Analysis of Andariel's New Attack Activities - ASEC

By ATCP

Published: 2023-08-21 · Archived: 2026-04-05 13:35:35 UTC

Contents

The Andariel threat group which usually targets Korean corporations and organizations is known to be affiliated with the Lazarus threat group or one of its subsidiaries. Attacks against Korean targets have been identified since 2008. Major target industries are those related to national security such as national defense, political organizations, shipbuilding, energy, and communications. Various other companies and institutes in Korea including universities, logistics, and ICT companies are also becoming attack targets. **[1]** (this report only supports the Korean version)

During the initial compromise stage, the Andariel threat group usually employs spear phishing, watering hole, and supply chain attacks. Additionally, there are cases where the group abuses central management solutions during the malware installation process. **[2]** A notable fact about the group is its creation and use of various malware types in its attacks. There are many backdoor types, including Andarat, Andaratm, Phandoor, and Rifdoor used in the past attacks, as well as TigerRAT **[3]** and MagicRAT **[4]** which have been detected for the past few years.

AhnLab Security Emergency response Center (ASEC) is continuously monitoring the attacks of the Andariel threat group. This blog post will cover details surrounding the recently identified attacks deemed to be perpetrated by the Andariel group. Note that because the malware strains and C&C servers identified in past attack cases were not used in the aforementioned attacks, there is no direct connection. Thus, in order to identify the connection

between the recent attacks and the Andariel threat group, this post will first analyze the cases of attacks by the Andariel group in the first half of 2023. Then the analysis will be used to identify the possible link between the attacks and the threat group. Details confirmed in the past attack cases will be included if necessary.

One characteristic of the attacks identified in 2023 is that there are numerous malware strains developed in the Go language. In an attack case where Innorix Agent was used, a Reverse Shell developed in Go was used. Black RAT was used in attacks targeting Korean companies afterward. Such trends continued into the recent cases, where other malware strains developed in Go such as Goat RAT and DurianBeacon are being used in attacks. Besides the Go version, DurianBeacon has a version developed in the Rust language as well.

```
.rdata:00000000006CFED3 aGDevGoDurianbe db 'G:/Dev/Go/DurianBeacon/Command.go',0
.rdata:00000000006CFED3                                         ; DATA XREF: .rdata:00000000006CAA64↑o
.rdata:00000000006CFEF5 aGDevGoDurianbe_0 db 'G:/Dev/Go/DurianBeacon/SSL.go',0
.rdata:00000000006CFEF5                                         ; DATA XREF: .rdata:00000000006CAAD8↑o
.rdata:00000000006CFF13 aGDevGoDurianbe_1 db 'G:/Dev/Go/DurianBeacon/Utils.go',0
.rdata:00000000006CFF13                                         ; DATA XREF: .rdata:00000000006CAB94↑o
.rdata:00000000006CFF33 aGDevGoDurianbe_2 db 'G:/Dev/Go/DurianBeacon/main.go',0
```

Figure 1. Source code information of DurianBeacon develooped in Go

Because the initial distribution case could not be identified directly, this post will conduct an analysis based on the malware strains used in the attacks. Note that various malware types are being used in the attacks. When a name given by the malware creator can be confirmed, the said name will be used. If not, the names of similar malware types or AhnLab's detection name will be used.

1. Past attack cases

1.1. Cases of Innorix Agent abuse

In February 2023, ASEC shared the case where the Andariel threat group distributed malware to users with a vulnerable version of Innorix Agent in the blog post "Distribution of Malware Exploiting Vulnerable Innorix: Andariel." [5] The Innorix Agent program abused in distribution is a file transfer solution client program. According to the post regarding the vulnerability by the Korea Internet & Security Agency (KISA), the affected versions were found to be INNORIX Agent 9.2.18.450 or earlier, which were advised to be applied with the security update. [6] (this content only supports the Korean version)

Target Type	File Name	File Size	File Path
Current	innorixas.exe	8.17 MB	%SystemDrive%\innorix_agent\innorixas.exe
Target	msdes.exe.irx	40.5 KB	%SystemDrive%\users\%ASD%\msdes.exe.irx

Process	Module	Target	Data
innorixas.exe	N/A	N/A	msdes.exe.irx
innorixas.exe	N/A	N/A	http://4.246.144.112/update.exe

Figure 2. Malware being distributed using Innorix Agent which had been vulnerable in the past

An investigation of the malware strains used in the attacks based on past attack cases revealed that multiple Korean universities were infected with malware strains. Most malware types used in the attacks were backdoors, and no previously identified type was present. However, because there is a connection with other malware strains used in the past or those used in subsequent attacks, a brief summary of their characteristics will be given.

1.1.1. NukeSped variant – Volgmer

As covered in the ASEC Blog before, this malware strain uses the following 0x10 byte key in the process of communicating with the C&C server to encrypt packets. The key value in question is the same as the one employed in Volgmer used by the Hidden Cobra (Lazarus) threat group, as stated in a report by the United States Cybersecurity & Infrastructure Security Agency (CISA). **[7]** (page currently unavailable)

- **Key: 74 61 51 04 77 32 54 45 89 95 12 52 12 02 32 73**

Volgmer was also used in comparatively recent attacks. It runs by reading the configuration data saved in the registry key “HKLM\SYSTEM\CurrentControlSet\Control\WMI\Security” and uses the HTTP protocol to communicate with the C&C server. Such characteristics are highly similar to the type mentioned in the CISA report in the past, which means that the malware continues to be used in attacks with no significant variants being released. While the same key value was used in both the malware mentioned in this post and Volgmer, there is a difference: the malware used in the current attack cases uses the key value to encrypt the packets used to communicate with the C&C server. Meanwhile, Volgmer uses the value to decrypt the encrypted configuration data saved in the registry.

