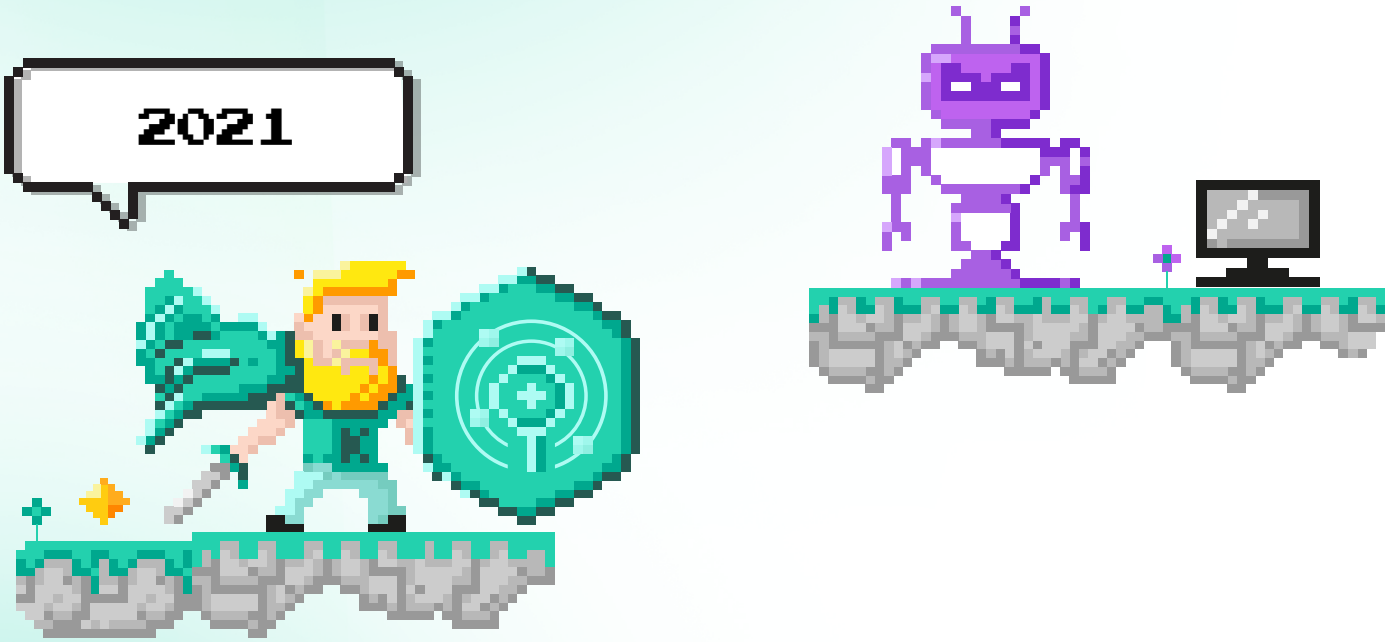
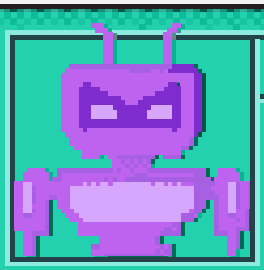
Managed Detection and Response: Analyst Report



kaspersky

Executive summary



Managed Detection and Response

up to 2 critical incident every day

41 min average detection time

77 % defeat rate from 1st try

Top target regions
(% of clients)

Europe	CIS	APAC
47 %	23 %	16 %

Top target Europe locations
(% of clients)

Italy	Germany	Austria
30 %	25 %	11 %

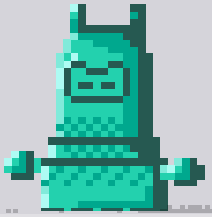
Top target facilities
(% of clients)

Factory	Bank	Server center
17 %	16 %	12 %

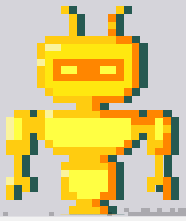
Favorite skins

41 % APT

18 % Pentester



14 % Criminal



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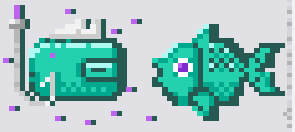
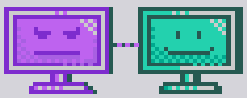
Favorite spells

T1566: Phishing



TA0001: Initial Access

T1210: Exploitation of Remote Services

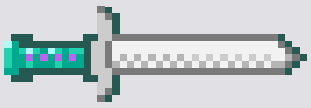


TA0008: Lateral Movement

T1204: User Execution

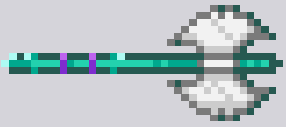
TA0002: Execution

Favorite tools



powershell.exe

rundll32.exe



certutil.exe

...

Incidents severity

14.3 % High

65.4 % Medium

20.3 % Low

Recommendations

- Year by year, the share of human-driven targeted attacks is increasing. To efficiently detect them, manual threat hunting in combination with classical alert-driven monitoring[1] should be implemented
- Red team exercises are similar to advanced attacks and are thus a good approach to assess an organization's security[2]
- More than 14% of high-severity incidents are related to malware that proves the need of comprehensive anti-malware protection[3]
- Focus on threat detection through all MITRE ATT&CK tactics[4]. Even complex attacks consist of simple steps, referred to as techniques, and detection of a single technique can reveal the whole attack

[1] https://www.kaspersky.com/enterprise-security/managed-detection-and-response
[2] https://www.kaspersky.com/enterprise-security/security-assessment
[3] https://www.kaspersky.com/enterprise-security/wiki-section/products/multi-layered-approach-to-security
[4] https://attack.mitre.org/tactics/enterprise/

