Experts on Optimizing Your Security Stack

Expert Insights on Upgrading and Optimizing Your Security Stack
Security teams have a difficult task to perform, and it’s not getting any easier. IT environments are becoming more complex, threats are becoming more sophisticated, and the number of known vulnerabilities is dramatically increasing. In addition, there is a critical shortage of skilled IT security specialists, and the tools used to defend IT environments are rapidly evolving.

Many organizations have reached a critical point where they must optimize their security stack just to keep up with threats and maintain their risk profile. Yet adding new technology requires new skills, and it potentially adds even more complexity. How are organizations addressing these challenges?

With the generous support of Carbon Black, we decided to dig into the problem by asking seven security experts the following question: What suggestions do you have for organizations that want to upgrade and optimize their security stack?

People across industries agree on the importance of being able to correlate data from the network, endpoints, and user behaviors and automating as many detection and response tasks as possible. To avoid adding unnecessary complexity, they recommend starting with a plan that includes the outcomes you expect to achieve.

This eBook explores strategies for getting the most out of your security stack. If you ever lie awake at night worrying about security issues you will face tomorrow, or even if you don’t, there is plenty of good advice in these essays.

All the best,
David Rogelberg
Publisher,
Mighty Guides, Inc.

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As the threat landscape evolves, it's imperative to develop a stack that is capable of evolving with it—one that is positioned to work with your organization's unique needs. Constantly replacing security tools isn't a sustainable practice, and neither is operating within silos.

You need access to the right data in a way that can be easily digested and acted upon. While selecting tools with specific capabilities is important, it's also imperative to focus on the way that they interact with one another. Can they integrate and share data? Can you use an alert from one tool to take action in another?

Endpoint security is a core component of an effective stack. With and more and more organizations moving to the cloud, Carbon Black offers a cloud-delivered endpoint protection platform that meets multiple use cases, using a single agent and console, that gives companies better protection and simplifies their operations. Because we understand the importance of integration, our platform is built on open APIs, making it easy for organizations to correlate data across their stack and have the full picture.

Optimizing security is easier said than done but, armed with the right plan and information, it is possible. I hope these essays aid in this endeavor.

Regards,

Mike Viscuso
Chief Strategy Officer and Cofounder of Carbon Black
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Before you can make decisions about building out your security stack, you must understand where you are and where you have to go. This involves performing a capabilities inventory and needs assessment. The needs assessment includes factors specific to the business, such as gaps in your current security capabilities, acceptable levels of risk, and any relevant regulatory and compliance requirements.

Based on this assessment, you can build a strategy matrix that plots key elements of your environment against a framework. For example, you can use the broad security categories of the National Institute of Standards and Technology (NIST) framework—identify, protect, detect, respond, and recover—as pillars in your matrix and then plot key areas of your security program against these. These key areas might include such things as threats, vulnerabilities, assets, governance, and compliance. Then you can use this matrix to drive the discussion around where you are and where you need to be.

For some things, it might be a discussion about security maturity to determine what the right next step is to reach a maturity objective. Or the need to change something might be driven by a particular threat, vulnerability, or weakness in your security program. Compliance could be a driver, where you know you're strong on identity proofing but you have weaknesses in documenting authorization. The point is, this matrix or strategy map becomes the basis for deciding what you need to do next.

To effectively correlate activity and identify events, you need tools with analytics capabilities.
As you consider technology solutions, automation is becoming the foundation of rapid event detection and response. This requires several capabilities:

- **Data visibility.** You need a holistic view of activity in the environment, which requires bringing together telemetry and log data from many sources in a way that can be analyzed. An integrated security stack gives you great telemetry by integrating everything into a single pane of glass.

- **Event correlation.** Event correlation has become table stakes in cybersecurity. For example, you have to be able to correlate device access activity logged by a domain controller with an IP address, what processes are using that IP address when the access occurs, and how that activity relates to other activities in the environment, such as application, port, or user activities at particular endpoints. Correlation engines can look at all the different events, study the timestamps, examine the user IDs involved, consider the network and endpoints involved, and then determine if it is normal activity or a security event.

