Bumblebee Malware Distributed Via Trojanized Installer Downloads

secureworks.com/blog/bumblebee-malware-distributed-via-trojanized-installer-downloads

Counter Threat Unit Research Team

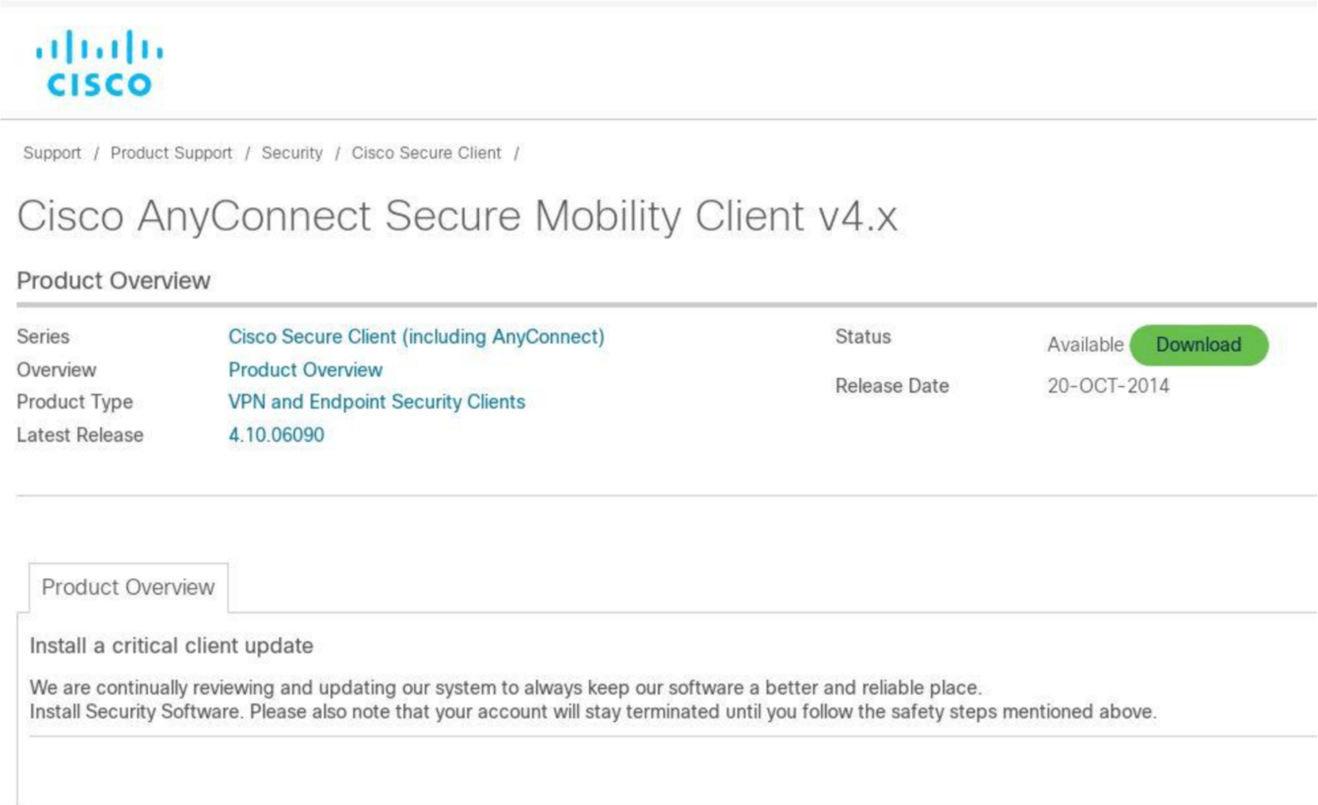
Restricting the download and execution of third-party software is critically important.

Thursday, April 20, 2023 *By: Counter Threat Unit Research Team*

Using malicious Google Ads or SEO poisoning to distribute malware has become a common tactic for cybercriminals. For example, in the Secureworks® 2022 State of the Threat report, Counter Threat Unit™ (CTU) researchers described legitimate web searches being hijacked by SEO poisoning to infect victims’ systems with Gootloader, and malicious Google Ads bundling infostealers like RedLine in trojanized installers for messaging apps such as Signal.

Recently, CTU™ researchers observed Bumblebee malware distributed via trojanized installers for popular software such as Zoom, Cisco AnyConnect, ChatGPT, and Citrix Workspace. Bumblebee is a modular loader, historically distributed primarily through phishing, that has been used to deliver payloads commonly associated with ransomware deployments. Trojanizing installers for software that is particularly topical (e.g., ChatGPT) or software commonly used by remote workers increases the likelihood of new infections.