Introduction

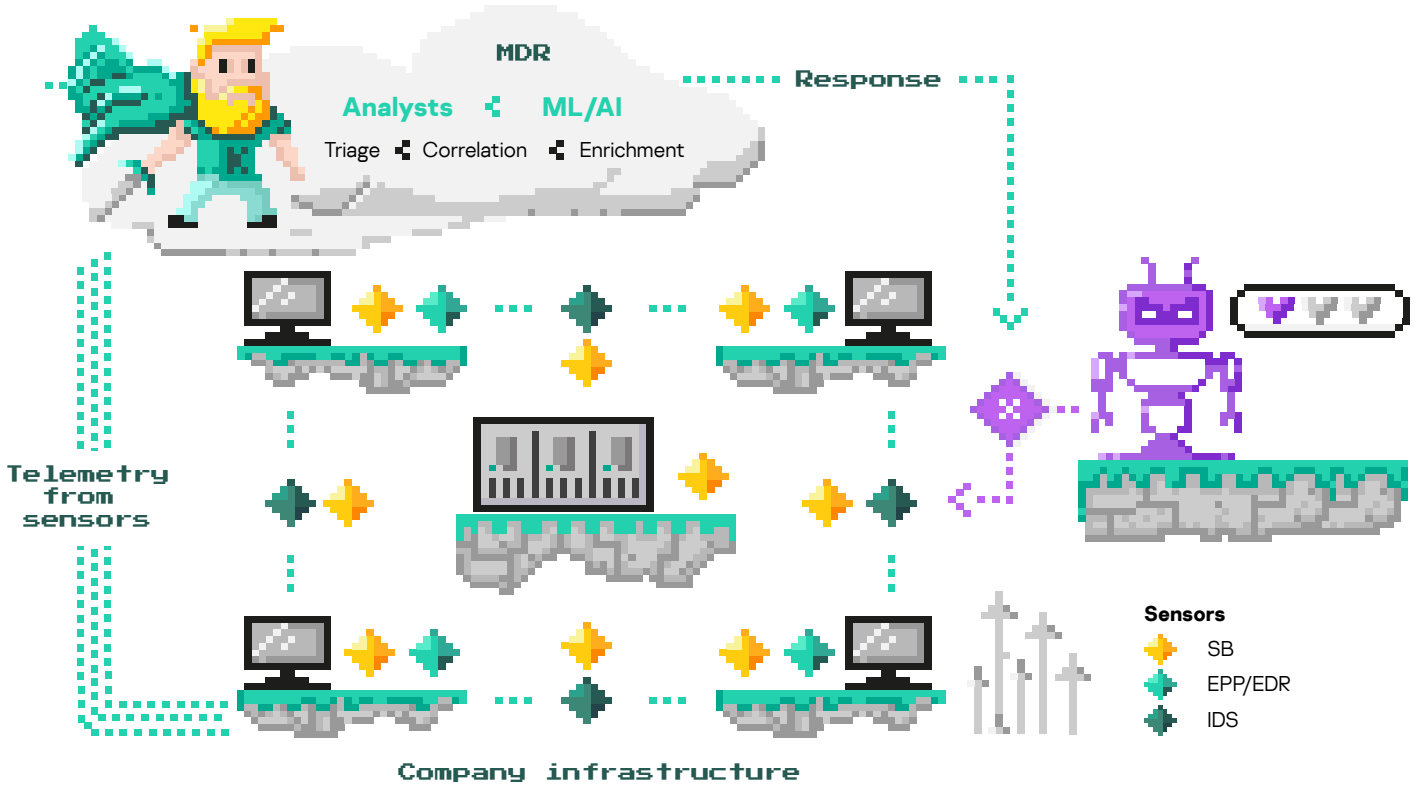
About MDR

Kaspersky Managed Detection and Response (MDR) helps organizations to complement existing detection function or to expand limited in-house resources to protect their infrastructure from the growing number and complexity of threats in real time, 24/7. We collect telemetry from clients' networks and analyze it using machine learning and artificial intelligence technologies, and human threat hunting analysts.
Kaspersky SOC investigates the alerts and notify the client if there is something bad going on, providing response actions or recommendations.

5/5 Overall Rating of Kaspersky

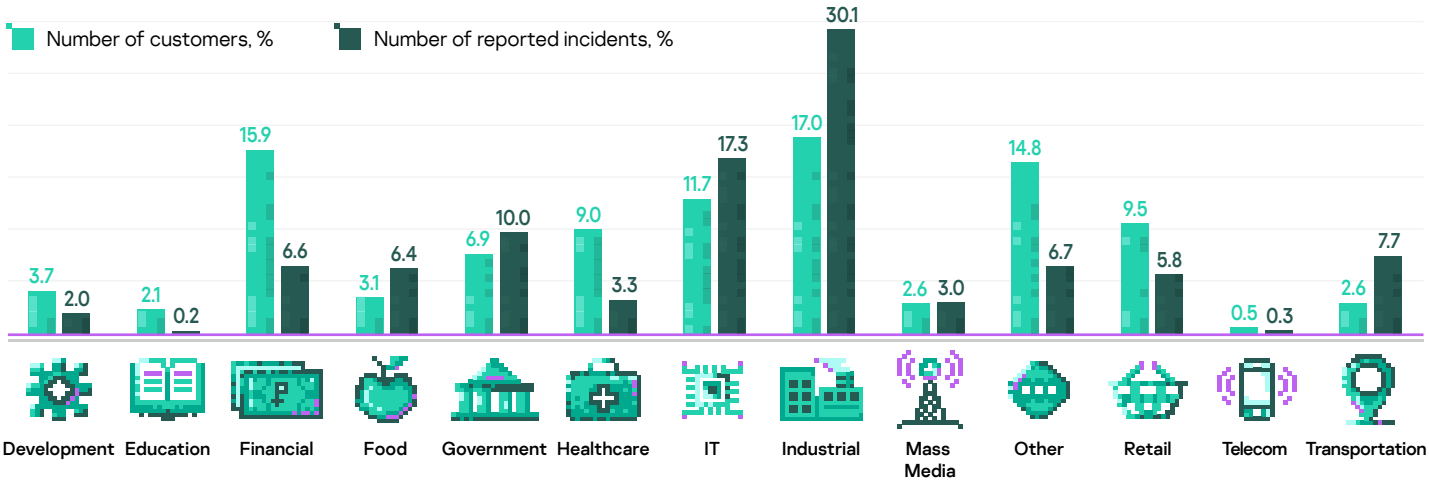
in the Managed Detection and Response Services

based on review ratings from real users/customers on Gartner Peer Insights[1] (as of 9th February 2022)



