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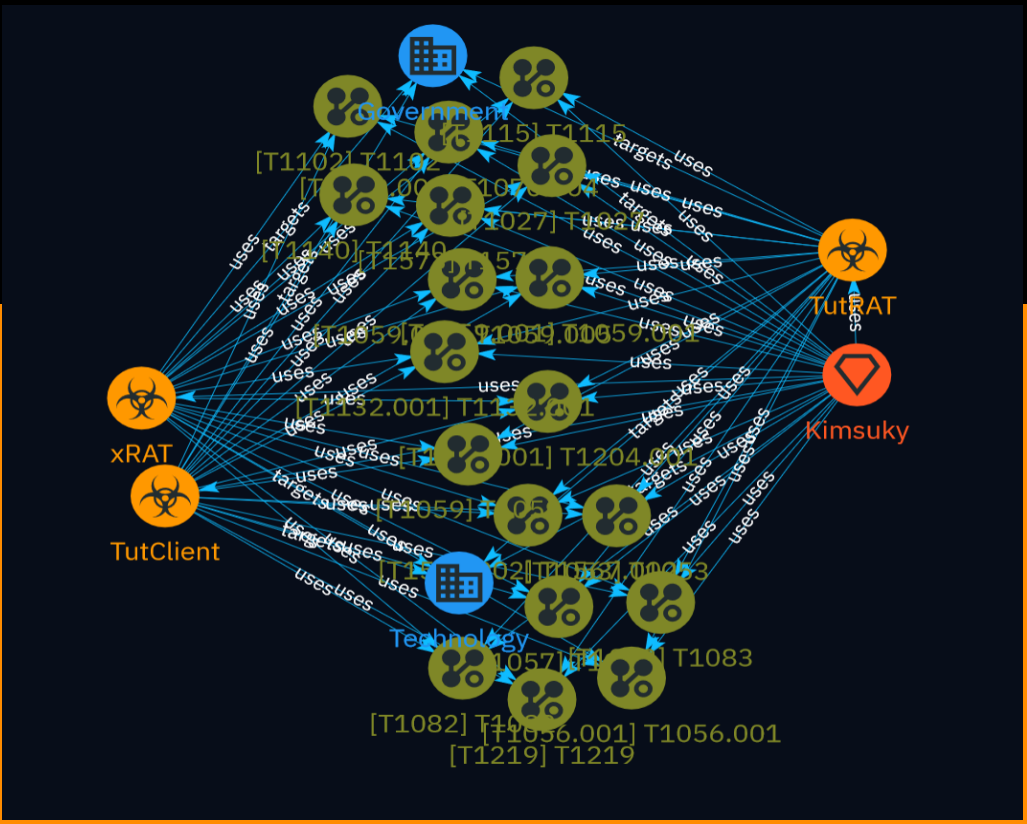
NETMANAGEIT

Intelligence Report

Analysis of New DEEP#GOSU Attack Campaign Likely Associated with North Korean Targeting Victims with Stealthy Malware



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Overview

Description

The Securonix Threat Research team uncovered a multi-stage attack campaign likely associated with the North Korean Kimsuky group featuring new code/stagers and recycled code/TTPs reported in the past. The group shifted to using a new script-based attack chain leveraging PowerShell and VBScript stagers to quietly infect systems with monitoring capabilities. All C2 communication handled through Dropbox/Google Docs to evade detection.

Confidence

This value represents the confidence in the correctness of the data contained within this report.

100 / 100

Content

N/A

Malware

Name
TutRAT

Name
TutClient

Name
xRAT

Intrusion-Set

Name

Kimsuky

Description

[Kimsuky](https://attack.mitre.org/groups/G0094) is a North Korea-based cyber espionage group that has been active since at least 2012. The group initially focused on targeting South Korean government entities, think tanks, and individuals identified as experts in various fields, and expanded its operations to include the United States, Russia, Europe, and the UN. [Kimsuky](https://attack.mitre.org/groups/G0094) has focused its intelligence collection activities on foreign policy and national security issues related to the Korean peninsula, nuclear policy, and sanctions.(Citation: EST Kimsuky April 2019)(Citation: BRI Kimsuky April 2019)(Citation: Cybereason Kimsuky November 2020)(Citation: Malwarebytes Kimsuky June 2021)(Citation: CISA AA20-301A Kimsuky) [Kimsuky](https://attack.mitre.org/groups/G0094) was assessed to be responsible for the 2014 Korea Hydro & Nuclear Power Co. compromise; other notable campaigns include Operation STOLEN PENCIL (2018), Operation Kabar Cobra (2019), and Operation Smoke Screen (2019).(Citation: Netscout Stolen Pencil Dec 2018)(Citation: EST Kimsuky SmokeScreen April 2019)(Citation: AhnLab Kimsuky Kabar Cobra Feb 2019) North Korean group definitions are known to have significant overlap, and some security researchers report all North Korean state-sponsored cyber activity under the name [Lazarus Group](https://attack.mitre.org/groups/G0032) instead of tracking clusters or subgroups.