Accordingly, it is not entirely accurate to categorize the above malware strain as a type of Volgmer, so it was categorized as a variant of NukeSped instead. The malware is a comparatively simple backdoor that only provides basic features. Notably, the Batch script used in the self-deletion process is similar to the one used in NukeSped types in the past.

```
.rdata:000000014001E248 aHelloServer    db 'Hello Server'       ; DATA XREF: fn_initComm+29↑r
.rdata:000000014001E248                                         ; fn_initComm+3A↑r
.rdata:000000014001E254 byte_14001E254  db 0                    ; DATA XREF: fn_initComm+43↑r
.rdata:000000014001E255                 align 8
.rdata:000000014001E258 ; const char Str2[]
.rdata:000000014001E258 Str2            db 'Hello Client',0     ; DATA XREF: fn_initComm:loc_14000143A↑o
.rdata:000000014001E265                 align 8
.rdata:000000014001E268 ; const char Source[]
.rdata:000000014001E268 Source          db 'uninstall.bat',0    ; DATA XREF: sub_1400017A0+41↑o
.rdata:000000014001E276                 align 8
.rdata:000000014001E278 ; const char data_SelfDelBat[]
.rdata:000000014001E278 data_SelfDelBat db ':L1',0Dh,0Ah        ; DATA XREF: sub_1400017A0+B1↑o
.rdata:000000014001E27D                 db 'del /F "%s"',0Dh,0Ah
.rdata:000000014001E28A                 db 'if exist "%s" goto L1',0Dh,0Ah
.rdata:000000014001E2A1                 db 'del /F "%s"',0Dh,0Ah,0
.rdata:000000014001E2AF                 align 10h
```

Figure 3. Batch script used in the self-deletion process

1.1.2. Andardoor

Developed in .NET, this malware is a backdoor that uses the name TestProgram. Based on AhnLab’s detection name, it is classified as Andardoor. It is notable for being obfuscated using the Dotfuscator tool. It offers various features for controlling the infected system, such as file and process tasks, executing commands, and capturing

screenshots. SSL encryption is used for communication with the C&C server. For the server name, it designated the “clientName” string.

Figure 4. SSL communications routine with the C&C server

1.1.3. 1th Troy Reverse Shell

1th Troy is a Reverse Shell malware developed in Go. The following string included in the binary shows that the malware has the simple name of “Reverse_Base64_Pipe” and the malware’s creator classified the malware as “1th Troy”.

G:/Code/01__1th Troy/Go/Reverse_Base64_Pipe/Client/client.go

Being a Reverse Shell that only provides basic commands, the commands supported include “cmd”, “exit”, and “self delete”. They support the command execution, process termination, and self-deletion features respectively.

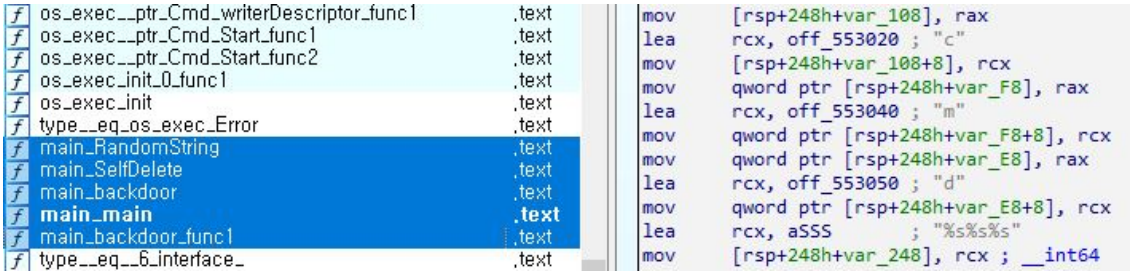


Figure 5. Reverse Shell with a simple structe

1.2. Cases of attacks against Korean corporations

The Andariel group also distributed malware in March 2023 in its attacks against the Korean defense industry and an electronics device manufacturer. The method of initial compromise has not yet been identified, but logs of the mshta.exe process installing TigerRat and the mshta.exe process being terminated were confirmed through the AhnLab Smart Defense (ASD) infrastructure. This means that the malware strains were installed through a script-type malware with the spear phishing attack method.

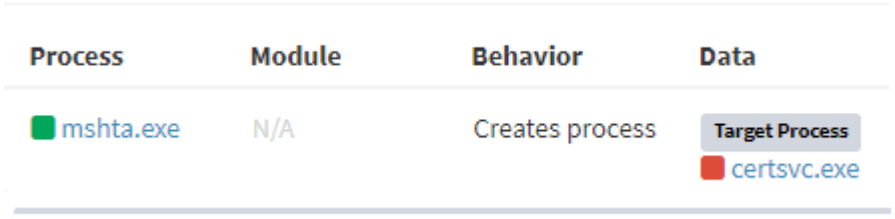


Figure 6. Mshta process installing TigerRat

Malware strains used in attacks were generally backdoor types. TigerRat, which has been used by the Andariel group since the past, was also included.

1.2.1. TigerRat

Tiger Rat is a RAT-type malware with its name given by KISA **[8]** and has been consistently employed by the Andariel threat group since 2020. It is known to be generally distributed through malicious document files containing macros that are attached to spear phishing emails, or through watering hole attacks. **[9]** There are also cases where the Andariel group targeted Korean corporations that use vulnerable versions of VMware Horizon and launched Log4Shell vulnerability attacks to install TigerRat. **[10]**

Besides offering basic features such as file tasks and executing commands, TigerRat is a backdoor that supports other various features such as collecting information, keylogging, capturing screenshots, and port forwarding. One of its characteristics is that there is an authentication process upon the first communication session with the C&C server. In past versions, the string shown below disguised as SSL communications was used in the authentication process. Depending on the malware version, either the string “HTTP 1.1 /member.php SSL3.4” or “HTTP 1.1 /index.php?member=sbi2009 SSL3.3.7” must be sent to the C&C server, and the string “HTTP 1.1 200 OK SSL2.1” should be sent in return for authentication to be successful.

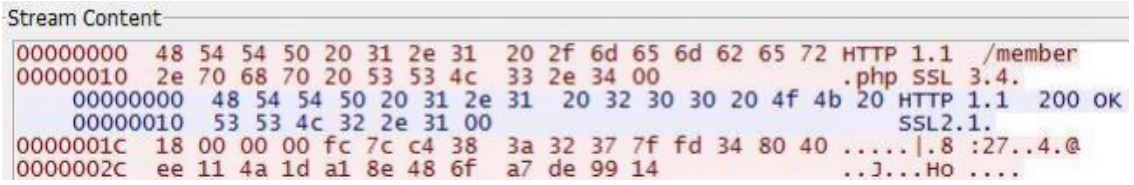


Figure 7. String used in the authentication process for the C&C server – past version

However, in the recently identified TigerRat type, the following random strings 0x20 in size are used. These strings are thought to be the MD5 hash for “fool” (dd7b696b96434d2bf07b34f9c125d51d) and “iwan” (01ccce480c60fcdb67b54f4509ffdb56). It seems that the threat actor used random strings in the authentication process to evade network detection.