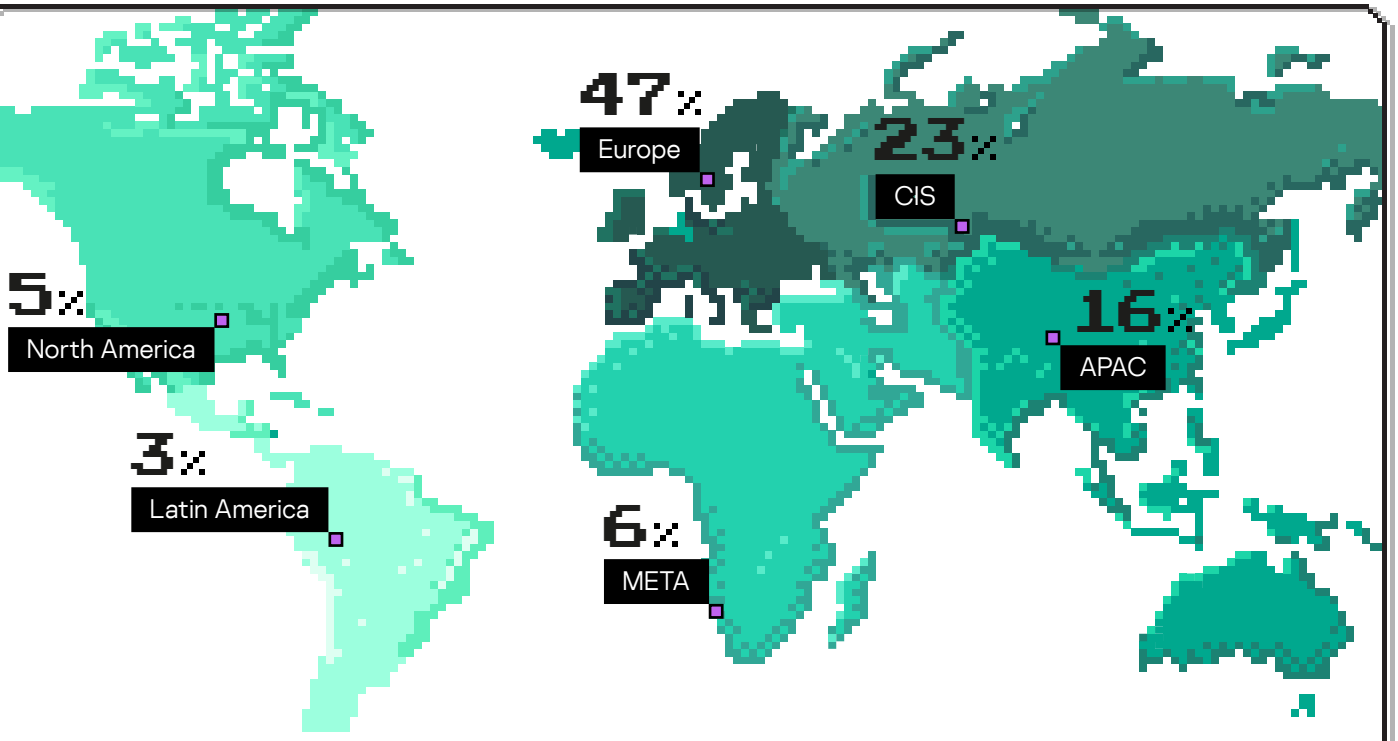
MDR service coverage: industries

Kaspersky MDR service in 2021 was used across different industries. Most of our customers are from industrial, financial or IT organizations.

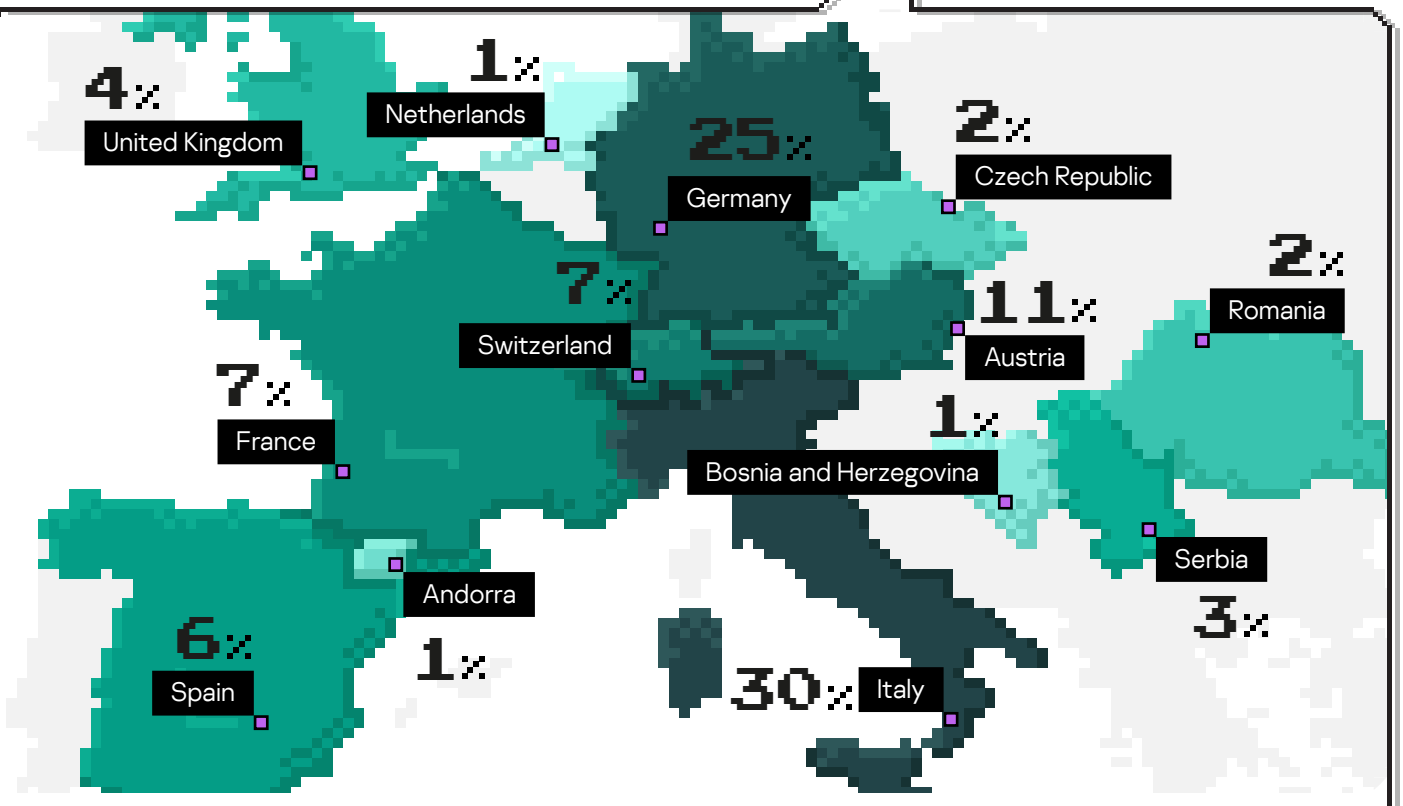


[1] https://www.kaspersky.com/about/press-releases/2022_kaspersky-managed-detection-and-response-gets-highest-rating-in-gartner-peer-insightstm

MDR coverage of regions



Accurate perception of the report in terms of threat intelligence requires us to disclose coverage of regions where we deliver the service: incident volumes, tactics and techniques do have geographical specifics.



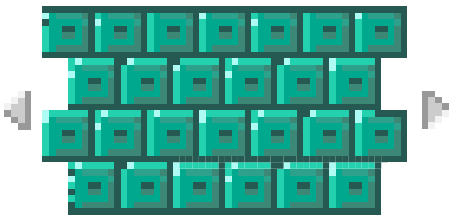
In Europe, the top countries where Kaspersky MDR is popular are Italy, Germany and Austria.

MDR Daily Routine

In 2021, each day MDR received a huge amount of telemetry that was processed into alerts. 73.74% of received alerts were processed by SOC analysts and 6.67% were related to real incidents that were reported to customers via the MDR portal.

Daily events from one host

~15k

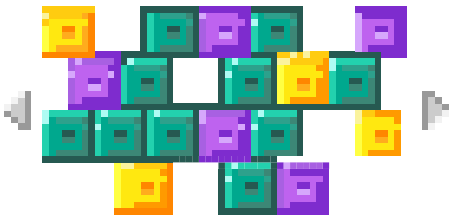


This number can vary significantly depending on the host activity

From which

414k alerts

were processed

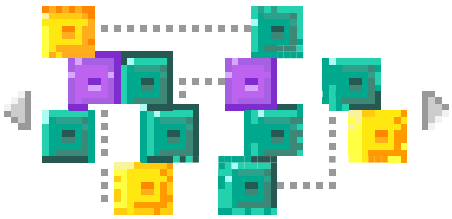


150k+ alerts were processed automatically using AI technology
264k+ were analyzed by SOC analysts

Resulting in

8,479 incidents

reported to customers



~18k alerts were related to security incidents, which was ~7% of the total

> Incidents remediation effectiveness

1 alert

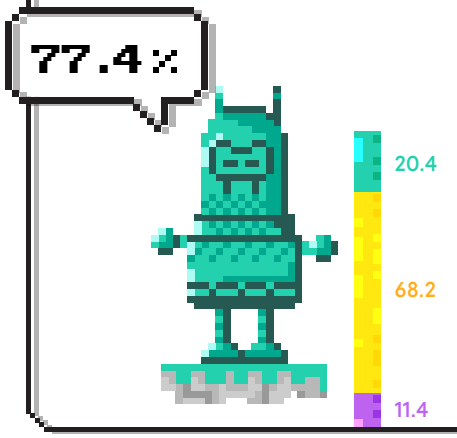
77.39% of all incidents are related to only one alert. That demonstrates a pretty high incident remediation efficiency. Also, typical incidents with well-defined playbooks[1] fall into this category. The share of High severity incidents here is the lowest – only 11.38%.

