicates a recognition of the value of metrics in guiding and improving threat hunting practices, along with showing value back to the broader organization. However, the effectiveness varies, with 62% reporting measurable improvements in their security posture and 23% reporting a negative impact, highlighting the need for effective implementation strategies.

The 2024 survey presents a cybersecurity landscape that increasingly recognizes the importance of threat hunting, both in-house and outsourced, and is actively working toward overcoming the barriers to its success. The commitment to regularly reviewing and updating threat hunting methodologies reflects a dedication to keeping pace with the dynamic nature of cyber threats. As organizations continue to evolve their threat hunting capabilities, they are likely to see further alignment of their cybersecurity efforts and strategic objectives, while also defending against or uncovering new threat actors.

Lastly, we have gathered data on the impact of threat hunting to gauge its success in bolstering organizational defenses. The findings underscore the critical role of threat hunting in equipping organizations to combat threat actors. Detailed analysis of these outcomes is presented in the report; for now, let us highlight a few additional insights from the SANS 2024 Threat Hunting Survey:

- Business email compromise (BEC) threat actors are currently the most common threat actors caught by threat hunting (discovered by 68% of those surveyed).
- Organizations now review/change their threat hunting methodologies as follows:
  - Whenever needed (35%)
  - Monthly (26%)
  - Quarterly (20%)
  - Annually (11%)
- Outsourced threat hunting is utilized by 37% of organizations.
- More than half of the organizations (51%) have adopted clearly defined methodologies for threat hunting in 2024, signifying a significant evolution in organizational practices compared to previous years.
- About 64% of organizations formally measure the success or effectiveness of their threat hunting efforts.
  - There is a marked decrease in organizations with no plans to formalize methodologies, from 7% down to 2% in 2024.
- Available human resources have begun to influence the selection of threat hunting methodologies more heavily, with 47% of organizations acknowledging this trend in 2024.
- The chief information security officer (CISO) is a primary contributor to threat hunting methodology development, with significant involvement at 40%.

- Significant improvements as a result of threat hunting efforts were observed in:
  - Attack surface exposure/hardened network and endpoints (49%)
  - Creation of more accurate detections and fewer false positives (49%)
  - Resources spent on remediation (39%)
- About 30% of respondents use vendor information as a fallback for their threat intelligence, while 14% rely entirely on vendor threat intelligence.
- Incident response teams increased their contributions to developing threat hunting methodologies to 33% in 2024, up from 30% in 2023, suggesting a greater integration of threat hunting within broader security functions.
- Concerns about the quality or quantity of data have risen from 34% to 44%, and issues regarding the lack of data standards or common data types have increased from 26% to 33%, highlighting the challenges of managing and leveraging a growing flood of cybersecurity data.

Figure 1 provides a snapshot of the demographics for the respondents to the 2024 survey.

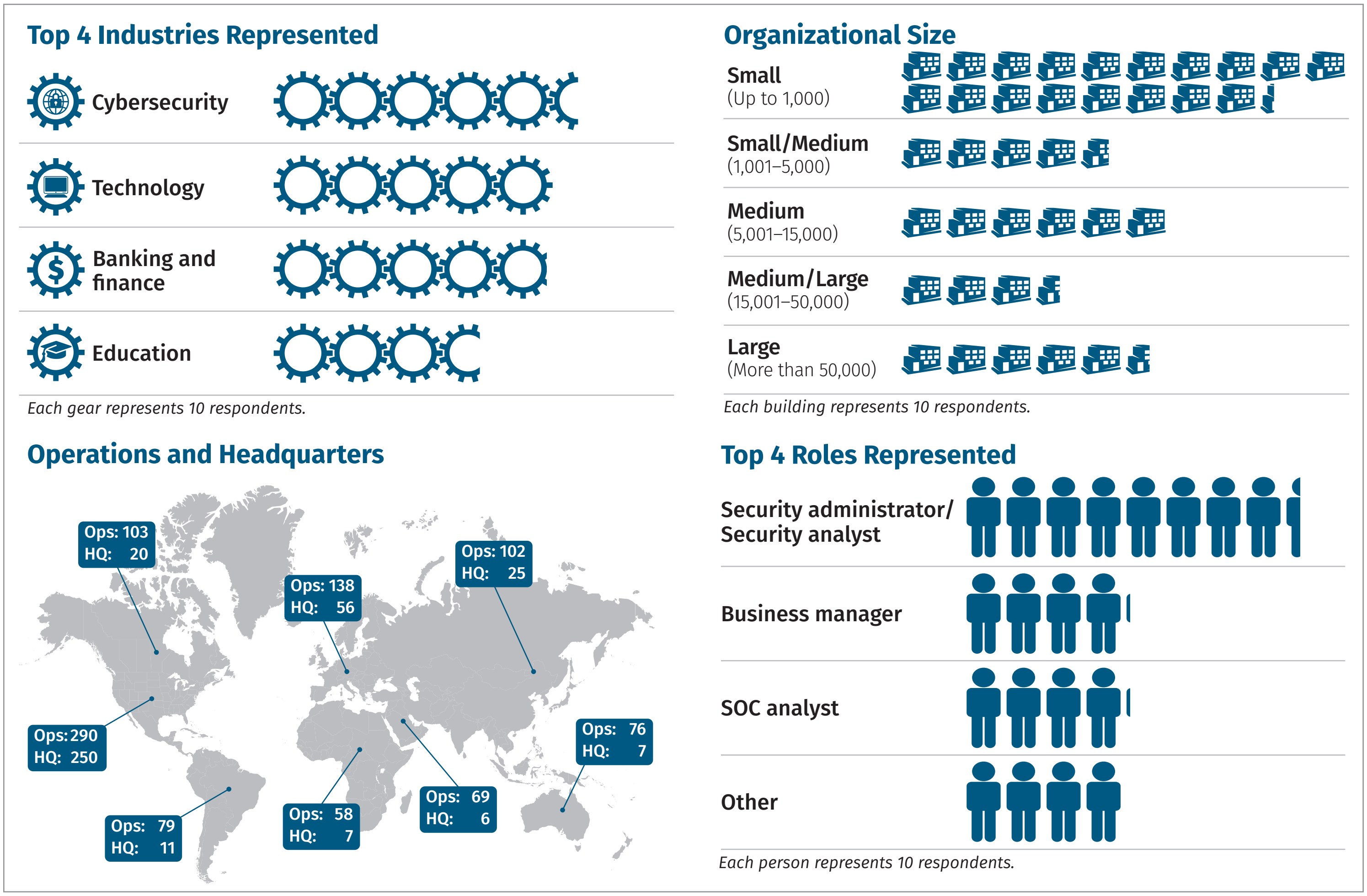


Figure 1. Demographics of Survey Respondents

Participants/Demographics

This year we were again looking at a broad spread of industries (Figure 2). Cybersecurity leads at 15%. It's good to see that 9% of our respondents are working in manufacturing organizations. They are one of the areas that have been hit very hard by ransomware attacks in the past few years.

From a size perspective (Figure 3), the survey covers organizations from less than 100 employees (24%) up to more than 100,000 employees (9%)

Threat hunting is a multidisciplinary operation. We clearly need people who know how to hunt, people who can plan the hunts, and intelligence analysts that feed sound intel into the operation. On the other hand, we have the more business-focused side that needs to understand and support threat hunting. This is reflected in the roles our respondents have.

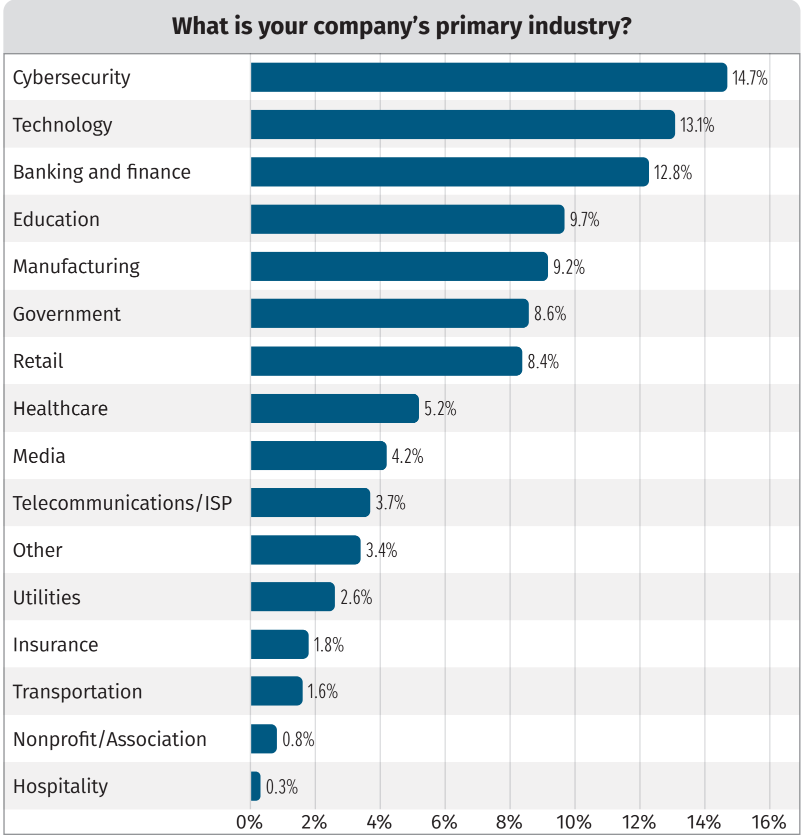


Figure 2. Respondents' Primary Industry

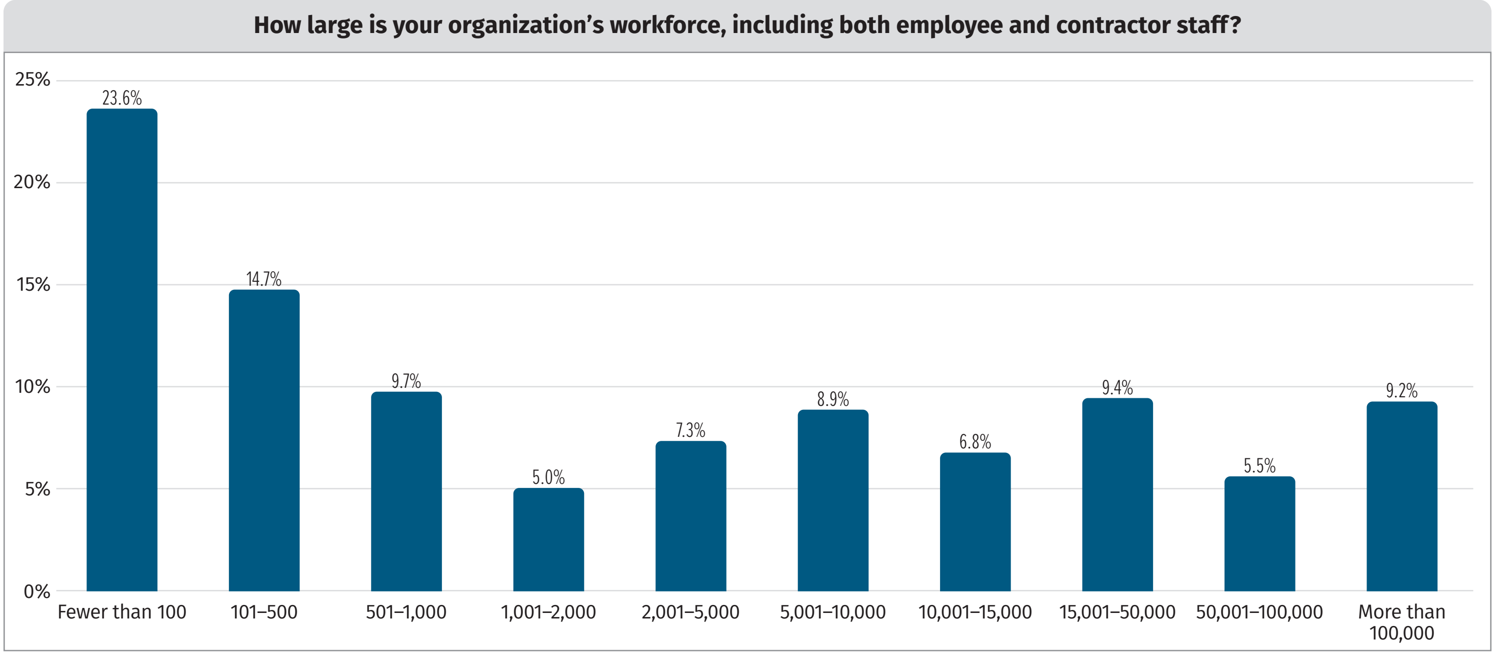


Figure 3. Respondents' Organization Size

Twenty-two percent of our respondents are security administrators or analysts. However, at number two we see 11% who represent the role of business managers. This mix allows us to address not only technical but also financial and personnel topics in our survey.

One fact that does skew the results a bit is the geographical profile of our respondents (Figure 4). Sixty-five percent of our respondents work for organizations headquartered in the United States. Although that might impact staffing and organizational topics, we don't believe that this impacts how threat hunting is done technically.

