Data-Centric Protection: Enabling Business Agility While Protecting Data Assets
Vulnerabilities Abound in Data-Driven Enterprises

Corporate, government and other enterprises are under relentless attack by cyber criminals determined to steal business-critical data and confidential customer and third-party information. Whether for the purpose of identity theft, corporate espionage or other malicious ends, hordes of hackers running the gamut from organized crime groups to sovereign government organizations are working around the clock, around the globe to penetrate data stores in virtually every industry sector.

Year after year, organizations have struggled to thwart these criminals and the existential risks they pose to business enterprises. Yet, vulnerabilities continue to abound and the associated attacks are more pervasive, more sophisticated and more damaging than ever. And, that damage can affect an organization’s reputation, bottom line, and impact business success for years.

The incidence of data breaches and thefts is mind-boggling. Consider the following:

- From 2005 to 2014, there have been 5,029 reported data breaches (many more go unreported). In 2014 alone, there were 783 reported data breaches in the US, a 27.5% increase over 2013.  
- A single data breach, such as the Experian ID theft or the Target breach, can expose and compromise millions to hundreds of millions of confidential records.
- Globally, there are an estimated 556-million cyber crime victims per year.
- Many data thefts can and do go on undetected for years.
- End-point protection solutions and even many fairly sophisticated data protection solutions have lost their effectiveness over time.

As the following diagram dramatically illustrates, there are more perpetrators, with more capabilities, using more attack vectors to accomplish their criminal aims than was once imaginable. These folks are tireless, agile and smart.

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2 http://krebsonsecurity.com/2014/03/experian-lapse-allowed-id-theft-service-to-access-200-million-consumer-records/
3 http://krebsonsecurity.com/2014/05/the-target-breath-by-the-numbers/
4 http://www.go-gulf.com/blog/cyber-crime/
5 https://www.usa.gov/identity-theft
**Feeling nervous yet? Well, there’s more:**

- According to one recent survey, an estimated 47% of organizations reported suffering at least one cyber attack during the past year. More shocking is the fact that 13% of those surveyed said they didn’t know whether they had been attacked!

- Enterprises have grown increasingly borderless due to disaggregated supply chains, outsourcing and mobile workforces, data is less centralized than ever before.

- Cyber threats don’t just originate outside of enterprises, but from inside as well. In fact, approximately 50% of all data breach incidents are sparked by insiders. Organizations should assume cyber criminals have already breached their perimeter defenses.

- Companies that fall victim to cyber attacks not only suffer the initial costs and damages, but continue to experience negative impacts including damage to their reputation, customer churn and various other hard costs for years after the incident.

It’s become clear that implementing basic security controls and traditional security techniques is not enough to prevent data breaches. New approaches to managing risk and neutralizing breaches, while at the same time enabling businesses to operate with the agility required in today’s business environments, are required.

Ironically, organizations’ successes in harnessing innovative technology to create competitive advantage and drive business growth are often also at the heart of their security problems. IT infrastructures were designed to enable organizations to communicate and collaborate more efficiently – not to keep people out. It’s important to keep this in mind when tackling data security challenges because as much as organizations must protect their data, they must also make sure it’s available to serve their businesses and continue to drive their growth.

The good news is that companies today can protect critical data through the implementation of well designed, tested and proven data-centric protection programs, customized to their unique business requirements and risk profiles.
A Successful Data Protection Program Begins With Questions

Presented with the preceding statistics, the urge might be to build the IT equivalent of thicker and stronger castle walls, deeper and wider moats and lock down every bit of data. Of course, completely locking down and preventing all access to data would make it impossible to run your business.

Given that you can't count on stopping cyber criminals at the boundary of your organization, you need to focus specifically on protecting your data. That means protecting your sensitive data at the point of origination and throughout its life cycle, wherever it is being stored, moved and used. This approach is called data-centric security.

To implement data-centric security, while simultaneously empowering your business to compete and win in today's nano-second world, you need to understand your data flows and your business needs from your data. Begin by answering some important questions:

• What does your organization need from your data in order to extract the maximum business value and gain a competitive advantage?

• What opportunities might be leveraged by improving the security posture of the data?

• What risks exist based upon your current security posture? What would the impact of a data breach be on the organization? Be specific!

• Have you clearly defined which data (both structured and unstructured) residing across your extended enterprise is most important to your business? Where is it?

• What people, processes and technology are currently employed to protect your business sensitive information?

• Who in your organization requires access to data and for what specific purposes?