- **Analytics.** To effectively correlate activity and identify events, you need tools with analytics capabilities to ingest all those logs from different sources in the security stack and differentiate legitimate from suspicious activity. This involves training the tools to tune out noise so you are not overwhelmed by false positives, but that is the only way to view and process all activity in the environment.
Once you identify and validate an event, automation plays a role in responding quickly to limit its effects. You may quarantine a device to a quarantine network, trigger a domain name system (DNS) black hole based in detected activity, or automatically delete a phishing email. Many response and recovery activities can be automated to reduce your exposure to malicious activity. To effectively build out these capabilities, you need to use your strategy matrix and tie the needs to the business.

KEY POINTS

1. Before building out your security stack, understand where you are and where you have to go. Perform a capabilities inventory and a needs assessment, and then build a strategy matrix that plots key elements of your environment against a framework.

2. As you consider technology solutions, automation is becoming the foundation of rapid event detection and response. This requires data visibility across the environment, including endpoints, event correlation, and analytics.
James Carder brings more than 21 years of experience working in corporate security and consulting for the Fortune 500 and U.S. Government. At LogRhythm, he oversees the company’s governance, risk, and compliance program and its security architecture, awareness, physical security, and security operations. He also directs the LogRhythm Labs strategic integrations, threat, and compliance research teams.

As security becomes a top IT priority for many companies, security budgets grow accordingly. Too often, companies use those budgets to buy every tool available to them without adequate regard for how these tools integrate with one another. This results in underutilized technology stacks and the collection of unused data.

To optimize their security stacks, companies need to simplify toward best-of-breed technologies that meet operational needs. Core security operations include network detection and response, endpoint detection and response, and correlation of data from all the technologies in the security stack. You need to be able to draw conclusions based on data collected from different parts of your environment. Integration is key. To be successful at stopping incidents before they become breaches, you must make sure that all those technologies talk to each other.

Additionally, your technology should be able to tell a complete story about how you are detecting and responding to incidents. When the security discussion reaches senior business management, they don’t want to hear about all the risks and threats you are dealing with. They want you to tell them what you are doing and how effectively you are doing it.

Endpoint detection and response is important because that’s where most attacks begin. Once an attacker breaches an endpoint, they move laterally to other endpoints or spread deeper into the network environment from the endpoints. Endpoint visibility is critical for detection and control. This is why many attack frameworks, such as MITRE ATT&CK (Adversarial Tactics, Techniques, and Common Knowledge), are so useful.

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Techniques, and Common Knowledge), emphasize detecting and responding to endpoint activity.

Detecting and responding to unusual network activity is also critical. The correlation ability through a security incident event monitoring (SIEM) or other correlation tool enables you to tell that complete story. For instance, you might have network traffic that says you have command-and-control activity back to a particular IP address. And, oh, by the way, one endpoint has spun up a process that connects back to that address, so those match up. The threat intelligence you’ve integrated into the SIEM platform indicates that address correlates to a Russian attack group. Now you have a complete story of the threat you are dealing with at that point in time, which gives you the power to respond. That might involve going to an endpoint to wipe a file, stop a process, or contain the system and then going to the network to block traffic.

This ability to observe and correlate behaviors becomes key to maintaining a zero-trust security strategy in which you compartmentalize user, network, system, and application. Your trust of the user is independent of your trust of the network or the system, and your trust of the system is independent of your trust of the network or the user. If an endpoint activity looks normal and the network activity looks normal, but suddenly the behaviors are changing for the user using that endpoint, that should throw up an alarm.

“Your technology needs to be able to tell a complete story about how you are detecting and responding to incidents.”
Executing this kind of strategy to speed detection and response depends on automation and orchestration. Automation can help you detect and neutralize attacks even before security personnel are aware that the attack is underway. Automation and orchestration is where the optimization and efficiency of your security stack are really tested. If automation is not built into your stack, you need to build it based on considerations such as your company risk profile, the industry you’re in, and the threats you face. Build automation orchestration to address your top 10 use cases for the biggest threats to the business, and then build out incrementally from there.

