

kaspersky

Threat Intelligence & The hateful eight:

Common TTPs of the Modern Ransomware Groups

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Масштаб современных кибератак



Средний ущерб от успешной кибератаки

SMB: 105k\$
Enterprise: ~1M\$



Отношение лидеров бизнеса

68% лидеров бизнеса считают, что риски, связанные с кибербезопасностью, растут



Мотивация атак

71% атак были финансово мотивированными



Оценка активности шифровальщиков

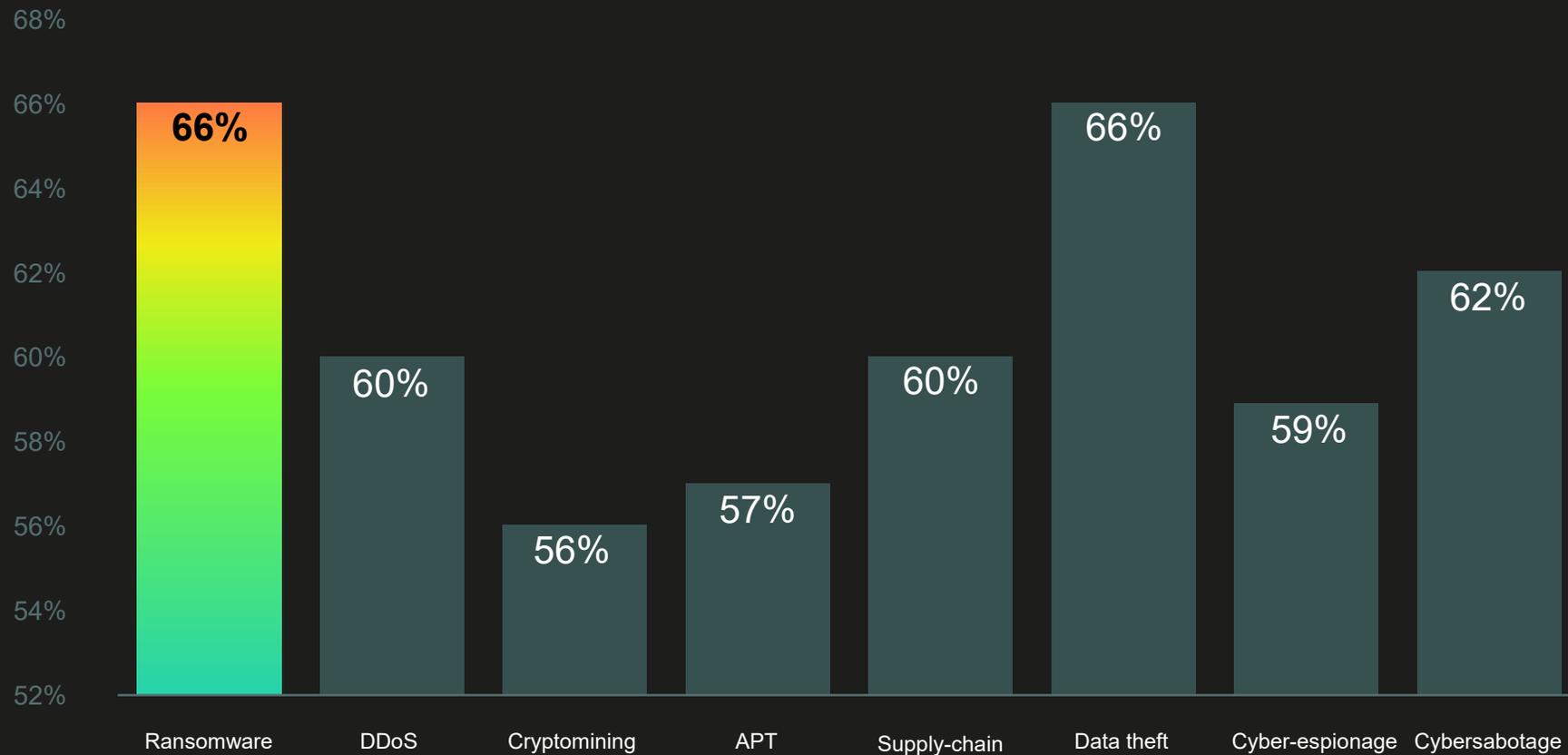
На 181% выросла доля детектируемых ежедневно программ-вымогателей



Последствия

Ежедневно эксперты "Лаборатории Касперского" находили в среднем 9500 зашифрованных такими зловредами файлов

