INCIDENT RESPONDER'S FIELD GUIDE

LESSONS FROM A FORTUNE 100
INCIDENT RESPONSE LEADER

DIGITALGUARDIAN®

TABLE OF CONTENTS

WHY READ THIS GUIDE?

Careful cyber security incident response planning provides a formal, coordinated approach for responding to security incidents affecting information assets. This e-book provides easy-to-follow steps for crafting an incident response plan in the event of cyber security attacks.

HOW TO USE THIS GUIDE

IF YOU ARE...	GO TO...
New to Incident Response Plan	Part One: Incident Response Do's and Don'ts
Not sure where to start?	Part Two: Get Ready
Familiar with Incident Response Plans, but how do I implement in my organization	Part Three: The Five Stages of Incident Response
Worried about managing Incident Response with limited resources	Part Four: Managed Detection & Response
Looking to understand what makes Digital Guardian different	Appendix: Digital Guardian — No-Compromise Data Protection

INCIDENT RESPONSE EXPERT

Tim Bandos is the Director of Cybersecurity at Digital Guardian. He has over 15 years of experience in the cybersecurity realm at a Fortune 100 company with a heavy focus on Internal Controls, Incident Response & Threat Intelligence. At this global manufacturer, he built and managed the company's incident response team.

Tim joined Digital Guardian to help build our Managed Security Program (MSP) to deliver Endpoint Detection & Response to our global customer base. He brings a wealth of practical knowledge gained from tracking and hunting advanced threats. He has led incident response programs to resolve high profile attacks. His team of cybersecurity experts relies on the latest tools and techniques to defend your organization's data.

SEE OUR BLOG

- Take a look at what cyber threat hunters do, the responsibilities of the role, skills and qualifications, and more.

TIM BANDOS
VP of Cybersecurity
Digital Guardian CISSP, CISA, CEH & CASS

DIGITALGUARDIAN®

PART ONE
INCIDENT RESPONSE DO'S AND DON'TS

5 THINGS **NOT** TO DO DURING AN INCIDENT

1 PANIC

Do **not** panic. It's the worst thing you can do. You want to remain calm and having an IR plan will help to do just that. An IR plan will provide you with a predefined path that outlines the best course of action to take during an incident.

2 SHUT DOWN SYSTEMS

Do **not** shut down infected systems. By shutting them down, you could lose volatile data that contains important forensic information. This information can be essential in determining the timeline of what transpired.

3 SOCIALIZE

Do **not** discuss the incident with others unless otherwise directed. It's important to be cautious about the audiences that you choose to communicate with about an incident that has just begun to unravel.

4 USE DOMAIN ADMIN CREDENTIALS

Do **not** use domain administrative credentials when accessing systems environment. Threat actors patiently wait for a user with enterprise-wide access to login in order to capture the password to gain complete control over the environment.

5 NON-FORENSIC TOOL USAGE

Do **not** execute any non-forensic software on the infected systems because this will overwrite the timelines associated with the attack in the Master File Table.

4 THINGS **TO DO** DURING AN INCIDENT

1 **COLLECT DATA**

Collect volatile data and other critical artifacts off the system using forensic tools.
Forensically sound tools have the ability to connect to the system without modifying any timestamps on the device.

2 **EXTERNAL INTELLIGENCE**

Gather external intelligence based on identified indicators of compromise (IOC). Search the web for intelligence about specific MD5s, IP addresses, domains that you discovered during your initial incident investigation. You are attempting to identify what the potential infection is or what type of malware may have been executed within the environment.

3 **SAFEGUARD**

Safeguard systems and other media for forensic collection.

4 **COLLECT LOGS**

Collect the appropriate logs. This may include Windows Events, Firewall, Netflow, Anti-Virus, Proxy, etc. It is important to view the story both at the network and at the endpoint level.

DIGITALGUARDIAN®

PART TWO
GET READY

BUILD YOUR IR TEAM

An Incident Response team is a centralized team that is responsible for incident response across the organization.

