SECURITY ANALYTICS AND MORE

Putting together an effective Incident Response plan

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What You Will Learn

In this white paper, IT and security team members will learn about the necessary components of an effective incident response plan, including:

- Why current incident response plans are failing
- Putting together the right incident response team
- Developing successful response procedures
- Selecting appropriate security technologies
- How NetFlow and security analytics can dramatically improve incident response and forensics

Attacks Are on the Rise

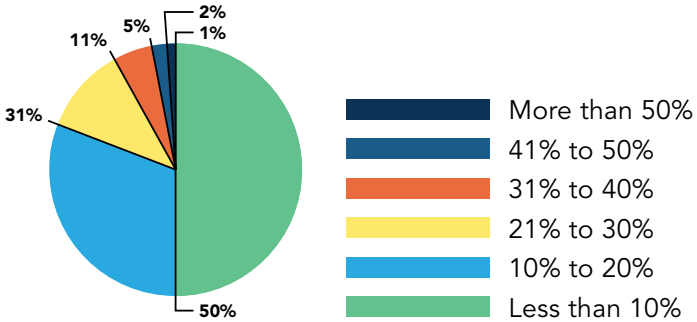
From large-scale retailers to healthcare providers and government agencies, no one remains safe from today's sophisticated, targeted attacks. Whether the attackers are after financial data, trade secrets or classified information, it has been proven time and again that no amount of perimeter security will stop them.

No matter how many technologies a company deploys at the edge of the network to try to keep unwanted intruders out, the reality is that one way or another, they will get in – whether it's via zero-day attacks, stolen access credentials, infected mobile devices, a vulnerable business partner, and the list goes on. Security success is no longer just about keeping threats out of your network, but instead about how quickly you can respond and thwart an attack when it happens.

According to Gartner, "organizations are failing at early breach detection, with more than 92 percent of breaches undetected by the breached organization."[1] In a survey by the SANS Institute, 55 percent of respondents said that up to 30 percent of their security incidents should have been detected by perimeter security measures but weren't.[2]

It is clear that we need to play a far more active role in security, constantly monitoring what is going on within our infrastructure and having an established, cyclical means of responding before attacks wreak havoc on our networks and reputations.

Incident Response Shortcomings



*Percentage of organizations' security budgets spent on incident response, according to Ponemon Institute

In a survey conducted by the Ponemon Institute, most respondents agreed that the best thing their organization could do to mitigate future breaches was to improve their incident response capabilities. Yet at that time, half of the respondents indicated that spending on incident response was less than 10 percent of their overall information security budget.[3] According to a new

"Organizations are failing at early breach detection, with more than **92%** of breaches undetected by the breached organization."[1]

– Gartner

1 - Gartner, "Magic Quadrant for Security Information and Event Management," May 2013

2 - SANS Institute, "The Case for Visibility: SANS 2nd Annual Survey on the State of Endpoint Risk and Security," March 2015

3 - Ponemon Institute, "Cyber Security Incident Response - Are we as prepared as we think?" January 2014

survey, 90 percent of large businesses say they have experienced major IT incidents throughout the year, yet only about half have an incident response team in place to handle such incidents.[4]

Based on the continuous deluge of attacks on the world's most well-known brands and institutions, we still have a long way to go when it comes to incident response. Today's hackers are remaining undetected on networks for an unacceptable amount of time – an average of 100 to 200 days![5]

Shoring Up Incident Response Plans

Incident response includes the people, processes and technology used to detect and respond to security incidents. Each of these pieces of the puzzle – people, processes and technology – are equally important in establishing and executing an effective response plan.

The People

So who should be involved in an organization's incident response plan? In short, everyone.

The CSIRT Team

First and foremost, enterprise organizations need to have a fully functional Computer Security Incident Response Team (CSIRT) consisting of trained, dedicated security professionals. Every organization, no matter how small, should have at least one designated person who is responsible for computer security incident response. And unfortunately, being an expert in security does not necessarily mean that you're an expert in incident response. Incident responders must possess specific background in, or be trained to handle, high-pressure response scenarios. It is also important to have committed incident responders who are not also responsible for myriad other IT/security functions.

The incident response team should have an in-depth understanding of their network and its assets. In many cases today, attackers conduct thorough reconnaissance and know more about their target network than the victim's own IT/security team! The right technologies can help incident responders discover assets on their network, determine which ones are most critical to protect, and baseline normal behaviors to more quickly identify anomalies that could signify an attack.