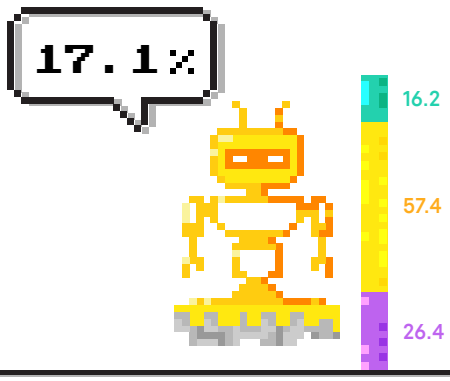
2-4 alerts

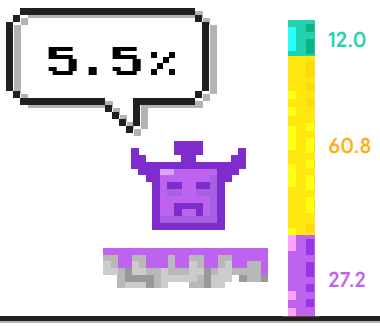
17.13% of incidents are linked with 2-4 alerts. To prevent detect evasion we use completely different technologies for the same threat. Different technologies generate different alerts and this category demonstrates to us there is room for more comprehensive alerts processing.

5+ alerts

Less than 5.48% of incidents are linked to 4 alerts or more. They are cases where remediation is not allowed or not efficient: new targeted attacks that require careful investigation before remediation, or the customer requested attack monitoring without response. The share of High severity incidents here is the biggest – more than 27% and for Low – only ~12%.



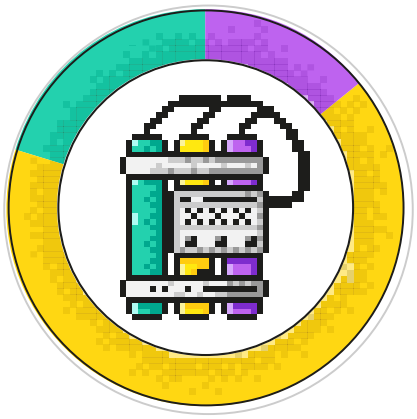




[1] For example, incidents related to Accessibility Features(T1546.008), LSASS memory dump (T1003.001), Registry dump (T1003.004), Rootkit detection (T1014) Brute force (T1110) and many others

Severity of incidents

In MDR, all incidents are actionable. That means we don't report incidents without a recommendation to prevent or decrease the probability of a possible impact.

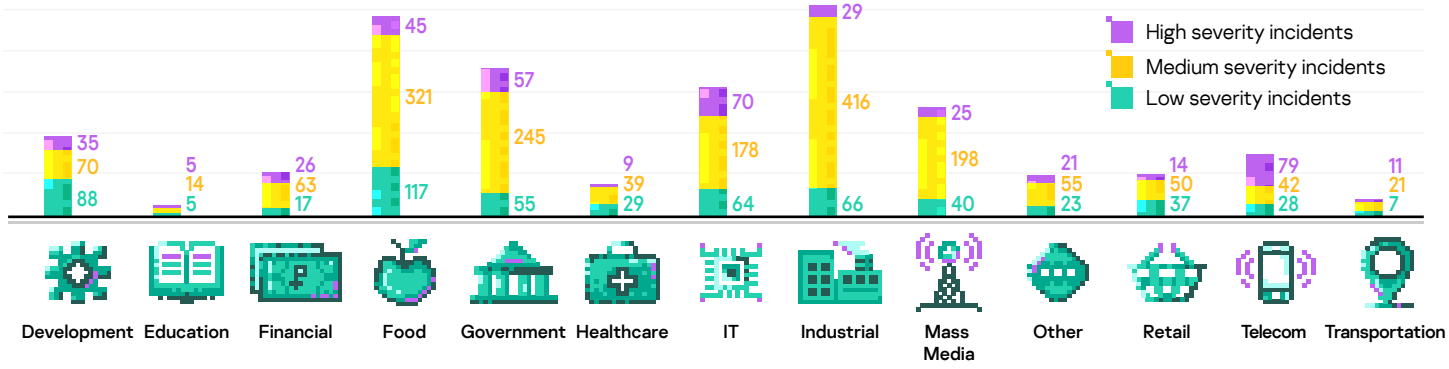


14% High severity incidents
human-driven attack
or malware outbreak with huge impact

66% Medium severity incidents
have no signs of human-driven activities, related to medium level of impact

20% Low severity incidents
without significant effect on corporate business processes, but still have actions that might be implemented to improve overall security posture

In 2021, we detected more than one High severity incident each day.
The diagram below reflects the number of incidents per 10k computers being monitored.



How long does it take to identify an incident?

The life of an alert related to suspicious activity starts in a queue assigned to SOC analyst who opens it in accordance with severity and time to SLA breach. If Alert data analysis shows that it's a FP[1], it's ignored and custom and/or global filters[2] are created. Then, the alert is imported to a case.

After an investigation, the case can be either closed as a FP or reported as an incident via MDR portal along with recommended response actions. If the customer approves, endpoint agents will automatically fulfill them.

41.4 min High severity
The most difficult incidents that require more time for additional data enrichment and checks. In comparison to previous periods[3] we were able to reduce this time by more incident card templates and introduction of new telemetry enrichments that speed up triage.

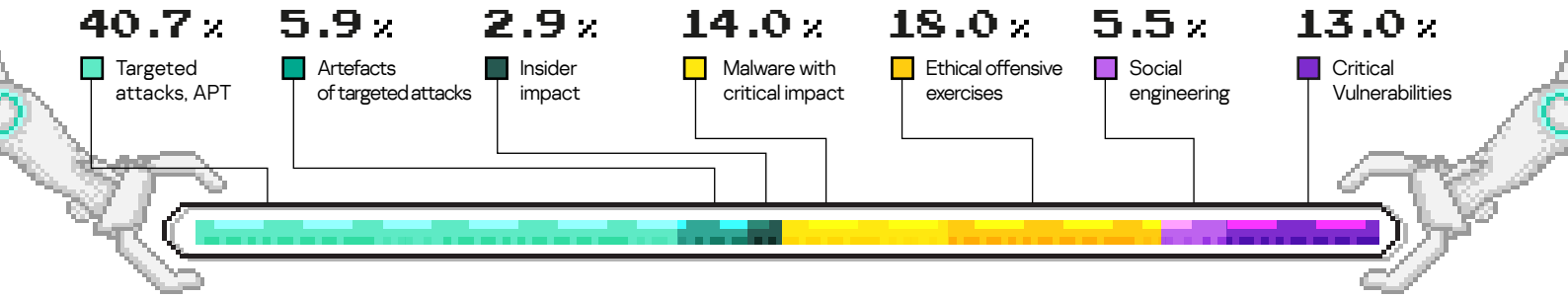
34.8 min Medium severity
The most common incident severity. In comparison to previous reports, this time is increased due to new types of incidents discovered that had no templates yet. Another reason is the increase of high-severity incidents that led to postponement of medium and low incidents.