KEY POINTS

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2. Automation can help you detect and neutralize attacks even before security personnel are aware that the attack is underway. Automation orchestration is where the optimization and efficiency of your security stack are really tested.
When you optimize your security stack, you must do so in the context of those items that pose the greatest threat. This is true whether you have a large environment with 80,000 connected devices or a small business. Every company has resource limitations; therefore, resources must be directed to where the statistical probability of events occurring is highest. Focus your strategy on three fundamentals:

1. **Ensure a strong vulnerability management program**, which includes having the tools that can scan your environment and locate vulnerabilities. Most breaches happen through known vulnerabilities, so hackers look for the easiest way in. They don’t need to invest in the most sophisticated attacks when all they have to do is find companies that don’t patch well and don’t have vulnerability management programs. Plenty of companies have weak patch and vulnerability management.

2. **Make sure you have strong configuration management**. This needs to include application access and authentication around network devices. This becomes more critical as IT environments become more complex.

3. **Be able to mitigate threats**—especially insider threats—as quickly as possible. Insider threats are often not malicious. They can be careless behaviors or mistakes that people with legitimate access make.

An effective optimization strategy is to **eliminate dashboards and integrate as much as possible.**
You need monitoring and detection tools that support these strategies, and it’s important to have the capability to consolidate and correlate data from various tools in the security stack. It’s common for a big company to be running 50 different security tools, and each one might come with its own dashboard. An effective optimization strategy is to eliminate dashboards and integrate as much as possible into a central location where you can monitor, correlate, and control everything. This might be a SOC (security operations center) with a solid security incident event monitoring (SIEM) system combined with security orchestration, automation, and response (SOAR) technology that can automate responses to events that happen in the environment.

It’s important to include endpoint monitoring because endpoints are typically the source of breaches. If you don’t know and understand what’s going on at the endpoint—whether it’s a laptop, a desktop, a server, or any endpoint device—you can’t detect and immediately respond to malicious endpoint activity. Also, you can’t perform forensic investigation, and you open yourself up to potential lateral movements to other devices. Because most events start on a device, without integrated endpoint security, you lose the ability to handle localized events quickly.

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It's important to integrate data from various tools in the security stack so that you can automate as much monitoring, correlation, and incident response as possible.

Detailed endpoint activity monitoring—whether it's on laptops, desktops, servers, or any endpoint device—enables you to detect and immediately respond to events and perform more effective forensics.
Before even thinking about optimizing or upgrading a security stack, an organization needs to have a solid roadmap that identifies current technological and process weaknesses. This becomes the basis for a plan to upgrade the tech stack driven by intelligent decision-making rather than a feckless pursuit of the latest gadgets.

Most organizations focus on key security strategies that include network controls, identity management, and data access management. That becomes a challenge in today's perimeterless environments. Now it's necessary to think about how you are going to secure data that resides with external service providers, data that is accessed by devices the company does not own, and ways to secure an environment marked by associates working in your organization who never touch a corporate-controlled perimeter. In this environment, security strategy shifts away from prevention and shifts toward a more proactive strategy of immediately seeing when people have done something incorrect. This enables you to identify weak spots quickly and close them down.

The fuel for proactive security in a perimeterless environment is activity data. That data comes from multiple sources, including security tools and cloud-based services, and processing it requires analytics capabilities. Effectively collecting and correlating all that data depends on interoperability in your security stack, and interoperability comes from open application programming interfaces (APIs). When choosing technologies for your security stack, a fundamental criteria should be the availability of open APIs.

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Interoperability allows the consolidation of data feeds into a security orchestration, automation, and response (SOAR) platform, which becomes the foundation upon which you build other capabilities. This kind of platform lets you analyze the consolidated data to identify usage patterns across your entire environment. For example, in cloud environments, some of your most sensitive data assets may be on service provider systems, where you have limited visibility and must rely on their logs and reporting. However, with an agent-based endpoint security system and big data analytics, you can find out where people are going, whether the protocols they're using are encrypted, whether the usage patterns off-network are different from the usage patterns on-network, and when those patterns change. Advanced endpoint detection and response suites help mitigate the user’s impact on your data in ways that are less intrusive to the user. You can extend the reach of the decisioning engine outside your perimeter so that when somebody is not on-network, there’s still a level of protection. These are important capabilities, and to get their full benefit, they have to function within the framework of your security stack.