Beyond IT

But there's more to incident response than having the right technical team in place. Beyond just the IT team, key stakeholders throughout the company in areas including Legal, Executive Management, HR and Public Relations should also play an integral role in an organization's incident response plan. Organizations need to figure out what these groups would need to do in the event of an incident. They need to establish roles and responsibilities BEFORE an incident occurs, and bring these individuals into the fold early on. It is also important to keep upper management informed about incident response procedures, successes and challenges to make sure that these efforts receive the appropriate amount of attention and funding needed to be effective.

And lastly, in an ideal world, each and every employee – and even third party – that an organization works with should help support the incident response team. Train employees on security so that they know what to look for in the event of a social engineering attempt. Carefully screen, conduct background checks and inquire about the security of any third party that has access to your network or even just confidential information about your company. And

"Stealthwatch enables security and incident response teams to remediate incidents faster than before, reducing downtime and the overall costs of managing networks and network services."

– Telenor Norway

4 - Dimensional Research, "Major Incident Management Trends 2016," December 2015

5 - Cisco 2015 Midyear Security Report

do not forget about the insider threat. Train managers to look out for and report suspicious employee behaviors to HR, and train HR to communicate these concerns to IT.

The Processes

Incident response cannot be an afterthought. Enterprise organizations need a firmly established, well thought out response plan that incorporates key individuals and groups from across the business.

In order to be truly effective, incident response plans should include:

1. **VERY CLEAR ROLES, RESPONSIBILITIES AND APPROVAL PROCESSES** for all players, and defined rules for when specific actions can and cannot be taken. For example, is the incident response team permitted to take machines offline without additional approval to contain an attack? What about wiping computers or blocking access to specific services? Are these actions permitted when necessary? Additionally, what are the company's legal, regulatory and contractual obligations when a breach occurs? It is critical to have these types of questions answered in writing before an incident happens. Ideally, your IR plan should strike a comfortable balance between having policies in place to ensure that the right decisions are made in a crisis, yet not having so many layers of approval that you hinder the efficacy of skilled responders.

2. **REGULAR TRAINING AND ASSESSMENT EXERCISES.** There may be a substantial amount of time between incidents at your company. During that time, it is critical to continue training all relevant staff and to conduct exercises to assess their readiness in the event of an incident. Additionally, when incidents do occur, do not forget to use them as an opportunity to measure the efficacy of your team. Using metrics such as the mean time to identify (MTTI), mean time to know the root cause (MTTK) and mean time to fix (MTTF) a security issue can greatly assist in your efforts to improve your response processes, as well as demonstrate return on investment to upper management.

3. **A REGULAR MEANS OF COMMUNICATING INCIDENT RESPONSE PLANNING EFFORTS AND SUCCESSES WITH UPPER MANAGEMENT** to ensure that the appropriate amount of attention and investment is dedicated to the process, and that its critical role in business continuity is understood.

4. **A FIRM UNDERSTANDING OF THE ORGANIZATION'S INFRASTRUCTURE AND WHERE THE "CROWN JEWELS" LIE.** Visibility into both the typical activity happening inside the network, as well as reliable threat intelligence from the outside world are critical components for incident response.

5. **A FEEDBACK LOOP TO ENSURE THAT INCIDENTS ARE NOT JUST SIMPLY CLEANED UP** but also investigated to forensically extract key details about the attackers and their methods in order to prevent similar attacks in the future.

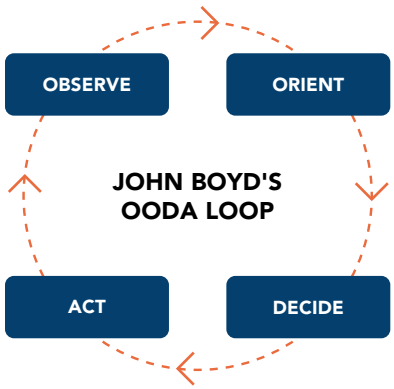
The Technology

Equally important as having the right people and processes in place is having the right technology deployed – BEFORE an incident occurs.

Threat intelligence from the outside is important for keeping up with known attacks, but without tools that help incident response teams gain critical insight into their own network activity, response efforts will be futile. After all, you can't protect what you can't see.