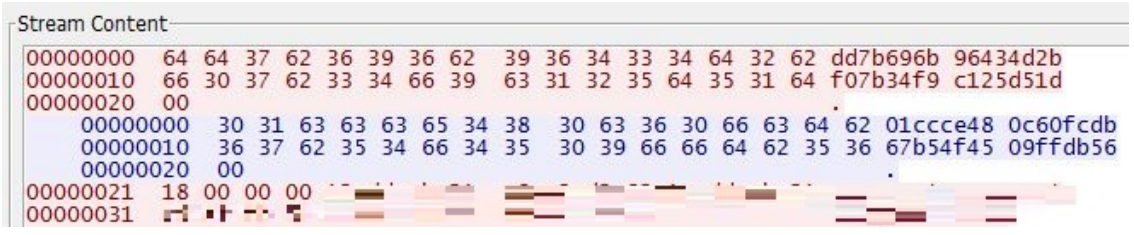


Figure 8. String used in authentication to the C&C server – latest version

- **C&C request string: dd7b696b96434d2bf07b34f9c125d51d**
- **C&C response string: 01ccce480c60fcdb67b54f4509ffdb56**

1.2.2. Black RAT

Black Rat is a backdoor-type malware that is likely created by the threat actor. Like other malware strains, it was developed in Go. While the 1th Troy Reverse Shell identified in the previous case only supports a basic command execution feature, Black Rat provides many additional features such as downloading files and capturing screenshots.

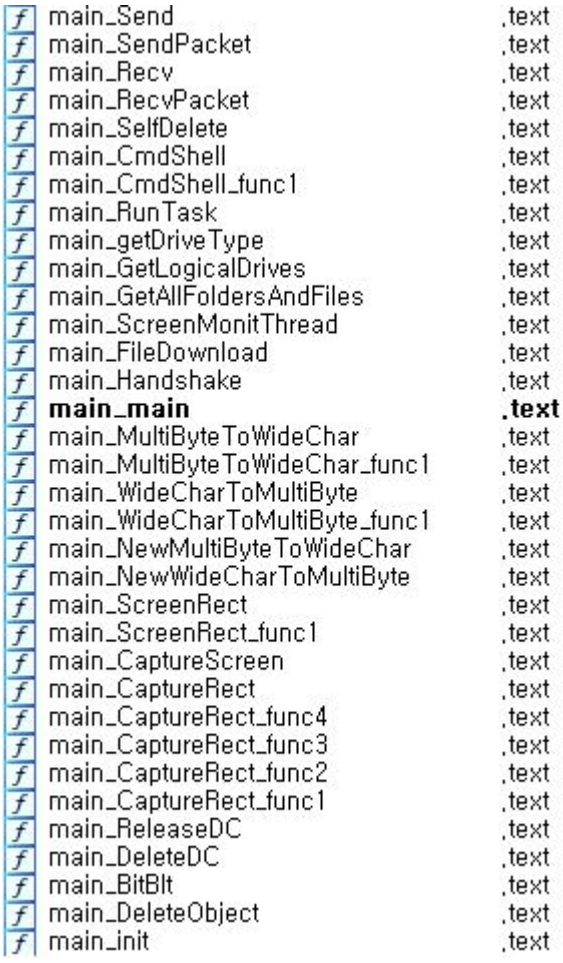


Figure 9. Features supported by Black RAT

Examining the following string included in the binary shows that the malware creator classified the malware as a RAT type and named it Black.

I:/01___Tools/02__RAT/Black/Client_Go/Client.go

1.2.3. NukeSped variants

A typical NukeSped-type backdoor was also used in this attack. Supported features include network scanning, process and file lookup, file upload/download, and command execution. The names of the APIs to be used are encrypted as shown below. These are decrypted and the API names are taken from somewhere else. A key with a size of 0x26 is used for decryption.

```
str_kernel32_dll = fn_decStr("wVWN7BLxxfV1HBby");
kernel32_dll = LoadLibraryA(str_kernel32_dll);
free(str_kernel32_dll);
if ( kernel32_dll )
{
  GetProcAddress = fn_decStr("zVWL0gXylYY/HAj7Olk=");
  GetProcAddress_0 = ::GetProcAddress(kernel32_dll, GetProcAddress);
  free(GetProcAddress);
  LoadLibrary = fn_decStr("xl+e5jv0lLU6CgPf");
  ::LoadLibrary = GetProcAddress_0(kernel32_dll, LoadLibrary);
  free(LoadLibrary);
  GetModuleFileNameA = fn_decStr("zVWLzxj5g6s+PhPyLGTnHtvG");
  ::GetModuleFileNameA = GetProcAddress_0(kernel32_dll, GetModuleFileNameA);
  free(GetModuleFileNameA);
  DeleteFileW = fn_decStr("zlWT5wP4sK43HS0=");
  ::DeleteFileW = GetProcAddress_0(kernel32_dll, DeleteFileW);
  free(DeleteFileW);
  CreateThread = fn_decStr("yUKa4wP4oq8pHRv6");
  ::CreateThread = GetProcAddress_0(kernel32_dll, CreateThread);
  free(CreateThread);
  CreateFileA = fn_decStr("yUKa4wP4sK43HTs=");
  ::CreateFileA = GetProcAddress_0(kernel32_dll, CreateFileA);
  free(CreateFileA);
  v11 = fn_decStr("yUKa4wP4sK43HS0=");
```

Figure 10. Obfuscated API string

- **Key value used for decryption: i<6fu>-0|HSLRCqd.xHqMB]4H#axZ%5!5!?SQ&**

This NukeSped variant also uses a Batch script for self-deletion, but it is slightly different from the one used in the previous attacks.

```
.rdata:0000000140020590 aSSCS:                                  ; DATA XREF: comm_execCmd+196↑o
.rdata:0000000140020590                 text "UTF-16LE", '%s\%S /c "%s"',0
.rdata:00000001400205AC                 align 10h
.rdata:0000000140020580 ; const size_t BufferCount
.rdata:0000000140020580 BufferCount     db '@echo off',0Dh,0Ah  ; DATA XREF: fn_selfDel+1E8↑o
.rdata:00000001400205BB                 db ':L1',0Dh,0Ah
.rdata:00000001400205C0                 db 'del "%s"%s "%s" goto L1',0Dh,0Ah
.rdata:00000001400205D9                 db 'del "%s"',0Dh,0Ah,0
.rdata:00000001400205E4                 align 8
```

Figure 11. Batch script used in the self-deletion process

There are two types of identified NukeSped variants: Reverse Shell and Bind Shell types. Both listen to port number 10443. This NukeSped variant has an authentication process before communicating with the C&C server like TigerRat. Yet whereas TigerRat disguised the process as SSL communications, NukeSped disguised it as HTTP communications. Thus, after sending the following POST request, an accurately matching HTTP response must be received for the malware to commence communications with the C&C server.