Attack-Pattern

Name
T1204.001
ID
T1204.001
Description
An adversary may rely upon a user clicking a malicious link in order to gain execution. Users may be subjected to social engineering to get them to click on a link that will lead to code execution. This user action will typically be observed as follow-on behavior from [Spearphishing Link](https://attack.mitre.org/techniques/T1566/002). Clicking on a link may also lead to other execution techniques such as exploitation of a browser or application vulnerability via [Exploitation for Client Execution](https://attack.mitre.org/techniques/T1203). Links may also lead users to download files that require execution via [Malicious File](https://attack.mitre.org/techniques/T1204/002).
Name
T1059.005
ID
T1059.005
Description

Adversaries may abuse Visual Basic (VB) for execution. VB is a programming language created by Microsoft with interoperability with many Windows technologies such as [Component Object Model](https://attack.mitre.org/techniques/T1559/001) and the [Native API](https://attack.mitre.org/techniques/T1106) through the Windows API. Although tagged as legacy with no planned future evolutions, VB is integrated and supported in the .NET Framework and cross-platform .NET Core.(Citation: VB .NET Mar 2020)(Citation: VB Microsoft) Derivative languages based on VB have also been created, such as Visual Basic for Applications (VBA) and VBScript. VBA is an event-driven programming language built into Microsoft Office, as well as several third-party applications.(Citation: Microsoft VBA)(Citation: Wikipedia VBA) VBA enables documents to contain macros used to automate the execution of tasks and other functionality on the host. VBScript is a default scripting language on Windows hosts and can also be used in place of [JavaScript](https://attack.mitre.org/techniques/T1059/007) on HTML Application (HTA) webpages served to Internet Explorer (though most modern browsers do not come with VBScript support).(Citation: Microsoft VBScript) Adversaries may use VB payloads to execute malicious commands. Common malicious usage includes automating execution of behaviors with VBScript or embedding VBA content into [Spearphishing Attachment](https://attack.mitre.org/techniques/T1566/001) payloads (which may also involve [Mark-of-the-Web Bypass](https://attack.mitre.org/techniques/T1553/005) to enable execution).(Citation: Default VBS macros Blocking)

Name

T1070.004

ID

T1070.004

Description

Adversaries may delete files left behind by the actions of their intrusion activity. Malware, tools, or other non-native files dropped or created on a system by an adversary (ex: [Ingress Tool Transfer](https://attack.mitre.org/techniques/T1105)) may leave traces to indicate to what was done within a network and how. Removal of these files can occur during an intrusion, or as part of a post-intrusion process to minimize the adversary's footprint. There are tools available from the host operating system to perform cleanup, but adversaries may use other tools as well.(Citation: Microsoft SDelete July 2016) Examples of built-in [Command and Scripting Interpreter](https://attack.mitre.org/

techniques/T1059) functions include `del` on Windows and `rm` or `unlink` on Linux and macOS.

Name

T1567.002

ID

T1567.002

Description

Adversaries may exfiltrate data to a cloud storage service rather than over their primary command and control channel. Cloud storage services allow for the storage, edit, and retrieval of data from a remote cloud storage server over the Internet. Examples of cloud storage services include Dropbox and Google Docs. Exfiltration to these cloud storage services can provide a significant amount of cover to the adversary if hosts within the network are already communicating with the service.

Name

T1573

ID

T1573

Description

Adversaries may employ a known encryption algorithm to conceal command and control traffic rather than relying on any inherent protections provided by a communication protocol. Despite the use of a secure algorithm, these implementations may be vulnerable to reverse engineering if secret keys are encoded and/or generated within malware samples/configuration files.