40.2 min Low severity
The lowest priority incidents in comparison to high and medium, spent more time in queue.

[1] There are two main types of FP: Infrastructural – the alert logic is OK, but due to customer's infrastructure peculiarities this is not actionable incident; Technological – the alert logic works wrong and should be fixed.
[2] Custom filter is adjustment of detection logic for particular customer infrastructure, - this sort of filters is created to fix Infrastructural FP. Global filter is detection logic adjustments in case of Technological FP.
[3] https://securelist.com/managed-detection-and-response-in-q4-2020/103387/

The nature of High severity incidents

What are the causes of High severity incidents?



More than 40% of reported High severity incidents were related to targeted attacks

Almost 6% - traces of previously active human-driven attacks (targeted attacks or cyber-exercises)

A little less than 3% of High severity incidents our SOC analysts classified as related to insiders[1]

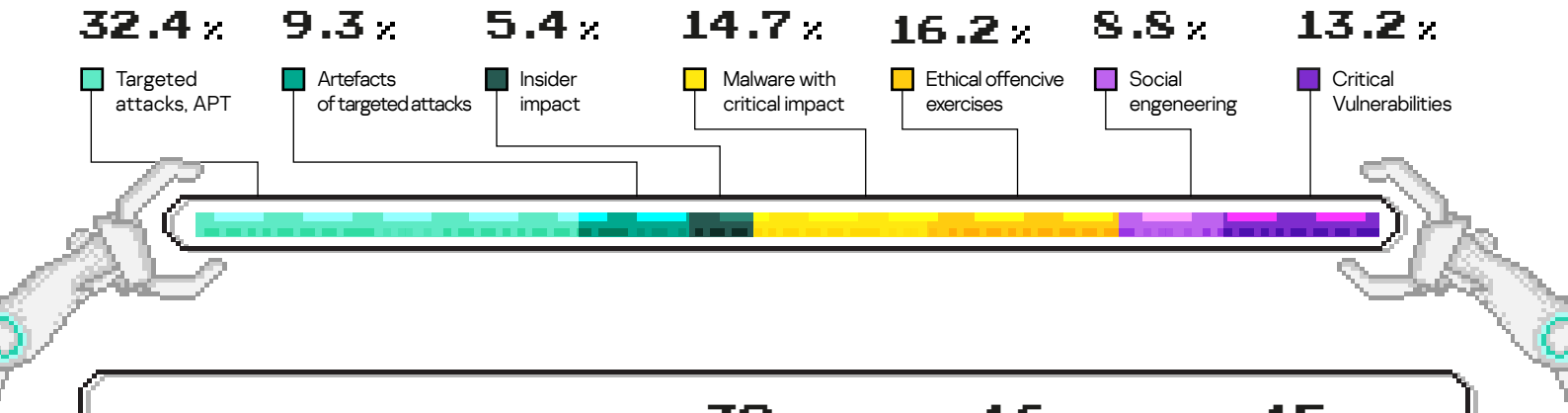
Malware with significant impact on infrastructure (like cryptor or wiper) with no signs of human attack management – 14%

Ethical offensive exercises (red teaming, penetration testing) 18%

About 5,5% of incidents were related to successful social engineering attacks, with consequent development that led to impact

Little less than 13% - related to publicly exposed critical vulnerabilities

How many organizations experienced High severity incidents?



In terms of companies, statistics in general similar to that regarding numbers of incidents.

The top three places are the same:

~32 % APT

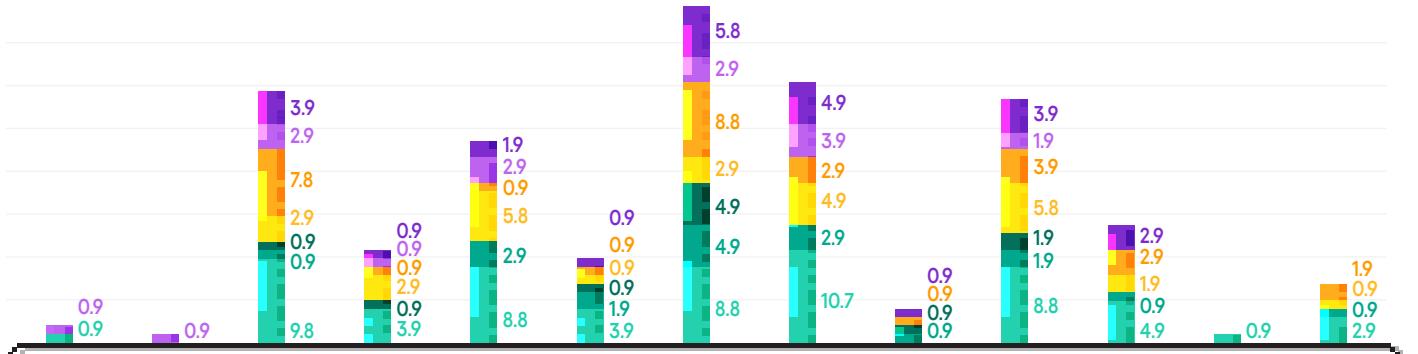
~16 % redteaming

~15 % malware

[1] In this type of incidents, we were not able to observe any signs of external attackers, but suspicious actions were done by legitimate privileged accounts. We asked customers if observed activities were legit or not, but did not receive any answer – that's why we have no reason to classify such cases as false positive (In reality it might be attempts to test MDR operational readiness, or really illegal activities from IT staff that customers preferred not to share with us)

The nature of High severity incidents

Number of organizations with High severity incidents by industry, %

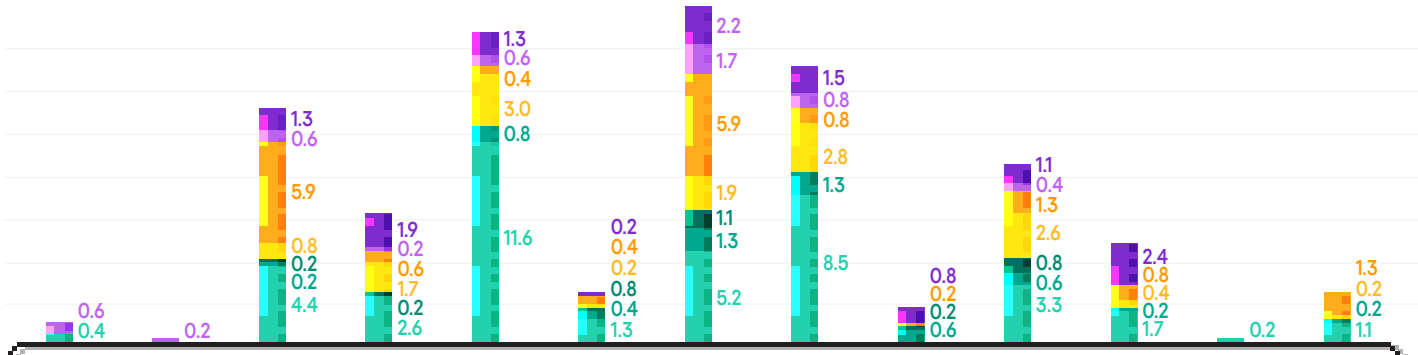


The main findings from this statistic are:

- APTs were detected in each vertical except Education and Mass Media
- Mass Media was also compromised previously because there were reported incidents related to APT traces
- Most verticals experienced all types of High severity incidents
- In 2021 almost all verticals except Development, Education and Telecom practiced red team exercises
- Social engineering is still very efficient

Targeted attacks, APT | Artefacts of targeted attacks | Insider impact | Malware with critical impact | Ethical offensive exercises | Social engeenering | Critical Vulnerabilities

Number of High severity incidents by industry, %



This statistic shows that:

- The biggest numbers of APT-related incidents were detected in Government, Industrial, IT and Financial
- Financial and IT are in top by number of red teaming cases
- Development and Telecom experienced APTs but didn't conduct red teaming
- Successful social engineering and publicly faced vulnerabilities correlate to distribution of APT cases
- APT cases in general go hand in hand with cases related to traces of previous APT

Detection technology and adversarial TTP

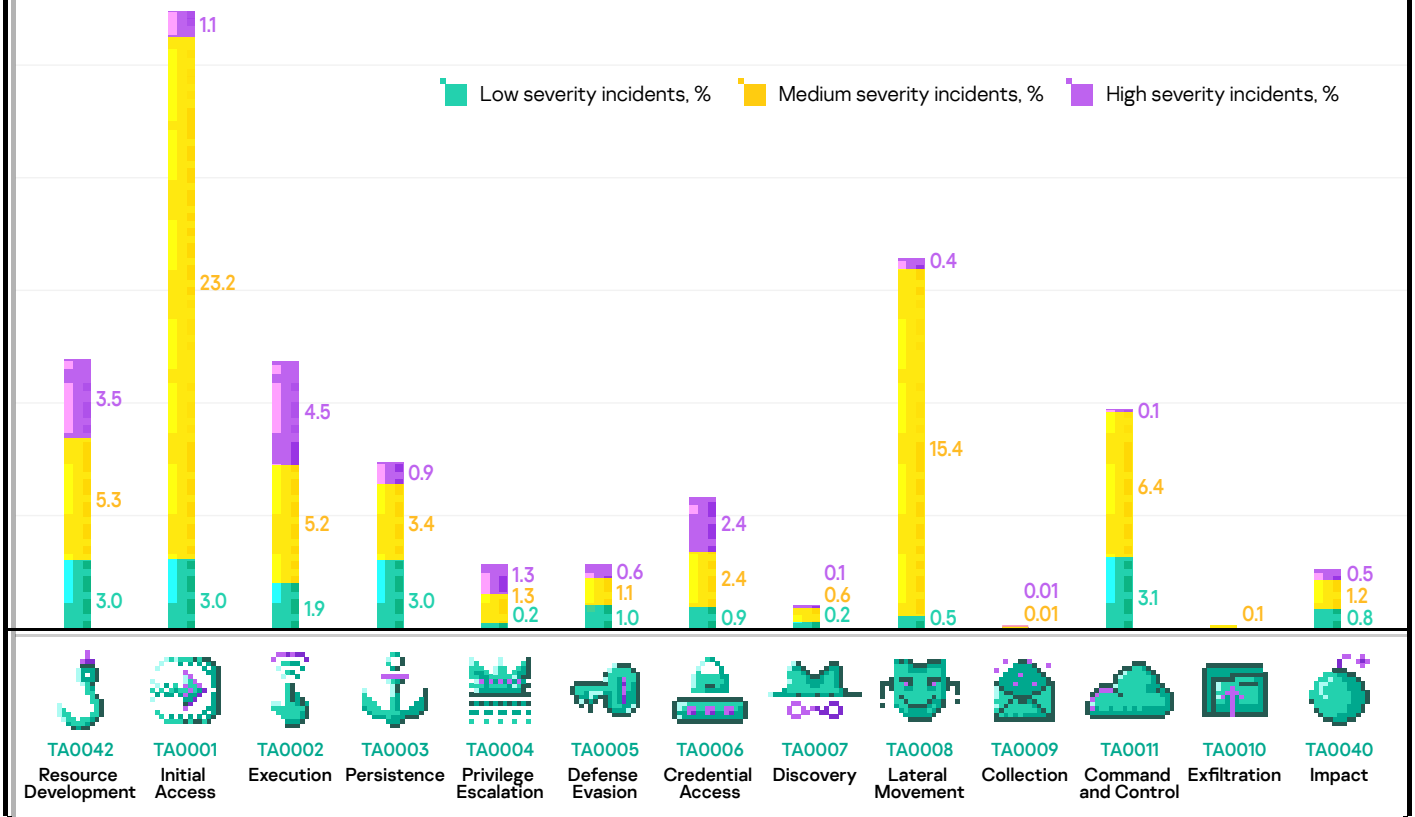
Adversarial tactics

MDR is capable of detecting Incidents at different stages of the attack kill chain. Usually, an incident is observed in different stages (MITRE ATT&CK tactics), but in the diagram below we count the earliest tactic for an incident. ...I

More

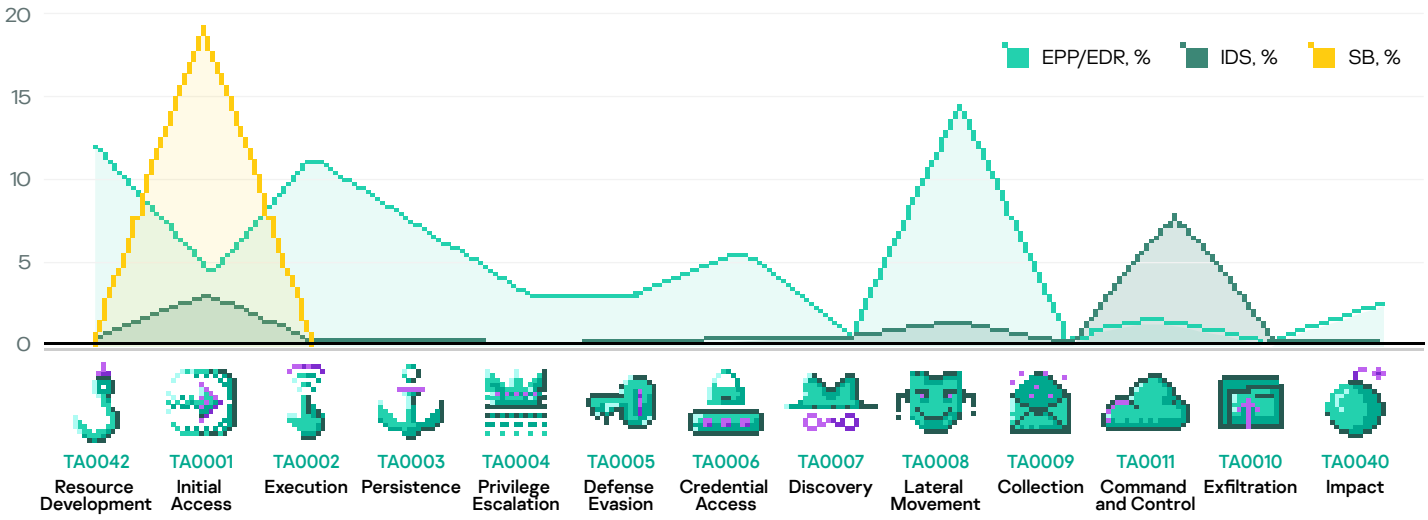
Top tactics where we detect incidents are:

- Initial Access mainly covered by Kaspersky Anti-Targeted Attack platform on the perimeter detecting phishing and social engineering that are still very popular
- Resource Development might sound strange, but it's related to many incidents like 'suspicious file' where a potentially offensive tool was observed without any signs of execution. Often it's related to red teaming, but sometimes it's linked to real attacker's foothold
- Detection at the Execution stage is very similar to previous, but we observed tool execution. Execution is always noisy if comprehensive EPP is a part of the detection pipeline and thus the most High severity incidents were detected here. This fact shows that tool-based detection is still pretty efficient because most actors use off-the-shelf attack frameworks
- Lateral Movement is usually pretty noisy as well, but is related to fewer high-severity incidents detected here
- Command and Control is also common, but for Low and Medium severity incidents
- Not many incidents were detected at the Impact stage because usually it might be too late
- Very few incidents are detected at the Discovery tactic. This is due to difficulty of creating detections with a reasonable number of FP
- More efficient detections are on Credential access, Persistence and Privilege Escalation that in practice have a lower false positive rate. Also, attempts to evade defense often lead to successful detection



Tactics and Detection technology

In MDR we analyze telemetry from different types of sensors: Endpoint (EPP/EDR), Network Intrusion Detection System (IDS) and Sandbox (SB). Network IDS and sandbox are parts of Kaspersky Anti-Targeted attack platform (KATA). The percentage of incidents detected by different types of sensors is provided in the diagram below.



Initial access

- EPP/EDR SB IDS — T1566.001 Spearphishing Attachment
- EPP/EDR — T1078 Valid Accounts
- EPP/EDR IDS — T1190 Exploit Public-Facing Application
- EPP/EDR IDS — T1133 External Remote Services
- EPP/EDR SB IDS — 1566.002 Spearphishing Link

Execution

- EPP/EDR SB — T1204.002 Malicious File
- EPP/EDR — T1059.001 PowerShell
- EPP/EDR — T1053 Scheduled Task/Job
- EPP/EDR — T1047 Windows Management Instrumentation
- EPP/EDR IDS — T1569.002 Service Execution

Persistence

- EPP/EDR — T1098 Account Manipulation
- EPP/EDR — T1547.001 Registry Run Keys / Startup Folder
- EPP/EDR — T1546.008 Accessibility Features

Privilege escalation

- EPP/EDR — T1055.002 Portable Executable Injection
- EPP/EDR — T1055 Process Injection
- EPP/EDR — T1068 Exploitation for Privilege Escalation

Defense evasion

- EPP/EDR — T1036.005 Match Legitimate Name or Location
- EPP/EDR — T1036.003 Rename System Utilities
- EPP/EDR — T1562.001 Disable or Modify Tools

Credential access

- EPP/EDR — T1003 OS Credential Dumping
- EPP/EDR IDS — T1110 Brute Force
- EPP/EDR IDS — T1110.001 Password Guessing

Discovery

- EPP/EDR — T1033 System Owner/ User Discovery
- EPP/EDR — T1007 System Service Discovery
- EPP/EDR — T1016 System Network Configuration Discovery

Lateral Movement

- EPP/EDR IDS — T1210 Exploitation of Remote Services
- EPP/EDR IDS — T1021 SMB/Windows Admin Shares
- EPP/EDR — T1021.006 Windows Remote Management

Collection

- EPP/EDR — T1119 Automated Collection
- EPP/EDR — T1560.001 Archive via Utility
- EPP/EDR — T1005 Data from Local System

Reconnaissance

- EPP/EDR IDS — T1595.002 Vulnerability Scanning
- EPP/EDR — T1592 Gather Victim Host Information
- EPP/EDR — T1590.005 IP Addresses

Command and control

- EPP/EDR SB IDS — T1071.001 Web Protocols
- EPP/EDR IDS — T1095 Non-Application Layer Protocol
- EPP/EDR IDS — T1071.004 DNS

Impact

- EPP/EDR IDS — T1496 Resource Hijacking
- EPP/EDR IDS — T1486 Data Encrypted for Impact
- EPP/EDR — T1485 Data Destruction

Resource Development

- EPP/EDR SB — T1587.001 Malware
- EPP/EDR IDS — T1588.002 Tool

Exfiltration

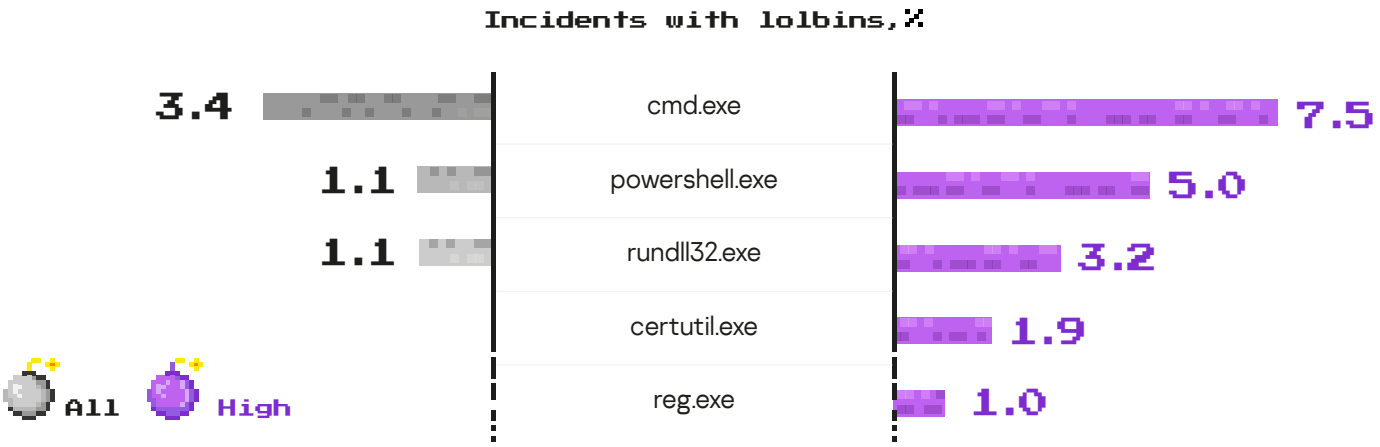
- IDS — T1048 Exfiltration Over Alternative Protocol
- EPP/EDR — T1020.001 Traffic Duplication

The high efficiency of sandbox and network IDS on Initial Access tactic is due to common use of KATA that detects phishing attacks. Also there are many Network IDS detects on Lateral Movement stage, and on Command and Control it's practically irreplaceable. For Execution, Persistence, Privilege Escalation, Defense Evasion, Credential Access and Impact tactics, the endpoint sensor is the main contributor. It is interesting to note that the Lateral Movement tactic is also well covered by endpoint.