The team receives reports of security breaches, analyzes the reports and takes necessary responsive measures.
The team should be composed of:

INCIDENT RESPONSE MANAGER

IR manager oversees and prioritizes different steps in detection, analysis and containment of the incident. In case of high severity incidents, IR manager also interfaces with the rest of the company, including corporate security, human resources, etc. to convey findings, status, and requirements.

SECURITY ANALYSTS

These are the cyber-ninjas that go deep down into the weeds to identify when an incident has occurred and what has happened during that period of time. The team consists of:

- Triage Analysts - Filter out false positives and alert on potential intrusions
- Forensic Analysts - Recover key artifacts of data and maintain integrity of evidence to ensure a forensically sound investigation.

THREAT RESEARCHERS

Threat researchers complement security analysts by providing threat intelligence and context to the incident. They are constantly combing the internet, identifying intelligence that may have been reported externally. They then build an internal database of internal intelligence derived out of prior incidents.

GET CROSS-FUNCTIONAL SUPPORT

All business representatives must fully understand and advocate the Incident Response plan in order to ensure that the plan is properly executed, smooth information flow occurs and remediation takes place.

MANAGEMENT

Management buy-in is necessary for provision of resources, funding, staff, and time commitment for incident response planning and execution.

HUMAN RESOURCES

Human Resources is called upon when an employee is discovered to be involved with the incident.

AUDIT AND RISK MANAGEMENT SPECIALISTS

The specialists help develop threat metrics and vulnerability assessments, along with encouraging best practices across the constituency or organization.

GENERAL COUNSEL

The Attorney's role is to ensure the forensic value of any evidence collected during an investigation in the event that the company chooses to take legal action. An attorney can also provide advice regarding liability issues in the event that an incident affects customers, vendors, and/or the general public.

PUBLIC AFFAIRS

The Public Relations' role is to communicate with team leaders, ensuring an accurate understanding of the issue and the company's status, so as to communicate with the press and/or informing the stockholders about the current situation.