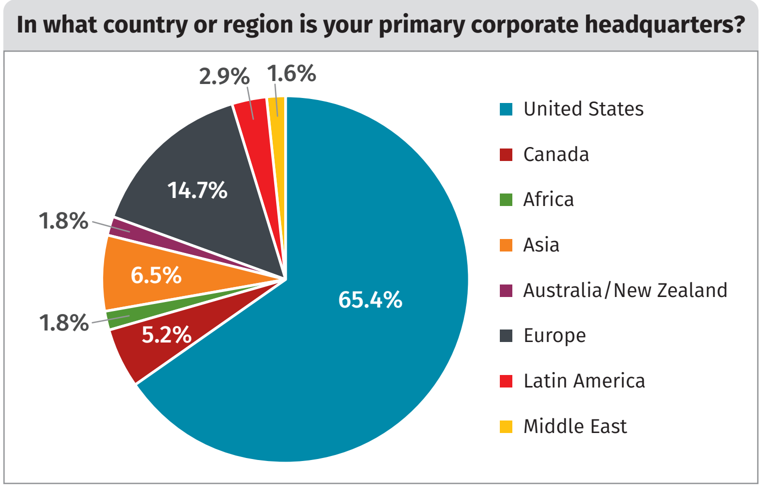


Figure 4. Respondents' Corporate Headquarters

How We Hunt and What We Find

The variety of cyber threats is large and seems to get larger every year. As a result, in this year's survey we wanted to know what threat hunting teams hunt for and what they find. As the maturity level of threat hunters keeps increasing, most threat hunting operations today are a form of intelligence-based hunting—it may be simply looking for curated indicators of compromise (IOCs) or full-blown hypothesis-based hunts.

Keep in mind that the way threat hunters hunt will impact what they find. So, the numbers we see in our survey results will never be a perfect representation of the current threat landscape. That is also true because ransomware actors or criminals that conduct business email compromise are usually easier to detect than highly funded nation-state attackers.

We asked what attackers our respondents are facing in their threat hunting operations. Surprisingly, ransomware attacks were not number one this year. At almost 68%, business email compromise (BEC) is the number-one attack type that threat hunters detect these days, followed by ransomware at 64% (Figure 5).

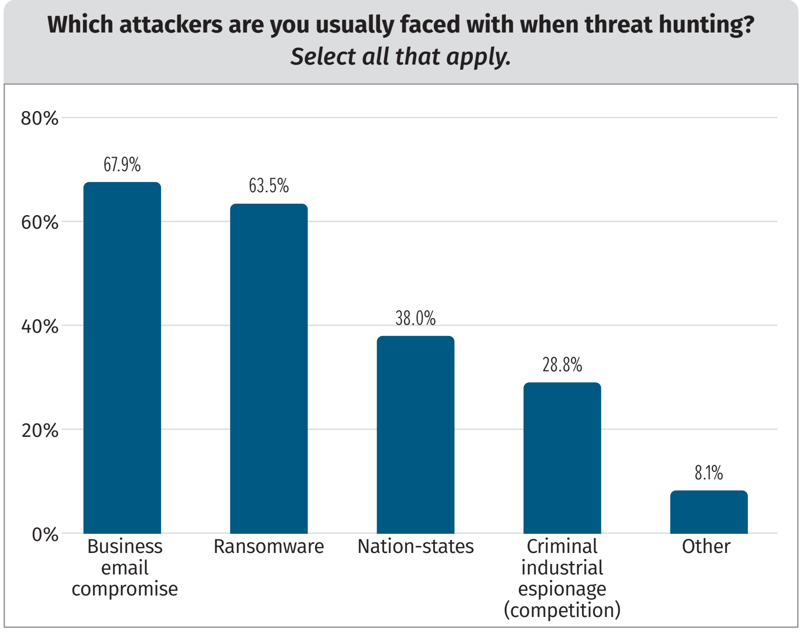


Figure 5. Most Common Types of Attackers

Although ransomware attacks are similar across the board, BEC comes in various forms and has been on the rise in the past few years. Attackers take over email accounts of legitimate employees within target companies and use a variety of social engineering tactics to get victims to transfer money to the attackers' accounts. One common tactic is to mimic an executive of the target company and pressure an employee with access to company bank accounts to transfer money for a super-secret and urgent project. Another quite common approach is for the attacker to intercept emails between the target company and its business customers. The attackers convince the target's customers to transfer money owed to the attacker's account rather than to the target's account. Usually, they give reasons like an ongoing audit in one country that would prevent them from receiving the amount due to that country's bank account.

To facilitate these tactics, attackers need to have access to one or more mailboxes within the target company. That usually happens by phishing or credential theft. Even though this type of attack is not limited to cloud-based email services, we see it happening most often in these setups. That might be because more companies have moved their communication and collaboration solutions into the cloud. The advantage of this for the threat hunters is that hunting for BEC in most relevant cloud infrastructures is very well documented and very clearly scoped. Although hunting for attackers in an enterprise infrastructure with thousands of computers and hundreds of services with tons of log sources and other evidence is something that you can never cover 100%, hunters might be able to apply the BEC detection tactics and leverage all the available logs that the cloud provider offers.

Let us add one side note when comparing ransomware and BEC concerning the money flow in these two cybercrime categories: Fairly often it is claimed that ransomware schemes only work because cryptocurrencies exist and make the money transfer to criminals possible. If that were true, BEC would not exist because it uses real-world bank accounts for the transfers. So, in this attack field, the responsibility does not fully lie in the laps of cybersecurity specialists; it also is the responsibility of the banks that facilitate these wrongful payments to the attackers' bank accounts.

Tactics, Techniques, and Procedures (TTPs) for the Attack Schema

In the survey, we looked deeper into the TTPs for some of the most hunted attack schemas. We didn't ask for BEC in particular, because the responses for this category would not show much variation. BEC does not usually require large-scale access to the victim's infrastructure, which significantly reduces the interaction with the victim's infrastructure. Locard's exchange principle tells us that a perpetrator will always bring something into a crime scene and leave with something from the crime scene. However, the less time someone spends at the crime scene and the less parts of the crime scene someone touches, the less exchange of evidence will occur.

Ransomware attacks, on the other hand, are very intrusive, and attackers usually leave a noticeably clear trail of evidence when they pivot through the network. The number-one TTP reported by our respondents for this hunted attack scenario is "custom malware" (see Figure 6). This is not a surprise because the ransomware executable is usually, with very few exceptions, a custom-made binary. Looking for that TTP is not especially useful for proactive threat hunting because the encryption binary will only be dropped in the final stages of a ransomware attack and swiftly executed.

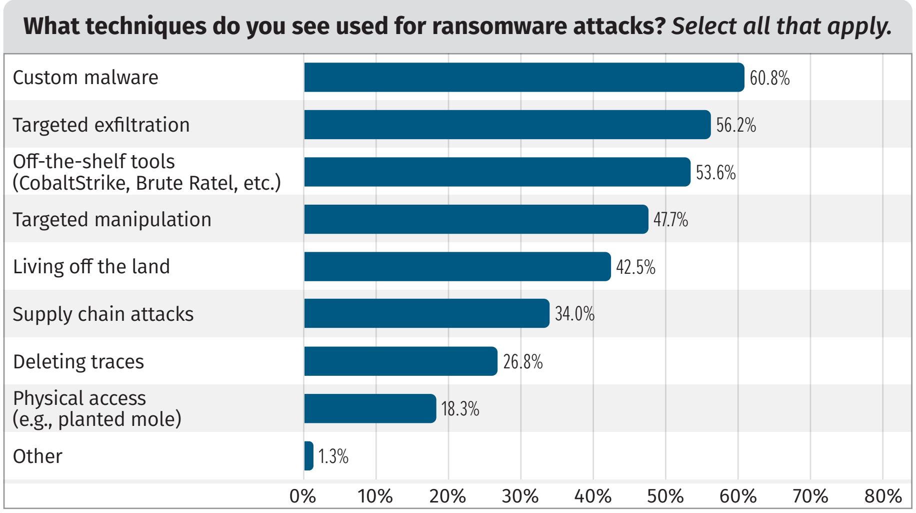


Figure 6. Ransomware Techniques

Another common TTP for ransomware actors is targeted exfiltration, which is second for this attack scenario according to our respondents. It might not be as targeted as exfiltration in nation-state attacks because ransomware attackers usually operate on a tight schedule, but ransomware groups have clear preferences as to which kinds of data they try to locate and exfiltrate. Incident responders frequently find traces that indicate what ransomware attackers looked for in the network.

The number three TTP, according to 54% of our respondents, is off-the-shelf tools like Cobalt Strike or Brute Ratel. This also includes legitimate remote access solutions like Anydesk.

To 27%, "deleting traces" is nothing that most ransomware actors do very successfully. We do see them trying to purge their traces, however, which quite frequently results in their leaving even more traces or tipping off the SOC that an attack is ongoing.

What we found interesting is that 18% of respondents see "physical access" being used in ransomware attacks. Please contact us if you are aware of cases where the attackers physically intruded into the target company in ransomware cases.

Next, we investigated the TTPs our respondents saw in nation-state cases. Clearly, the leading TTP is "living off the land" at 76% (Figure 7). Whenever an attacker plants malware on a device or pivots to a device using malware, there is a very real chance of their being detected. Using legitimate tools that already exist in a company is a good way to remain undetected, but there are still several methods to detect an attack.

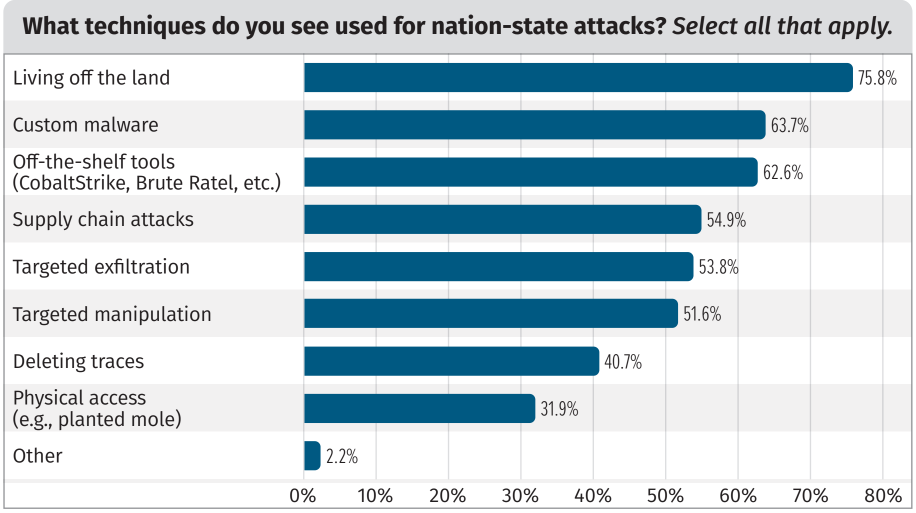


Figure 7. Nation-State Attacker Techniques

When nation-state attackers penetrate a network, they frequently use custom-made and often highly sophisticated malware. This is reflected in the survey results where 64% of our respondents have seen custom malware in nation-state attacks. Also, the number of physical access attempts, for instance in the form of a planted mole, is quite high at 32%. This does not come as a surprise because often the cheapest and easiest way to gather information from or gain access to a company is a human asset.

Finally, we asked our respondents which TTPs they see in industrial espionage cases. These numbers might be a little skewed because nation-states are involved in industrial espionage as well. The distribution of TTPs is not entirely different than for the ransomware category; however, the category of physical access is higher at 30% versus the 18% in ransomware cases. This does not come as a surprise because industrial espionage cases have been human operations long before IT was introduced.

Charting the Shifting Sands of Cyber Threats

In the dynamic landscape of cyber threats, staying current with the latest attacker techniques is vital for effective threat hunting. This is the first year that we asked respondents how they stay up to date with the newest attacker techniques. Their responses suggest that the most favored sources for this information are vendor blogs and papers—slightly more than 59% of respondents rely on them (Figure 8). These platforms often provide timely insights and analysis from cybersecurity product and service providers, which can be instrumental in understanding new threats in the field.

Sources of Information

It's unsurprising that vendor blogs and papers are the most used source of new attacker techniques, because they're also often completely free to organizations. The challenge organizations may face from vendor blogs, however, is that the results may be painted with a brush stroke that can often make the vendor stand out better in the market or shed a better light on its "wares." It is important for organizations to consume this material while fully understanding who wrote it and why. A great example of this is the report you're currently reading: Although both authors were compensated for our time in analyzing the results and writing this report, the content is created independently of SANS or the sponsors. Hopefully, this continues to instill trust in this report and our analysis.