Опрос: Вероятность различных типов угроз



Общая информация по шифровальщикам



Индустрии



Регионы



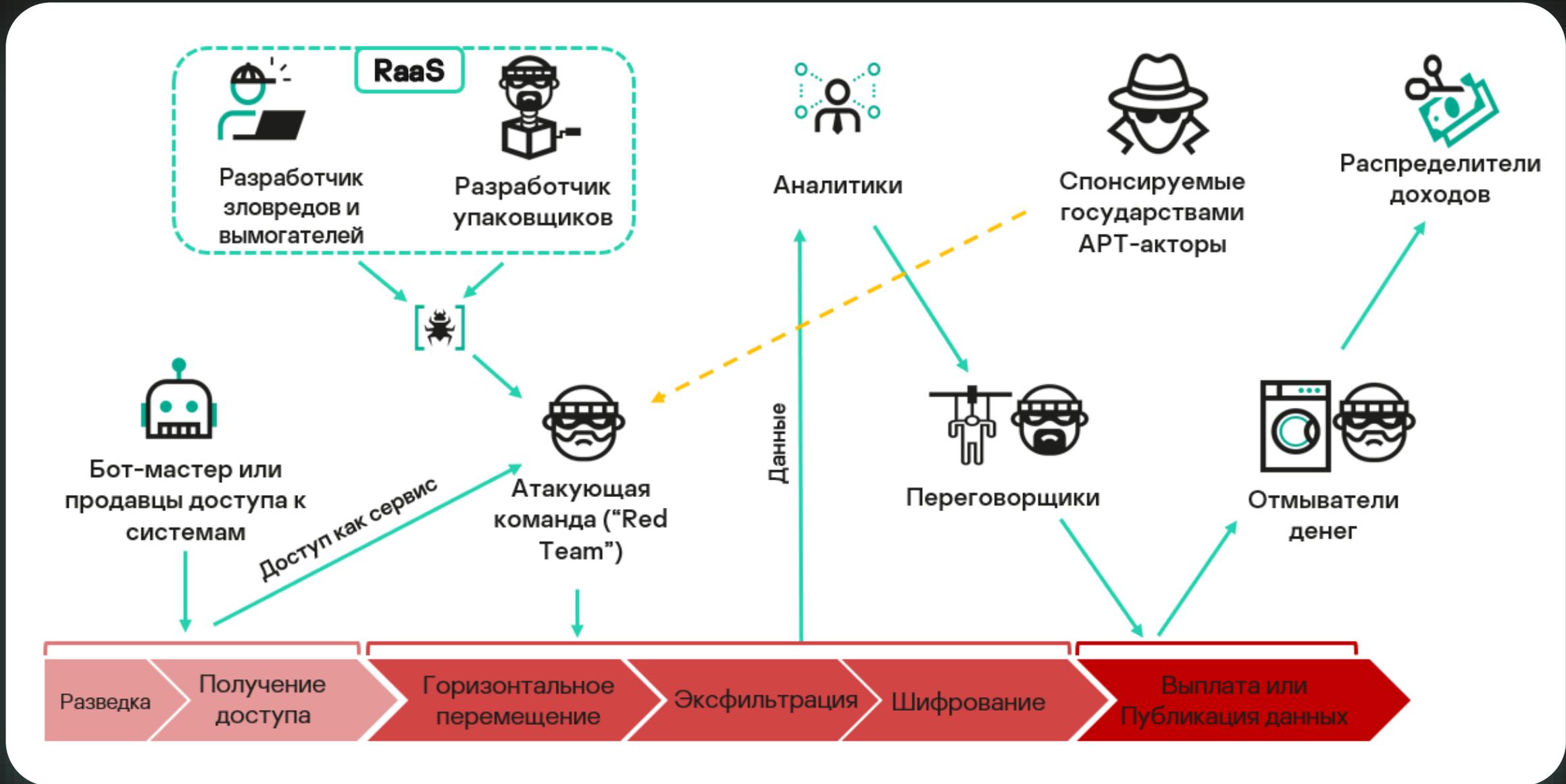
3 мифа
о шифровальщиках

Банды кибервымогателей — это автономные группировки

Цели вымогательских атак определяются заранее

Киберпреступники — это компьютеризированные уголовники

Экосистема вымогательского «бизнеса»



На основе нашей статистики мы составили график появления новых группировок Ransomware

2017	Фев	PClock	WannaCry	Erebus	PetrWrap	Cryptat	Hermes	AechHu
	Март	Matrix	Pycl	BTCWare				
	Апр	Poster	Ranion	Tiny	Everbe			
	Май	Manna	Ferber	Jaff	Rao	Savant		
	Июнь	Fairy	MacRansom	Erebus	NotPetya			
	Авг	Nubi						
	Окт	Magni	Pyrgen	BadRabbit				
	Нояб	Phobos	Ordin					
	Дек	Clop						
	Янв	GandCrab						
	Апр	WhiteRose	BlackHeart					
	Авг	Ryuk						
2018	Сент	LimeRat						
	Окт	WannaCash	Scrobo	Dcrtr				
	Нояб	Stop/DJVVU						
	Янв	Anatova	MegaCortex					
	Фев	Vega						
	Март	JNEC	RobbinHood					
	Май	JSWorm	Wesker	Maze				
	Июнь	VoidCrypt						
	Июль	DoppelPaymer						
	Сент	NetWalker						
	Окт	Medusa	Snatch					
	Нояб	Thanos	NextCry	WastedLocker				
2019	Дек	Lockbit	PwndLocker	DMR				
	Янв	Makop	Bitpylock					
	Фев	RagnarLocker	Conti	Cuba	Sorena			
	Март	TeslaRvng	Blackin					
	Апр	WannaRen	Ransomexx	Sfile				
	Май	Snake						
	Июнь	Avaddon	GottaCrypt					
	Июль	EvilQuest	Fonix					
	Авг	Darkside	XmrLocker					
	Сент	MountLocker						
	Окт	Egregor						
	Нояб	HelloKitty	CoronaLock					
2020	Дек	Suncrypt	DeathRansom	Cring	Babuk	Hades		
	Янв	Lorenz	Pysa					
	Март	Quoter						
	Апр	Jesus	Qlocker					
	Май	DiscoRan	Everest					
	Июнь	Hive	Zikma					
	Июль	AvosLocker	Scrypt	BlackMatter				
	Авг	Loki	LockFile					
	Сент	Chaos	Blackbyte	Colossus				
	Окт	Diavol	Prans					
	Нояб	Polaris	Rook	Surtr	Sabbath			
	Дек	BlackCat						
2021	Янв	NightSky						
	Фев	Stormous	Krus	Hermetic				
	Март	Freeud	Pandora					

Восемь наиболее активных групп Ransomware

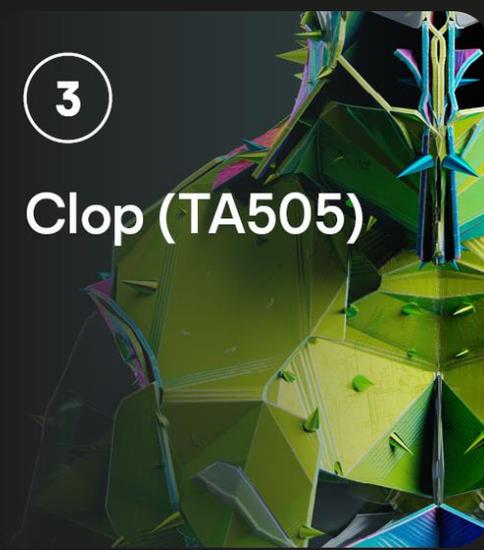
1
Conti / Ryuk



2
Pysa



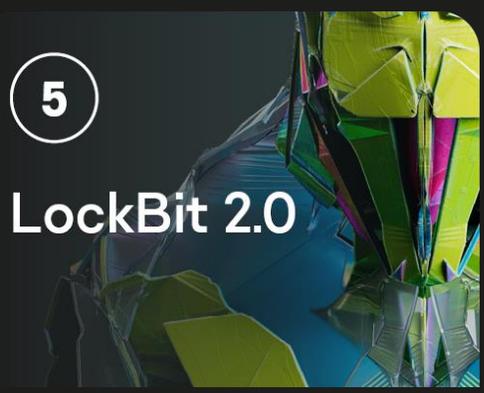
3
Clon (TA505)



