Panda Adaptive Defense 360 Technologies

Powerful Detection, Reliable Mitigation

panda
a WatchGuard brand

Panda Adaptive Defense 360

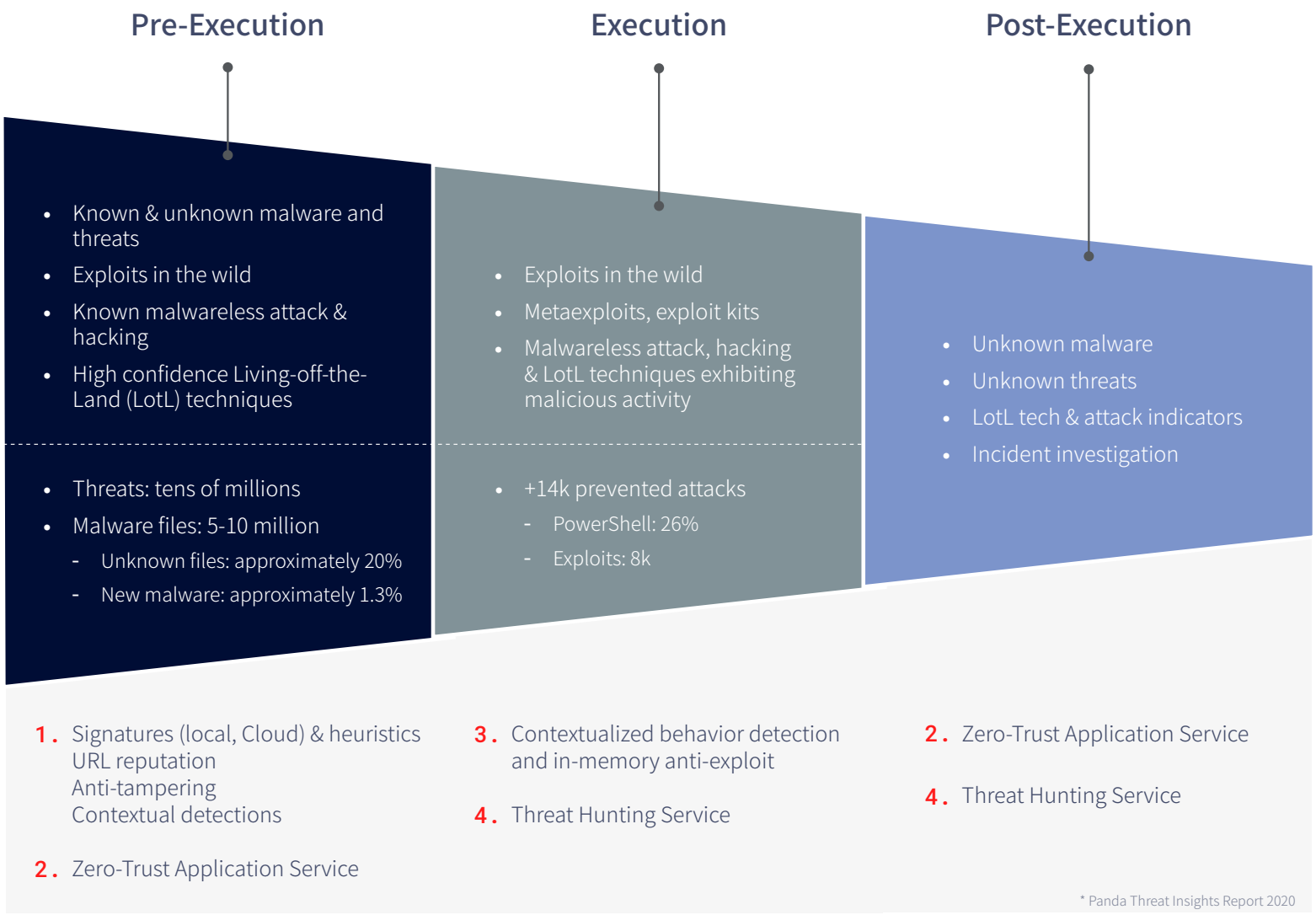
Index

Technologies and Services in Panda Adaptive Defense 360

Introduction

This document explains how the **technologies and services integrated in Panda Adaptive Defense 360** work together. The Endpoint Detection and Response (EDR) capabilities and the leverage of artificial intelligence (AI) technologies are differentiating factors.