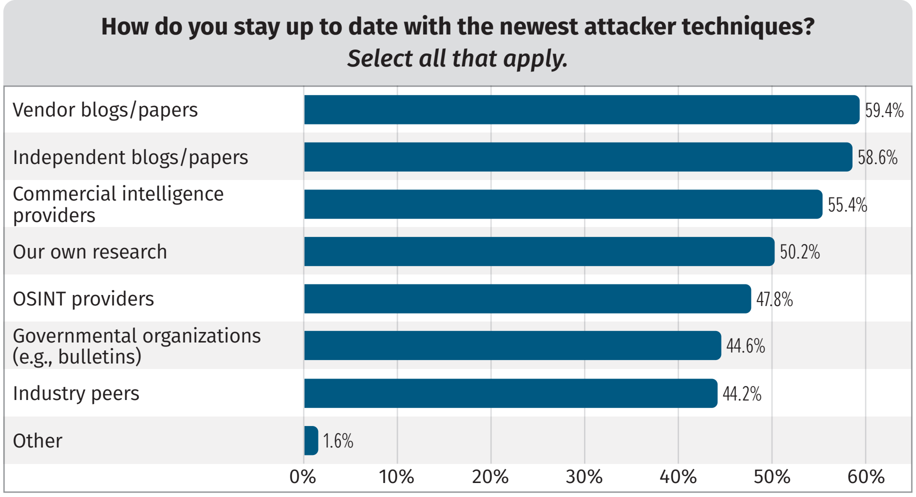


Figure 8. Sources for the Latest Attack Techniques

Closely following vendor blogs and papers are independent blogs and papers, preferred by slightly less than 59% of respondents. This preference indicates trust in the expertise of individuals and organizations outside of commercial entities, which can offer unaffiliated and possibly more diverse perspectives on emerging threats. These sources are often considered to be at the forefront of threat discussion, because they can move quickly to disseminate information without the constraints that might affect commercial providers.

Commercial intelligence providers are also a significant resource, with 55% of respondents utilizing them. These entities specialize in threat intelligence and often have the resources to provide extensive research and real-time data on threat actor techniques, making them valuable assets for organizations building their threat hunting capabilities.

Interestingly, “our own research” is cited by 50% of the respondents, highlighting that a significant number of organizations conduct in-house threat research but rely on it less than they rely on vendors and independent blogs. This self-reliance is crucial for contextualizing and understanding how generic threat information applies to their specific environments. It allows for tailored threat hunting that aligns with the organization’s unique risk profile and security posture. However, this is likely the costliest option because it requires staffing, time, skills/education, and resources to be successful.

Governmental organizations’ bulletins are utilized by 45% of respondents. This is a much more difficult statistic to analyze because we both know from personal experience in different countries that some government organizations can provide attacker information quite quickly, whereas others take much longer to declassify information and make it available to non-government organizations. Governments that can move quickly on this information can provide strategic insights and alerts about state-sponsored activities or high-impact cybercrime campaigns, which can be extremely beneficial to organizations for threat hunting.

Overall, the diverse range of sources reflects a multifaceted approach to threat intelligence gathering in cybersecurity. Given that the variance between how organizations find new attacker techniques in all the sources is only 15%, it shows that organizations are ensuring they use a multi-source approach for more robust and proactive threat hunting.

Structured Tracking of the Threat Landscape

Implementing a formal program to track changes in the threat landscape is essential to an organization's cybersecurity posture. When asked if organizations formally keep track of changes to the threat landscape, 61% of respondents affirm that their organizations have established such a program. This proactive stance enables continuous threat hunting and monitoring, which is crucial for the early detection of potential security threats and vulnerabilities.

On the other hand, the survey reflects a significant portion of respondents (29%) that do not have a formal program in place, along with another 10% that aren't sure. This gap exposes these organizations to hunting with outdated threat intelligence, potentially leading to delayed threat actor discovery and mitigation. The lack of a formal program might indicate resource constraints, a lack of awareness, or possibly an underestimation of the importance of continuous threat landscape monitoring.

Having a strategy for tracking changes to the threat landscape is only helpful if you have the ability and tooling to track those changes. We found that respondents indicated their dominant method for monitoring changes to the threat landscape is using open-source intelligence (OSINT) tools (70% of respondents). Most organizations likely favor OSINT tools due to their accessibility and the breadth of data they can scan, not to mention their low price tag. Additionally, OSINT tools are continuously improving, with the cybersecurity community continuing to publish or update new tools. Survey results suggest that the cybersecurity community places significant trust in the collective power of publicly available information to track changes to the threat landscape.

Commercial intelligence tools also play a pivotal role, with 61% of organizations utilizing them to track the threat landscape. These tools can offer more curated threat intelligence, with features tailored to organizational needs such as real-time alerts, in-depth analysis, and integration with existing SOAR or SIEM tools. They can provide a more targeted and refined set of data, making them an asset for organizations that require a more curated approach to threat intelligence.

Although internally built tools are used notably less often (33%), this may also reflect organizations that are further along with their maturity. Hopefully, organizations with their own internally built tools will have more automation to track threat landscape changes.

The Vendors' Threat Landscape

Reliance on endpoint detection and response (EDR) and extended detection and response (XDR) vendors is significant yet varied among organizations. We wanted to understand organizations' dependence on EDR/XDR vendors to track the threat landscape.

The majority of this year's respondents consume EDR and XDR vendors' threat intelligence. However, most use that information in combination with their own threat intelligence (47%), 14% depend on vendor-supplied intelligence completely, and another 30% use the information as a fallback to their own threat intelligence. The use of threat landscape information from an EDR vendor can be significantly useful given that EDR vendors often have a comprehensive view of the threat landscape through their customers that are using their products. It's vital for organizations to consider that although EDR vendors are likely to see a good cross-section of common threat actors, they may be less likely to see targeted threat actors for your organization. This is often where your own threat landscape Intelligence becomes useful.

Are Hunters Using a Methodology or Being Given a Policy?

The statistics from 2023 and 2024 regarding the adoption of clearly defined methodologies for threat hunting demonstrate a significant evolution in organizational practices. In 2024, the data shows that more than half of the organizations (51%) report having formally defined threat hunting methodologies, marking a notable increase from 35% in the previous year (Figure 9). This growth reflects a maturing industry with an enhanced focus on establishing standardized processes to improve the effectiveness and efficiency of threat hunting activities. Formally defined methodologies can lead to better consistency in threat detection, faster incident response, and more effective allocation of resources, which are critical for maintaining robust cybersecurity defenses in an increasingly complex threat landscape.

Conversely, there is a slight decrease in organizations relying on ad hoc methodologies, from 38% in 2023 to 35% in 2024. This shift may indicate a trend toward more systematic threat hunting approaches as organizations recognize the benefits of structure and predictability over improvisation. Interestingly, the percentage of organizations planning to define their methodologies has decreased from 20% to 13%, possibly suggesting that many of those with intentions to formalize processes in 2023 have already done so. This premise is also supported by a marked decrease in organizations with no plans to formalize methodologies, from 7% in 2023 to 2% in 2024. This change could signal a broad acknowledgement of the necessity for formal methodologies in the continuous and increasingly complex battle against cyber threats. Overall, these trends underscore a proactive shift in the cybersecurity community toward institutionalizing threat hunting as a key defense strategy.

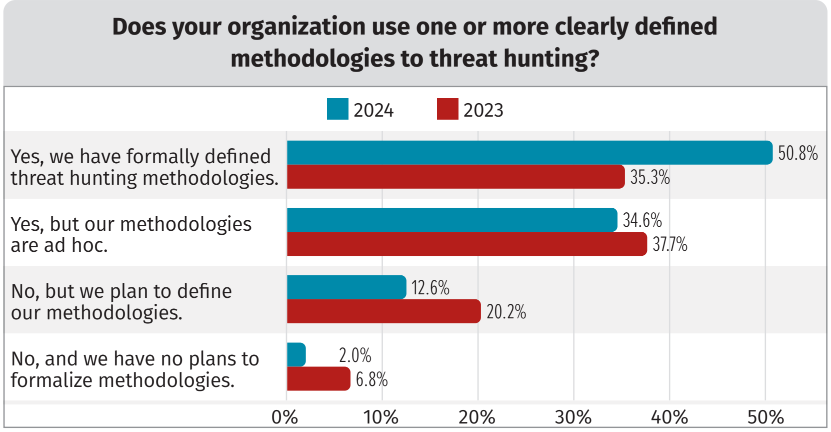


Figure 9. Use of Threat Hunting Methodologies

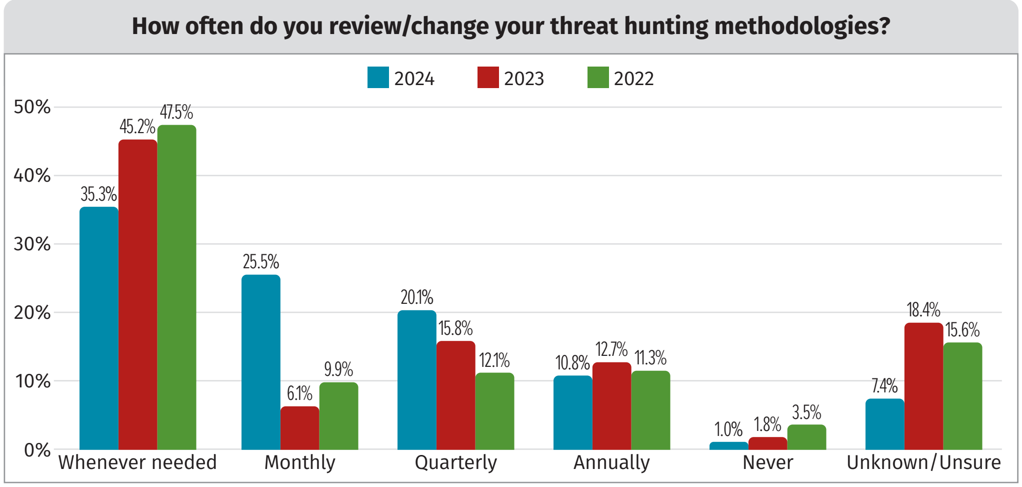


Figure 10. Frequency of Reviewing/ Changing Methodologies

The responses from the last three years provide an insightful look into how organizations adapt their threat hunting methodologies over time. This year, the percentage of organizations that revise their threat hunting methodologies "whenever needed" has decreased to 35% from 45% in 2023 and 48% in 2022 (Figure 10). This positive trend might suggest that organizations are moving toward more regular and scheduled reviews of their practices rather than ad hoc changes, which can help ensure a more disciplined and consistent approach to threat hunting. The increased frequency of reviews can be critical for keeping pace with the rapidly evolving nature of cyber threats, where new vulnerabilities and attack strategies emerge at a continually increasing pace.

A corresponding increase in monthly reviews seems to show where our "whenever needed" respondents have moved: This increase has more than quadrupled from 6% in 2023 to 26% in 2024. This leap indicates a shift toward more dynamic and responsive methodologies, potentially driven by the recognition that cyber threats are becoming more sophisticated and require frequent attention to ensure that threat hunting activities remain effective.

Quarterly reviews have also steadily increased over the years, aligning with the best practices of regular check-ins and updates to security processes. Interestingly, the number of respondents who are "unknown/unsure" about their review frequency has more than halved, dropping from 18% in 2023 to 7% in 2024, which may indicate better internal awareness and communication regarding threat hunting. Similarly, the percentage of organizations that never review or change their methodologies has decreased, suggesting a decline in complacency and an increased understanding that stagnation in threat hunting practices can lead to vulnerabilities within cybersecurity defenses.

Generally, a threat hunting methodology is designed to be flexible enough to be adapted to the ever-changing threat landscape. Although a threat hunting methodology should be used as a guide during hunting missions, it probably does not need to be updated monthly; monthly updates could be a sign that the methodology is not broad enough to cover the majority of hunt missions. For a mature organization, a quarterly review of the threat hunting methodology is a reasonable expectation—more often than this is probably a sign that organizations may need to go back to the drawing board and redraft the methodology to make it suitable for a longer period of time.

Building the Methodology

When asking respondents who contributes to their threat hunting methodology, the key contributors are notably diverse, indicating a multidisciplinary approach to shaping these critical procedures. The CISO emerges as the primary contributor with a significant 40% involvement. This level of contribution from the top echelons of cybersecurity governance may reflect a turning point in threat hunting, which is no longer merely a technical activity but a strategic one integral to the organization's overall security posture.

The data also reveals substantial input from external entities at 35%, suggesting a reliance on specialized knowledge and external perspectives to augment internal capabilities. Incident response (IR) teams are also pivotal contributors, involved in 33% of cases, due to their front-line experience and practical insights into the TTPs of adversaries. Note: the IR team has seen an overall increase in their contribution to developing a threat hunting methodology since 2023, when only 30% of respondents said that the IR team contributed.

Surprisingly, dedicated threat hunting teams or personnel are listed as contributors in only 21% of instances, which points toward the integration of threat hunting roles within broader security functions rather than as a standalone team.

Methodology Selection

The fluctuating statistics in threat hunting methodologies and staffing strategies over the past three years highlight the challenges organizations are facing in both areas. In 2024, there is a marked shift toward available human resources influencing the selection of methodologies, with 47% of respondents acknowledging this trend, a significant increase from 21% in 2023 and 23% in 2022.

This change suggests that organizations are becoming more resource-conscious, tailoring their threat hunting approaches to the skills and numbers of their available staff. This could reflect the growing skills gap in threat hunting, or even cybersecurity, with a more pragmatic adaptation of methodologies to suit the existing workforce capabilities and capacity.