4
Hive



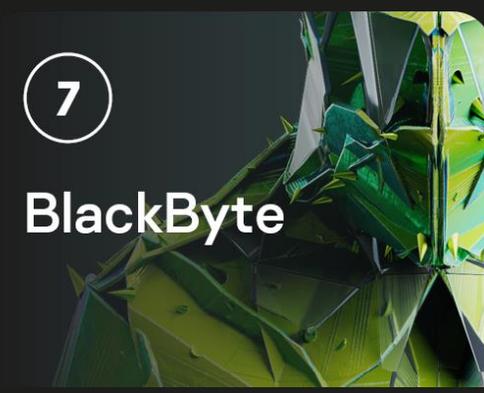
5
LockBit 2.0



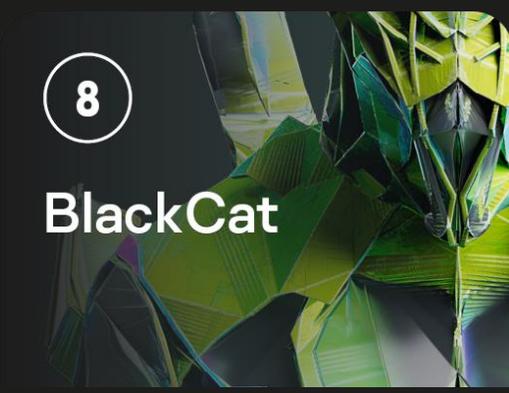
6
Ragnar Locker



7
BlackByte



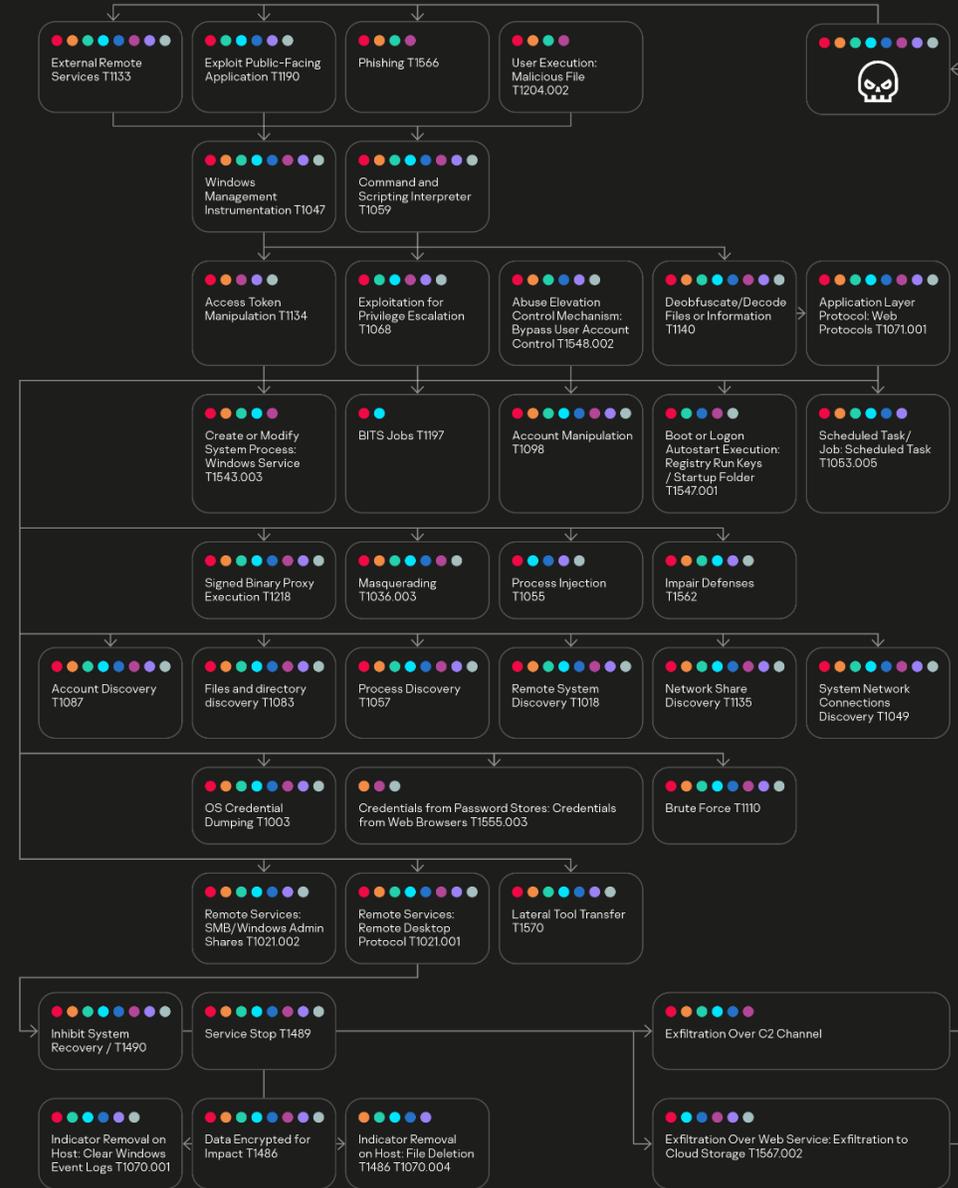
8
BlackCat



Cyber Kill Chain

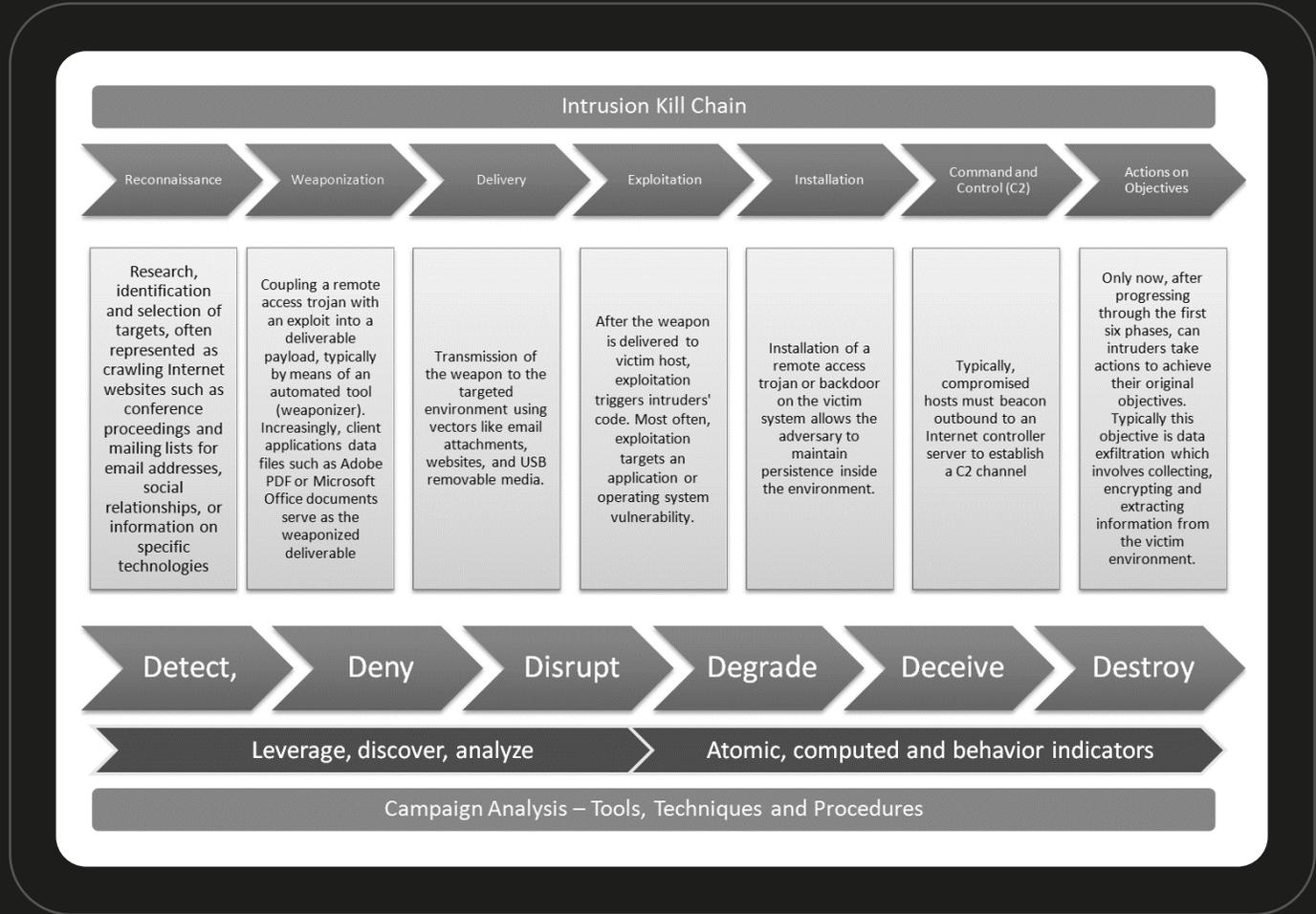
- Conti/Ryuk
- Clop (TA505)
- Pysa
- Hive
- Lockbit 2.0
- BlackByte
- RagnarLocker
- BlackCat