Figure 12. HTTP packet used in authentication

2. Cases of Recent Attacks

ASEC is monitoring attacks of the Andariel group and has recently identified cases of Innorix Agent being abused to install malware. Unlike past cases where Innorix Agent was downloading malware strains, the recent case directly creates the malware file, so it is not certain whether the attacks are vulnerability attacks or if Innorix Agent was simply abused.

Malware strains identified in these attacks are not those that had been used by the Andariel group in the past, but aside from the fact that Innorix was used in the attacks, the current attack is similar to past attack cases in that the attack targets are Korean universities. While the attack was being perpetrated, attack cases against Korean ICT companies, electronic device manufacturers, the shipbuilding industry, and the manufacturing industry were identified as well. Analysis showed that there was a connection with the malware strains used in attack cases where Innorix was abused.

This part will analyze each attack case and malware strains used in the attacks. Afterward, a summary will be given of the conclusion that the same threat actor is behind these attacks and the basis behind the claim, as well as

the relationship between the current attacks and past attack cases of the Andariel threat group.

2.1. Cases of Innorix Agent abuse

2.1.1. Goat RAT

In recent attacks against Korean universities, there were cases where Innorix Agent installed malware strains. Innorix Agent installed the malware strains under the name “iexplorer.exe”. This is one of the names that has been often used by the Andariel group.

Target Type	File Name	File Size	File Path
Current	innorixas.exe	7.93 MB	%SystemDrive%\innorix_agent\innorixas.exe
Target	iexplore.exe.irx	2.07 MB	%SystemDrive%\users\%ASD%\downloads\iexplore.exe.irx

Process	Module	Target	Behavior	Data
innorixas.exe	N/A	N/A	Creates executable file	iexplore.exe.irx
innorixas.exe	N/A	N/A	Changes executable file name	iexplore.exe.irx

Figure 13. Using Innorix Agent to install Goat RAT

E:/Projects/Malware/6_Goat_23/Goat/Goat.go
E:/Projects/Malware/6_Goat_23/Goat/define.go
E:/Projects/Malware/6_Goat_23/Goat/anti-vaccine.go
E:/Projects/Malware/6_Goat_23/Goat/command.go

Although the recent version is obfuscated unlike the Go-based backdoor-type malware used in past attacks, basic file tasks, self-deletion features, etc. can be identified. There are also logs where the following commands were executed.

> cmd /c tasklist
> cmd /c ipconfig /all

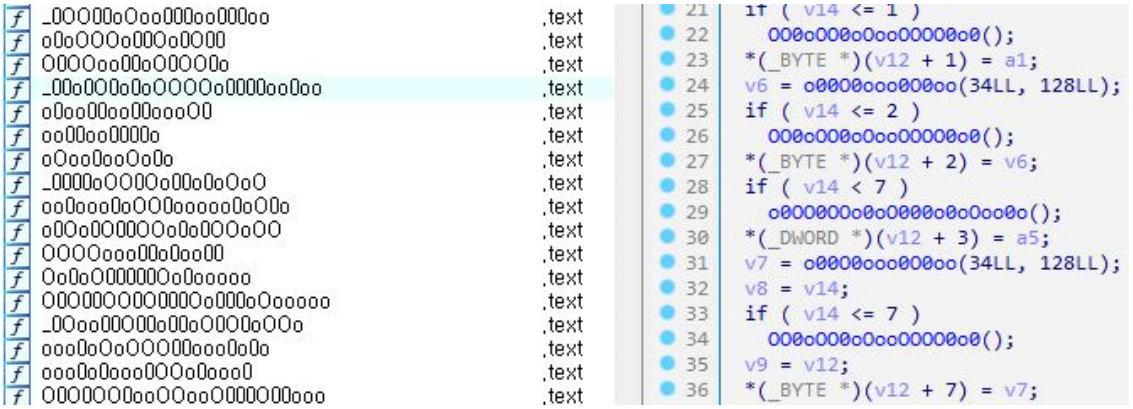


Figure 14. Obfuscated function name

2.2. Cases of attacks against Korean corporations

2.2.1. AndarLoader

Aside from the attack cases where Innorix Agent was abused, ASEC identified another type of attack in a similar period of time. While the initial distribution route has not yet been ascertained, the malware strains used in the attacks were obfuscated with a tool called Dotfuscator like the .NET malware strains classified as Andardoor. Another common trait is that both types use SSL communications with the C&C server. Unlike Andardoor which used “clientName” when connecting to the C&C server, this attack case used the string “sslClient”.

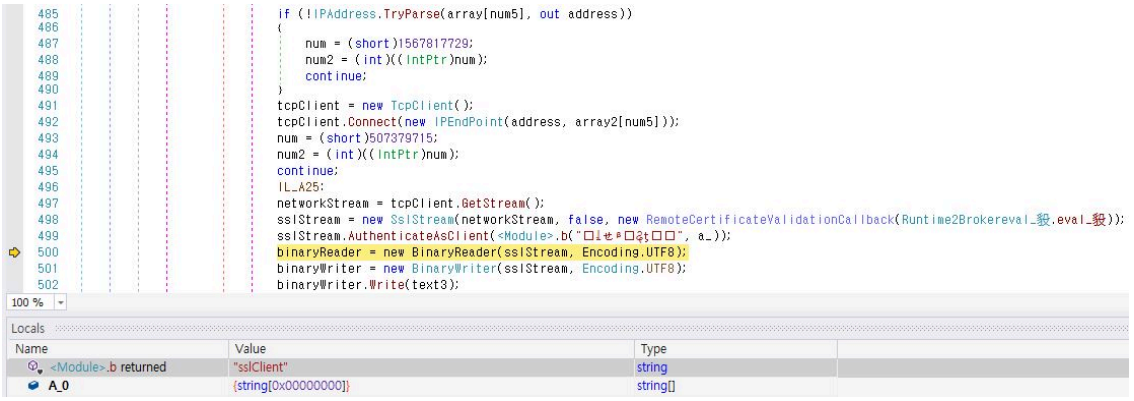


Figure 15. SSL connectjion process with the C&C server

Whereas Andardoor had most of its features already implemented, this malware strain only has a downloader feature to download and execute executable data such as .NET assemblies from external sources. Out of the commands sent from the C&C server, the commands shown below can be used to execute or terminate the received code. Behaviors performed by the threat actor using AndarLoader include installing Mimikatz in the infected system, which has been confirmed through a recorded log.