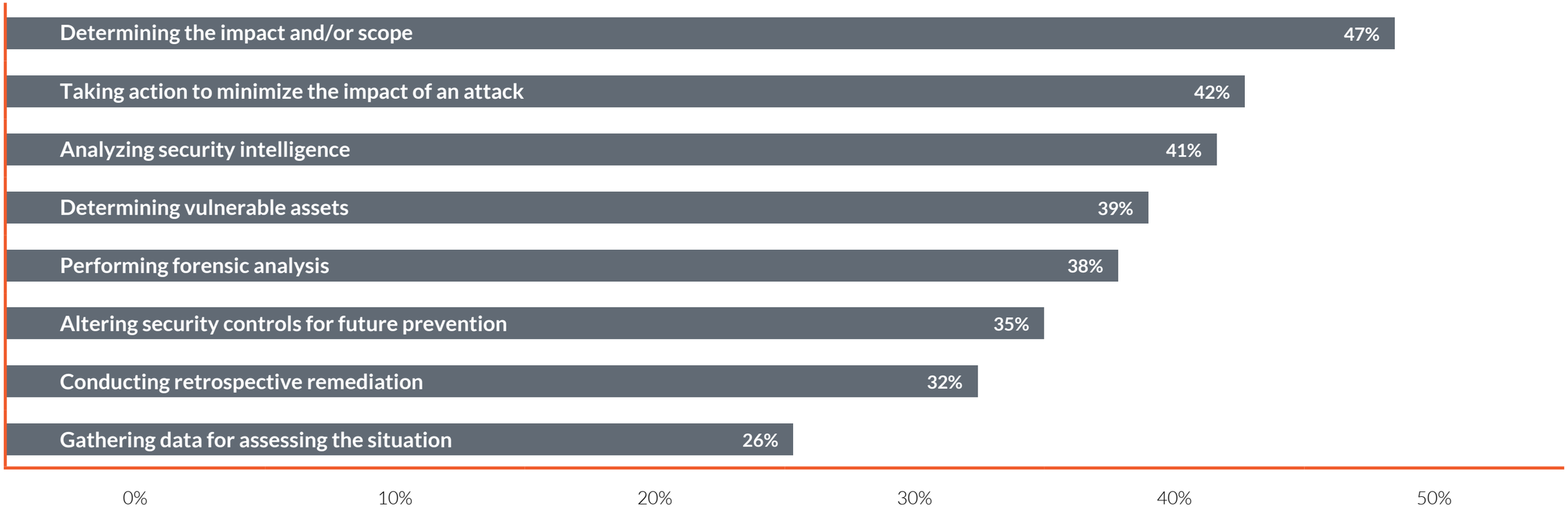
TIPS FROM TIM

TIM BANDOS
VP of Cybersecurity
Digital Guardian CISSP,
CISA, CEH & CASS

COMMUNICATION WITHIN AND ACROSS TEAMS IS CRITICAL

Communications during an incident should be conducted in a manner which protects the confidentiality of the information that is being disseminated. The incident response manager should be the central point of all communication and only those with a valid need-to-know is included in communications regarding key incident details, indicators of compromise, adversary tactics and procedures. Securing this communication so that Mr. Threat Actor is unable to snoop your messages is extremely vital to avoid tipping them off that an on-going investigation is occurring. Any indication that 'You're On to Them' may lead to swift changes by the attackers to further mask their activity.

MOST TIME CONSUMING IR TASKS



Percent of respondents, N=700, three responses accepted
(source: Enterprise Strategy Group, May 2015.)

CREATE YOUR INCIDENT CLASSIFICATION FRAMEWORK

Creating an Incident Classification Framework is a critical component in enabling the proper prioritization of incidents. It will also help you derive meaningful metrics for future remediation purposes. We recommend a two-tiered classification scheme.

INCIDENT CLASSIFICATION FRAMEWORK

SECURITY INCIDENT CLASSIFICATION
1. Category
2. Type
3. Severity

SECURITY INCIDENT TAXONOMY
1. Detection Method
2. Attack Vector
3. Impact
4. Intent
5. Data Exposed
6. Root Cause

Note: Incident classification may change several times during the incident management lifecycle as the team learns more about the incident from the analysis being performed.

INCIDENT CLASSIFICATION FRAMEWORK

This first tier of classification organized by category, type and severity give the information you need to prioritize incident management.

CATEGORY

- Unauthorized Access of the Network
- Malware
- Denial of Service
- Improper Usage by an IT administrator (accidently or intentionally)
- Unsuccessful access Attempt
- Physical Asset Loss
- Explained Anomaly

TYPE

- Targeted vs Opportunistic Threat
- Advanced Persistent Threat
- State sponsored act of espionage
- Hacktivism Threat
- Insider Threat
- Nuisance Threat

SEVERITY

- **Critical Impact -** Threat to public safety or life
- **High Impact -** Threat to sensitive data
- **Moderate Impact -** Threat to computer systems
- **Low Impact -** Disruption of services

INCIDENT TAXONOMY

Taxonomy gives you additional information you need to identify root cause, trends and intelligence. It also provides you with the information for essential incident response metrics.

DETECTION METHOD

- End user
- 3rd party service provider
- Law enforcement such as the FBI
- Intrusion prevention and detection systems
- Data loss Irevention system, firewall, anti-virus, proxy and netflow

ATTACK VECTOR

- Viruses
- E-mail attachments
- Web pages
- Pop-up windows
- Instant messages
- End user action
- Exploiting system vulnerabilities
- 3rd party compromises, etc

IMPACT

- Employee dismissal
- HR/Ethics violation
- Loss of productivity
- Unauthorized privileges
- Website defacement
- Brand image
- Lawsuit
- Denial of service
- Compromise of IP
- Malicious code execution

INCIDENT TAXONOMY (CONT.)

Taxonomy gives you additional information you need to identify root cause, trends and intelligence. It also provides you with the information for essential incident response metrics.

INTENT

- Non-malicious
- Malicious
- Theft
- Accidental
- Physical damage
- Fraud
- Defamation
- Espionage

DATA EXPOSED

- Public
- Confidential
- Export control
- Financial reporting
- Unknown

ROOT CAUSE

- Unauthorized action
- Vulnerability management
- Theft
- Security control failure/gap
- Disregard of policy
- User negligence
- Non-compliance to standards such as PII, PCI, HIPPA
- Service provider negligence

TIPS FROM TIM

TIM BANDOS
VP of Cybersecurity
Digital Guardian CISSP, CISA, CEH & CASS

DETECT THREAT ACTORS THROUGH ANTIVIRUS LOGS

Your good ol' antivirus solution may only detect 10 to 15 percent of malware, but your antivirus logs may contain critical indicators of the attack.