The following chart shows where each technology works and the techniques used to block adversaries as quickly as possible, preventing endpoints from being compromised, and detecting, containing and responding to attackers before damage is done.



The main groups of prevention, detection and response technologies and services integrated in Panda Adaptive Defense 360 are as follows:

1. **Panda's full Endpoint Protection technologies stack**
2. **The Zero-Trust Application Service**
3. **Contextualized behavior detections and in-memory anti-exploit**
4. **The Threat Hunting Service**

In the rest of the eBook, we were looking at how they work together to provide **higher level of protection with minimum effort**.

1. Full Endpoint Protection (EPP) Technology Stack

EPP Proactive Technology Stack	Panda Adaptive Defense 360
Generalist signatures & heuristics	✓
Cloud-based lookup to the Collective Intelligence (Threat Intel)	✓
Behavioral analysis & IoAs (indicators of attack) detection	✓
Firewall, intrustion detection (IDS)/intrusion prevention systems (IPS), Networks packet inspection	✓
Anti-tampering	✓
Device control	✓
URL reputation	✓
Application control	✓
Antispam, antiphishing, content filtering for MS Exchange servers	✓
Mailbox protection and intelligence scan for MS Exchange servers	✓
Vulnerability assessment & patch management*	✓

*Panda Patch Management

There is a common misconception in the market about EPP technologies, believing they are just traditional, signature-based antivirus, and that they can be replaced by an EDR solution.

In reality, these technologies, besides signature-based analysis, combine generic signatures, heuristics, firewall, URL reputation, contextual detections, vulnerability management, application control, and other capabilities which can greatly mitigate risk.

These prevention technologies, which work together with EDR solutions, bring important benefits, among them:

- **Significant risk reduction.** They don't need to run a file to detect malware, and they only need connectivity to query the Cloud.
- **Very low level of false positives.** EPP technologies, which can protect autonomously, are widely distributed in a large number of endpoints, and are configured to minimize false positives.
- **Performance optimization.** They work together, integrated, to avoid redundancies and minimize any performance impact in the endpoints they protect.

2. Zero-Trust Application Service

AI as disruptive innovation in security

A managed service is included as part of the license of **Panda Adaptive Defense and Adaptive Defense 360**. This service classifies as either malware or as trusted, prior to letting only the trusted execute on each endpoint. Since it is a fully automated service, it does not require any input or decision from the end user or from the Security or IT teams.

The Zero-Trust Application Service has three key components:

1. **Continuous monitoring of endpoint activity, from a Cloud-native platform.**

   Continuous monitoring of endpoint activity, from a Cloud-native platform. The activity of every application at the endpoints, regardless of its nature, is monitored and sent to the Cloud for its continuous classification. This way, malware executions, and even sophisticated threats, such as supply chain attacks, can be prevented.