At the time of analysis, the C&C server was unavailable for access and the part in charge of the actual features could not be investigated, so no direct similarity with Andardoor could be confirmed. However, the use of the same obfuscation tool or the similarities in the communication process with the C&C server led AhnLab to categorize this malware as the AndarLoader type.

Command	Feature
alibaba	Execute the downloaded .NET assemblies
facebook	Execute the downloaded .NET method
exit	Terminate
vanish	Self-delete and terminate

Table 1. List of commands that can be executed

Among the commands given by the treat actor that AndarLoader executes, there is a command to terminate the mshta.exe process. The fact that AndarLoader was installed via PowerShell and the mshta.exe process was involved leaves the possibility that this is a spear phishing attack like the cases of attacks covered above.

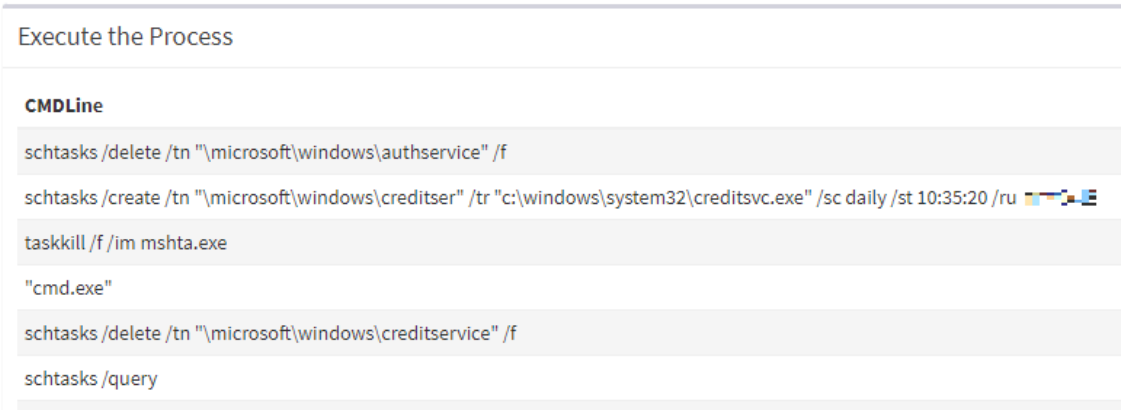
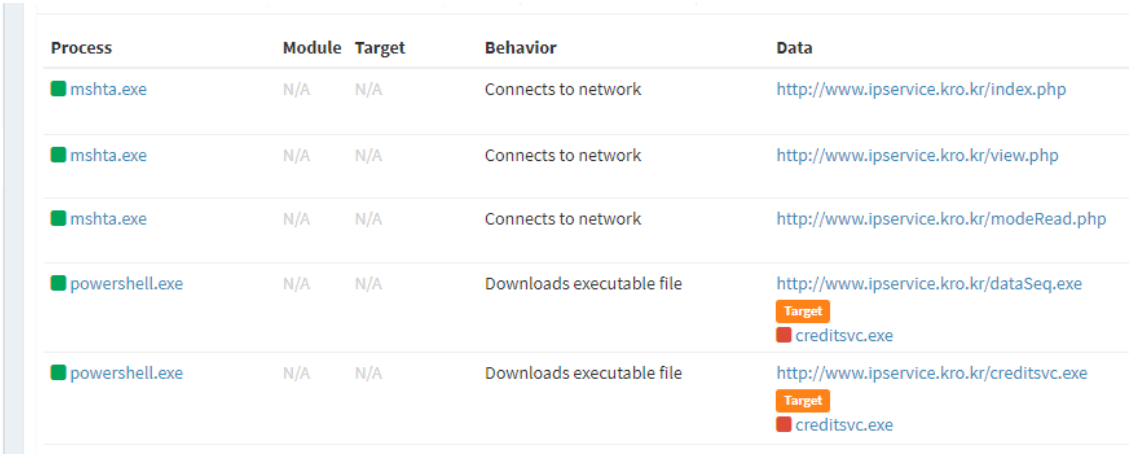


Figure 16. Commands executed by AndarLoader

Additionally, logs of the mshta.exe process connecting to the C&C server can be found in systems infected with AndarLoader.



Process	Module	Target	Behavior	Data
mshta.exe	N/A	N/A	Connects to network	http://www.ipservice.kro.kr/index.php
mshta.exe	N/A	N/A	Connects to network	http://www.ipservice.kro.kr/view.php
mshta.exe	N/A	N/A	Connects to network	http://www.ipservice.kro.kr/modeRead.php
powershell.exe	N/A	N/A	Downloads executable file	http://www.ipservice.kro.kr/dataSeq.exe Target creditsvc.exe
powershell.exe	N/A	N/A	Downloads executable file	http://www.ipservice.kro.kr/creditsvc.exe Target creditsvc.exe

Figure 17. Network communications log

The domain kro.kr was used as the C&C and download URLs. This is a domain generally used by the Kimsuky threat group. Also, the fact that Ngrok was installed for RDP connection during the attack process shows how the case is similar to the attack pattern of the Kimsuky group.

```
"targetProcess": {
  "imageInfo": {
    "fileObj": {
      "fileName": "service.exe",
      "fileSize": 24948456,
      "filePath": "%SystemDrive%\\users\\%ASD%\\service.exe",
    "commandLine": "%SystemDrive%\\users\\%ASD%\\service.exe  tcp 3389"
  }
},
"currentProcess": {
  "imageInfo": {
    "fileObj": {
      "fileName": "cmd.exe",
      "fileSize": 289792,
      "filePath": "%SystemRoot%\\system32\\cmd.exe",
    }
  }
},
"parentProcess": {
  "imageInfo": {
    "fileObj": {
      "fileName": "mshta.exe",
      "fileSize": 43520,
      "filePath": "%SystemRoot%\\system32\\mshta.exe",
    }
```


Figure 18. Log showing the installed Ngrok bveing executed

2.2.2. DurianBeacon

While investigating the AndarLoader malware, AhnLab identified that a malware strain named DurianBeacon was also used in the attack process. There are two versions of DurianBeacon, one developed in Go and the other developed in Rust. Both are backdoors that can perform malicious behaviors by receiving the threat actor's commands from the C&C server.