When threat actors break into your environment, one of their first objectives is to acquire passwords by running a credential dumping program. Your antivirus might detect this activity the first time and block the program from executing. But further executions of different credential dumping programs may go unnoticed, so it's important to alert on any activity associated with these types of malicious tools. Having the log of the first attempt is critical because that might be the single thread that you need to pull and unravel to identify a potential incident.

DIGITAL GUARDIAN®

PART THREE

5 STAGES OF INCIDENT RESPONSE

1 **PREPARATION**

2 **DETECTION AND REPORTING**

3 **TRIAGE AND ANALYSIS**

4 **CONTAINMENT AND NEUTRALIZATION**

5 **POST-INCIDENT**

1. PREPARATION

"Preparation is the key to effective incident response."

DEVELOP AND DOCUMENT IR POLICIES

Establish policies, procedures, and agreements regarding incident response management.

DEFINE COMMUNICATION GUIDELINES

Create standards and guidelines to enable effective communication flow during and after the incident.

INCORPORATE THREAT INTELLIGENCE FEEDS

Perform ongoing collection, analysis, and fusion of your threat intelligence feeds.

CONDUCT CYBER HUNTING EXERCISES

Conduct operational threat hunting exercises to find incidents occuring within your environment. This will enable you to be more proactive in your incident response.

ASSESS YOUR THREAT DETECTION CAPABILITY

Assess your current threat detection capability and accordingly influence risk assessment and improvement program.

SAMPLE TEST PLAN

NIST GUIDE

- Guide to Test, Training, and Exercise Programs for IT Plans and Capabilities

SANS GUIDE

- SANS Institute InfoSec Reading Room, Incident Handling Annual Testing and Training

TIPS FROM TIM

TIM BANDOS
VP of Cybersecurity
Digital Guardian CISSP,
CISA, CEH & CASS

5 TIPS TO MAKE INCIDENT COMMUNICATION EFFECTIVE

1. Avoid using speakerphones. You don't want people in the hallway to overhear your discussions.
2. Avoid using instant messenger systems unless they are encrypted end to end or secure in some other way.
3. Try to avoid using email as much as possible because threat actors may have access to your email systems ("Man in the Mailbox") watching every message coming in and out.
4. Communicate in-person if possible and use secure lines for phone conversations.
5. Use pre-shared access codes for authenticating users for bridge/ conference calls.

2. DETECTION AND REPORTING

The focus of this phase is monitoring and correlation of security events in order to detect, alert, and report on potential security incidents.

MONITOR

Monitor and correlate security events occurring across various systems in your environment. These systems include firewalls, intrusion prevention systems and data loss prevention.

DETECT

Detect potential security incidents through correlating alerts within a SIEM solution.

ALERT

Analysts create an incident ticket and document any initial findings and assign an initial incident classification.

REPORT

Initiate reporting process including accommodation for regulatory reporting escalations.

TIPS FROM TIM

TIM BANDOS
VP of Cybersecurity
Digital Guardian CISSP,
CISA, CEH & CASS

CENTRALIZED LOGS CAN OFTEN TELL YOU THE STORY

A centralized SIEM that ingests logs from all of your security systems—such as antivirus, firewall, intrusion prevention systems, data loss prevention, is a critical tool.

A SIEM enables you to search across all devices within your enterprise to identify malicious activity and enable you to trace back and determine how a potential threat gained access. What boxes did they touch? What firewall did they go through or what data leak prevention logs may have been generated when they were on a system. Incident Responders need to answer these types of questions and having a SIEM will make it easier in doing so.