Чтобы выделить общие паттерны различных схем атак и TTPs, используемые различными группами вымогателей, мы создали диаграмму Cyber Kill Chain



Cyber Kill Chain

- 1996 F2T2EA
- 2011 Cyber Kill Chain
- 2012 Intelligence – Driven Defense
- 2013 ATT&CK Matrix



1996 F2T2EA

2011 Cyber Kill Chain

2012 Intelligence – Driven Defense

2013 ATT&CK Matrix

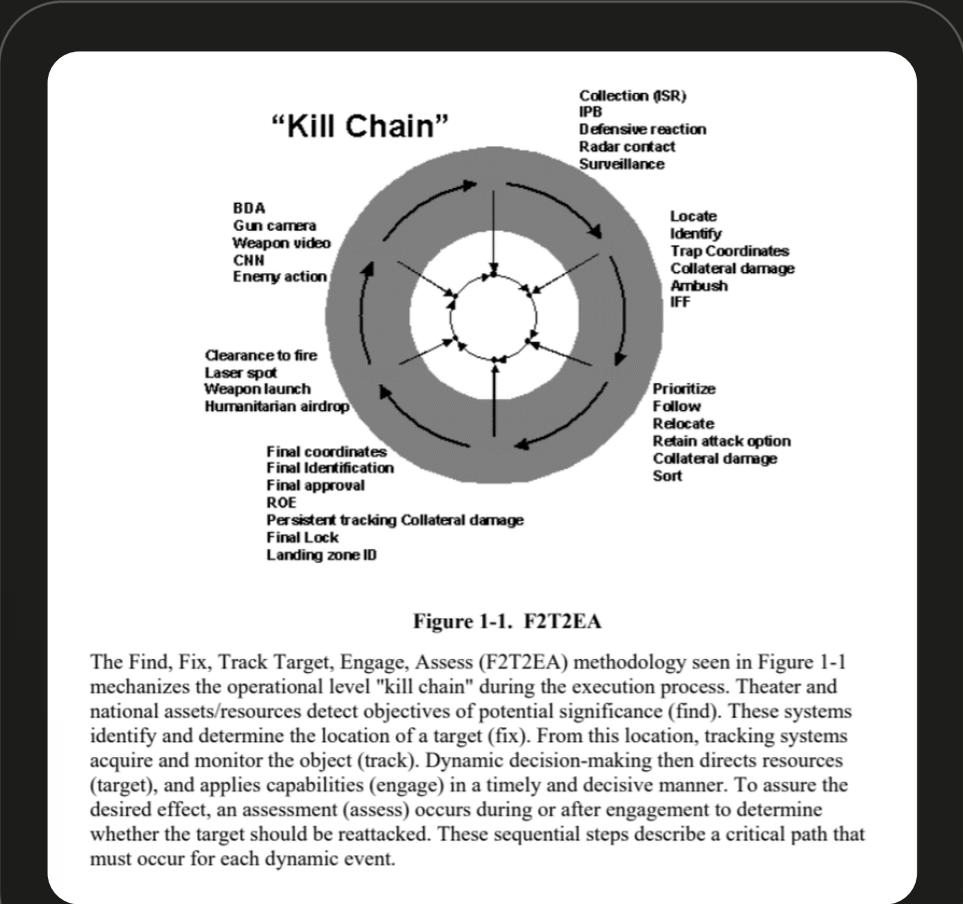


Figure 1-1. F2T2EA

The Find, Fix, Track Target, Engage, Assess (F2T2EA) methodology seen in Figure 1-1 mechanizes the operational level "kill chain" during the execution process. Theater and national assets/resources detect objectives of potential significance (find). These systems identify and determine the location of a target (fix). From this location, tracking systems acquire and monitor the object (track). Dynamic decision-making then directs resources (target), and applies capabilities (engage) in a timely and decisive manner. To assure the desired effect, an assessment (assess) occurs during or after engagement to determine whether the target should be reattacked. These sequential steps describe a critical path that must occur for each dynamic event.

TABLE I. KEY INDICATORS OF KILL CHAINS

Phase	Indicators
Find	detection range(km), transmit power(kW), endurance(h), working frequency(MHz), pulse width(μ s), pulse repetition rate(kHz), antenna length(m), radome thickness(m), azimuth beam width($^{\circ}$), elevation beam width($^{\circ}$), antenna side lobe (dB)
Fix	transmit power(kW), received frequency(MHz), dynamic range(dB), sensitivity(dBv), output power(kW), MTBF(h), peak power(w), recognition range (km)
Track	target tracking capacity, angular accuracy($^{\circ}$), velocity measurement range (kn) , clutter improvement factor(dB), operating range(km), endurance(h), MTBF(h)
Target	navigation capability, target processing capacity, azimuth($^{\circ}$), data transfer rate(kbps), working frequency(MHz), operating range(km)
Engage	tactical range(km), service ceiling(m), maximum suspension weight(kg), maximum level flight speed(km/h), hitting probability(%) ,maximum attack range(km), maximum missile speed(km/h)
Assess	endurance(h), transmit frequency(MHz), received frequency(MHz), dynamic range(dB), sensitivity(dBv) , operating range(km) , MTBF(h)

1996 F2T2EA

2011 Cyber Kill Chain

2012 Intelligence – Driven
Defense

2013 ATT&CK Matrix

Intelligence-Driven Computer Network Defense Informed by Analysis of Adversary Campaigns and Intrusion Kill Chains