2. **Automated, AI-based classification.**

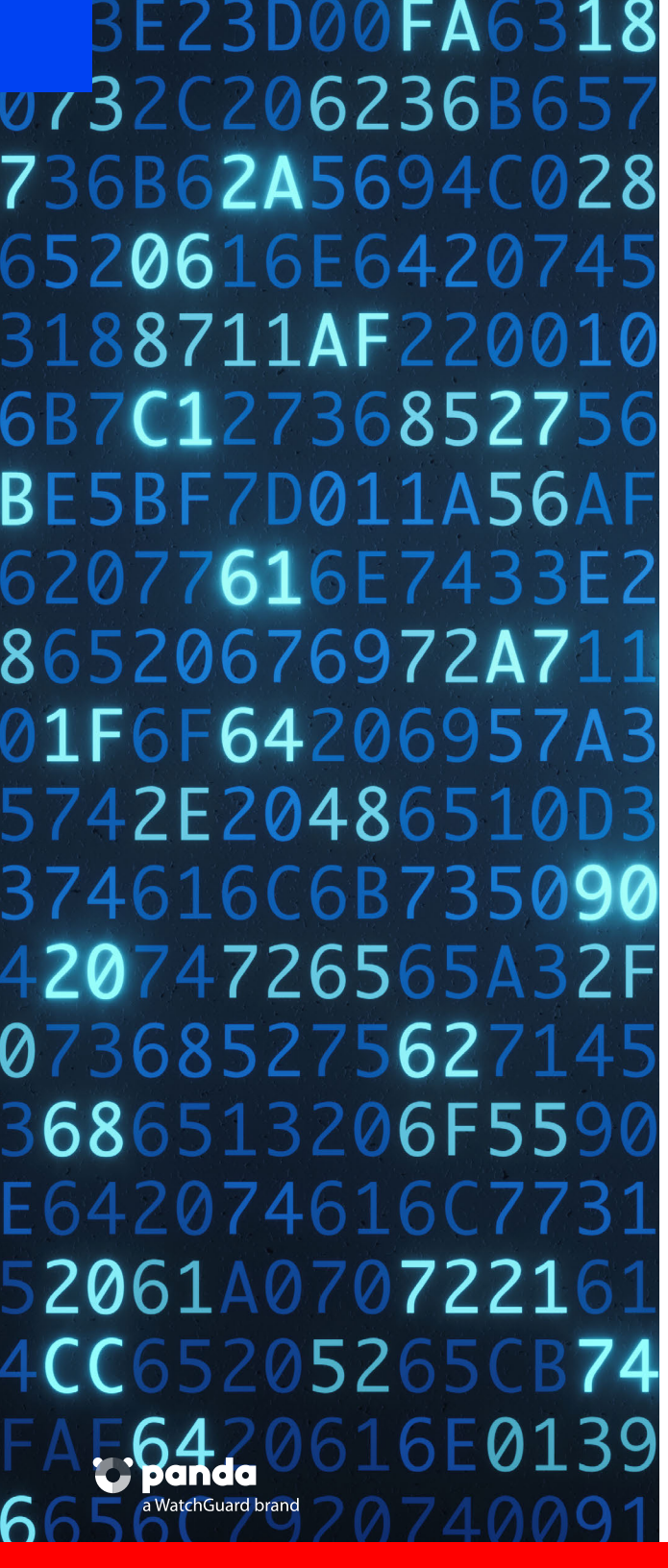
   Automated classifications are made in a Cloud-based AI system, where an array of multiple machine learning (ML) algorithms is run, processing hundreds of static, behavioral and context attributes are processed in real time. Attributes are extracted from the telemetry of the protected environment and from a set of **physical sandboxes** in which executable files are detonated.

Today, the rate of automated classification is 99.98%, so that only 0.02% of the processes need intervention from our experts. The AI classification system is therefore self-sufficient, scalable to large volumes of files, working in real time and without relying on any input from the end user.

What is physical sandboxing?

An array of Cloud-based custom-made machines specifically configured to detonate files and extract real-time behavioral and contextual observables.

We use physical sandboxing instead of virtual machine sandboxing, because there are numerous malicious applications that are VM-aware, detecting when they are being run inside a VM, inhibiting their malicious behavior.



3. Risk-based application control.

Refers to the modes of operation of the Protection agent running at the endpoints. There are two levels of protection:

- **Hardening mode:** default-deny for any unknown application or binary coming the outside (web downloads, email, removable media, remote locations, etc).

- **Lock mode:** default-deny for any unknown application or binary, regardless of its origin (from the network, from within the endpoint itself, or from the outside). It ensures that all running processes are trusted.