Conversely, the proportion of organizations reporting that methodologies affect staffing strategy has decreased over the years, dropping to 14% in 2024 from 18% in 2023 and 23% in 2022 (Figure 11). This could imply a shift away from idealized, methodology-driven staffing plans toward a more flexible, resource-driven approach, likely in response to the practical challenges of recruitment and training in cybersecurity. The decrease in the "unknown" category from 12% in 2023 to 7% in 2024 also reflects improved clarity and decision making within organizations about the drivers behind their threat hunting strategies. These trends underscore the evolving nature of threat hunting as organizations move toward adopting a methodology to suit the staffing and expertise they have, instead of a methodology to suit their attacks.

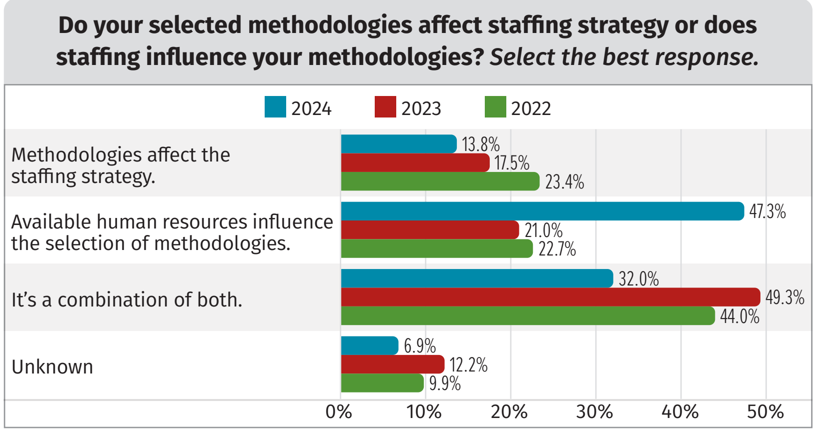


Figure 11. The Relationship Between Methodologies and Staffing

Organizations seem to vary widely in their methods, from structured, tool-reliant detection strategies and formal frameworks like the 4 A's (assess, acquire, analyze, action) to more instinctual or ad hoc methods, highlighting the adaptability of threat hunting to different operational contexts. Several organizations lean on frameworks such as MITRE ATT&CK and PEAK, utilize a combination of automated software and manual query analysis, or engage external partners for managed detection and response. Methodologies are variously documented, from informal internal records to detailed documentation in platforms like Confluence or Jira, with some organizations allowing hunters considerable flexibility to deviate from established procedures when necessary. This flexibility is often contingent on the documentation of the rationale behind deviations, ensuring that although creativity is permitted, accountability and learning are maintained. Overall, the responses reflect a field that values both the rigor of structured methodologies and the agility to adapt to the nuanced and evolving nature of threat actors.

Do Organizations Still Want to Employ Threat Hunters?

The IT world uses a variety of sourcing strategies. Like in the 2023 SANS Threat Hunting Survey, we were interested in whether outsourcing threat hunting is a viable option for our respondents. Given that slightly less than half of our respondents claim that their threat hunting capabilities are mature or very mature (Figure 12), outsourcing might be a viable option.

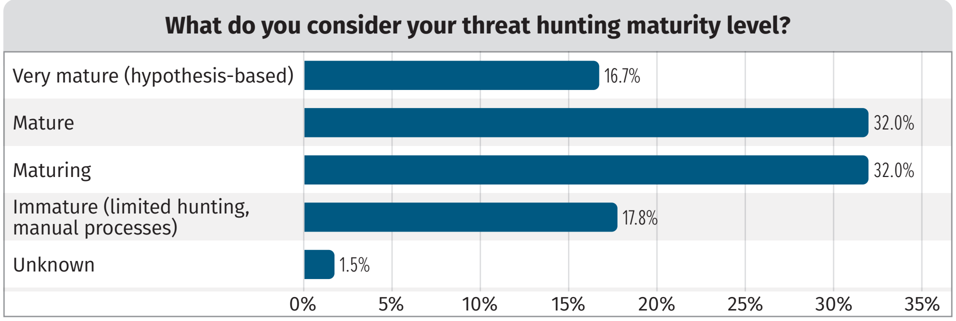


Figure 12. Threat Hunting Maturity

Whereas in 2023, 63% responded that they didn't outsource threat hunting, this year only 45% don't outsource threat hunting. In contrast, 37% have outsourced threat hunting. The remaining 18% either do not know or are working for a consultancy that offers threat hunting to third parties (Figure 13).

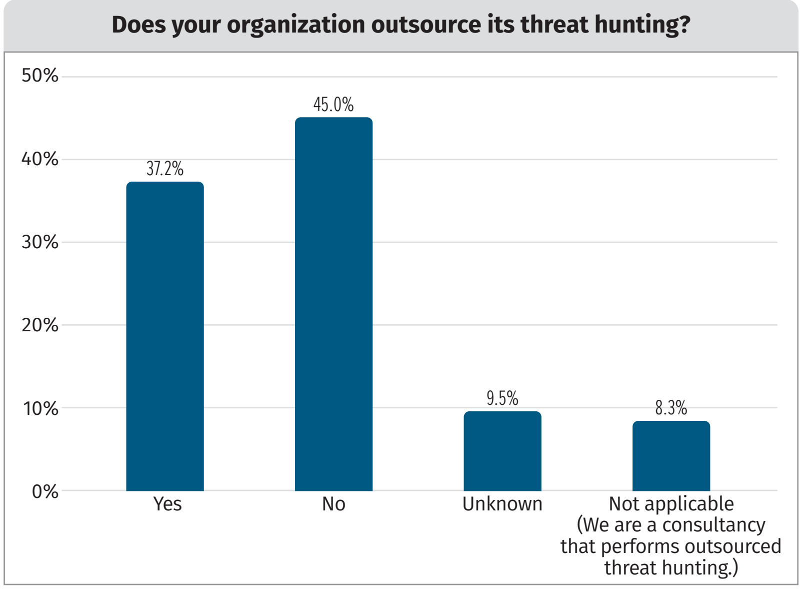


Figure 13. Outsourcing of Threat Hunting

So, what are the pros and cons of outsourcing threat hunting operations? One way to look at it is to split the evaluation into three categories: personnel, intelligence, and consistency.

- **Personnel—**The major point of outsourcing is that another company, and thus external people, are running the hunt. A big advantage to this is that these experts are exposed to a larger number of environments than internal personnel. Frequently, external threat hunters double as incident responders and are remarkably close to what threats and TTPs to hunt for. There are some downsides, though. One is that it might be more difficult and resource heavy to onboard the external entity to exactly what your company is doing and how IT impacts the value chain. Another is that threat hunting can be great training for internal security personnel like security analysts and SOC analysts. When you fully outsource threat hunting, there is no training effect, and SOC and threat hunting might not be integrated well.

- **Intelligence—**Regarding intelligence, again, both options have ups and downs. An external party might be better trained in accumulating and structuring time-sensitive threat intel. They will also be more exposed to current cyber breaches, because most companies that offer threat hunting are also engaged in incident response cases. What external parties might be lacking, though, is a clear understanding of what threats are most dangerous to your company. Usually, governments and peer groups are good intelligence sources for companies. External entities might not have access to that information. Sometimes companies might even be prohibited from sharing certain intelligence with their threat hunting provider. This results in coverage gaps in the threat hunting operations.
- **Consistency—**Although internal personnel are not necessarily stable—employees might only remain in the company for a few years—our experience has shown us that external entities tend to be more volatile. You might get different incident responders on every hunt based on the schedule of the external party. That does not help continuity. Even if all hunts are documented very well, documentation will never fully describe all parts of a threat hunting mission. When there is no continuity of personnel and strategy, you might miss finding skilled attackers quickly.

So, continuity is a major aspect of threat hunting, and it comes down to having a good strategy and following it. As already mentioned, external parties focused on threat hunting bring knowledge and experiences to the table that internal personnel may take longer to build. At the same time, internal personnel usually better understand how the company works. That allows for better adjustment of threat hunts that are being undertaken.

Ultimately, someone needs to be in the driver's seat. We wanted to know who is in that driver's seat for our respondents who claimed that they outsource threat hunting. The results are interesting. In 2023, 52% stated that threat hunting would be done together with the outsourced team, and 23% left the field completely to the outsourcing partner; however, the numbers have changed. This year, the tables turned toward the outsourcing providers. Now, a good third of respondents (35%) hand over all threat hunting to the third party. The shared approach dropped to 45%. We can only speculate as to what is causing this change. From the authors' experience, it might be that more companies understand the value of threat hunting. At the same time, they are unable to hire the right personnel on short notice, which might make them outsource threat hunting. Because they are new to the field, the tendency to fully outsource might be higher than for more experienced organizations.

To summarize, outsourcing threat hunting can present significant challenges compared to utilizing internal skilled staff. One primary concern is the potential for a disconnect between the outsourced personnel's understanding of the organization's unique systems and culture and the nuanced threat landscape they face. Internal staff typically have a more intimate knowledge of the organization's network architecture, historical security incidents, and specific business risks, which is crucial for effective threat identification and response. Moreover, in-house teams are generally better positioned to facilitate rapid communication and coordination with other internal stakeholders during a security incident—if and when your hunting team uncovers one. Outsourcing can also introduce issues of data governance and security, because sensitive information must be shared with third parties, increasing the risk of data breaches or leaks. There is also the matter of continuity and investment in personnel; internal staff development leads to the accumulation of institutional knowledge and a dedicated, consistent approach to cybersecurity, which could be diluted when relying on external entities that may change personnel or priorities over time.

Hunting for an Impact Within Your Organization

Showing the importance of threat hunting is only helpful if you're measuring its success within your organization. Data from the last four years reveals a change in the overall trend, with a significant increase in organizations now measuring success or effectiveness for their threat hunting missions (64%). This suggests that organizations increasingly recognize the importance of quantifying the effectiveness of their threat hunting activities.

This significant rise from 34% in 2023 (see Figure 14) indicates a maturing field where the value of metrics and KPIs in guiding and improving threat hunting practices is better appreciated. It also demonstrates a shift toward more strategic and results-oriented cybersecurity operations, where success is not just assumed but evaluated against specific objectives, such as reducing breach detection times, increasing the accuracy of threat detection, or improving response times. In combination with the increase in outsourcing threat hunting, organizations may also be ensuring they are measuring their outsourced vendor against their engagement. Time will tell if this trend is tied to outsourcing or just further improvement in recognizing how threat hunting contributes to the posture of an organization's cyber defenses.

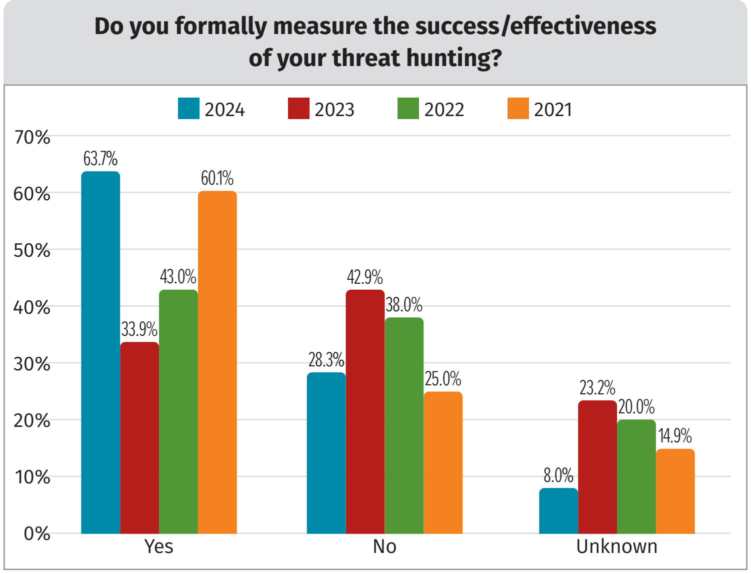


Figure 14. Formal Measurement of Threat Hunting Efforts

Conversely, the proportion of organizations that do not measure the effectiveness of their threat hunting has seen a notable decrease over the past year, from 43% in 2023 to 28% in 2024, which aligns with the increased adoption of measurement practices. This change suggests there is a movement away from informal or ad-hoc threat hunting approaches to more structured methodologies that prioritize accountability and continuous improvement.

When it comes to the measurable improvement that organizations are seeing, compared to last year, those that saw some improvement roughly fell within a very similar pattern. This is somewhat useful in that we're seeing an overall trend in how effective threat hunting is for organizations. Overall, 63% of organizations see some measurable improvement to the security posture of their organization. That's a brilliant outcome! However, a concerning 23% reported a negative impact, which could reflect challenges in effectively implementing threat hunting strategies. The 14% reporting no change might suggest either a mature security posture where threat hunting didn't provide additional benefits or possibly a lack of effective measurement of threat hunting outcomes. Although the data reflects a predominance of positive outcomes, it also underscores the complexity of threat hunting and the variability in its execution and impact.

When it comes to where organizations are seeing improvements, this year, compared to 2023, we see a wider spread across all the areas we poll respondents on (Figure 15). Reducing attack surge exposure on the network and endpoints is one of the two areas with the greatest improvement, at 49%. The category "creation of more accurate detections and fewer false positives" also saw the same level of significant improvement with 49%. For organizations tracking the benefits of threat hunting, there are significant operational cybersecurity improvements. We also saw the areas with no or unknown improvement start to shrink, obviously due to the gains in other areas. It's likely that as organizations mature further, they are getting better at tracking metrics across multiple improvement areas.