Name

T1059.001

ID

T1059.001

Description

Adversaries may abuse PowerShell commands and scripts for execution. PowerShell is a powerful interactive command-line interface and scripting environment included in the Windows operating system.(Citation: TechNet PowerShell) Adversaries can use PowerShell to perform a number of actions, including discovery of information and execution of code. Examples include the `Start-Process` cmdlet which can be used to run an executable and the `Invoke-Command` cmdlet which runs a command locally or on a remote computer (though administrator permissions are required to use PowerShell to connect to remote systems). PowerShell may also be used to download and run executables from the Internet, which can be executed from disk or in memory without touching disk. A number of PowerShell-based offensive testing tools are available, including [Empire](https://attack.mitre.org/software/S0363), [PowerSploit](https://attack.mitre.org/software/S0194), [PoshC2](https://attack.mitre.org/software/S0378), and PSAttack.(Citation: Github PSAttack) PowerShell commands/scripts can also be executed without directly invoking the `powershell.exe` binary through interfaces to PowerShell's underlying `System.Management.Automation` assembly DLL exposed through the .NET framework and Windows Common Language Interface (CLI).(Citation: Sixdub PowerPick Jan 2016)(Citation: SilentBreak Offensive PS Dec 2015)(Citation: Microsoft PSfromCsharp APR 2014)

Name

T1057

ID

T1057

Description

Adversaries may attempt to get information about running processes on a system. Information obtained could be used to gain an understanding of common software/

applications running on systems within the network. Adversaries may use the information from [Process Discovery](https://attack.mitre.org/techniques/T1057) during automated discovery to shape follow-on behaviors, including whether or not the adversary fully infects the target and/or attempts specific actions. In Windows environments, adversaries could obtain details on running processes using the [Tasklist](https://attack.mitre.org/software/S0057) utility via [cmd](https://attack.mitre.org/software/S0106) or `Get-Process` via [PowerShell](https://attack.mitre.org/techniques/T1059/001). Information about processes can also be extracted from the output of [Native API](https://attack.mitre.org/techniques/T1106) calls such as `CreateToolhelp32Snapshot`. In Mac and Linux, this is accomplished with the `ps` command. Adversaries may also opt to enumerate processes via /proc. On network devices, [Network Device CLI](https://attack.mitre.org/techniques/T1059/008) commands such as `show processes` can be used to display current running processes.(Citation: US-CERT-TA18-106A)(Citation: show_processes_cisco_cmd)

Name

T1102

ID

T1102

Description

Adversaries may use an existing, legitimate external Web service as a means for relaying data to/from a compromised system. Popular websites and social media acting as a mechanism for C2 may give a significant amount of cover due to the likelihood that hosts within a network are already communicating with them prior to a compromise. Using common services, such as those offered by Google or Twitter, makes it easier for adversaries to hide in expected noise. Web service providers commonly use SSL/TLS encryption, giving adversaries an added level of protection. Use of Web services may also protect back-end C2 infrastructure from discovery through malware binary analysis while also enabling operational resiliency (since this infrastructure may be dynamically changed).

Name

T1083

ID

T1083

Description

Adversaries may enumerate files and directories or may search in specific locations of a host or network share for certain information within a file system. Adversaries may use the information from [File and Directory Discovery](https://attack.mitre.org/techniques/T1083) during automated discovery to shape follow-on behaviors, including whether or not the adversary fully infects the target and/or attempts specific actions. Many command shell utilities can be used to obtain this information. Examples include `dir`, `tree`, `ls`, `find`, and `locate`.(Citation: Windows Commands JPCERT) Custom tools may also be used to gather file and directory information and interact with the [Native API](https://attack.mitre.org/techniques/T1106). Adversaries may also leverage a [Network Device CLI](https://attack.mitre.org/techniques/T1059/008) on network devices to gather file and directory information (e.g. `dir`, `show flash`, and/or `nvram`).(Citation: US-CERT-TA18-106A)

Name

T1059

ID

T1059

Description

Adversaries may abuse command and script interpreters to execute commands, scripts, or binaries. These interfaces and languages provide ways of interacting with computer systems and are a common feature across many different platforms. Most systems come with some built-in command-line interface and scripting capabilities, for example, macOS and Linux distributions include some flavor of [Unix Shell](https://attack.mitre.org/techniques/T1059/004) while Windows installations include the [Windows Command Shell](https://attack.mitre.org/techniques/T1059/003) and [PowerShell](https://attack.mitre.org/techniques/T1059/001). There are also cross-platform interpreters such as [Python](https://attack.mitre.org/techniques/T1059/006), as well as those commonly associated with client applications such as [JavaScript](https://attack.mitre.org/techniques/T1059/007) and [Visual Basic](https://attack.mitre.org/techniques/T1059/005). Adversaries may abuse these technologies in various ways as a means of executing arbitrary commands. Commands and scripts can be embedded in [Initial Access](https://attack.mitre.org/tactics/TA0001) payloads delivered to victims as lure documents or as secondary payloads downloaded from an existing C2. Adversaries may also execute commands through interactive terminals/shells, as well as utilize various [Remote Services](https://attack.mitre.org/techniques/T1021) in order to achieve remote Execution. (Citation: Powershell Remote Commands)(Citation: Cisco IOS Software Integrity Assurance - Command History)(Citation: Remote Shell Execution in Python)