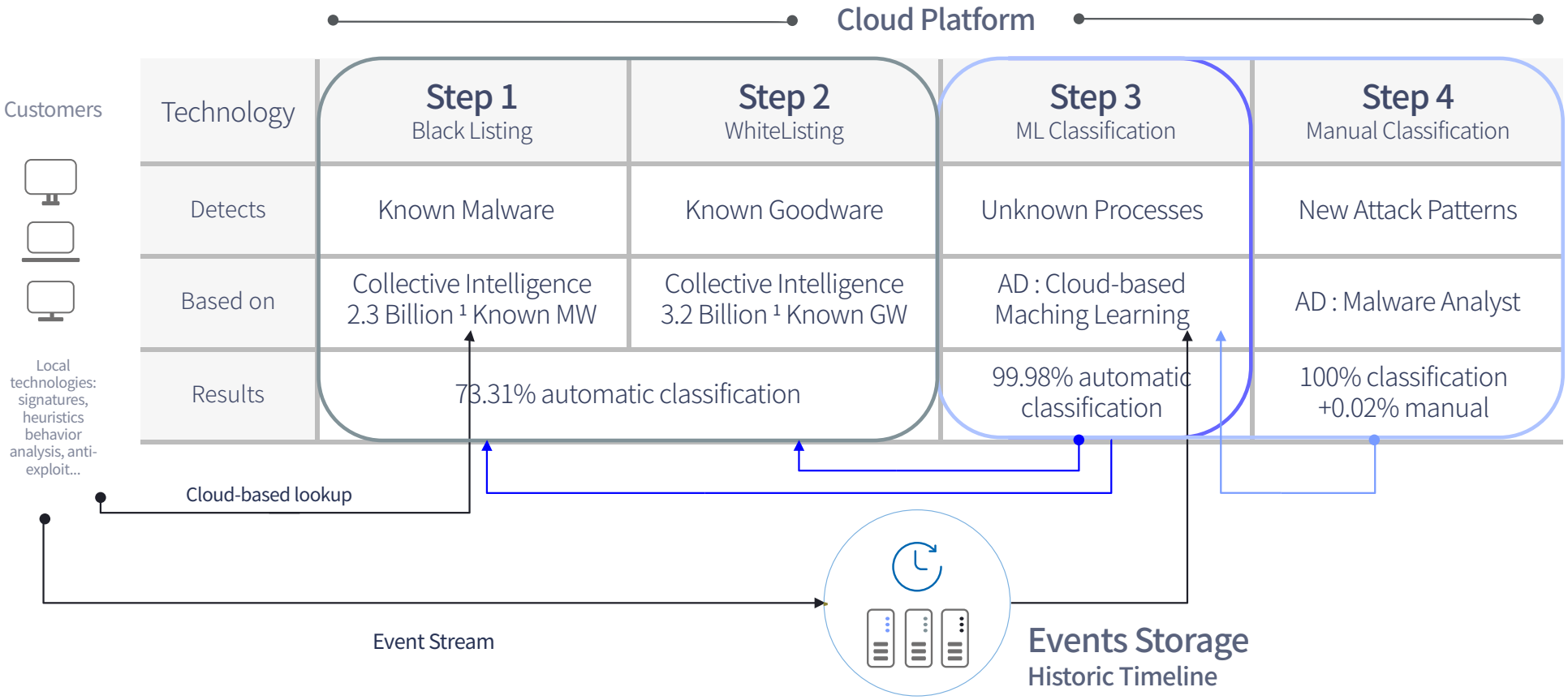
Panda Security's Collective Intelligence. Hosted in a Cloud-based platform, is another key component which enables the operation of the new protection model, which increases the efficiency of the Zero-Trust Application Service.

The Collective Intelligence represents the consolidated and incremental knowledge repository of all applications, binaries and other files containing interpreted code, both trusted and malicious.

This repository in the Cloud is continuously fed by the AI system and by the expert analysts, and it is at the same time continuously being queried by the solutions and services of Panda Security, prior to any execution.

- The following graphic shows how the technologies in the stack seamlessly work together, enabling the classification of all applications, binaries and files with interpreted code, in real time.

How the Zero-Trust Application Service Works



3. Contextualized Behavior Detection and In-Memory Anti-Exploit

The continuous monitoring of the activity at the endpoints allows the agent to act as a sensor and inform the Cloud platform not only about the files being run, but also about their context of execution (what happened right before, which users are trying to run which command or application, which network traffic is generated, which data files are being accessed, parameters, etc).