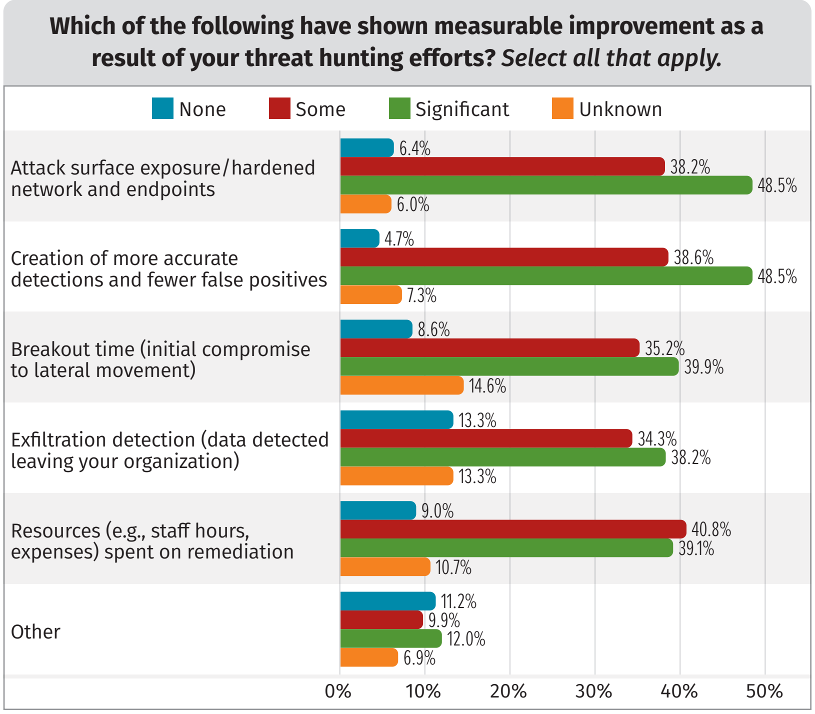


Figure 15. Improvements Resulting from Threat Hunting

So, what issues are troubling our threat hunters or organizations wanting to do threat hunting? Comparing 2024 and 2023 results, there is a noteworthy shift in the perceived barriers to threat hunting. Although the lack of skilled staff remains the top challenge, it has seen a significant decrease from 73% in 2023 to 50% in 2024, suggesting that either the talent gap is slowly being addressed or organizations are finding alternative solutions to manage this issue.

Budget constraints have decreased from 54% in 2023 to 40% in 2024, due to organizations finding funding to train internal staff or hire externally skilled staff. Data quality and/or quantity has become this year's rising concern, increasing from 34% to 44%, which may reflect an ever-growing flood of cybersecurity data and the associated complexities of processing and leveraging this information for threat hunting purposes. Interestingly, the concern regarding the lack of data standards or common data types has grown from 26% to 33%, which could signify a growing awareness of the importance of data interoperability in threat detection and analysis.

There is also a decrease in the percentage of respondents who cite limitations of tools/technology, lack of defined processes, and budget constraints as primary barriers, indicating possible improvements in these areas or a shift in focus toward other challenges. These trends suggest that although progress is being made in some areas, there are still challenges around skills and a growing burden of data. Oddly enough, skilled staff may be able to fix the growing data burden further, assuming we find or train skilled staff.

Conclusion

The SANS 2024 Threat Hunting Survey provides insights that reflect not only an industry in evolution, but also one that is actively seeking enhancements to its cyber defense capabilities. Organizations recognize the need for improved contextual awareness in their threat hunting efforts, with 51% planning to refine their ability to discern and respond to nuanced threats through better data sources and tools. Furthermore, 47% of organizations aim to integrate artificial intelligence (AI) and machine learning (ML) into their threat hunting apparatus, acknowledging the growing complexity and volume of threats that demand smarter and more autonomous responses.

Investment in both staff and tools is on the agenda for many organizations, with a notable percentage planning to increase their investment by more than 10% (20% for staff, 23% for tools) or by more than 25% (15% for staff, 19.0% for tools) within the next 24 months. This prospective financial commitment underscores the strategic importance placed on threat hunting as a discipline within the cybersecurity industry. Conversely, a minority of organizations anticipate a decrease in investment, with less than 2% expecting a 100% change in staff and in tools, potentially indicating a shift away from threat hunting to a different security strategy—definitely a place for further questions next year.

Addressing the primary barriers to threat hunting, the survey indicates a decrease in concerns over the limitations of tools/technology and budget constraints, which could suggest an industry that is finding its footing with the existing technological advancements and available resources. However, the gap in skilled personnel remains a prominent challenge. Organizations are looking to fortify their teams with more internal staff possessing investigative skills, as indicated by 39% of respondents, aiming to bolster their search capabilities and enhance scalability across the enterprise.

In summation, the survey reveals a cybersecurity landscape in transition, with organizations not only recognizing the indispensable role of threat hunting in a robust security posture but also committing to significant investments in both human and technological capital. As the threat landscape continues to advance, so does the recognition of the need for greater sophistication in threat hunting capabilities, from AI integration to better data management and staff expertise. These strategic priorities will undoubtedly shape the future of cybersecurity defense mechanisms.

Sponsors

SANS would like to thank this survey's sponsors:

Carbon Black.

CISCO™

corelight

CYBORG SECURITY

HYAS

LACEWORK®

RAPID7

splunk>®

Carbon Black.

SANS | Research Program

Product Briefing

Threat Hunting with Carbon Black: Insights from the 2024 SANS Institute Survey

March 2024

Today's complex and fast-changing threat environment means security professionals need highly advanced threat hunting technologies to ensure that they're always one step ahead of the bad actors out there. This year's edition of the annual SANS Institute threat hunting survey shows increasing enterprise recognition of the importance, and the challenges, of this essential security discipline.

Carbon Black

Carbon Black addresses threat hunters' rapidly evolving requirements and challenges with a comprehensive software-as-a-service (SaaS) endpoint protection platform with capabilities including:

- **Carbon Black Enterprise EDR—**advanced endpoint detection and response (EDR), with threat-hunting and incident response (IR) tools that enable security operations centers (SOCs) to proactively harden internet-facing systems, applications, and devices
- **Carbon Black XDR—**extended detection and response (XDR) capabilities that make it possible to rapidly detect and stop emerging attacks, using automated correlation of telemetry across endpoints, networks, containers, workloads and users

Carbon Black focuses primarily on SaaS, but also delivers Application Control endpoint protection and EDR technologies on premises. All the company's SaaS products and services use a single unified agent, console, and dataset, and are completely integrated with Windows, MacOS, and Linux operating systems.

The 2024 SANS survey shows threat hunting maturing rapidly as a security discipline, with 51% of the respondents reporting the adoption of formal threat hunting methodologies—up from just 35% the year before. But serious challenges remain. The lack of skilled personnel is still the top barrier to better threat detection and response for 50% of respondents, followed by data quality issues and tool limitations. Carbon Black targets these and other areas of concern with tools that address the needs of both large enterprises with highly capable SOCs and smaller and midsize businesses that may struggle to attract and retain advanced threat hunting skills.

Key Findings from the 2024 SANS Threat Hunting Survey

The growing maturity of threat hunting is reflected in the adoption of formal methodologies by half the survey respondents.

The need for skilled personnel remains the No. 1 obstacle to improved threat detection and response.

Data quantity and quality represent two of the most serious challenges for threat hunters.

The survey shows business email compromise as the No. 1 attack type (identified by almost 68% of the threat hunters surveyed). The fundamental problem with the continuing prevalence of email compromise is that these attacks move laterally and can potentially infect every area of an IT environment, resulting in credential threats, brute-force attacks, or large-scale data breaches.

Another important challenge for threat hunters is the quantity and quality of the telemetry data they deal with—including huge sets of disparate data types—and a lack of common data standards. The complexity of this threat environment, and the increasing demands it places on SOCs, are why Carbon Black presents all its threat hunting and associated products and services in a single standalone platform. This makes it possible to take in rich sets of telemetry data, in whatever format, without needing to map different data types and metadata frameworks and—crucially—without disrupting the SOC's workflow. The result is threat hunting that is less manual, less labor-intensive, and more cost-effective.

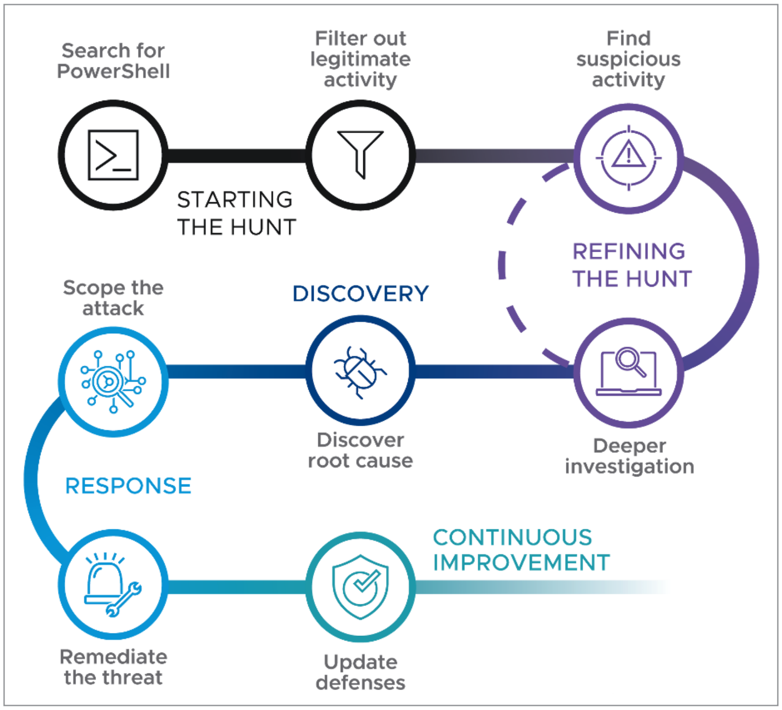


Figure 1. The Carbon Black Hunt Chain[1]

Carbon Black focuses its detection and response capabilities on a wide range of potential attack surfaces. One important example is containers, like Kubernetes components, which frequently come from third-party sources like GitHub or Y Combinator. These components are now widely used in application development, but they remain poorly understood, with enterprises sometimes completely unaware that they're using them. That makes them highly attractive threat vectors for everything from ransomware attacks to crypto mining.

A recent survey by the IT research firm Forrester found that 94% of Carbon Black users report "significant improvement in security efficiency," with an average of 7.5 full-time employee (FTE) hours saved per security incident.[2]

Container vulnerabilities are an excellent example of the need for comprehensive threat hunting capabilities like Carbon Black's. It's essential that threat intelligence be deployed enterprisewide, so that disparate internal organizations can communicate and collaborate effectively, detecting vulnerabilities, like weaknesses in containers, at the earliest stages of development, and ensuring that code is secure by design. This early intervention also means that Carbon Black can impose standards—which can be fine-tuned according to the enterprise's most granular policy requirements—preventing questionable code from being run, or allowing it to run but with protections that effectively create temporary fixes for errors. Carbon Black also stores telemetry data, so that SOCs can test the impact of a proposed policy change on endpoint security.

To learn more about Carbon Black's threat hunting capabilities, visit **www.carbonblack.com**.

SANS 2024 Threat Hunting Survey: Hunting for Normal Within Chaos **represents the ninth edition of SANS Institute's survey of security professionals engaged in or impacted by this proactive approach to identifying and remediating previously unknown or undetected security threats. The sponsors of this year's survey all offer advanced threat hunting capabilities that we believe will be of interest to SANS' clients, and, for this reason, we're presenting product briefings on their relevant product and service offerings. Note that SANS Product Briefings do not represent a SANS endorsement of a sponsor or its products, but rather an overview of its offerings and their capabilities.**

[1] "Threat Hunting for Dummies," https://content.carbonblack.com/content/threat-hunting-dummies

[2] "Cost Savings And Business Benefits Enabled By Carbon Black," https://content.carbonblack.com/reports/tei-carbon-black#embedded-form-with-image-YfUJaHYDjE

corelight

SANS Research Program

Product Briefing

Threat Hunting with Corelight: Insights from the 2024 SANS Institute Survey

March 2024

Today's complex and fast-changing threat environment means security professionals need highly advanced threat hunting technologies to ensure that they're always one step ahead of the bad actors out there. This year's edition of the annual SANS Institute threat hunting survey shows increasing enterprise recognition of the importance, and the challenges, of this essential security discipline.

Corelight Open NDR Platform

The Corelight Open NDR Platform—primarily offered as software-as-a-service (SaaS), but also available as an on-premises installation—combines platform-agnostic proprietary and open-source technologies to deliver a complete range of network detection and response (NDR) and threat-hunting capabilities. At the heart of the platform is Zeek, a highly advanced network security monitor, which generates network telemetry and analytics. Corelight offers all types of network sensors—physical, software, cloud or virtual, depending on the client's needs—and sends the detections and data to either Corelight's own interface (Investigator) or a security operations center's (SOC's) third-party security incident and event management (SIEM) system for analysis, reporting and response. Corelight analytics use machine learning, behavioral analysis, signatures (Suricata IDS) and threat intel and map alerts to MITRE ATT&CK; Corelight also generates comprehensive protocol logs, and supports file extraction and selective packet capture, so that threat hunters can identify historical attack trends. The Corelight platform also applies prescriptive analytics to determine the possible severity of a threat, using advanced generative artificial intelligence (AI) to recommend the most appropriate response. See Figure 1.