Adversarial techniques

Tools used in incidents

Adversaries use built-in OS tools to minimize their chances of being detected during instruments delivery.



The most popular LOL-binaries[1] that are observed almost in any incident are cmd.exe and powershell.exe. rundll32.exe is also pretty popular among incidents of all severities.

High-severity incidents are distinguished by a wide variety of LOL tools used. In addition to aforementioned tools, in high-severity incidents reg.exe, te.exe and certutil.exe are also pretty popular.

Incident mapping to MITRE ATT&CK

Our detection logic is mapped to MITRE ATT&CK techniques. For each detect, we calculate conversion and contribution and that's why we can share them for techniques. Below, eight techniques that showed the highest conversion are listed and the following heatmap demonstrates techniques contribution[2].

80.0%

T1003: OS Credential Dumping

LSASS memory, LSA Secrets and DCSync were observed in almost each critical incident at the Credential Access stage

55.8%

T1569: System Services

System services are very popular for malicious content execution

52.4%

T1021: Remote Services

Different types of remote services like RDP, SMB/Windows Admin Shares, DCOM or SSH were detected in almost all incidents at the Lateral Movement attack stage

50.6%

T1110: Brute Force

Another popular credential access technique that demonstrates a low false positive rate

47.3%

T1558: Steal or Forge Kerberos Tickets

This technique and its sub-techniques are observed in every Active Directory infrastructure compromise, but they were efficiently detected

38.2%

T1078: Valid Accounts

Domain and Local accounts are widely used by adversaries for Defense Evasion and Persistence after successful Credential Access

38.1%

T1190: Exploit Public-Facing Application

In 2021, we encounter several critical vulnerabilities that led to the success of this technique

34.9%

T1049: System Network Connections Discovery

All discovery techniques might be observed in human-driven incidents, but usually they demonstrate the biggest false positive rate because no malicious activity was performed. However, this technique worked very well in 2021

[1] https://lolbas-project.github.io/
[2] Conversion – the ratio of alerts classified as incidents to the total number of alerts based on particular technique.
Contribution – the ratio of incidents based on particular technique to the total number of incidents.

<0,5% <5% <10% <20%

TA0043: Reconnaissance	TA0042: Resource Development	TA0001: Initial Access	TA0002: Execution	TA0003: Persistence	TA0004: Privilege Escalation	TA0005: Defense Evasion
T1590.005: IP Addresses	T1583.005: Botnet	T1078: Valid Accounts	T1047: Windows Management Instrumentation	T1037: Boot or Logon Initialization Scripts	T1055: Process Injection	T1014: Rootkit
T1592: Gather Victim Host Information	T1583.006: Web Services	T1091: Replication Through Removable Media	T1053.005: Scheduled Task	T1098: Account Manipulation	T1068: Exploitation for Privilege Escalation	T1027: Obfuscated Files or Information
T1595: Active Scanning	T1587.001: Malware	T1133: External Remote Services	T1053: Scheduled Task/Job	T1136: Create Account	T1134: Access Token Manipulation	T1036: Masquerading
T1598.003: Spearphishing Link	T1588.001: Malware	T1189: Drive-by Compromise	T1059: Command and Scripting Interpreter	T1137: Office Application Startup	T1548.002: Bypass User Account Control	T1070: Indicator Removal on Host
	T1588.002: Tool	T1190: Exploit Public-Facing Application	T1064: Scripting	T1176: Browser Extensions		T1112: Modify Registry
	T1588.003: Code Signing Certificates	T1195: Supply Chain Compromise	T1106: Native API	T1197: BITS Jobs		T1127.001: MSBuild
	T1588.005: Exploits	T1566.001: Spearphishing Attachment	T1129: Shared Modules	T1205.001: Port Knocking		T1140: Deobfuscate/ Decode Files or Information
	T1588.006: Vulnerabilities	T1566.002: Spearphishing Link	T1203: Exploitation for Client Execution	T1505.003: Web Shell		T1202: Indirect Command Execution
	T1608.002: Upload Tool		T1204: User Execution	T1542: Pre-OS Boot		T1207: Rogue Domain Controller
			T1569: System Services	T1543: Create or Modify System Process		T1211: Exploitation for Defense Evasion
				T1546.002: Screensaver		T1218: Signed Binary Proxy Execution
				T1546.003: Windows Management Instrumentation Event Subscription		T1220: XSL Script Processing
				T1546.007: Netsh Helper DLL		T1222.001: Windows File and Directory Permissions Modification
				T1546.008: Accessibility Features		T1497: Virtualization/ Sandbox Evasion
				T1546.010: AppInit DLLs		T1550.002: Pass the Hash
				T1546.012: Image File Execution Options Injection		T1550.003: Pass the Ticket
				T1546.015: Component Object Model Hijacking		T1553.002: Code Signing
				T1547: Boot or Logon Autostart Execution		T1553.004: Install Root Certificate
				T1554: Compromise Client Software Binary		T1562.001: Disable or Modify Tools
				T1556.002: Password Filter DLL		T1564.001: Hidden Files and Directories
				T1574.002: DLL Side-Loading		T1564.002: Hidden Users
						T1564.004: NTFS File Attributes

<0,5% <5% <10% <20%

TA0006: Credential Access	TA0007: Discovery	TA0008: Lateral Movement	TA0009: Collection	TA0011: Command and Control	TA0010: Exfiltration	TA0040: Impact
T1003: OS Credential Dumping	T1007: System Service Discovery	T1021: Remote Services	T1005: Data from Local System	T1001: Data Obfuscation	T1020.001: Traffic Duplication	T1485: Data Destruction
T1040: Network Sniffing	T1012: Query Registry	T1210: Exploitation of Remote Services	T1113: Screen Capture	T1071: Application Layer Protocol	T1048: Exfiltration Over Alternative Protocol	T1486: Data Encrypted for Impact
T1056: Input Capture	T1016: System Network Configuration Discovery	T1570: Lateral Tool Transfer	T1119: Automated Collection	T1090: Proxy	T1052: Exfiltration Over Physical Medium	T1496: Resource Hijacking
T1110: Brute Force	T1018: Remote System Discovery		T1560.001: Archive via Utility	T1095: Non-Application Layer Protocol		T1561.001: Disk Content Wipe
T1212: Exploitation for Credential Access	T1033: System Owner/User Discovery			T1102: Web Service		T1561.002: Disk Structure Wipe
T1555: Credentials from Password Stores	T1046: Network Service Scannin			T1104: Multi-Stage Channels		T1565: Data Manipulation
T1558: Steal or Forge Kerberos Tickets	T1049: System Network Connections Discovery			T1105: Ingress Tool Transfer		
	T1069: Permission Groups Discovery			T1219: Remote Access Software		
	T1082: System Information Discovery			T1568.002: Domain Generation Algorithms		
	T1083: File and Directory Discovery			T1571: Non-Standard Port		
	T1087: Account Discovery			T1572: Protocol Tunneling		
	T1124: System Time Discovery					
	T1135: Network Share Discovery					
	T1482: Domain Trust Discovery					
	T1518.001: Security Software Discovery					