When building out your stack to improve incident detection, your analytical capabilities must be scalable to your worst data day. On the response side, you need technology that can rapidly take network-based control of assets in your environment. This can be through microsegmentation and network access control. It can include enterprise data replication (EDR) technology that quarantines individual or group...
Effectively collecting and correlating all that data depends on interoperability in your security stack, and interoperability comes from open APIs. An agent-based endpoint security system allows you to see where people are going, whether the protocols they’re using are encrypted, whether the usage patterns off-network are different from the usage patterns on-network, and if those patterns change.

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2. An agent-based endpoint security system allows you to see where people are going, whether the protocols they’re using are encrypted, whether the usage patterns off-network are different from the usage patterns on-network, and if those patterns change.
Optimizing a security practice is first and foremost about optimizing people and processes. Technology is important, but the technology stack serves the operational needs of people and processes. Therefore, the first step in optimizing a technology stack is to clearly understand the outcomes you expect from people, process, and technology that compose a security practice.

A key goal for most security organizations is to reduce mean time to detection and mean time to remediation. These go hand-in-hand. Technology can now detect events as they happen, and it can trigger actions that immediately begin a remediation process. It's no longer necessary to put in a ticket and wait for the next available IT person to address an issue that may or may not plug a vulnerability.

On the detection side, one of the best ways to reduce mean time to detect is to correlate all the data sets from security technologies throughout the environment, apply behavioral analysis to that correlated data, and then drive high-fidelity alerts. This can only be done if you are able to integrate that technology stack so that endpoint technology can reach out to firewall technology and domain name system (DNS) technology.

Correlating data from all the different security technologies is the only way to build a complete picture of event activity in an IT environment, but doing that manually is a time-consuming process that’s ultimately impossible. Organizations need to prioritize configuration of open application programming interfaces (APIs) so they can begin orchestrating and automating the tools in their stack to communicate with each other and correlate their event data.

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Because of where data resides, one of the most important data sources comes from endpoints. Although configuration files for routers and switches can provide useful information for attackers, the data attackers are after does not reside on routers or switches. The data attackers really want is found on endpoints. You need to monitor endpoint activity to detect such things as registry changes that could be signs of persistence, credential harvesting, and lateral movement. To understand when privileged accounts are in use or misuse, you need to correlate endpoint activity data to active directory logs, and then you have to be able to correlate this data with network data so you can build the complete picture of an attack.

On the response side, you need to be able to orchestrate and automate tasks based on detection alerts. This includes things like shunning ports and IP addresses, automating a DNS sinkhole, and isolating specific endpoints. It can also include changing endpoint registry settings or resetting a system to a previous state. To optimize time to remediation, humans should not be in the loop on these kinds of response tasks.

Another important piece of an optimization strategy is the ability to perform behavior analytics, which plays an essential role in interpreting all this correlated data. Behavioral analytics not only helps identify events that require immediate action, but also helps with forensics in determining where an attack came from, how it unfolded, and how far it spread.
Furthermore, it establishes a baseline of normal behavior. This is critical in minimizing false positives so that your team can focus on real threats.

Many security teams struggle with too many pieces of technology. Even if they look at the Center for Internet Security (CIS) top-20 critical security controls, that’s 20 individual pieces of technology that have to be integrated, orchestrated, and managed—or not if the teams lack the skills or resources to tie it all together. When optimizing the security stack, security teams must consider the time they will spend operating and maintaining the technology versus the time they should be spending improving detection and remediation and refining their security practice. In most cases, a security practice benefits from one orchestration and automation platform that correlates all data, applies behavioral analytics, accurately identifies threats in real time, and automatically initiates remediation. That is how teams will secure their environment and stay ahead of the bad guys.

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2. When optimizing the security stack, security teams need to consider the time they will spend operating and maintaining the technology versus the time they should be spending improving detection and remediation and refining their security practice.
Many factors in IT security make greater process automation a necessity. Key among them are the volume of activity data, alerts, and event data that must be analyzed and a shortage of security people available to do the work that needs to be done.

To address these issues, security orchestration and automation platforms are emerging that bring together the different applications in a security stack so that monitoring, analysis, and response become faster and more efficient. This can only be done if there is interoperation between the applications in your security stack. A key consideration when optimizing a security stack is making sure new technologies work with each other and with your existing tools. Upgrading capabilities in a way that fails to align with an existing or planned orchestration and automation effort results in siloed functionalities.