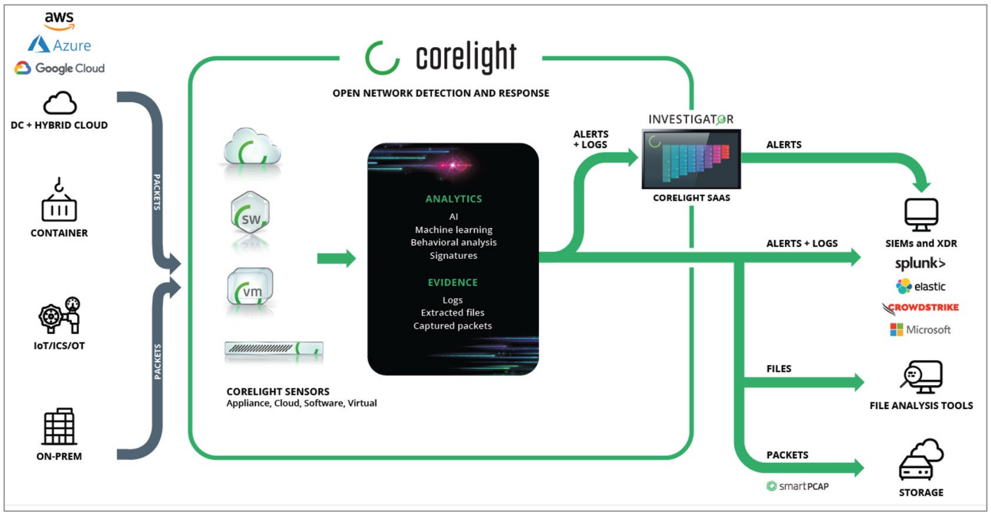


Figure 1. Corelight Workflow

Key Findings
from the 2024 SANS Threat Hunting Survey

The most common threat types identified in the SANS survey are email compromise (reported by 67% of respondents), ransomware (63.5%), and attacks by nation-state actors (38.0%).

Threat hunters consider data quantity and quality problems among their most serious challenges (reported by 44% of respondents, up from 34% just since last year), with lack of standards and common data types also a major problem (33%, up from 26%).

The need for skilled personnel remains the No. 1 obstacle to improved threat detection and response.

Corelight's primary market focus is on large enterprises across virtually every industry vertical, including Fortune 100/500/1000 companies in financial services, pharmaceuticals, retail, transportation and logistics, and aviation. Notably, its client base also includes many government entities, intelligence agencies and defense contractors. All these enterprises are under essentially constant threat, and face serious reputational, legal, regulatory and financial damage in the event of a successful attack. They all manage highly sensitive data, and as a result are especially attractive targets for the ransomware and nation-state attacks that the SANS survey respondents identified as their second and third most urgent threats.

Corelight works to address the threat-hunting challenges of these demanding enterprises—and especially the challenges the SANS survey respondents identified as most urgent—by:

- Expanding visibility into all network activity, capturing and interpreting meaningful evidence—even from encrypted data—to deliver rich insights and enable improved decision-making
- Improving detection coverage, with coverage across MITRE ATT&CK, in-depth machine learning detection, signature analysis and behavioral analysis, and community-based detection engineering
- Accelerating incident response, tying alerts to evidence history, and offering AI-guided investigations
- Increasing operational efficiency, consolidating disparate capabilities (NDR, IDS, PCAP) in a single platform, replacing legacy network data sources, and improving SOC efficiency and automation

A key element of the Corelight approach to threat hunting is its adaptability to the specific requirements and IT architectures of its clients. SOCs are, of course, at very different stages in the development of threat hunting as a security discipline. The SANS survey shows, for example, that half of respondents have formal threat hunting methodologies in place, and while this shows encouraging improvement, it also shows that many enterprises have a long way to go. For this reason, some Corelight clients will choose to threat hunt using the company's proprietary interface, while others will integrate Corelight data wholly with their SIEMs for threat hunting. And—crucially—some extremely sensitive enterprises, like defense agencies, will operate in air-gapped on-premises environments, to ensure complete security, with their data invisible even to Corelight.

One key problem in improving threat hunting maturity—identified as the No. 1 obstacle by the survey respondents—is the difficulty of attracting and retaining personnel with the necessary skills. Corelight addresses this issue by extensive use of automation, AI and ML, reducing manual interactions and freeing up scarce personnel to deal with higher-level responsibilities. Another important challenge reported by the survey respondents year after year is the difficulty of dealing with enormous amounts of disparate data types, and the absence of common standards for them. Corelight focuses intensely on this problem, ingesting and processing a vast range of data types, both standard and nonstandard, from many different sources, so that threat hunters can make sense of the activity they're seeing across their networks.

The result of this highly sophisticated approach to threat hunting and related capabilities is that SOCs are able to detect and respond to threats not only more effectively, but also more efficiently. In a recent presentation to SANS, a senior Corelight executive offered a real-world example of these closely interrelated benefits: A Corelight client in the entertainment industry was contacted by a nation-state-sponsored group that claimed it had breached its networks and stolen extremely sensitive intellectual property (IP). The attackers threatened to release the IP to the public if a huge ransom payment wasn't made. The company, of course, immediately went into crisis mode, using Corelight's extensive capabilities to examine the complete range of network activity for an extensive time period. The result of the threat hunter's investigation: It was determined that while the attackers had, in fact, breached the network, they had not accessed the IP they claimed. The company was able to reject the attackers' demands, and its senior management, including the board of directors, were satisfied that they had fully protected the interests of the company and its customers and met all regulatory compliance requirements.

To learn more about Corelight's threat hunting capabilities,
visit **https://corelight.com/solutions/threat-hunting**.

SANS 2024 Threat Hunting Survey: Hunting for Normal Within Chaos **represents the ninth edition of SANS Institute's survey of security professionals engaged in or impacted by this proactive approach to identifying and remediating previously unknown or undetected security threats. The sponsors of this year's survey all offer advanced threat hunting capabilities that we believe will be of interest to SANS' clients, and, for this reason, we're presenting product briefings on their relevant product and service offerings. Note that SANS Product Briefings do not represent a SANS endorsement of a sponsor or its products, but rather an overview of its offerings and their capabilities.**

CYBORG SECURITY

SANS Research Program

Product Briefing

Threat Hunting with Cyborg Security: Insights from the 2024 SANS Institute Survey

March 2024

Today's complex and fast-changing threat environment means security professionals need highly advanced threat hunting technologies to ensure that they're always one step ahead of the bad actors out there. This year's edition of the annual SANS Institute threat hunting survey shows increasing enterprise recognition of the importance, and the challenges, of this essential security discipline.

Cyborg Security HUNTER Platform

HUNTER Platform is a comprehensive threat hunting platform designed to enable enterprises to proactively detect and respond to both known and emerging security threats. The platform offers access to an extensive library of expertly crafted and constantly updated threat hunting content, as well as a suite of tools for managing and executing hunts simply, easily, and effectively, even by security professionals without advanced skills. A host-based offering, HUNTER Platform integrates with an enterprise's existing security tools and applications, including security incident and event management, endpoint detection and response, and incident response systems. HUNTER Platform's expert threat hunters, developers, and validation engineers create behavior-based hunt packages, reverse-engineering attacks by known malware creators—including the most sophisticated nation-state adversaries—in order to identify possible future variations on the techniques they use. The result is that enterprises can proactively protect themselves against the rapidly evolving and expanding array of threats they face, from email compromises moving laterally to insider attacks to ransomware. This approach makes all these benefits possible without the need to attract and retain skilled threat hunting personnel—an especially challenging issue in this very specialized field. The use of HUNTER Platform's up-to-the-minute threat intelligence, presented in familiar, accessible, and actionable formats that can be ingested by the enterprise's existing systems, makes it possible for security organizations to both scale their threat hunting operations without adding full-time employees (FTEs) and upskill their current employees with new threat hunting expertise. And Cyborg's HUNTER Platform's comprehensive metrics and reporting features allow security organizations to both measure and optimize their threat hunting and show measurable return on investment (ROI).

Key Findings

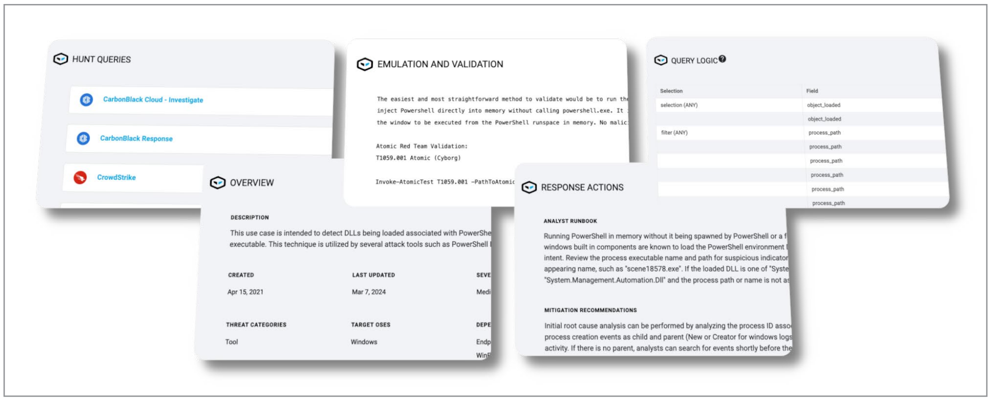
from the 2024 SANS Threat Hunting Survey

The scarcity of skilled threat hunting personnel remains an overwhelming problem for security organizations, with 50% of survey respondents identifying it as their No. 1 obstacle to improved threat detection and response.

Threat hunters consider data quantity and quality problems among their most serious challenges (reported by 44% of respondents, second only to lack of skills and up from 34% since last year).

The need to formally measure the success or effectiveness of threat hunting efforts is now clearly recognized as a must-have, with 98% of respondents indicating that they have formalized measurement methodologies or plan to.

Cyborg Security's HUNTER Platform addresses many of the most critical challenges identified by the respondents to this year's SANS threat hunting survey. Let's take a close look at three of the most important:



```
The easiest and most straightforward method to validate would be to run the
inject Powershell directly into memory without calling powershell.exe. It
the window to be executed from the PowerShell runspace in memory. No malic

Atomic Red Team Validation:
T1059.001 Atomic (Cyborg)

Invoke-AtomicTest T1059.001 -PathToAtomic
```

Selection	Field
selection (ANY)	object_loaded
	object_loaded
filter (ANY)	process_path
	process_path
	process_path
	process_path
	process_path
	process_path

DESCRIPTION

This use case is intended to detect DLLs being loaded associated with PowerShe executable. This technique is utilized by several attack tools such as PowerShell

CREATED	LAST UPDATED	SEVE
Apr 15, 2021	Mar 7, 2024	Medi

THREAT CATEGORIES	TARGET OSES	DEPE
Tool	Windows	Endp WinF

ANALYST RUNBOOK

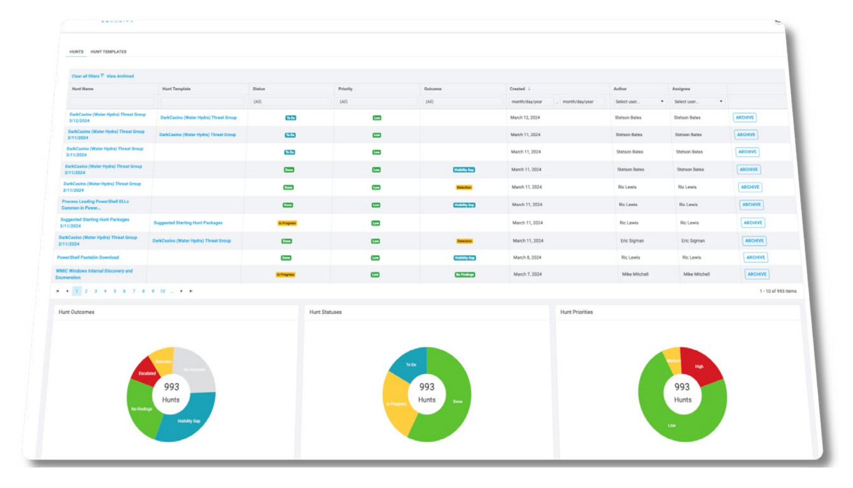
Running PowerShell in memory without it being spawned by PowerShell or a f windows built in components are known to load the PowerShell environment intent. Review the process executable name and path for suspicious indicator appearing name, such as "scene18578.exe". If the loaded DLL is one of "Syste "System.Management.Automation.Dll" and the process path or name is not as

MITIGATION RECOMMENDATIONS

Initial root cause analysis can be performed by analyzing the process ID asso process creation events as child and parent (New or Creator for windows logs activity. If there is no parent, analysts can search for events shortly before the

Figure 1. The Five Components in Cyborg Security's HUNTER Platform Workflow

- **The difficulty of attracting and retaining personnel with specialized threat-hunting skills.** Threat hunting is maturing rapidly as a security discipline, but highly skilled threat hunters are still hard to find—and they're expensive. The HUNTER Platform radically simplifies threat hunting, with pre-engineered packages that make in-house operations more accessible and more manageable, reducing the need to either seek out new FTEs or outsource operations to service providers that may require extensive management. And the personnel and management benefits don't end there. The experience and insight gained from working with HUNTER Platform's predefined threat hunts and analytics helps to upskill the enterprise's in-house personnel and improve the security organization's threat-hunting maturity, all without increasing headcount and associated costs.