3. TRIAGE AND ANALYSIS

The triage and analysis phase initiates the bulk of the effort in properly scoping and understanding the security incident. Resources should be engaged to collect data from tools and systems for further analysis and identifying Indicators of Compromise. These individuals should have in-depth skills and a detailed understanding of **Live System Response, Digital Forensics, Memory Analysis,** and **Malware Analysis.**

As evidence is collected, the analyst will now focus on 3 primary areas:

END-POINT ANALYSIS → **BINARY ANALYSIS** → **ENTERPRISE HUNTING**

3. TRIAGE AND ANALYSIS (CONT.)

END POINT ANALYSIS

- Determine what tracks may have been left behind by the threat actor.
- Gather the artifacts needed to build a timeline of activities.
- Analyze a bit-for-bit copy of systems from a forensic perspective & capture RAM to parse through and identify key artifacts of what occurred on a device. RAM is feature rich with data on activities executed by a threat.

BINARY ANALYSIS

- Investigate malicious binaries or tools leveraged by the attacker in order to document the purpose and functionality of those programs. This analysis is performed in two ways:

1. **Behavioral Analysis -** Executes malicious program in a VM to monitor its behavior.
2. **Static Analysis -** Reverse engineer the malicious program in order to scope out the entire functionality.

ENTERPRISE HUNTING

- Enterprise hunting is performed to identify all systems impacted by a security incident.
- Analyze existing systems and event log technologies to determine machines in scope of a compromise.
- This will allow the responder to document all compromised accounts, machines, malware used, etc. so that effective containment and neutralization can be performed.

4. CONTAINMENT AND NEUTRALIZATION

This is one of the most critical stages of the incident to ensure that a malicious infection is completely eradicated from the environment. The strategy for containment and neutralization is based on intelligence and indicators of compromise developed throughout the incident analysis phase. After the system is restored and verified that there are no further security compromises, normal operations can resume.

COORDINATED SHUTDOWN

Once you have identified all systems within the environment that have been either accessed or compromised by a threat actor, perform a coordinated shutdown of these devices at the same time. When performing the coordinated shutdown, a notification is sent out to all IR team members to gain alignment on timing and the resources requiered to perform the remediation.

WIPE AND REBUILD

Wipe the infected devices and rebuild the operating system from the ground up. Change passwords of all compromised accounts.

THREAT MITIGATION REQUESTS

If you have identified domains or IP addresses that are known to be leveraged by threat actors for command and control, issue threat mitigation requests to block the communication at all egress channels.

TIPS FROM TIM

TIM BANDOS
VP of Cybersecurity
Digital Guardian CISSP,
CISA, CEH & CASS

COORDINATE SYSTEM SHUTDOWN

I recall once during an incident that a compromised server was not shutdown during a coordinated effort. It actually alerted the threat actors and they knew that something was going on within our environment and that we were attempting to kick them out. So they immediately came back in, not even within 10 minutes of those servers being shut down to move laterally again within the environment and installed a whole set of new malware and tools. We had to go through the entire process again of conducting triage and analysis. Therefore, it is extremely important that all parties involved in a neutralization process follow the instructions carefully to avoid this from happening.

TIPS FROM TIM

TIM BANDOS
VP of Cybersecurity
Digital Guardian CISSP,
CISA, CEH & CASS

NEVER LET A GOOD INCIDENT GO TO WASTE

Now is the time to answer those critical questions: How did this happen? What were they targeting? What controls should we have had in place that would've prevented this intrusion from occurring in the first place? Are there specific areas within our security that require additional resources or funding to cover those gaps? As you think through these questions that relate to the Incident at hand, also begin to think about the organization in general and what security metrics could be reported each week/month/quarter to further shed light on any chinks in the armor. Develop a heat-map of your Cyber Security Readiness Scorecard and include areas such as Vulnerability Assessments / Remediation, SIEM Event Collection, Continuous Visibility, Security Configurations, etc. A scorecard that appears to have been dipped in red paint, indicating serious control gaps, will undoubtedly get the attention that it deserves.

5. POST-INCIDENT ACTIVITY

1. COMPLETE INCIDENT REPORT

Documenting and disseminating the incident will help improve the incident response plan and to augment additional security measures to avoid such security incidents in the future.