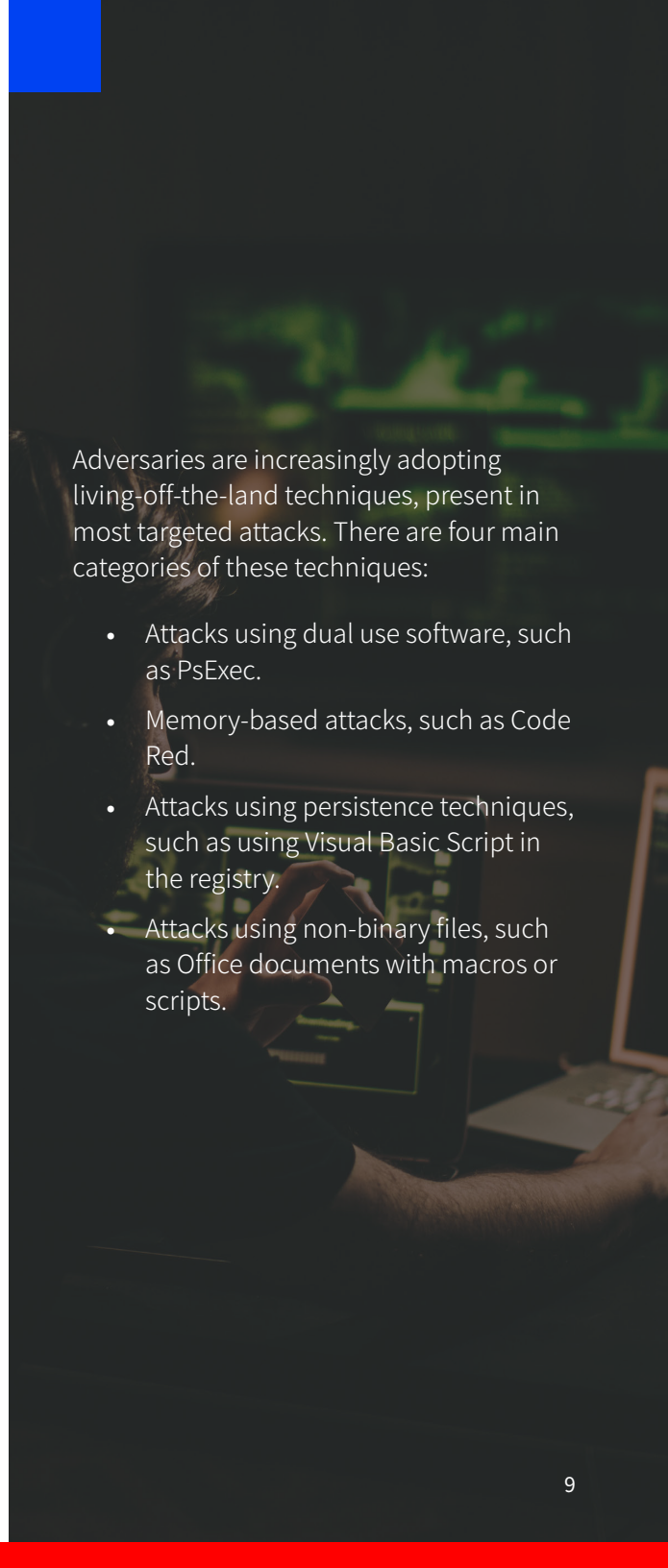
This allows the identification, first at the endpoint, of abnormal behaviour or suspicious activity and their categorization as indicators of attack (IoAs), with a high degree of confidence and without false positives.

Many times, IoAs are related to specific phases of the **Cyber Kill Chain** or to the tactics of the **MITRE ATT&CK framework**[1]:

- Initial access
- Execution
- Persistence
- Privilege escalation
- Defense evasion
- Credential access
- Discovery
- Lateral movement
- Collection
- Command and Control
- Exfiltration
- Impact

The detection of IoAs before data is exfiltrated (or encrypted in the case of a ransomware attack) is a very effective defense mechanism, and especially against Living-off-the-Land (LotL) attacks, even if endpoints may have already been compromised.

Panda Adaptive Defense and Panda Adaptive Defense 360 integrate, within the same Protection agent, a complete technology stack to detect IoAs in different attack phases. Far from being static technologies, they are updated continuously with new attack patterns and techniques, which are discovered by the Threat Hunting and Investigation Service (THIS).



Adversaries are increasingly adopting living-off-the-land techniques, present in most targeted attacks. There are four main categories of these techniques:

- Attacks using dual use software, such as PsExec.
- Memory-based attacks, such as Code Red.
- Attacks using persistence techniques, such as using Visual Basic Script in the registry.
- Attacks using non-binary files, such as Office documents with macros or scripts.