There has always been a need for security tools to interoperate at some level. What’s new is the emergence of security orchestration platforms that allow you to use open application programming interfaces (APIs) to stitch together solutions so you can perform tasks faster and do things that you couldn’t do before. For example, rather than have an analyst with 10 tabs open in her browser doing the grunt work of correlating data and processing alerts, a technology stack can automate these functions. Security personnel are too valuable to be burned out performing those mundane tasks. It is far better for them to receive fully analyzed and correlated alert reports that allow them to do what they can uniquely do—make informed determinations quickly—and then take appropriate action.

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Orchestration and automation are critical because, without them, security teams cannot handle the volume of alerts they receive. As a result, too many alerts are left on the floor. Much of what is done to detect and analyze a suspicious event can be automated. For example, in the case of a phishing attack, you can automatically parse emails against criteria for deciding whether or not you create a case. You can strip everything out of the email—where it came from, maybe an executable, and maybe a malicious URL that’s serving an executable. Then you can look at who registered that domain and how long it has been registered. You can also see how broad that attack was, which endpoints were affected, who manages them, and what data was available on them. All of this can be automated and done in minutes to bring enormous speed and efficiency to the process. Machine learning takes it a step further by comparing this to previous incidents and other activity in the system and then prioritizing responses.

Building these capabilities into your security stack is not just about buying new technology. It also involves getting the most out of your existing technologies, which are often underutilized. One reason for their underutilization is a lack of interoperability in the technology stack, which severely limits the security team’s ability to correlate event data from different tools looking at different parts of the environment. Another reason for technology underutilization is a people and process factor. To be successful, you need to understand what your standard operating procedure is, and you need to be able to consistently and repeatedly follow that standard procedure. If you do not have that capability nailed, any success you have with automation and orchestration will be because
you are lucky, not because you are ready. You must know what the process is before you can intelligently build out your technology stack to orchestrate and automate that process.

Successful companies often approach automation and orchestration carefully, using a crawl, walk, run strategy. An incremental approach could involve these steps:

- Look at upgrading specific controls that lend themselves to integration into an orchestration and automation framework.
- Work to maximize incremental efficiency offered by each control as it is deployed.
- Use those efficiency gains to justify further investment.
- Avoid throwing the highest volume incidents into the process until the newly integrated control is proven on attack types you may see only a couple of times a month.

As they build competency, security teams can begin having more meaningful security conversations with business managers. This can include discussion of incidents specific to those business units, their time to detection, their time to remediation, and their risk to the business. Security automation gives the security team what it needs to engage more strategically in the business.

**KEY POINTS**

1. Security Orchestration and Automation platforms are emerging that bring together the different applications in a security stack so that monitoring, analysis, and response become faster and more efficient.

2. Building automation into your security practice is not just about buying new technology. It also involves getting the most out of existing technologies through better integration and clearly understanding your processes.
In any organization, cybersecurity is 30–40% technology and 60–70% human behavior. At the end of the day, you can’t have a good cybersecurity program if your organization doesn’t understand it and actively buy into it.

Securing complex IT environments depends on running a proactive security practice. To do that successfully, you must align a business’s security requirements with technology needs and available resources. One approach is to develop a scorecard that balances security needs against other competing priorities. On the security side of the equation, you would include risks, the likelihood of those risks being realized, their potential impact to the business, and the cost of addressing those risks. This enables you to weigh security costs and business priorities so that you can make wise security investments.

This balance scorecard will continually change to reflect changes in the IT environment, threat landscape, and business needs. By translating that scorecard into a strategic roadmap for presentation in nontechnical, business language, you can win buy-in from key leaders in the organization. This does more than help you make smarter decisions about resource allocation and technology investments. It brings the rest of the organization into the security process and gives them an ownership stake in cybersecurity.

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When investing in a security stack, it’s easy to get caught up in acquiring specific technologies to solve specific problems without really defining the complexity of the stack you are building. This is an important consideration because complexity itself is a risk. The more complexity there is in a solution set, the harder it is to respond effectively with those tools. You need more people to manage them, which is itself a challenge because of the scarcity to security talent. You end up managing the complexity rather than managing the outcomes you are trying to derive from that technology.