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Abstract

Conventional network defense tools such as intrusion detection systems and anti-virus focus on the vulnerability component of risk, and traditional incident response methodology presupposes a successful intrusion. An evolution in the goals and sophistication of computer network intrusions has rendered these approaches insufficient for certain actors. A new class of threats, appropriately dubbed the “Advanced Persistent Threat” (APT), represents well-resourced and trained adversaries that conduct multi-year intrusion campaigns targeting highly sensitive economic, proprietary, or national security information. These adversaries accomplish their goals using advanced tools and techniques designed to defeat most conventional computer network defense mechanisms. Network defense techniques which leverage knowledge about these adversaries can create an intelligence feedback loop, enabling defenders to establish a state of information superiority which decreases the adversary’s likelihood of success with each subsequent intrusion attempt. Using a kill chain model to describe phases of intrusions, mapping adversary kill chain indicators to defender courses of action, identifying patterns that link individual intrusions into broader campaigns, and understanding the iterative nature of intelligence gathering form the basis of intelligence-driven computer network defense (CND). Institutionalization of this approach reduces the likelihood of adversary success, informs network defense investment and resource prioritization, and yields relevant metrics of performance and effectiveness. The evolution of advanced persistent threats necessitates an intelligence-based model because in this model the defenders mitigate not just vulnerability, but the threat component of risk, too.

Intelligence-Driven Defense – Courses of Action

1996 F2T2EA

2011 Cyber Kill Chain

2012 Intelligence – Driven Defense

2013 ATT&CK Matrix

Phase	Detect	Deny	Disrupt	Degrade	Deceive	Destroy
Reconnaissance	Web analytics	Firewall ACL				
Weaponization	NIDS	NIPS				
Delivery	Vigilant user	Proxy filter	In-line AV	Queuing		
Exploitation	HIDS	Patch	DEP			
Installation	HIDS	"chroot" jail	AV			
C2	NIDS	Firewall ACL	NIPS	Tarpit	DNS redirect	
Actions on Objectives	Audit log			Quality of Service	Honeypot	