Among the numerous indicators of attack that the agent detects, we find the following categories:

1. IoAs of exploits in the wild

Through these behavioral and context IoAs, exploits in the wild, as well as exploit kits are detected and blocked prior to execution, closing one of the main entry vectors for attackers.

Additionally, proprietary "**virtual patching**" firewall technology attempts to exploit vulnerabilities are detected and blocked, by monitoring inbound traffic.

As an example, this technology is used to identify and block exploits against the BlueKeep vulnerability, in which specific connections are established within an RDP session. These connections, unless they are blocked, allow an attacker to remotely execute code (RCE).

The virtual patching technology detects such connections and rejects them automatically. Detections are recorded in the Cloud and presented in the web interface of Panda Adaptive Defense 360, allowing administrators to immediately take action.

They can, as a containment measure, apply configuration changes, for example, activating Network Level Authentication (NLA), or disabling non-essential RDP services at the endpoints, or patching the systems if possible, and effectively reducing the attack surface.

2. In-memory IoAs: dynamic anti-exploit technology

Panda Adaptive Defense 360 incorporates dynamic anti-exploit technology.

This technology, integrated in Panda Adaptive Defense 360, is independent of the technologies in Microsoft's EMET, and it is not based on any morphological analysis of the files, or on additional protections against exploit techniques not covered by Windows (ASR, EP, EAF, etc), or on specific detections against known vulnerabilities. These techniques are not sufficient to stop attacks designed against zero day vulnerabilities.

The dynamic anti-exploit technology monitors the internal behavior of processes, searching for anomalies. This is highly effective, regardless of the exploit used in the attack, and it is complemented with a proprietary **memory framework analysis**, which inspects a section of memory at certain times, after some specific events or behaviors are triggered. This way, new attack patterns of different types can be discovered.

These technologies can effectively protect against any type of exploit, particularly zero day exploits targeting:

- **Vulnerabilities in web browsers:** Internet Explorer, Firefox, Chrome, Opera and others.
- **Common applications** often used in targeted attacks, such as Java, Adobe Reader, Adobe Flash, Microsoft Office, multimedia players, etc.
- **Vulnerabilities in unsupported operating systems**, such as Windows XP and others.

3. IoAs to detect Living-off-the-Land attacks and malicious use of administrative tools

To detect this type of indicators, events of scripts executed by script interpreters are correlated (Powershell, Visual Basic, Javascripts, etc), as well as macros/scripts in MS Office, WMI activity, etc.

Other indicators are included to deny execution of certain processes by other processes, and depending on the context, blocking malwareless attacks using administrative tools and command-line sequences. Also, some other in-memory attacks are detected, such as detections of code injections in memory without files on disk.

4. Threat Hunting Service

Revealing the undetectable

The Threat Hunting and Investigation Service, included in Panda Adaptive Defense and Panda Adaptive Defense 360, is operated and managed entirely by Panda Security's analysts.

They operate a Cloud-native, proprietary platform for Threat Hunting and Incident Response to coordinate L1, L2, and L3 analysts, as well as hunters and incident responders, to minimize MTTD and MTTR (Mean Time To Detect and Mean Time To Respond).

Analysts may also create new rules representing new IoAs. These high-confidence IoAs can be delivered to the endpoints, protecting, as early as possible, against adversaries bypassing other controls with techniques such as fileless, LotL, etc.

These new indicators of attack are the result of a continuous process to discover threat actors, using advanced data analytics, our proprietary threat intelligence, and the expertise of our analysts.

This service inherits all the cyber intelligence that we have perfected thanks to our years of experience in threat research, the historical visibility offered by the registry of the behavior of applications, users and machines for more than 30 years, and our alliances with international organizations such as the Cyber Threat Alliance, where we exchange indicators of being under an attack or compromised and their corresponding responses.