Name

T1027

ID

T1027

Description

Adversaries may attempt to make an executable or file difficult to discover or analyze by encrypting, encoding, or otherwise obfuscating its contents on the system or in transit. This is common behavior that can be used across different platforms and the network to evade defenses. Payloads may be compressed, archived, or encrypted in order to avoid detection. These payloads may be used during Initial Access or later to mitigate detection. Sometimes a user's action may be required to open and [Deobfuscate/Decode Files or Information](https://attack.mitre.org/techniques/T1140) for [User Execution](https://attack.mitre.org/techniques/T1204). The user may also be required to input a password to open a password protected compressed/encrypted file that was provided by the adversary. (Citation: Volexity PowerDuke November 2016) Adversaries may also use compressed or archived scripts, such as JavaScript. Portions of files can also be encoded to hide the plain-text strings that would otherwise help defenders with discovery. (Citation: Linux/Cdorked.A We Live Security Analysis) Payloads may also be split into separate, seemingly benign files that only reveal malicious functionality when reassembled. (Citation: Carbon Black Obfuscation Sept 2016) Adversaries may also abuse [Command Obfuscation](https://attack.mitre.org/techniques/T1027/010) to obscure commands executed from payloads or directly via [Command and Scripting Interpreter](https://attack.mitre.org/techniques/T1059). Environment variables, aliases, characters, and other platform/language specific semantics can be used to evade signature based detections and application control mechanisms. (Citation: FireEye Obfuscation June 2017) (Citation: FireEye Revoke-Obfuscation July 2017)(Citation: PaloAlto EncodedCommand March 2017)

Name
T1219
ID
T1219
Description
An adversary may use legitimate desktop support and remote access software to establish an interactive command and control channel to target systems within networks. These services, such as \`VNC\`, \`Team Viewer\`, \`AnyDesk\`, \`ScreenConnect\`, \`LogMein\`, \`AmmyyAdmin\`, and other remote monitoring and management (RMM) tools, are commonly used as legitimate technical support software and may be allowed by application control within a target environment.(Citation: Symantec Living off the Land)(Citation: CrowdStrike 2015 Global Threat Report)(Citation: CrySyS Blog TeamSpy) Remote access software may be installed and used post-compromise as an alternate communications channel for redundant access or as a way to establish an interactive remote desktop session with the target system. They may also be used as a component of malware to establish a reverse connection or back-connect to a service or adversary controlled system. Adversaries may similarly abuse response features included in EDR and other defensive tools that enable remote access. Installation of many remote access software may also include persistence (e.g., the software's installation routine creates a [Windows Service](https://attack.mitre.org/techniques/T1543/003)).

Name
T1140
ID
T1140
Description
Adversaries may use [Obfuscated Files or Information](https://attack.mitre.org/techniques/T1027) to hide artifacts of an intrusion from analysis. They may require

separate mechanisms to decode or deobfuscate that information depending on how they intend to use it. Methods for doing that include built-in functionality of malware or by using utilities present on the system. One such example is the use of [certutil](https://attack.mitre.org/software/S0160) to decode a remote access tool portable executable file that has been hidden inside a certificate file.(Citation: Malwarebytes Targeted Attack against Saudi Arabia) Another example is using the Windows `copy /b` command to reassemble binary fragments into a malicious payload.(Citation: Carbon Black Obfuscation Sept 2016) Sometimes a user's action may be required to open it for deobfuscation or decryption as part of [User Execution](https://attack.mitre.org/techniques/T1204). The user may also be required to input a password to open a password protected compressed/encrypted file that was provided by the adversary. (Citation: Volexity PowerDuke November 2016)

Name

T1053

ID

T1053

Description

Adversaries may abuse task scheduling functionality to facilitate initial or recurring execution of malicious code. Utilities exist within all major operating systems to schedule programs or scripts to be executed at a specified date and time. A task can also be scheduled on a remote system, provided the proper authentication is met (ex: RPC and file and printer sharing in Windows environments). Scheduling a task on a remote system typically may require being a member of an admin or otherwise privileged group on the remote system.(Citation: TechNet Task Scheduler Security) Adversaries may use task scheduling to execute programs at system startup or on a scheduled basis for persistence. These mechanisms can also be abused to run a process under the context of a specified account (such as one with elevated permissions/privileges). Similar to [System Binary Proxy Execution](https://attack.mitre.org/techniques/T1218), adversaries have also abused task scheduling to potentially mask one-time execution under a trusted system process. (Citation: ProofPoint Serpent)