1996 F2T2EA

2011 Cyber Kill Chain

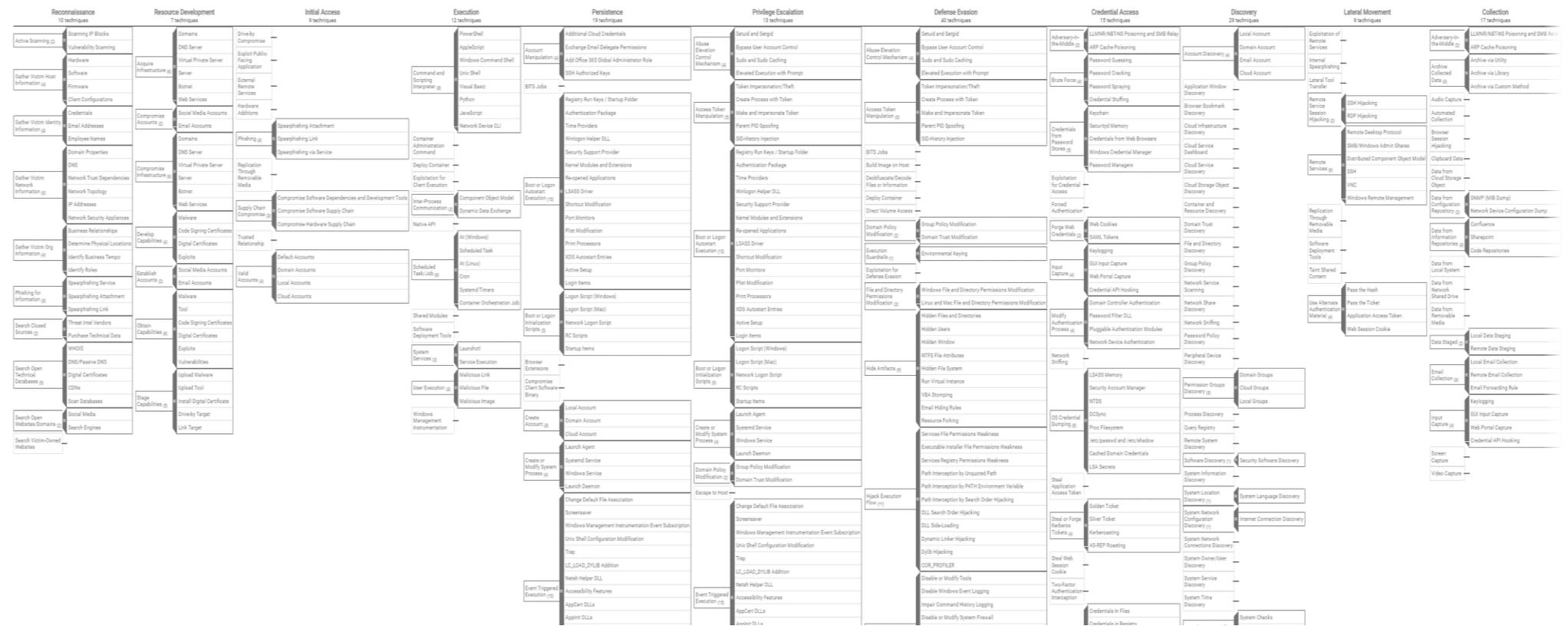
2012 Intelligence – Driven Defense

2013 ATT&CK Matrix

ATT&CK Matrix for Enterprise

layout: side | show sub-techniques | hide sub-techniques

Reconnaissance 10 techniques	Resource Development 7 techniques	Initial Access 9 techniques	Execution 12 techniques	Persistence 19 techniques	Privilege Escalation 13 techniques	Defense Evasion 40 techniques	Credential Access 15 techniques	Discovery 29 techniques	Lateral Movement 9 techniques	Collection 17 techniques	Command and Control 16 techniques	Exfiltration 9 techniques	Impact 13 techniques
Active Scanning (2)	Acquire Infrastructure (6)	Drive-by Compromise	Command and Scripting Interpreter (8)	Account Manipulation (4)	Abuse Elevation Control Mechanism (4)	Abuse Elevation Control Mechanism (4)	Adversary-in-the-Middle (2)	Account Discovery (4)	Exploitation of Remote Services	Adversary-in-the-Middle (2)	Application Layer Protocol (4)	Automated Exfiltration (1)	Account Access Removal
Gather Victim Host Information (4)	Compromise Accounts (2)	Exploit Public-Facing Application	Container Administration Command	BITS Jobs	Access Token Manipulation (2)	Access Token Manipulation (2)	Brute Force (2)	Application Window Discovery	Internal Spearphishing	Archive Collected Data (3)	Communication Through Removable Media	Data Transfer Size Limits	Data Destruction
Gather Victim Identity Information (3)	Compromise Infrastructure (4)	External Remote Services	Deploy Container	Boot or Logon Autostart Execution (15)	Boot or Logon Autostart Execution (15)	Build Image on Host	Credentials From Password Stores (2)	Browser Bookmark Discovery	Lateral Tool Transfer	Audio Capture	Data Encoding (2)	Exfiltration Over Alternative Protocol (2)	Data Encrypted for Impact
Gather Victim Network Information (6)	Develop Capabilities (4)	Hardware Additions	Exploitation for Client Execution	Boot or Logon Initialization Scripts (2)	Boot or Logon Initialization Scripts (2)	Deobfuscate/Decode Files or Information	Exploitation for Credential Access	Cloud Infrastructure Discovery	Remote Service Hijacking (2)	Automated Collection	Data Obfuscation (2)	Exfiltration Over C2 Channel	Data Manipulation (3)
Gather Victim Org Information (4)	Establish Accounts (2)	Phishing (2)	Inter-Process Communication (2)	Browser Extensions	Browser Extensions	Deploy Container	Forced Authentication	Cloud Service Dashboard	Remote Services (2)	Browser Session Hijacking	Dynamic Resolution (2)	Disk Wipe (2)	Disk Wipe (2)
Phishing for Information (4)	Obtain Capabilities (6)	Replication Through Removable Media	Native API	Compromise Client Software Binary	Create or Modify System Process (4)	Direct Volume Access	Forge Web Credentials (2)	Cloud Service Discovery	Replication Through Removable Media	Clipboard Data	Encrypted Channel (2)	Exfiltration Over Other Network Medium (1)	Endpoint Denial of Service (4)
Search Closed Sources (2)	Stage Capabilities (5)	Supply Chain Compromise (2)	Scheduled Task/Job (6)	Create Account (3)	Domain Policy Modification (2)	Domain Policy Modification (2)	Input Capture (4)	Cloud Storage Object Discovery	Software Deployment Tools	Data from Cloud Storage Object	Fallback Channels	Firmware Corruption	Inhibit System Recovery
Search Open Technical Databases (3)	Trusted Relationship	Software Deployment Tools	System Services (2)	Event Triggered Execution (15)	Event Triggered Execution (15)	Exploitation for Defense Evasion	Modify Authentication Process (4)	Container and Resource Discovery	Taint Shared Content	Data from Configuration Repository (2)	Ingress Tool Transfer	Exfiltration Over Physical Medium (1)	Network Denial of Service (2)
Search Open Websites/Domains (2)	Valid Accounts (4)	User Execution (3)	Windows Management Instrumentation	External Remote Services	Hijack Execution Flow (11)	Hijack Execution Flow (11)	OS Credential Dumping (8)	File and Directory Discovery	Use Alternate Authentication Material (4)	Data from Information Repositories (3)	Multi-Stage Channels	Exfiltration Over Web Service (2)	Resource Hijacking
Search Victim-Owned Websites				Hijack Execution Flow (11)	Process Injection (11)	Process Injection (11)	Steal Application Access Token	Group Policy Discovery		Data from Local System	Non-Application Layer Protocol	Scheduled Transfer	Service Stop
				Implant Internal Image	Scheduled Task/Job (6)	Scheduled Task/Job (6)	Steal Network Service Scanning	File and Directory Discovery		Data from Network Shared Drive	Protocol Tunneling	Transfer Data to Cloud Account	System Shutdown/Reboot
				Modify Authentication Process (4)	Valid Accounts (4)	Valid Accounts (4)	Steal Web Session Cookie	Network Sniffing		Data from Removable Media	Proxy (4)		
				Office Application Startup (6)	Pre-OS Boot (3)	Pre-OS Boot (3)	Two-Factor Authentication Interception	Password Policy Discovery		Data from Network Shared Drive	Remote Access Software		
				Pre-OS Boot (3)	Scheduled Task/Job (6)	Scheduled Task/Job (6)	Unsecured Credentials (7)	Peripheral Device Discovery		Data from Local System	Traffic Signaling (1)		
				Server Software Component (4)	Traffic Signaling (1)	Traffic Signaling (1)	Modify Cloud Compute Infrastructure (4)	Process Discovery		Input Capture (4)	Web Service (2)		
				Valid Accounts (4)	Valid Accounts (4)	Valid Accounts (4)	Modify Registry	Query Registry		Screen Capture			
							Modify System Image (2)	Remote System Discovery		Video Capture			
							Network Boundary Bridging (1)	Software Discovery (1)					
							Obfuscated Files or Information (6)	System Information Discovery					
							Process Injection (11)	System Location Discovery (1)					
							Reflective Code Loading	System Network Configuration Discovery (1)					
							Rogue Domain Controller	System Network Connections Discovery					



Common TTPs

Initial Access	External Remote Services T1133	Exploit Public Facing Application T1190	Phishing T1566					
Execution	User Execution: Malicious File T1204.002	Command and Scripting Interpreter T1059	Windows Management Instrumentation T1047					
Persistence	Scheduled Task T1053.005	Boot or Logon Autostart Execution: Registry Run Keys / Startup Folder T1547.001	Account Manipulation T1098	Create or Modify System Process: Windows Service T1543.003	BITS Jobs T1197			
Privilege Escalation	Abuse Elevation Control Mechanism: Bypass User Account Control T1548.002	Exploitation for Privilege Escalation T1068	Access Token Manipulation T1134					
Defense Evasion	Signed Binary Proxy Execution T1218	Process Injection T1055	Impair Defenses: Disable or Modify System Firewall T1562.004	Impair Defenses: Disable or Modify Tools T1562.001	Masquerading T1036	Indicator Removal on Host: File Deletion T1070.004	Indicator Removal on Host: Clear Windows Event Logs T1070.001	Deobfuscate / Decode Files or Information T1140
Credential Access	OS Credential Dumping: LSASS Memory T1003.001	Credentials from Password Stores: Credentials from Web Browsers T1555.003	Brute Force T1110					
Discovery	System Network Connections Discovery T1049	Remote System Discovery T1018	Network Share Discovery T1135	Account Discovery T1087	File and Directory Discovery T1083	Process Discovery T1057		
Lateral Movement	Remote Services: Remote Desktop Protocol T1021.001	Lateral Tool Transfer T1570	Remote Services: SMB/ Windows Admin Shares T1021.002					
Command and Control	Application Layer Protocol: Web Protocols T1071.001							
Exfiltration	Exfiltration Over C2 Channel T1041	Exfiltration Over Web Service: Exfiltration to Cloud Storage T1567.002						
Impact	Inhibit System Recovery T1490	Service Stop T1489						

Для кого этот отчет

SOC Analysts

Threat Hunting Teams

Digital Forensics Specialists

Cyber Threat Intelligence Analysts

Cyber security specialists who are involved in the incident response

Technical Details

Каждая из техник, показанная на предыдущей диаграмме, сопоставлена с группами и сопровождается таблицей, показывающей, кто из обсуждаемых группировок использовал данную технику

MITRE ATT&CK TTP

User Execution: Malicious File
T1204.002

Количество

4 / 8

Актеры, применявшие эту технику

Conti
Pysa

Clop (TA505)
Hive

Ragnar Locker

Нет подтвержденных случаев

LockBit

BlackByte

BlackCat

Подробное описание TTPs

Как уже было сказано в предыдущей главе, самый распространенный способ доставки вредоносной полезной нагрузки в рамках фишинговых кампаний заключается в отправке электронных писем с прикрепленными вредоносными документами Microsoft Office. Злоумышленники могут поместить вредоносные документы в защищенные паролем архивы, которые и прикрепляются к фишинговым письмам.