2. MONTOR POST-INCIDENT

Closely monitor for activities post-incident since threat actors will re-appear again. We recommend a security log hawk analyzing SIEM data for any sign of indicators tripping that may have been associated with the prior incident.

3. UPDATE THREAT INTELLIGENCE

Update the organization's threat intelligence feeds.

4. IDENTIFY PREVENTATIVE MEASURES

Identify new security initiatives to prevent future incidents.

5. GAIN CROSS-FUNCTIONAL BUY-IN

Coordination across the organization is critical in order to implement new security initiatives.

TIPS FROM TIM

TIM BANDOS
VP of Cybersecurity
Digital Guardian CISSP, CISA, CEH & CASS

BE SURE TO RESET CREDENTIALS

You have to be sure to reset any passwords that may have been compromised during the incident. It's important to note though that, once a threat actor has gained access to a system they immediately dump the credentials. Consequently, they have a whole bunch of credentials and it might not just be the one or two that they've used. Therefore as part of the post-incident monitoring, identify any failed login attempts with those accounts. It could be a potential indication that they're back in within the environment attempting to use what they've previously harvested.

DIGITALGUARDIAN®

PART FOUR
MANAGED DETECTION & RESPONSE

WHEN DOES IT MAKE SENSE TO CONSIDER EDR AS A SERVICE?

If any of these apply to your organization it may make more sense to outsource or augment your incident response team with a Managed Detection & Response Program:

SECURITY TALENT SHORTAGE

The severe security talent shortage, especially for cyber security professionals, is preventing you from finding and retaining the people you need to build an IR team.

HEADCOUNT CHALLENGES

The political climate of your organization makes it difficult to gain approval for the 3-5 people you need to build an effective IR team.

COMPLEXITY OF STAYING ON TOP OF SOPHISTICATED MALWARE

Modern malware is sophisticated, targeted and difficult to detect. According to Verizon's latest Data Breach Investigations Report, companies on an average went more than 200 days between the time they were breached and the day they discovered the malware. As malwares get smarter, your ability to prevent the loss of sensitive data on your own gets harder and harder.

MANAGED DETECTION & RESPONSE PROGRAM

THE LATEST DEFENSE STRATEGIES AND INTELLIGENCE

Our Managed Detection & Response Program is led by an experienced cybersecurity expert, with the practical knowledge from building a program at a Fortune 100 organization. The program combines security researchers and analysts' expertise, Digital Guardian's No-Compromise Data Protection Platform and a centralized threat intelligence management system. This combination enables Digital Guardian to detect and remediate threats faster and more efficiently. You can expect the highest level of protection from threats including polymorphic malware, zero-day attacks, advanced persistent threats (APTs), ransomware and attacks involving sophisticated data theft methods.

DIGITAL GUARDIAN
Managed Detection & Response

WHY DIGITAL GUARDIAN?

REAL-TIME VISIBILITY

Digital Guardian continues endpoint monitoring includes real-time and historic visibility into more than 200+ parameters associated with system activities. Visibility into the entire kill chain lifecycle means more effective detection & analysis by our team.

THREAT INTELLIGENCE

Our team harnesses both externally and internally generated intelligence feeds for immediate detection based on known threat activity.

EYES ON GLASS IDENTIFYING YOUR REAL RISKS

Our analyst team is constantly reviewing your data for anomalous behavior and alerting you immediately upon discovery. Alerts generated by your team will provide you with a summary of what's been detected and details around the type of alert.

INDICATORS OF EXECUTION

Our service utilizes behavioral-based signatures based on profiled malware and threat actor activity that is delivered via your content feeds. Your team is constantly researching emerging threats and developing these signatures to keep up with the dynamic & evolving world of threats.