Hunt Name	Hunt Template	Status	Priority	Outcome	Created		Author	Assignee	
		(All)	(All)	(All)	month/day/year	month/day/year	Select user...	Select user...	
DarkCasino (Water Hydra) Threat Group 3/12/2024	DarkCasino (Water Hydra) Threat Group	To Do	Low		March 12, 2024		Stetson Bates	Stetson Bates	ARCHIVE
DarkCasino (Water Hydra) Threat Group 3/11/2024	DarkCasino (Water Hydra) Threat Group	To Do	Low		March 11, 2024		Stetson Bates	Stetson Bates	ARCHIVE
DarkCasino (Water Hydra) Threat Group 3/11/2024		To Do	Low		March 11, 2024		Stetson Bates	Stetson Bates	ARCHIVE
DarkCasino (Water Hydra) Threat Group 3/11/2024		Done	Low	Visibility Gap	March 11, 2024		Stetson Bates	Stetson Bates	ARCHIVE
DarkCasino (Water Hydra) Threat Group 3/11/2024		Done	Low	Detection	March 11, 2024		Ric Lewis	Ric Lewis	ARCHIVE
Process Loading PowerShell DLLs Common in Power...		Done	Low	Visibility Gap	March 11, 2024		Ric Lewis	Ric Lewis	ARCHIVE
Suggested Starting Hunt Packages 3/11/2024	Suggested Starting Hunt Packages	In Progress	Low		March 11, 2024		Ric Lewis	Ric Lewis	ARCHIVE
DarkCasino (Water Hydra) Threat Group 3/11/2024	DarkCasino (Water Hydra) Threat Group	Done	Low	Detection	March 11, 2024		Eric Sigman	Eric Sigman	ARCHIVE
PowerShell Pastebin Download		Done	Low	Visibility Gap	March 8, 2024		Ric Lewis	Ric Lewis	ARCHIVE
WMIC Windows Internal Discovery and Enumeration		In Progress	Low	No Findings	March 7, 2024		Mike Mitchell	Mike Mitchell	ARCHIVE

1 2 3 4 5 6 7 8 9 10 ...

1 - 10 of 993 items

Figure 2. The HUNTER Platform Hunt Management Module

- **Data quantity and quality problems.** Threat hunters, like all security practitioners, must deal with staggering amounts of data, much of it irrelevant or out-of-date. One of the key threat hunting problems Cyborg has identified is enterprises' excessive reliance on stale indicators of compromise. HUNTER Platform delivers only high-quality, actionable content, and—even more importantly—focuses on behavioral content that enhances early threat hunting and detection capabilities and makes threat hunting truly proactive, not reactive.
- **The problem of measuring the effectiveness of threat hunting.** Security organizations need to know whether their threat-hunting activities are actually working, and to be able demonstrate the effectiveness of their efforts to senior management. This isn't simply a matter of being able to say, for example, that *X* numbers of attacks have been identified and stopped, but also that actionable and effective steps are being taken to prevent future attacks. HUNTER Platform's comprehensive metrics and reporting tools make it possible to track ongoing status and outcomes—and, crucially, show real-world ROI that will help to justify budget requests in a time of highly constrained resources.

The bottom line: Cyborg Security's HUNTER Platform makes it possible for enterprises to transition from reactive threat detection to proactive threat hunting, simplifying their in-house operations and reducing the need to find scarce and specialized talent. And it does it all in a way that makes it easy to measure, report, and demonstrate the value of threat hunting.

Try the free HUNTER Platform Community Account: **www.cyborgsecurity.com/user-account-creation**

SANS 2024 Threat Hunting Survey: Hunting for Normal Within Chaos **represents the ninth edition of SANS Institute's survey of security professionals engaged in or impacted by this proactive approach to identifying and remediating previously unknown or undetected security threats. The sponsors of this year's survey all offer advanced threat hunting capabilities that we believe will be of interest to SANS' clients, and, for this reason, we're presenting product briefings on their relevant product and service offerings. Note that SANS Product Briefings do not represent a SANS endorsement of a sponsor or its products, but rather an overview of its offerings and their capabilities.**

Product Briefing

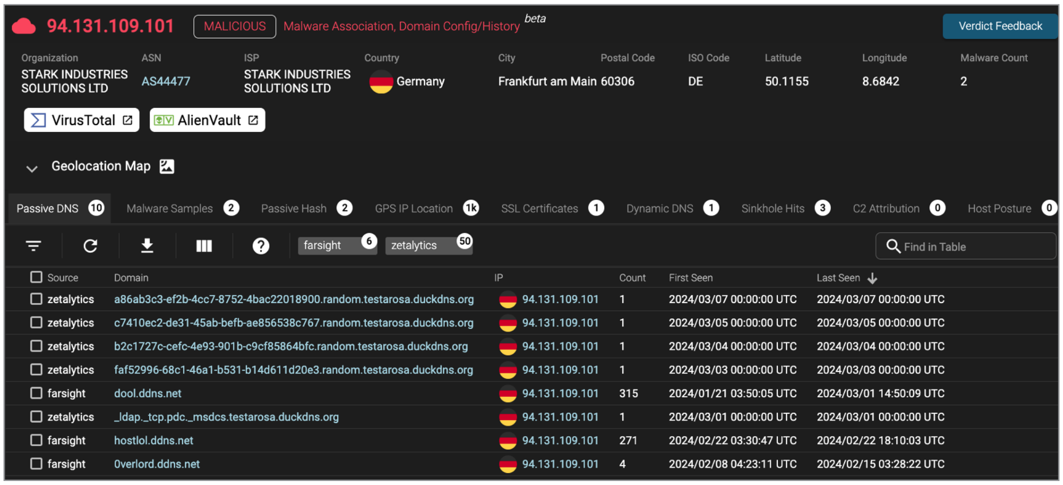
Threat Hunting with HYAS Insight: Insights from the 2024 SANS Institute Survey

March 2024

Today's complex and fast-changing threat environment means security professionals need highly advanced threat hunting technologies to ensure that they're always one step ahead of the bad actors out there. This year's edition of the annual SANS Institute threat hunting survey shows increasing enterprise recognition of the importance, and the challenges, of this essential security discipline.

HYAS Insight

HYAS Insight is an external threat intelligence application used by security professionals worldwide, including threat hunters, security operations center (SOC) analysts, cyber threat intelligence (CTI) teams, and fraud investigators. HYAS' client base includes enterprises across industry verticals like financial services, healthcare, and high-tech, as well as government entities, law enforcement agencies, and even other cybersecurity service providers. HYAS Insight aggregates, analyzes, and distills threat and adversary information from HYAS' adversary infrastructure data lake, which transacts billions of data points daily. HYAS packages this intelligence in highly adaptable and customizable formats that are accessible and actionable for both sophisticated threat hunters and less skilled security practitioners. See Figure 1.



Organization	ASN	ISP	Country	City	Postal Code	ISO Code	Latitude	Longitude	Malware Count
STARK INDUSTRIES SOLUTIONS LTD	AS44477	STARK INDUSTRIES SOLUTIONS LTD	Germany	Frankfurt am Main	60306	DE	50.1155	8.6842	2

□ Source	Domain	IP	Count	First Seen	Last Seen ↓
□ zetalytics	a86ab3c3-ef2b-4cc7-8752-4bac22018900.random.testarosa.duckdns.org	94.131.109.101	1	2024/03/07 00:00:00 UTC	2024/03/07 00:00:00 UTC
□ zetalytics	c7410ec2-de31-45ab-befb-ae856538c767.random.testarosa.duckdns.org	94.131.109.101	1	2024/03/05 00:00:00 UTC	2024/03/05 00:00:00 UTC
□ zetalytics	b2c1727c-cefc-4e93-901b-c9cf85864bfc.random.testarosa.duckdns.org	94.131.109.101	1	2024/03/04 00:00:00 UTC	2024/03/04 00:00:00 UTC
□ zetalytics	faf52996-68c1-46a1-b531-b14d611d20e3.random.testarosa.duckdns.org	94.131.109.101	1	2024/03/03 00:00:00 UTC	2024/03/03 00:00:00 UTC
□ farsight	dool.ddns.net	94.131.109.101	315	2024/01/21 03:50:05 UTC	2024/03/01 14:50:09 UTC
□ zetalytics	_ldap._tcp.pdc._msdcs.testarosa.duckdns.org	94.131.109.101	1	2024/03/01 00:00:00 UTC	2024/03/01 00:00:00 UTC
□ farsight	hostlol.ddns.net	94.131.109.101	271	2024/02/22 03:30:47 UTC	2024/02/22 18:10:03 UTC
□ farsight	0verlord.ddns.net	94.131.109.101	4	2024/02/08 04:23:11 UTC	2024/02/15 03:28:22 UTC

Figure 1. Typical IOC Detail Showing HYAS Insight Verdict, Context Enrichment, and Third-Party Integrations

This is made possible by an API-first architecture with hundreds of endpoints to support specific client use cases, as well as by integration with a broad range of other security technologies, including security incident and event management (SIEM); security orchestration, automation, and response (SOAR); endpoint detection and response (EDR); and data visualization and analysis tools. The result: Enterprises have a straightforward,

Key Findings from the 2024 SANS Threat Hunting Survey

The scarcity of threat hunting skills at all levels remains an overwhelming problem for security organizations, with 50% of survey respondents identifying it as their No. 1 obstacle to improved threat detection and response.

The need for improved contextual awareness is now clearly recognized, with more than half of the respondents planning to refine their threat hunting efforts with better data sources and tools.

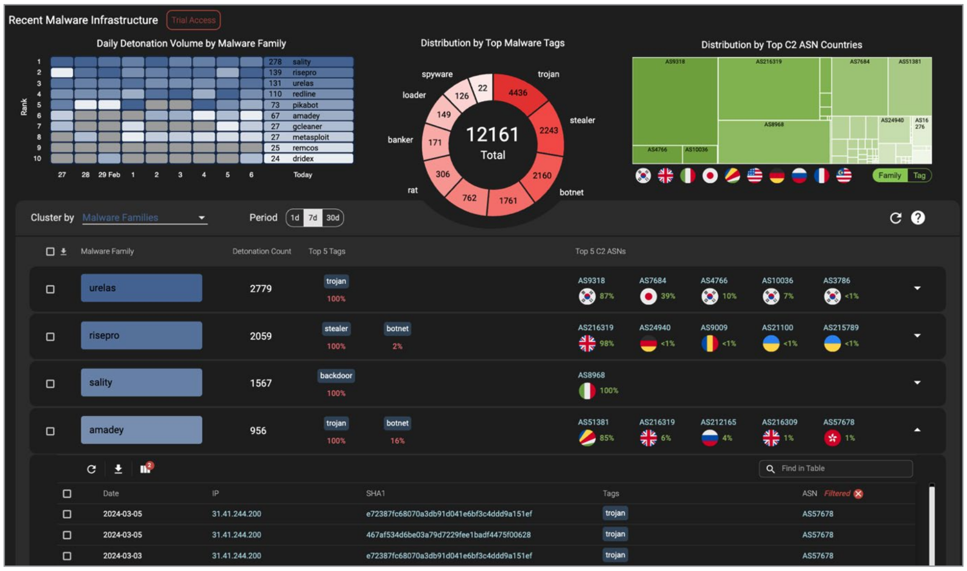
easy-to-use and cost-effective means of leveraging their threat hunting capabilities. Proactively identifying, prioritizing, and addressing threats of all types—whether ransomware attacks, insider threats, or advanced persistent threats (APTs)—becomes achievable *before* they can become weaponized.

HYAS Insight addresses many of the most critical challenges identified by the respondents to this year's SANS threat hunting survey. Let's take a close look at two of the most important:

- **The difficulty of attracting and retaining personnel with threat hunting skills.** Threat hunting is rapidly maturing as a security discipline, but highly skilled threat hunters are still hard to find—and expensive. HYAS Insight helps enterprises make the most of these scarce professionals' skills, by giving them the highly granular threat information they need to act rapidly and efficiently. But HYAS also recognizes the need to enable security professionals with less threat-hunting experience. HYAS Insight provides actionable and relevant intelligence that less experienced operators can use, while providing seasoned operators with detailed technical intelligence that helps them "connect the dots." This makes it possible for SOCs to optimize the resources they have and develop their threat hunting maturity—and does it without increasing headcount and associated costs.
- **The need for formal threat hunting methodologies.** HYAS Insight takes a highly formalized approach to threat intelligence, focusing on the three areas its clients have identified as their most critical: verdicts on adversary infrastructure, like indicators of compromise (IOCs); related infrastructure that better characterizes a threat; and threat actor information that further characterizes the people and organizations behind malicious activity. This makes it possible for threat hunters to readily make sense of threat and adversary patterns and respond effectively to those that are most relevant to them.