Пример исполнения

```
Image_path: "$windir\system32\regsvr32.exe",  
Command_line: "regsvr32 $user\AppData\Vote1.ocx",  
Parent_image_path: "$programfiles\Microsoft Office\Office14\Excel.EXE"
```

Правила SIGMA

SIGMA

Приложение I. Started windows shell from Trusted process
Приложение I. Drop Execution File From by Trusted Process

Mitigations

Мы собрали лучшие практики из NIST, NCSC, CISA, SANS в организованную структуру, которую можно применять в организациях

There are additional measures that can be taken to make your organization more secure: Countering data loss and Preparing for an incident

We highlight the following stages of a ransomware incident, that can be mitigated or hampered for adversaries by defenders:

Intrusion

At the intrusion stage, an adversary tries to break into a protected perimeter.

Examples: spear phishing emails, bruteforce internet-facing services (RDP)

The Defenders' Main Goal: Prevent the malware from reaching the devices

Exploitation

At the exploitation stage, an adversary tries to run code in order to escalate privileges, access and exfiltrate sensitive information, or harvest credentials.

The Defenders' Main Goal: Prevent malware from launching on endpoint devices

Lateral Movement

At the lateral movement stage, an adversary tries to spread across the network.

The Defenders' Main Goal: Prevent malware from reaching other devices

Victims

Для этого анализа мы использовали статистические источники по обнаружениям, а также источники объявлений в даркнете о жертвах, размещенных операторами Ransomware

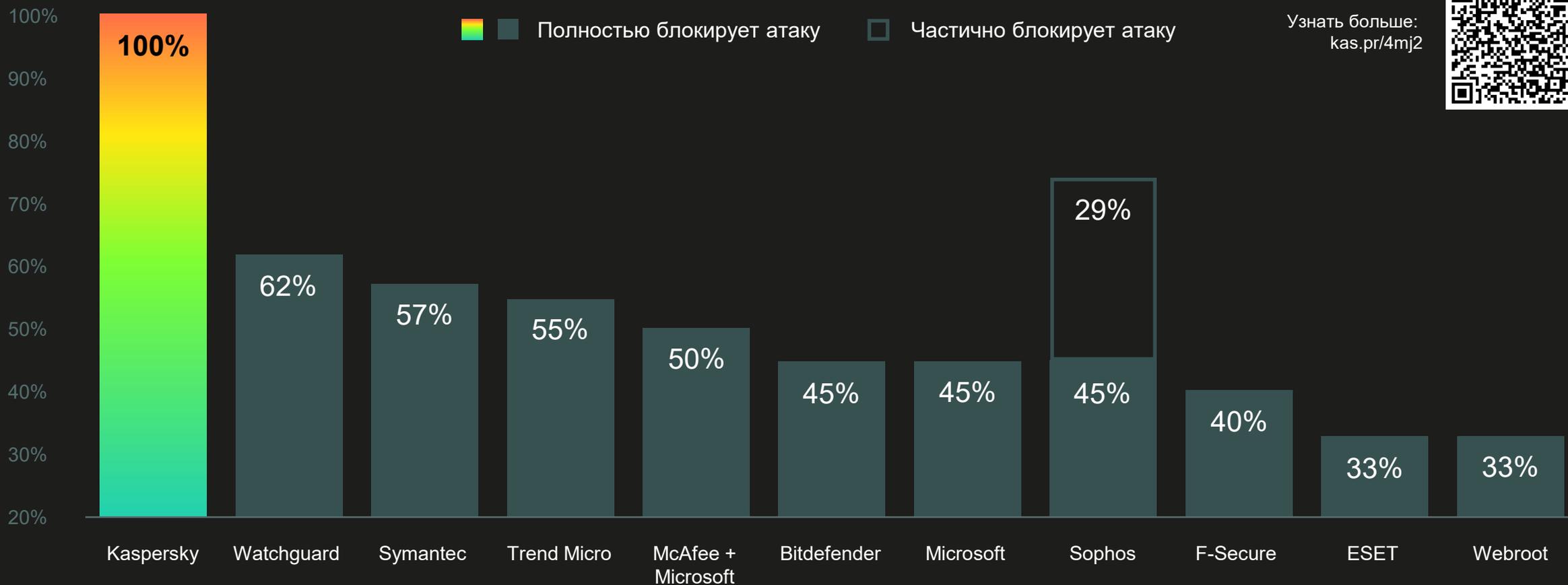
Семейство шифровальщиков	Рейтинг по отраслям	Всего пострадавших организаций
Conti/Ryuk	Производство	45
	Строительство	19
	Разработка ПО	16
	Юриспруденция	6
	Страхование	6
Pysa	Образование	18
	Производство	3
CI0p (TA505)	Разработка ПО	9
	Юриспруденция	8
	Производство	5
	Образование	4
	Консалтинг	3
Hive	Малый бизнес	14
	Здравоохранение	7
	Юриспруденция	5
	Недвижимость	4
	Транспорт	4
Ragnar Locker	Производство	3
	Разработка ПО	3
	Юриспруденция	2
	Фармацевтика	2
	Авиастроение	2
Lockbit	Малый бизнес	12
	Юриспруденция	2
BlackCat	Малый бизнес	6
	Производство	3
	Консалтинг	2
BlackByte	Малый бизнес	5
	Строительство	2
	Консалтинг	2

Sigma Rules

Также мы создали SIGMA правила которые вы можете использовать в своих SIEM системах чтобы обнаруживать активность противника в собственной инфраструктуре