That’s one reason why it’s so important to invest in technology that integrates across the stack. For example, endpoint security is critical because you have to manage the entry points where human activity occurs. But the more intelligence you can build into activity monitoring and the more endpoint data you have to integrate with the rest of the stack, the more real-time contextual information is available for analysis. This makes fast incident response possible. But again, you need to be mindful of complexity. Better technology integration reduces the staff overhead required to manage the entire security program.
Optimizing your security program and your security technology is a continuous process that has to happen along with all the other IT operations that keep the business running. This involves regularly querying the cybersecurity team and business leaders about their top-five security concerns that keep them up at night. Then go back to that balance scorecard to reevaluate your security investment priorities to be sure you are covering those top-five security concerns. Optimizing the security stack requires the right balance of technology and human involvement, organizational trust in the security practice, and proactive thinking.

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2. With too much complexity in the system, you manage the complexity rather than the outcomes you are trying to get from that security stack. That’s one reason it’s so important to have technology that integrates across the stack.
When planning a security stack upgrade, context is important. Many businesses depend on third parties for services that give them access to your IT assets. For example, it’s a common practice for businesses to contract with third parties to handle payments, manage human resources, and perform other functions. You may have a technology stack set up to protect your internal systems, but how do you protect yourself from those third parties? For example, attackers using an island hopping strategy could breach one of your partners as an interim stage in an attack that is ultimately targeting you. For both regulatory reasons and just good security, you need to recognize that your security operation involves an extended environment. There are technologies that can help assess third parties, and you can monitor activities related to their touch points.

Another important consideration is whether your security practice is at a maturity level where you are able to track assets and stay current with the kinds of changes that happen continuously in an IT environment. This is important because, as you build out your security stack, lots of data will be generated by the technologies you use. To collect and analyze data for suspicious activity, you must have data compatibility so that you can correlate information in a way that allows you to tell a consistent story about the activities you are monitoring. In addition, you have to be able to correlate those activities to specific assets, people, and policies. This can be a challenge for security organizations because it involves continuous change management.

“It’s great to have a lot of data sources, but you also must have mature communication and processes between the teams.”
To get the most out of your security stack, you must keep it tuned to your continuously changing IT environment.

Within a typical IT environment, database names, host names, users, and IP addresses are always changing. Those changes, which mostly originate in IT operations, must be updated with the security team working to correlate network event data using SIEM technology or monitoring security controls using governance, risk, and compliance (GRC) tools. It’s great to have a lot of data sources, but you also must have mature communication and processes between the teams.

It’s important that technologies within the security stack provide data that is compatible with your SIEM or security orchestration platform. The inability to integrate and correlate activity data from endpoints, users, and the network can severely limit your ability to quickly detect bad things happening in the environment. Whenever and wherever possible, build a security stack with integrated feeds. This will enable you to have powerful incident reporting at the click of button. Then you will be able to process alerts more quickly, and you will be able to provide details to business leaders and regulators about what is happening right now, without having to wait six weeks to get that information.
These are the fundamentals that make quick detection and response possible. It’s a combination of a well-integrated technology stack, an always-current inventory of assets and security controls, and a mature process workflow between teams. To respond effectively to alerts and incidents, you must have a clearly defined incident-handling process that extends from your security stack to first responders, your level-two people, and a clear escalation process. These need to be spelled out in playbooks, but incident response should be practiced. People need to do exercises that run them through the process, and these can be technology based as well. People need to know what to do so they are not trying to work out those issues for the first time when a problem crops up.

Having detection and response processes worked out and proven is a prerequisite for automating those processes through orchestration and automation technologies. As you update your security stack, you must document everything, especially if you are operating in a highly regulated industry. Regulators will expect you to walk them through actual examples of how you have deployed technologies and processes, and they will need to see proof of their effectiveness. Finally, do not expect to set up your security stack and walk away to let it run on its own. To get the most out of your security stack, you must keep it tuned to your continuously changing IT environment.

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The CB Predictive Security Cloud (PSC) is an extensible cloud platform that consolidates security and provides what’s need to secure endpoints, using a single lightweight agent.

CarbonBlack.com/PSC
Carbon Black has been a leader in endpoint security for years. The CB Predictive Security Cloud platform meets multiple use cases for both security and IT. Find out what leading analysts, publications, and public, unbiased tests say about Carbon Black.