"Stealthwatch reduces problem-solving from days to seconds. With Stealthwatch, we can stay ahead of potential attacks and breaches."

– Edge Web Hosting



It is not just about simply cleaning up malware and getting infected computers back online. Further investigation needs to be done to determine the full extent of the attack, whether additional machines were affected, and the types of tactics used by the attackers, to make sure that you have completely rooted the attack out of your environment and that the same exact attack will not happen again.

Leveraging Network Audit Trails

The best way to see what is going on within today's large, complex networks is to collect and analyze network audit trails. In fact, eighty percent of respondents in a Ponemon survey indicated that analysis of audit trails from sources like NetFlow and packet captures was the most effective approach for detecting security incidents and breaches.[6]

By leveraging network activity logs, organizations can more easily be aware of and shut down attack attempts. NetFlow in particular is a highly effective technology because it can be collected throughout the network without installing dedicated probes, and can be stored for long periods of time at an affordable cost.

The Power of NetFlow

First created by Cisco and now inherent in a wide range of network infrastructure devices, NetFlow provides valuable network metadata from existing routers, switches and firewalls to increase visibility and situational awareness. It provides a record of each connection that occurs over a network, including the 'to' and 'from' addresses, port numbers and the amount of data transferred. When fully leveraged, NetFlow can reveal countless valuable details about your network assets and behaviors – who is talking to whom, which devices and applications are being used, etc.

Most organizations will already have access to NetFlow within their environment; they simply have to begin collecting and analyzing it in order to achieve new levels of insight into their network. But not all NetFlow monitoring technologies are created equal.

With the constant network evolution we are experiencing today, networks are churning out massive quantities of Big Data. While having access to that data is a good first step, unfortunately it means nothing if incident response teams cannot make sense of it and leverage it for improved awareness and better decision-making. That is where advanced, flow-based monitoring solutions like Cisco Stealthwatch come in.

Cisco Stealthwatch

Cisco Stealthwatch serves as the eyes and ears of the network – rapidly collecting and analyzing massive amounts of NetFlow data to deliver in-depth visibility and actionable intelligence to security and response teams. Combined with other Cisco security technologies, Stealthwatch enables organizations to cost-effectively leverage their existing infrastructure to turn their network into an always-on security sensor for more seamless threat detection.

Stealthwatch also allows IT teams to better understand their network before a security event occurs. Additionally, through sophisticated, behavioral-based analytics, Stealthwatch can quickly find that "needle in the haystack" and automatically detect a wide range of attacks from zero-day malware and DDoS to APTs and insider threats.

Stealthwatch dramatically reduces the manual analysis associated with other network/security monitoring tools, often reducing troubleshooting down from days/months to minutes. Intuitive dashboards and reports enable security and incident response professionals to rapidly get to the information they need

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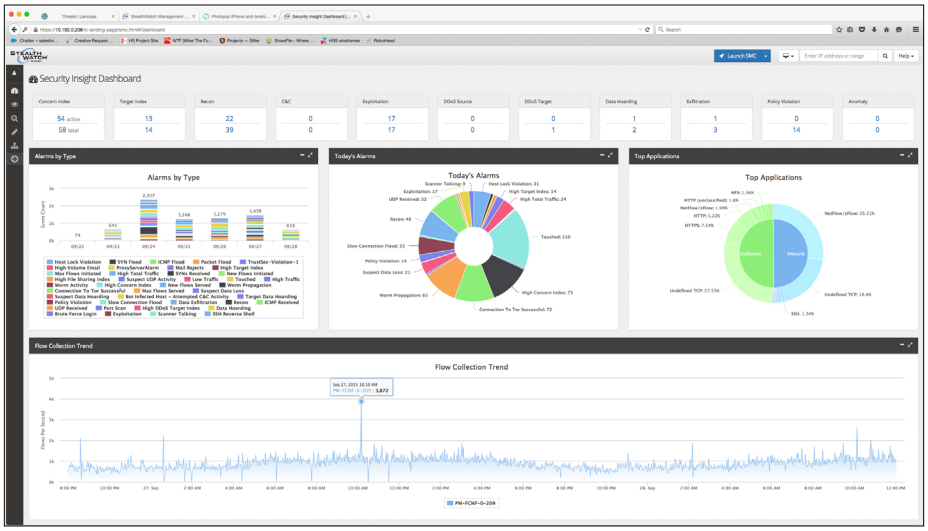
– Ponemon Institute

6 – Ponemon Institute, "Cyber Security Incident Response - Are we as prepared as we think?" January 2014

with just a few clicks – whether it's an overall picture of network activity, a list of potential issues or a view into a specific host.