Техники	SIGMA
Exploit Public-Facing Application T1190	Windows Shell Start by Web Applications
User Execution T1204	Started windows shell from Trusted process Drop Execution File From by Trusted Process
Command and Scripting Interpreter T1059	Доступно в полной версии отчета на портале Kaspersky Threat Intelligence: Execution of Downloaded Powershell Code Encoded/decoded PowerShell Code Execution Executing PS1 from Public Directory Powershell Suspicious Arguments Executing JavaScript from Public Directories
Windows Management Instrumentation T1047	Доступно в полной версии отчета на портале Kaspersky Threat Intelligence: Suspicious Command wmic.exe Suspicious Child Process Wmiprvse.exe
Scheduled Task/Job: Scheduled Task T1053.005	Scheduled Task Start from Public Directory Windows Shell Started Schtasks
Boot or Logon Autostart Execution: Registry Run Keys / Startup Folder T1547.001	Доступно в полной версии отчета на портале Kaspersky Threat Intelligence: Modification Main Registry Run Keys Adding Path of Open Folder in Run Keys via Registry Adding Suspicious File in Autorun Keys via Registry Suspicious File Creation in Startup Folder
Account Manipulation T1098	Доступно в полной версии отчета на портале Kaspersky Threat Intelligence: Account Creation via Powershell Account Creation via net.exe Adding Account in Domain or Local Admin Group via net.exe Adding Account in Domain or Local Admin Group via PowerShell
Create or Modify System Process: Windows Service T1543.003	Доступно в полной версии отчета на портале Kaspersky Threat Intelligence: Service Installation From Non-System Directory Service Image Path Modification via sc.exe
BITS Jobs T1197	Доступно в полной версии отчета на портале Kaspersky Threat Intelligence: File Download via Bitsadmin Suspicious Jobs via Bitsadmin
Abuse Elevation Control Mechanism: Bypass User Account Control T1548.002	UAC Bypass via COM Object Disabling UAC via Registry
Exploitation for Privilege Escalation T1068	Доступно в полной версии отчета на портале Kaspersky Threat Intelligence: Created Windows Shell from Critical Windows Process

Лучшая защита от шифровальщиков



Узнать больше:
kas.pr/4mj2



Иногда есть возможность помочь пользователю, зараженному Ransomware, вернуть доступ к зашифрованным данным без уплаты выкупа.

Мы создали коллекцию ключей и утилит, которые могут помочь пользователям восстановить доступ к своим системам, атакованным Ransomware группировками.

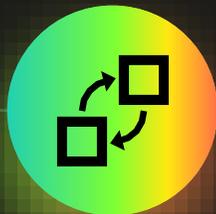
[Подробнее](#)

Ключевые элементы защиты



Квалифицированный персонал

Эффективность современных комплексных защитных решений напрямую коррелирует с уровнем экспертизы ИБ- и SOC-команд, работающих с ними. Организациям следует инвестировать в обучение сотрудников или воспользоваться услугами сторонних MDR-сервисов от надежного поставщика



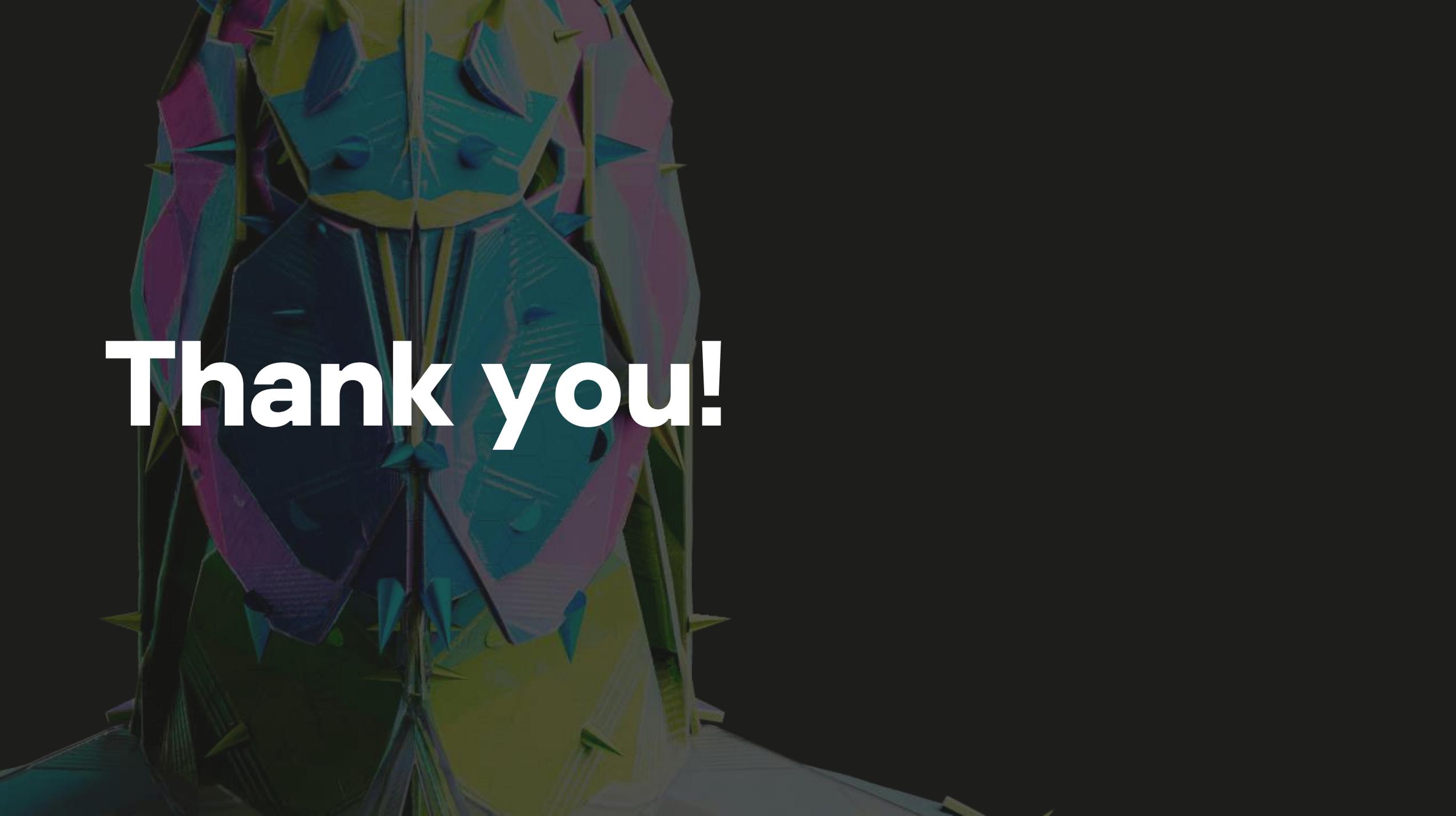
Надежные защитные решения

Экспертам ИБ/SOC требуются решения, которые надежно обеспечат мониторинг всего, что происходит в сети организации с точки зрения кибербезопасности, и с максимальной степенью автоматизации помогут своевременно обнаружить и заблокировать угрозы. Решения, на которые можно положиться и в нашей новой реальности



Аналитические данные Threat Intelligence

Без актуальной и релевантной информация о том, какие злоумышленники представляют угрозу для организации, как они действуют и какими инструментами пользуются, невозможно обеспечить защиту от современных киберугроз. Использование данных Threat Intelligence должно стать неотъемлемой частью стратегии защиты



Thank you!