• What time constraints exist upon the organization that might affect the technical infrastructure?

• What must you do to comply with the myriad government and industry regulations relevant to your business?

Finally, ask yourself what a successful data-centric protection program should look like in your organization. What’s most appropriate for your organization?

The answers to these and other related questions would provide you with a clearer picture of your enterprise’s “data attack surface,” which in turn will provide you with a well-documented risk profile. By answering these questions and thinking holistically about where your data is, how it’s being used and by whom, you’ll be well positioned to design and implement a robust, business-enabling data-centric protection plan that is tailored to the unique requirements of your organization.

Creating the Blueprint

Based on hundreds of client engagements to design and deploy data-centric protection frameworks and programs, Booz Allen Hamilton has found its assessment and diagnostic process – a process called cyber-solution blueprinting – invaluable in jump-starting the design and implementation of customized data-centric protection solutions that match organizations' operational needs, commercial requirements and the realities of their business environments.

This cyber-solution blueprinting process also significantly reduces development time and expense. Solution blueprints include four key elements, which are illustrated below. These elements then drive program development and implementation.
Why Implement Data-Centric Protection

Organizations typically employ a layered approach to prevent access to their enterprises and to protect their data. However, even using such a layered approach involving various point solutions, security gaps remain that can be exploited by cyber-criminals. It’s quite common for organizations to feel confident that they are well protected, only to be rudely disabused of that notion by a clever, industrious crook.

That’s why Booz Allen Hamilton and HPE Security - Data Security have developed and strongly advocate a different approach – a data-centric, data de-identifying approach to data security that enables you to protect data over its entire lifecycle – from the point at which it’s captured, throughout its movement across your extended enterprise, all without exposing live information to high-risk, high-threat environments. That’s the essence of data-centric security. HPE SecureData solutions, including HPE Format-Preserving Encryption (FPE), and HPE Secure Stateless Tokenization (SST), protect sensitive data as soon as it is acquired and ensures that it is always used, transferred and stored in protected form. It effectively “de-identifies” data, rendering it useless to attackers, while maintaining its usability – its referential integrity – for authorized production and non-production data processes, applications and services.

Data De-Identification with HPE SecureData quite literally neutralizes data breaches by making your protected data absolutely worthless to an attacker.

This is an illustration of HPE FPE and HPE SST in use. Note how HPE FPE encrypts the original data without changing the format. HPE SST tokenizes data without the need to build and maintain a token database.
Data-Centric Protection in the Real World

Let’s take a look at several quite real and quite demanding situations in which these technologies are in use.

Live Production Data

Protecting live production data is both an obvious imperative and, perhaps, the very definition of mission-critical.

You may have transaction information, for example, that’s being captured in a mainframe environment. You want to encrypt that data in a very simple way so you can protect it even as it moves out and into other types of systems – perhaps various Oracle databases for departmental use, or into Hadoop for big data analytics, or into the cloud for outsourcing of testing, application development. The data likely contains at least some sensitive data – it may be personally identifiable customer information (e.g. credit card numbers, social security numbers, etc.) as well as external, third party data, perhaps HIPAA regulated data.

Consider the example of a global insurance company that wants to reduce its cost of application development. The company needs to provide its offshore vendor with realistic data in order to do this development work. But it cannot afford to risk providing the vendor with the actual data that application is being developed for. Using HPE SecureData technology, the company can provide the vendor with realistically formatted data that has been completely de-identified. In that way, it can achieve its development cost reduction goal without jeopardizing its live production data.

Or the company may want to do various types of analytics on broad data sets consisting of hundreds of millions of records. In such a case it would extract data from traditional highly trusted data-warehouse environments and move and merge those data sets into low-cost Hadoop ecosystems. You’d also be exposing the data to other downstream systems and tools like Greenplum or Data Mirror via ETL tools. Again, protecting the live data requires that it be de-identified, prior to being moved out of the trusted data warehouse environments. Additionally, you might also want to be able to reverse the process after the analytics are performed. HPE SecureData technology provides the ability to analyze the data in a protected form and then under very tight policy control, be returned to its original form once back in the warehouse. This kind of flexible, data-centric protection is extremely valuable and is employed in many organizations.

High Performance Hadoop Data De-identification

While many times organizations have the luxury of being able to stage the de-identification process, in other instances the de-identification must be done on the fly.

For instance, a global communications company needs to routinely analyze several hundred milllion customer records to detect patterns to provide the intelligence needed for retail optimization and other business activities.