Cisco Stealthwatch provides advanced network visibility and security intelligence for accelerated incident response.

Perhaps an insider is trying repeatedly to access restricted areas of your network. Or maybe unusually large amounts of data are being sent out of your network, or an internal host is communicating with a suspicious IP address in a foreign country. An effective network visibility and security analytics tool can pick up on these behaviors and alert administrators to investigate further.

The Stealthwatch Difference

Unlike other technologies that only monitor traffic going in and out of the network, Stealthwatch also monitors lateral (East-West) traffic to detect attacks spreading inside the network, which is critical for identifying insider threats. By constantly monitoring the network for anomalous behavior, and using advanced security analytics, alarming and reporting to alert administrators to potential issues, Stealthwatch enables faster, more efficient incident response.

While processing NetFlow can be less resource-intensive than alternatives such as full packet capture, pervasive logging on a global enterprise may still generate record volumes exceeding one million flows per second. An effective solution must be able to scale appropriately to cut down on storage and power consumption. Stealthwatch's massive scalability and ability to de-duplicate and stitch unidirectional flow records together results in cost-effective flow monitoring and storage for even the largest, most complex enterprise networks.

In addition to improving real-time threat detection, Stealthwatch also enables faster, more thorough forensic investigations with the ability to store flow data for months or even years, and quickly drill down into the data with advanced querying capabilities to extract pertinent information about previous attacks. This historical look-back is critical for evaluating previous incidents and fine-tuning incident response procedures to improve threat defense in the future. The ability to efficiently collect, analyze and interpret huge volumes of network and security data will become even more important as networks continue to grow and evolve through cloud, SDN and IoT architectures.

"Before Stealthwatch, we manually analyzed and correlated our network activity data. Stealthwatch automatically gives us detailed network insight through a single, easy-to-use interface, aiding our security, network operations and compliance efforts."

– BlueCross BlueShield of Tennessee

Enhanced Security Context and Integrations

Research reveals that 69 percent of organizations say their security tools do not provide enough context for them to understand their risk.[7] Through both its own technologies and industry collaborations, including tight integration with other Cisco technologies, Stealthwatch brings in additional layers of security context to further accelerate and improve incident response and forensics. Examples of these value-added layers of intelligence include:

- User and device awareness
- Cloud visibility
- Application awareness
- Threat Feed data
- Endpoint security integration
- Proxy visibility
- Packet capture

Having access to all of this information from a single console dramatically streamlines threat investigation and remediation. In fact, according to the Enterprise Strategy Group, 80 percent of organizations believe that their incident detection/response processes are hindered by a lack of security technology integration.[8] Unfortunately, disjointed solutions slow down threat mitigation and leave security gaps that attackers can more easily exploit. Enhanced layers of context and deep integrations enable a more automated, fluid and effective response to the full spectrum of cyber threats facing today's organizations.

Conclusion

Unfortunately, there are no technologies out there today that can completely keep hackers out of enterprise networks. However, if an organization is regularly monitoring its own environment with the right mix of people, processes and technology, the security team will be better equipped to pinpoint and stop an attack while it's still happening – avoiding the disastrous results and costs associated with a data breach.

For More Information

Combined with Cisco's broad security portfolio, Stealthwatch can provide comprehensive protection and streamlined incident response from edge to access – across the network, data center, endpoints, mobile devices and the cloud.

Click here to read how Cisco's own CSIRT uses Stealthwatch to detect and analyze malicious traffic for improved incident response and forensics.

To learn more about the role of NetFlow in digital forensics and incident response, go to:

https://www.lancope.com/blog/netflow-forensics-incident-response

80% of organizations believe that their incident detection/response processes are hindered by a lack of security technology integration.[8]

– Enterprise Strategy Group

7 – Ponemon Institute, "Privileged User Abuse & The Insider Threat," May 2014

8 - Enterprise Strategy Group, "Tackling Attack Detection and Incident Response," April 2015

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