Name

T1082

ID

T1082

Description

An adversary may attempt to get detailed information about the operating system and hardware, including version, patches, hotfixes, service packs, and architecture. Adversaries may use the information from [System Information Discovery](https://attack.mitre.org/techniques/T1082) during automated discovery to shape follow-on behaviors, including whether or not the adversary fully infects the target and/or attempts specific actions. Tools such as [Systeminfo](https://attack.mitre.org/software/S0096) can be used to gather detailed system information. If running with privileged access, a breakdown of system data can be gathered through the `systemsetup` configuration tool on macOS. As an example, adversaries with user-level access can execute the `df -aH` command to obtain currently mounted disks and associated freely available space. Adversaries may also leverage a [Network Device CLI](https://attack.mitre.org/techniques/T1059/008) on network devices to gather detailed system information (e.g. `show version`).(Citation: US-CERT-TA18-106A) [System Information Discovery](https://attack.mitre.org/techniques/T1082) combined with information gathered from other forms of discovery and reconnaissance can drive payload development and concealment.(Citation: OSX.FairyTale)(Citation: 20 macOS Common Tools and Techniques) Infrastructure as a Service (IaaS) cloud providers such as AWS, GCP, and Azure allow access to instance and virtual machine information via APIs. Successful authenticated API calls can return data such as the operating system platform and status of a particular instance or the model view of a virtual machine.(Citation: Amazon Describe Instance)(Citation: Google Instances Resource)(Citation: Microsoft Virutal Machine API)

Name

T1115

ID

T1115

Description

Adversaries may collect data stored in the clipboard from users copying information within or between applications. For example, on Windows adversaries can access clipboard data by using `clip.exe` or `Get-Clipboard`.(Citation: MSDN Clipboard)(Citation: clip_win_server)(Citation: CISA_AA21_200B) Additionally, adversaries may monitor then replace users' clipboard with their data (e.g., [Transmitted Data Manipulation](https://attack.mitre.org/techniques/T1565/002)).(Citation: mining_ruby_reversinglabs) macOS and Linux also have commands, such as `pbpaste`, to grab clipboard contents.(Citation: Operating with EmPyre)

Name

T1056.001

ID

T1056.001

Description

Adversaries may log user keystrokes to intercept credentials as the user types them. Keylogging is likely to be used to acquire credentials for new access opportunities when [OS Credential Dumping](https://attack.mitre.org/techniques/T1003) efforts are not effective, and may require an adversary to intercept keystrokes on a system for a substantial period of time before credentials can be successfully captured. In order to increase the likelihood of capturing credentials quickly, an adversary may also perform actions such as clearing browser cookies to force users to reauthenticate to systems. (Citation: Talos Kimsuky Nov 2021) Keylogging is the most prevalent type of input capture, with many different ways of intercepting keystrokes.(Citation: Adventures of a Keystroke) Some methods include: * Hooking API callbacks used for processing keystrokes. Unlike [Credential API Hooking](https://attack.mitre.org/techniques/T1056/004), this focuses solely on API functions intended for processing keystroke data. * Reading raw keystroke data from the hardware buffer. * Windows Registry modifications. * Custom drivers. * [Modify System Image](https://attack.mitre.org/techniques/T1601) may provide adversaries with hooks into the operating system of network devices to read raw keystrokes for login sessions.(Citation: Cisco Blog Legacy Device Attacks)

Name

T1132.001

ID

T1132.001

Description

Adversaries may encode data with a standard data encoding system to make the content of command and control traffic more difficult to detect. Command and control (C2) information can be encoded using a standard data encoding system that adheres to existing protocol specifications. Common data encoding schemes include ASCII, Unicode, hexadecimal, Base64, and MIME.(Citation: Wikipedia Binary-to-text Encoding)(Citation: Wikipedia Character Encoding) Some data encoding systems may also result in data compression, such as gzip.

Sector

Name
Technology
Description
Private entities related to the research, development, manufacturing and distribution of electronics, softwares, computers and products related to information technologies.
Name
Government
Description
Civilian government institutions and administrations of the executive and legislative branches. The diplomatic and judicial branches are not included.

External References

- https://www.securonix.com/blog/securonix-threat-research-security-advisory-new-deepgosu-attack-campaign/
- https://otx.alienvault.com/pulse/65f987734b421146530e4f00