DIGITAL GUARDIAN®

APPENDIX

DIGITAL GUARDIAN NO-COMPROMISE DATA PROTECTION PLATFORM

DIGITAL GUARDIAN DATA PROTECTION PLATFORM

No-compromise data protection for your no-compromise organization. Our platform, powered by AWS, performs on traditional endpoints, across the corporate network, and cloud applications, making it easier to see and block threats to sensitive information. Cloud-delivered means simplified deployment, cross platform coverage for no gaps, and flexible controls to stop the riskiest behavior. Available either as SaaS or managed service deployment, Digital Guardian gives you the deployment flexibility to match your enterprise needs.

powered by aws

FREE DOWNLOAD

Digital Guardian Platform Technical Overview

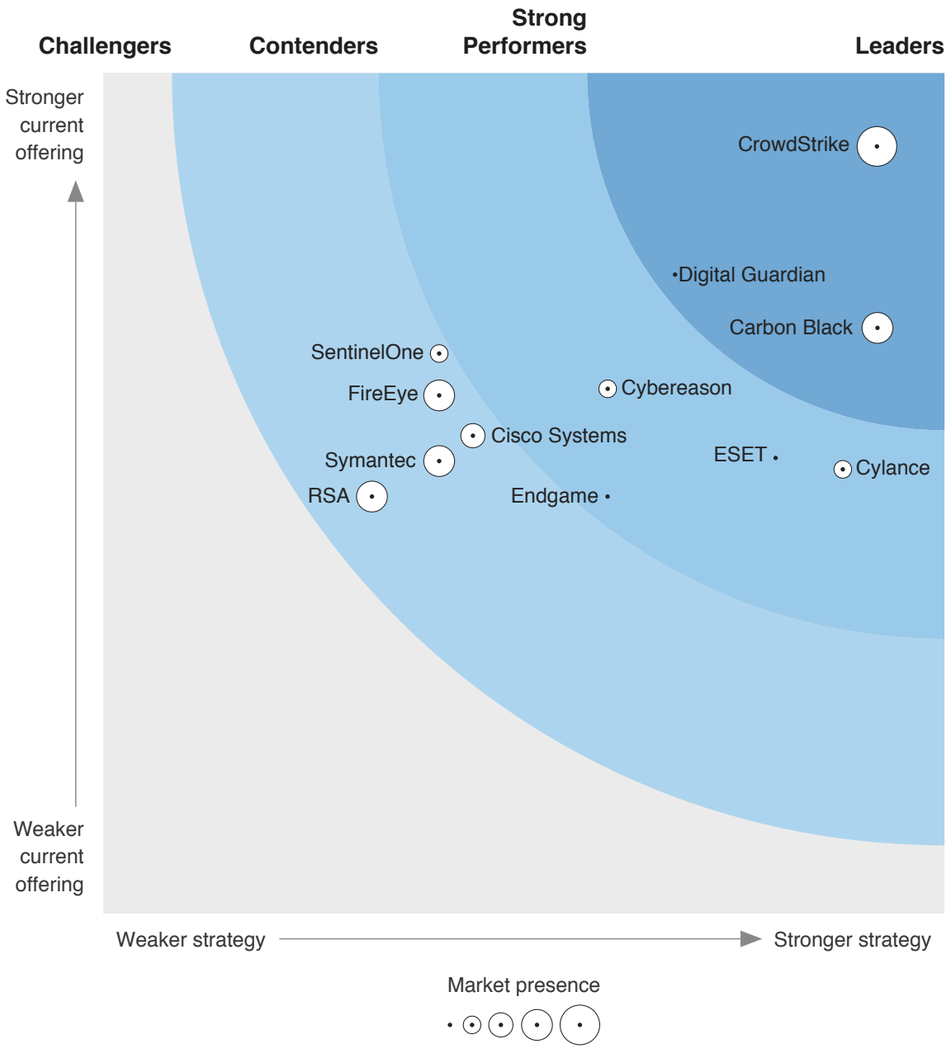
"LEADER" IN FORRESTER WAVE: ENDPOINT DETECTION AND RESPONSE

"Digital Guardian is a newer entrant into the space and has built an extremely exciting EDR solution on top of its data loss prevention (DLP) technology."

Forrester, *The Forrester Wave: Endpoint Detection and Response, Q3 2018*

FREE DOWNLOAD

· The Forrester Wave: Endpoint Detection and Response, Q3 2018



INCIDENT RESPONDER'S FIELD GUIDE

QUESTIONS?

1-781-788-8180
info@digitalguardian.com
www.digitalguardian.com

DIGITAL GUARDIAN®