A. Go Version

Examining the following strings included in the binary indicates that the malware creator named this malware strain DurianBeacon.

G:/Dev/Go/DurianBeacon/Command.go
G:/Dev/Go/DurianBeacon/SSL.go
G:/Dev/Go/DurianBeacon/Utils.go
G:/Dev/Go/DurianBeacon/main.go

The Go version of DurianBeacon uses the SSL protocol to communicate with the C&C server. After initial access, it sends the infected system's IP information, user name, desktop name, architecture, and file names before awaiting commands. When a command is sent, it returns a result. Supported features besides collecting basic information about the infected system include file download/upload, lookup, and command execution features.

Figure 19. Features supported by DurianBeacon

Because the SSL protocol is used, communications packets are encrypted. The following packet structure is used internally.

Offset	Size	Description
0x00	0x04	Command number
0x04	0x04	Size of the command argument
0x08	Variable	Command argument

Table 2. Command packet structure of DurianBeacon

The features corresponding to each command code are as follows.

Command	Feature
0x00	Hibernate
0x01	Interval
0x02	Execute commands (return results)
0x03	Look up directories

Command	Feature
0x04	Drive information
0x05, 0x06, 0x07, 0x08	Upload files
0x09, 0x0A, 0x0B	Download files
0x0C	Create directories
0x0D	Delete files
0x0E	Run commands
0x0F	Terminate

Table 3. List of DurianBeacon commands

After executing commands, the malware sends the success status or the command execution results to the threat actor's C&C server. The response is also similar to the command packet.

Offset	Size	Description
0x00	0x04	Response number
0x04	0x04	Size of the command execution results
0x08	Variable	Command execution results

Table 4. Structure of the DurianBeacon response packet

Response	Description
0x00	Return command results
0x01, 0x02, 0x03	Look up directories (start, terminate, etc.)
0x04	Drive information
0x05, 0x06, 0x07	Upload files (error, success, etc.)
0x08, 0x09, 0x0A	Download files (error, success, etc.)
0x0B, 0x0C	Create directories (failure or success)
0x0D, 0x0E	Delete files (failure or success)
0x0F, 0x10	Run commands (failure or success)

Table 5. DurianBeacon's response list

B. Rust Version

Investigation of related files revealed that the Rust version of DurianBeacon was also used in attacks.

- PDB information: C:\Users\Anna\Documents\DurianBeacon\target\x86_64-pc-windows-msvc\release\deps\DurianBeacon.pdb

DurianBeacon supports packet encryption using XOR aside from SSL to communicate with the C&C server, using the key 0x57.

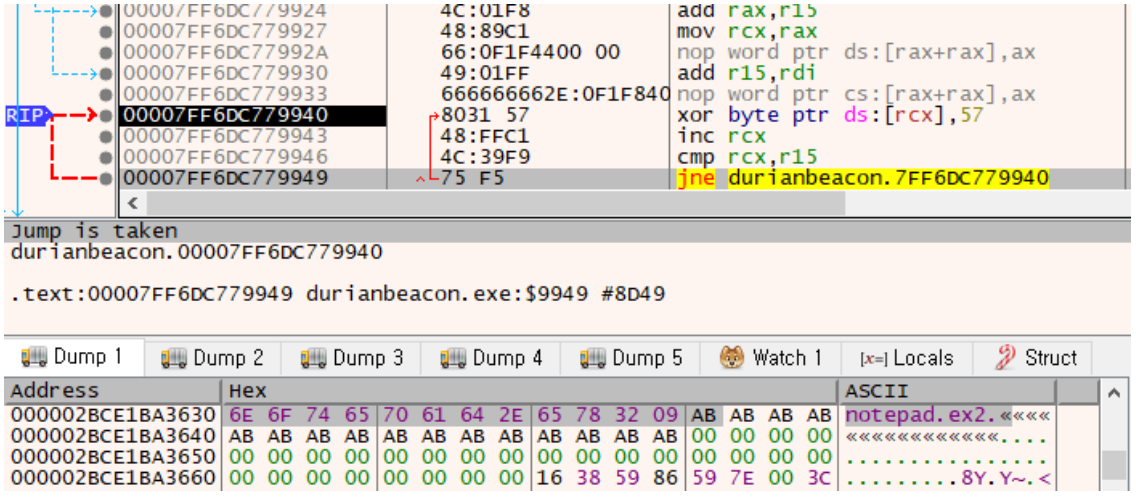


Figure 20. Rust version of DurianBeacon supporting XOR encryption

The packet structure and commands are also the same as the Go version. The Rust version of DurianBeacon sends the keyword “durian2023” alongside the infected system’s IP information, user name, desktop name, architecture, and file names before awaiting command. When a command is sent, it returns the results.