Certifications, Awards and Contributions

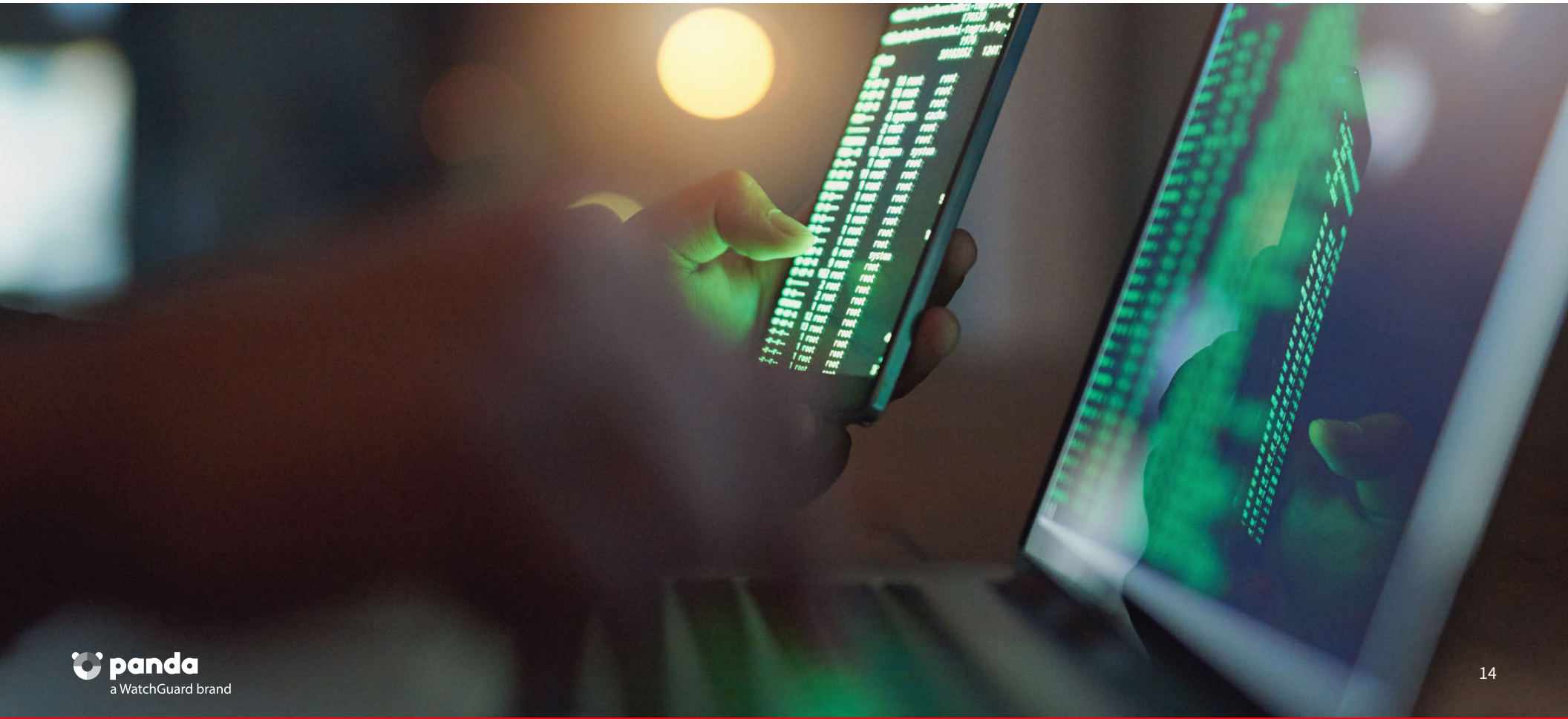
Panda Security regularly participates in competitive analyses and wins awards for protection and performance from Virus Bulletin, AV-Comparatives, AV-Test, and NSS Labs. Panda Adaptive Defense achieved the EAL2+ certification in its evaluation for the Common Criteria standard.

CONTRIBUTING MEMBER

Notes

1. Attacks on the supply chain are an emerging threat that targets developers and software vendors. The goal is to access source codes, create processes or update mechanisms by infecting legitimate applications to distribute malware.

2. MITRE ATT&CK Framework: **https://attack.mitre.org/**



Panda Adaptive Defense 360

Limitless Visibility, Absolute Control

U.S. SALES 1.800.734.9905 INTERNATIONAL SALES +1.206.613.0895 www.watchguard.com | pandasecurity.com