Similarly, a healthcare innovator wanted to do real-time analysis of pharmaceutical, healthcare and third party data to provide the information and insights it needed to create and offer new, high value services to medical networks.

In these instances, the organizations used HPE SecureData technologies to de-identify event-driven data from multiple sources in real time in order to accomplish their extraordinarily demanding business objectives, while fully protecting sensitive personal, financial, and healthcare data.
Protecting Data in the Cloud

As organizations extend their enterprises to the cloud – using both public and private clouds – as part of their efforts to reduce costs, all sorts of data protection red flags begin waving. They may be extending their enterprises to the cloud for storage, to run applications such as fraud detection or perform various analytics. The cloud does provide a low-cost environment in which to operate, but that benefit is accompanied by significant data security risks. It’s easy enough to send a continuum of data up into cloud platforms like Azure or AWS, but not so easy to exert the level of control over these environments that you can in your own data centers.

For instance, one global finance firm moved its customer data analysis to Azure Workloads in order to cut per application costs by 40%. Another organization – a global investment bank, created a private cloud stack to enable it to deliver new services more rapidly. The data being moved to the cloud included CRM, PCI (payment card industry) and other personally identifiable information. These organizations felt confident in making these moves thanks to the business-enabling power of HPE SecureData data de-identification technology.

Protecting Sensitive Data in Test and Development Environments

Generating data for test and development environments presents serious challenges for enterprise security and risk management. When data is copied from production databases and used directly for application development, large volumes of private data accumulate on unprotected servers and workstations. The use of outsourced and offshore QA and development services further increases the risks and costs of data leakage – potentially resulting in damages affecting reputation, compliance, and revenues.

A nonprofit financial services company that provides financing to rural electric cooperatives in the U.S. faced just this challenge. To reduce the application development and testing costs for a new web application, the organization decided to offshore the project. It needed, however, to provide the offshore contractor with realistic data for use in development and testing, but not the actual, confidential data, which if stolen, could wreak havoc with the organization’s reputation, member relationships and survival. By using HPE SecureData with HPE FPE, it was able to meet its tight deadline for this offshore project, reduce its application development costs, effectively neutralize data breaches, ensure the security of its sensitive data and maintain the confidence of its members.

Business Empowerment and Solid Data Protection: You Can Have Both

As discussed earlier, security approaches that have attempted to prevent cyber criminals from accessing enterprise data have been less than fully effective. That does not mean you should abandon network security, of course. It’s just that you can’t rely solely on perimeter defenses to protect your invaluable data assets.

Only by employing a data-centric data protection approach can you truly reduce your risk profile and render attacks on your data pointless and worthless. By de-identifying critical data throughout its entire life-cycle, you can neutralize data breaches while retaining your data’s referential integrity and usability. Most important, implementing a data-centric program does not hamper your organization’s ability to access, move, analyze, and use your data to enable business success.

The unique cyber-solution blueprinting and data de-identification processes described in this white paper – beginning with an enterprise risk assessment, then the development of a cyber-solution blueprint, and the implementation of HPE SecureData data de-identification solutions – have proven effective in numerous extremely challenging situations and environments. They provide consistent, robust data protection while also protecting organizations’ access to the information they rely upon to run and grow their businesses. And they do this without you having to embark on a lengthy and horrendously expensive project.

In fact, they produce significant cost savings while providing the business with the information it needs to glean critical insights that can lead to formidable growth and enhanced customer loyalty.
To learn how this approach to data protection can allow your organization to deploy your data where, when and to whom it needs to be deployed while keeping it fully protected visit www.voltage.com and/or contact BAH.

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With international headquarters in McLean, Virginia, the firm employs more than 22,500 people globally, and had revenue of $5.27 billion for the 12 months ended March 31, 2015. To learn more, visit www.boozallen.com. (NYSE: BAH)

About HPE Security - Data Security  
HPE Security - Data Security drives leadership in data-centric security and encryption solutions. With over 80 patents and 51 years of experience we protect the world’s largest brands and neutralize breach impact by securing sensitive data-at-rest, in use and in motion. Our solutions provide advanced encryption, tokenization and key management that protect sensitive data across enterprise applications, data processing infrastructure, cloud, payments ecosystems, mission critical transactions, storage and big data platforms. HPE Security - Data Security solves one of the industry’s biggest challenges: simplifying the protection of sensitive data in even the most complex use cases. For more information, visit www.voltage.com.

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