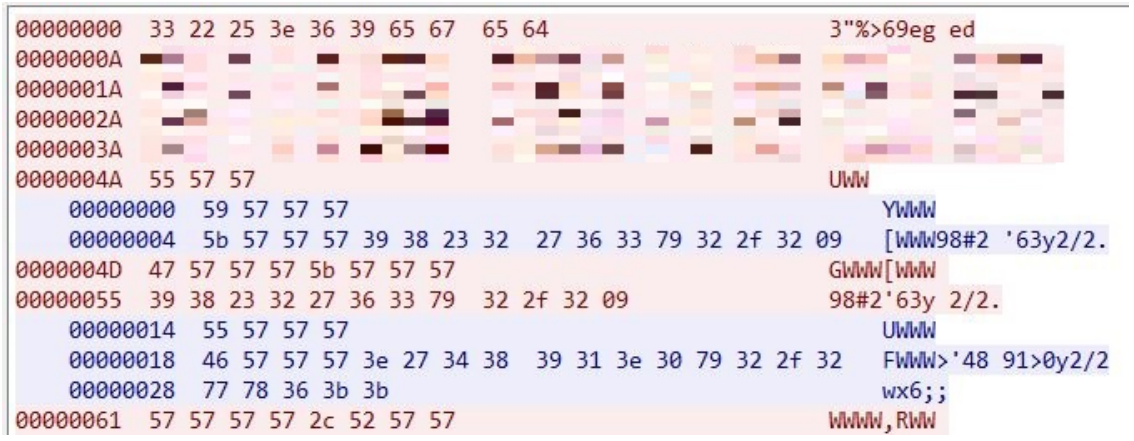


Figure 21. Communications packet of the Rust version – test

3. Connections to recent attack cases

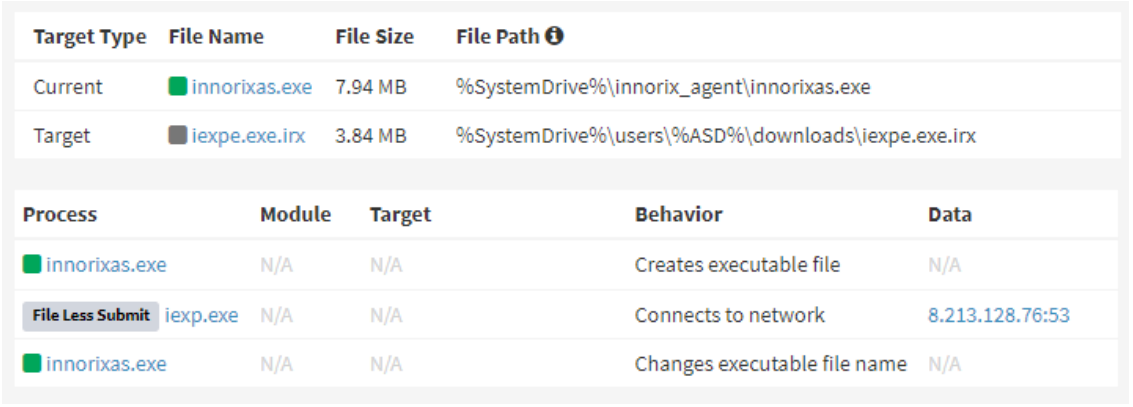
The above section covered the recently identified two cases where universities in Korea were attacked through abusing Innorix Agent and where malware strains were installed in Korean corporations through presumably spear

phishing attacks. This part will explain why AhnLab considers the same threat actor to be behind both types of attacks.

First, there are cases in AhnLab's ASD logs where Durian, Goat RAT, and AndarLoader were collected together in a similar period. The system in question is thought to be the threat actor's test PC because the path name of AndarLoader was as follows.

- **AndarLoader collection pathZ** : d:\01__developing\99__c#_obfuscated\runtime broker.exe

There are also cases where the C&C servers of backdoor-type malware strains were the same. When the threat actor used Innorix Agent to install malware, Goat RAT was mainly employed, but there is a significant portion where other malware strains were installed. While such malware samples could not be collected, there are recorded communications logs with the C&C server. Also, the URL in question was the same as the DurianBeacon C&C server URL used in other attacks.

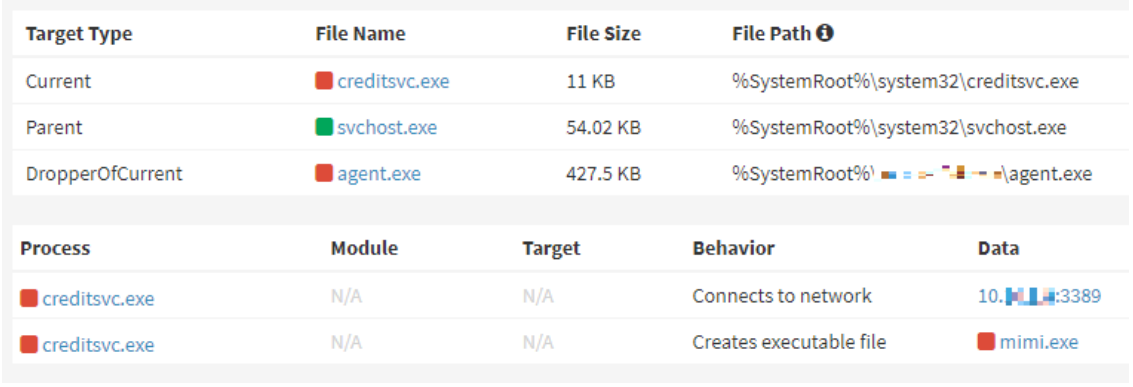


Target Type	File Name	File Size	File Path
Current	innorixas.exe	7.94 MB	%SystemDrive%\innorix_agent\innorixas.exe
Target	iexpe.exe.irx	3.84 MB	%SystemDrive%\users\%ASD%\downloads\iexpe.exe.irx

Process	Module	Target	Behavior	Data
innorixas.exe	N/A	N/A	Creates executable file	N/A
File Less Submit iexp.exe	N/A	N/A	Connects to network	8.213.128.76:53
innorixas.exe	N/A	N/A	Changes executable file name	N/A

Figure 22. C&C communications log of the malware installed through Innorix Agent

Finally, there was a log where DurianBeacon installed AndarLoader. This means that these attacks happened around a similar time period, and the attacks might be related to each other as the installation processes and the C&C server URLs used tend to be similar.



Target Type	File Name	File Size	File Path
Current	creditsvc.exe	11 KB	%SystemRoot%\system32\creditsvc.exe
Parent	svchost.exe	54.02 KB	%SystemRoot%\system32\svchost.exe
DropperOfCurrent	agent.exe	427.5 KB	%SystemRoot%\ [redacted] \agent.exe

Process	Module	Target	Behavior	Data
creditsvc.exe	N/A	N/A	Connects to network	10.[redacted]:3389
creditsvc.exe	N/A	N/A	Creates executable file	mimi.exe

Figure 23. Log showing DurianBeacon creating AndarLoader

4. Connections to past attack cases of the Andariel group

The recently identified two attack cases are likely done by the same threat actor. This section will cover the relationship between these attacks and the Andariel threat group.

A. Attack Targets

- Attacked universities, the national defense industry, electronic device manufacturers, ICT companies, etc. in Korea.