The concept of "pivot crawling" is central to HYAS Insight's ability to quickly provide threat hunters with actionable intelligence. Pivot crawling is a proprietary HYAS innovation that assembles data, static rules, and data science methods (both generative AI and machine learning algorithms) to make contextual sense of a vast array of threat intelligence. Interestingly—and somewhat paradoxically—pivot crawling not only assists with formal threat hunting methodologies, but also makes it possible for security organizations to rapidly develop *informal*, ad hoc threat hunts when circumstances demand them. Pivot crawling enables threat hunters to contextualize and prioritize threats that are most relevant to a specific user's requirements.

Here's a real-world example: HYAS Insight was recently able to prevent an attack targeting one of its banking clients' partner ecosystems, using highly refined, client-specific information—including geosourcing data—to identify the threat as coming from a known Russia-based group using infrastructure located in the UK. Not only was the attack stopped dead in its tracks, but HYAS Insight was able to provide forward-looking insight into ways the group might adapt its techniques in the future. See Figure 2.



☐	Malware Family	Detonation Count	Top 5 Tags		Top 5 C2 ASNs				
☐	urelas	2779	trojan 100%		AS9318 87%	AS7684 39%	AS4766 10%	AS10036 7%	AS3786 <1%
☐	risepro	2059	stealer 100%	botnet 2%	AS216319 98%	AS24940 <1%	AS9009 <1%	AS21100 <1%	AS215789 <1%
☐	sality	1567	backdoor 100%		AS8968 100%				
☐	amadey	956	trojan 100%	botnet 16%	AS51381 85%	AS216319 6%	AS212165 4%	AS216309 1%	AS57678 1%

☐	Date	IP	SHA1	Tags	ASN Filtered
☐	2024-03-05	31.41.244.200	e72387fc68070a3db91d041e6bf3c4ddd9a151ef	trojan	AS57678
☐	2024-03-05	31.41.244.200	467af534d6be03a79d7229fee1badf4475f00628	trojan	AS57678
☐	2024-03-03	31.41.244.200	e72387fc68070a3db91d041e6bf3c4ddd9a151ef	trojan	AS57678

Figure 2. Recent Malware Infrastructure Showing High-Level Patterns and Ability to Drill Down into the Tactical Intelligence

The bottom line: HYAS insight makes it possible for security organizations to make the most of their available threat hunting resources, completing more threat hunts and closing more cases. The vast array of threat intelligence HYAS Insight makes available—and, crucially, the way it makes sense of that intelligence—enables threat hunters and other security practitioners to better know their adversaries, understand their evolving tools and techniques, and both efficiently and cost-effectively protect their attack surface and increase organizational resiliency.

To learn more about HYAS' threat hunting capabilities, visit **www.hyas.com**.

SANS 2024 Threat Hunting Survey: Hunting for Normal Within Chaos **represents the ninth edition of SANS Institute's survey of security professionals engaged in or impacted by this proactive approach to identifying and remediating previously unknown or undetected security threats. The sponsors of this year's survey all offer advanced threat hunting capabilities that we believe will be of interest to SANS' clients, and, for this reason, we're presenting product briefings on their relevant product and service offerings. Note that SANS Product Briefings do not represent a SANS endorsement of a sponsor or its products, but rather an overview of its offerings and their capabilities.**

Product Briefing

Threat Hunting with Splunk: Insights from the 2024 SANS Institute Survey

March 2024

Today's complex and fast-changing threat environment means security professionals need highly advanced threat hunting technologies to ensure that they're always one step ahead of the bad actors out there. This year's edition of the annual SANS Institute threat hunting survey shows increasing enterprise recognition of the importance, and the challenges, of this essential security discipline.

The Splunk Platform

Splunk offers a comprehensive data platform designed to offer end-to-end threat visibility, from the network to the cloud to security operations centers (SOCs) at every level of threat hunting maturity. The platform, delivered flexibly as a fully managed offering in Splunk Cloud Platform or a customer-managed offering in Splunk Enterprise, makes it possible for SOCs to proactively explore, analyze, visualize, and—most importantly—act on threat data, with capabilities to support their available personnel and skill sets. These capabilities range from advanced analytics to custom boards and visualizations to artificial intelligence (AI) and machine learning (ML) toolkits. The Splunk platform capabilities are extended by the Splunk App Ecosystem, which includes thousands of free add-ons, and the Machine Learning Toolkit (MLTK) and Data Science and the Deep Learning (DSDL) app. The range of the Splunk platform capabilities is crucial, because the company—like the majority of respondents to this year's SANS Threat Hunting survey—recognizes that the difficulty of attracting and retaining skilled personnel is the single greatest problem enterprises face in addressing a rapidly evolving threat environment. To address this challenge, Splunk's SURGe security research team[1] developed the PEAK Threat Hunting Framework[2] that includes the Hunting Maturity Model (HMM),[3] which enables enterprises and their security organizations to determine what their current threat hunting capabilities are, what they need them to be, and what they'll have to do to get there. The result: SOCs can identify and mitigate security threats, rapidly, efficiently, and cost-effectively—and also use the lessons learned in the process to develop more and more sophisticated threat hunting capabilities, advance the enterprise's overall security maturity, drive continuous improvement in their security posture, and justify budget requests for further advances. As SOCs continue to mature, Splunk also offers premium security solutions to strengthen digital resilience with unified threat detection, investigation, and response.

Key Finding from the 2024 SANS Threat Hunting Survey

The need for skilled personnel remains the key obstacle to improved threat detection and response, with fully 50% of the survey respondents identifying it as their No. 1 challenge. It's worth noting that this result represents a significant decrease from the previous year's 73%. This may reflect greater overall awareness of the importance of threat hunting in the security industry and its attractiveness as a career path—but shows that attracting and retaining necessary skills is still a critical problem industrywide. It also suggests a need to reduce the reliance on manual processes by techniques like automation, AI and ML wherever appropriate.

[1] www.splunk.com/en_us/surge

[2] www.splunk.com/en_us/form/the-peak-threat-hunting-framework

[3] Bianco, David J., "A Simple Hunting Maturity Model," October 2015, https://bit.ly/HuntingMaturityModel

The Splunk platform approach to threat hunting begins with its proprietary SPL query language, which includes rich and highly expressive data analytics capabilities. This means Splunk doesn't simply stop at searching for threats, but it allows a hunter to quickly and easily create new detection techniques, taking advantage of both Splunk's speedy search and SPL's extensive analysis capabilities—in essence, giving hunters quick answers to their questions and allowing them to rapidly ask newer and better questions. The result is that threat hunting becomes faster, more efficient, and more cost-effective; and the SOC's threat hunting capabilities become dramatically more mature.

The first step in advancing a SOC's threat hunting maturity is, of course, to determine its current level of maturity. The HMM, an integral part of the PEAK Threat Hunting Framework, uses threat hunting results to establish the enterprise's current state, identify its current and future requirements, and determine the skills and technologies that will be needed to address those requirements. See Figure 1.

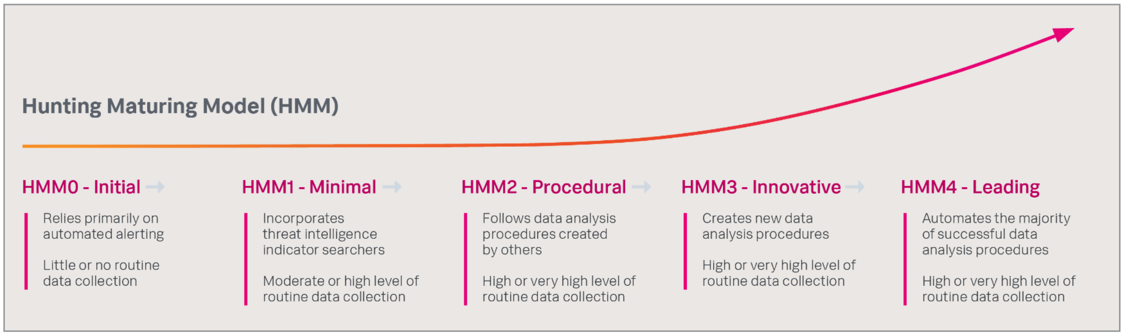

Hunting Maturing Model (HMM)
HMM0 - Initial
Relies primarily on automated alerting
Little or no routine data collection
HMM1 - Minimal
Incorporates threat intelligence indicator searchers
Moderate or high level of routine data collection
HMM2 - Procedural
Follows data analysis procedures created by others
High or very high level of routine data collection
HMM3 - Innovative
Creates new data analysis procedures
High or very high level of routine data collection
HMM4 - Leading
Automates the majority of successful data analysis procedures
High or very high level of routine data collection

Figure 1. The Hunting Maturity Model (HMM)

Figure 2 shows the steps an enterprise and its security organization may take along the path to more and more advanced threat hunting maturity, and what Splunk does at each step.

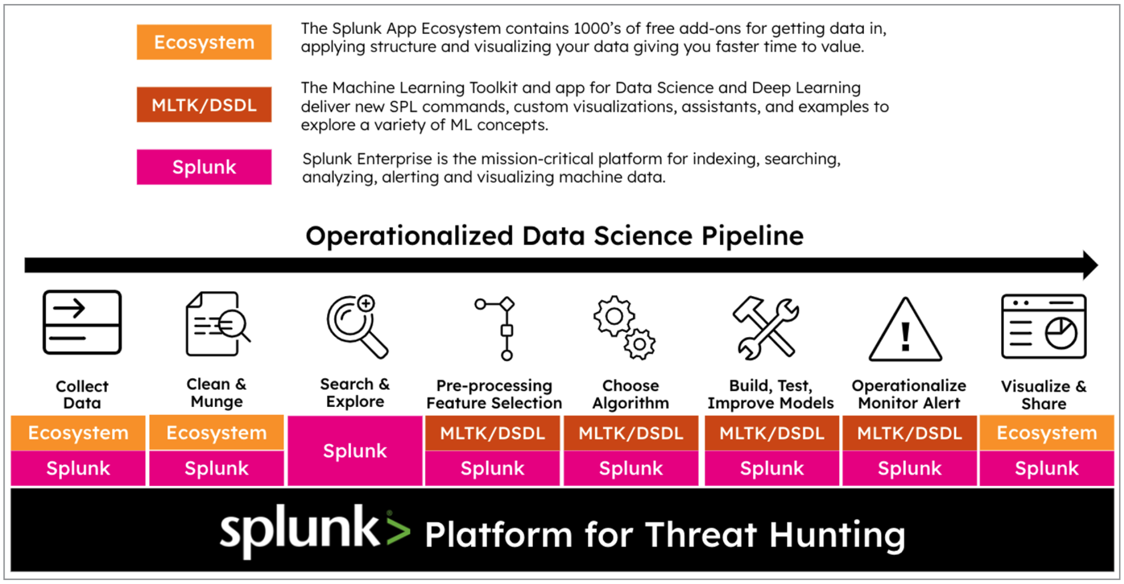

Ecosystem
The Splunk App Ecosystem contains 1000's of free add-ons for getting data in, applying structure and visualizing your data giving you faster time to value.
MLTK/DSDL
The Machine Learning Toolkit and app for Data Science and Deep Learning deliver new SPL commands, custom visualizations, assistants, and examples to explore a variety of ML concepts.
Splunk
Splunk Enterprise is the mission-critical platform for indexing, searching, analyzing, alerting and visualizing machine data.
Operationalized Data Science Pipeline
Collect Data
Ecosystem
Splunk
Clean & Munge
Ecosystem
Splunk
Search & Explore
Splunk
Pre-processing Feature Selection
MLTK/DSDL
Splunk
Choose Algorithm
MLTK/DSDL
Splunk
Build, Test, Improve Models
MLTK/DSDL
Splunk
Operationalize Monitor Alert
MLTK/DSDL
Splunk
Visualize & Share
Ecosystem
Splunk
splunk> Platform for Threat Hunting

Figure 2. Splunk's Operationalized Data Science Pipeline

This is, of course, an iterative process, and one that builds on its successes and its other outcomes. Security professionals need to recognize that threat hunting isn't just about identifying and addressing existing security events. It's also about driving continuous improvement across an organization's entire security posture. Threat actors are becoming ever more sophisticated, and their threats are becoming ever more widespread. SOCs simply can't scale to address those threats using their current labor-intensive techniques. They need tools and techniques—notably including AI and ML—that will enable them to both protect the enterprise and show their value to its most senior decision-makers.

To learn more about Splunk's threat hunting capabilities, visit **www.splunk.com/security**.

SANS 2024 Threat Hunting Survey: Hunting for Normal Within Chaos **represents the ninth edition of SANS Institute's survey of security professionals engaged in or impacted by this proactive approach to identifying and remediating previously unknown or undetected security threats. The sponsors of this year's survey all offer advanced threat hunting capabilities that we believe will be of interest to SANS' clients, and, for this reason, we're presenting product briefings on their relevant product and service offerings. Note that SANS Product Briefings do not represent a SANS endorsement of a sponsor or its products, but rather an overview of its offerings and their capabilities.**