B. Attack Methods

- Abused Innorix Agent like in past cases
- Probably employed spear phishing method like in past cases
- Similarities between the path and file names used when installing the malware strains

C. Malware Types Used

- Malware strains developed in Go were used
- Similarities between Andardoor and AndarLoader
- Malware types similar to the Infostealer used in previous attacks were identified

First, there are the facts that the industries and sectors that became attack targets were the same as the targets identified in past attack cases and the same attack methods used in previous attacks were employed in recent cases. AhnLab identified cases where Innorix Agent was used. While not confirmed, many logs showed circumstances of spear phishing attacks.

The file name “iexplorer.exe” used to install malware has been identified from Andariel’s past attack cases to the present. Besides “iexplorer.exe”, names including the “svc” keyword such as “authsvc.exe” and “creditsvc.exe” has been continuously used. Also, aside from “mainsvc.exe” and “certsvc.exe”, there are cases where similar names such as “netsvc.exe” and “srvcredit.exe” were used.

As covered in the corresponding section, AndarLoader was obfuscated with the trial version of Dotfuscator, the tool used in Andardoor in previous attacks. It also uses SSL encryption to communicate with the C&C server, again showing similarities with past attack cases. Two other malware strains developed in Go were used as well. These align with the trend of malware strains developed in Go such as 1th Troy Reverse Shell and Black RAT continuously being used since the early part of this year.

Finally, there is also the system thought to be the threat actor’s test PC and Infostealer strains presumably created by the threat actor during the attack process. In fact, the Andariel group in the past installed malware strains responsible for stealing account credentials during the attack process, exfiltrating account credentials saved in Internet Explorer, Chrome, and Firefox web browsers. Such malware strains are command line tools that output the extracted account credentials via command lines. It seems that the threat actor used a backdoor to send the results to the C&C server.

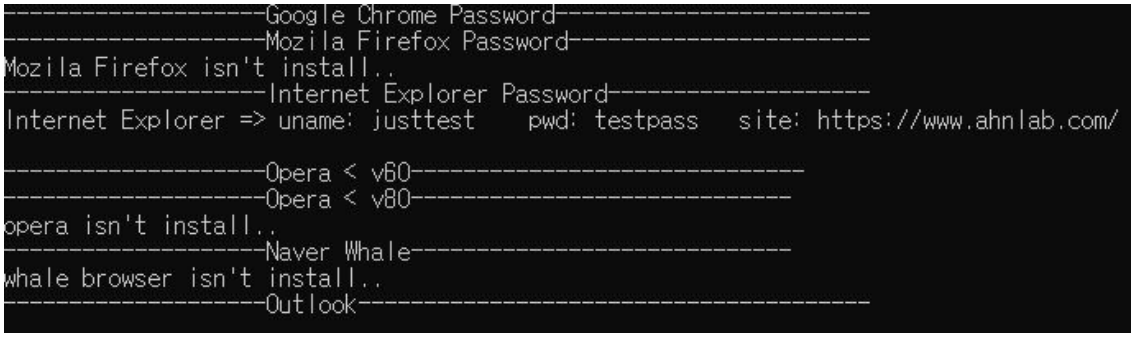


Figure 24. Infostealer identified in past attack cases

The Infostealer used in the recent attacks has a similar format. The only difference is that it only targets web browsers and steals account credentials and histories. Additionally, unlike the past cases where results were outputted by command lines, the recent version saves the stolen information in the same path under the file name “error.log”.

Figure 25. Infostealer identifed in recent attack cases

5. Conclusion

The Andariel group is one of the highly active threat groups targeting Korea along with Kimsuky and Lazarus. The group launched attacks to gain information related to national security in the early days but now carries out attacks for financial gains. **[11]** The group is known to employ spear phishing attacks, watering hole attacks, and vulnerability exploits for their initial infiltration process. There have also been cases where it used other vulnerabilities in the attack process to distribute malware strains.

Users must be particularly cautious about attachments to emails with unknown sources or executable files downloaded from websites. Users should also apply the latest patch for OS and programs such as internet browsers and update V3 to the latest version to prevent malware infection in advance.

File Detection

– Backdoor/Win.Agent.R562183 (2023.03.14.00)
– Backdoor/Win.Andardoor.C5381120 (2023.02.16.01)
– Backdoor/Win.Andardoor.R558252 (2023.02.16.01)
– Backdoor/Win.AndarGodoor.C5405584 (2023.04.05.03)
– Backdoor/Win.DurianBeacon.C5472659 (2023.08.18.02)
– Backdoor/Win.DurianBeacon.C5472662 (2023.08.18.02)
– Backdoor/Win.DurianBeacon.C5472665 (2023.08.18.03)
– Backdoor/Win.Goat.C5472627 (2023.08.18.02)
– Backdoor/Win.Goat.C5472628 (2023.08.18.02)
– Backdoor/Win.Goat.C5472629 (2023.08.18.02)
– Backdoor/Win.NukeSped.C5404471 (2023.04.03.02)
– Backdoor/Win.NukeSped.C5409470 (2023.04.12.00)
– Backdoor/Win.NukeSped.C5409543 (2023.04.12.00)
– Infostealer/Win.Agent.C5472631 (2023.08.18.02)
– Trojan/Win.Agent.C5393280 (2023.03.11.00)
– Trojan/Win.Agent.C5451550 (2023.07.11.00)
– Trojan/Win.Andarinodoor.C5382101 (2023.02.16.01)
– Trojan/Win.Andarinodoor.C5382103 (2023.02.16.01)
– Trojan/Win32.RL_Mimikatz.R366782 (2021.02.18.01)

Behavior Detection

– Suspicious/MDP.Download.M1004
– Infostealer/MDP.Behavior.M1965

MD5

0211a3160cc5871cbcd4e5514449162b

0a09b7f2317b3d5f057180be6b6d0755

1ffccc23fef2964e9b1747098c19d956

3ec3c9e9a1ad0e6a6bd75d00d616936b

426bb55531e8e3055c942a1a035e46b9

Additional IOCs are available on AhnLab TIP.

URL

http[:]//13[.]76[.]133[.]68[:]10443/

http[:]//13[.]76[.]133[.]68[:]8080/

http[:]//139[.]177[.]190[.]243/update[.]exe

http[:]//27[.]102[.]107[.]224/update[.]exe

http[:]//27[.]102[.]107[.]224[:]5443/

Additional IOCs are available on AhnLab TIP.

Gain access to related IOCs and detailed analysis by subscribing to **AhnLab TIP**. For subscription details, click the banner below.

Source: https://asec.ahnlab.com/en/56405/