One of the Bumblebee samples CTU researchers analyzed was downloaded from http: //appcisco . com/vpncleint/cisco-anyconnect-4_9_0195.msi. On or around February 16, 2023, a threat actor created a fake download page for Cisco AnyConnect Secure Mobility Client v4.x (see Figure 1) on the appcisco . com domain. An infection chain that began with a malicious Google Ad sent the user to this fake download page via a compromised WordPress site.



Support / Product Support / Security / Cisco Secure Client /

Cisco AnyConnect Secure Mobility Client v4.x

Product Overview

Series	Cisco Secure Client (including AnyConnect)	Status	Available Download
Overview	Product Overview	Release Date	20-OCT-2014
Product Type	VPN and Endpoint Security Clients		
Latest Release	4.10.06090		

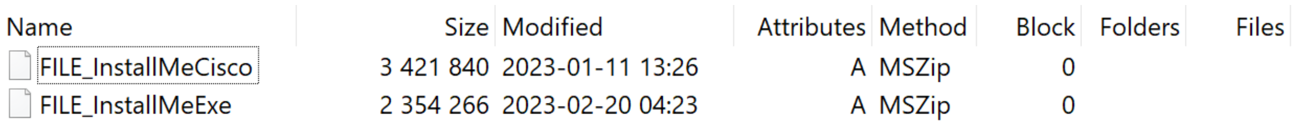
Product Overview

Install a critical client update

We are continually reviewing and updating our system to always keep our software a better and reliable place.
Install Security Software. Please also note that your account will stay terminated until you follow the safety steps mentioned above.

Figure 1. Malicious web page serving trojanized Cisco AnyConnect VPN installer. (Source: DomainTools)

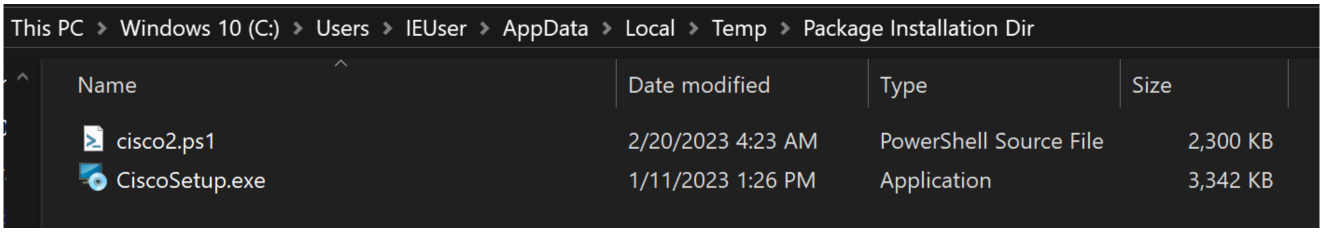
The cisco-anyconnect-4_9_0195.msi file is an MSI installer that contains two files (see Figure 2).



Name	Size	Modified	Attributes	Method	Block	Folders	Files
FILE_InstallMeCisco	3 421 840	2023-01-11 13:26	A	MSZip	0		
FILE_InstallMeExe	2 354 266	2023-02-20 04:23	A	MSZip	0		

Figure 2. Contents of trojanized Cisco AnyConnect VPN installer. (Source: Secureworks)

When the MSI installer is executed, renamed versions of these two files are copied to the "%Temp%\Package Installation Dir" folder (see Figure 3) and executed.



This PC > Windows 10 (C:) > Users > IEUser > AppData > Local > Temp > Package Installation Dir

Name	Date modified	Type	Size
cisco2.ps1	2/20/2023 4:23 AM	PowerShell Source File	2,300 KB
CiscoSetup.exe	1/11/2023 1:26 PM	Application	3,342 KB

Figure 3. Renamed contents of trojanized Cisco AnyConnect installer. (Source: Secureworks)

FILE_InstallMeCisco (renamed to CiscoSetup.exe) is a legitimate installer for the Cisco AnyConnect VPN Secure Mobility Client application. FILE_InstallMeExe (renamed to cisco2.ps1) is a PowerShell script. CTU researchers identified other samples that used the same technique with a different software installer and related PowerShell script name, such as Zoom (ZoomInstaller.exe and zoom.ps1), ChatGPT (ChatGPT.msi and chch.ps1) and Citrix (CitrixWorkspaceApp.exe and citrix.ps1).

The PowerShell script contains a selection of renamed functions copied from the PowerSploit ReflectivePEInjection.ps1 script. It also contains an encoded Bumblebee malware payload that it reflectively loads into memory.

In one compromised environment, CTU researchers observed the threat actor moving laterally approximately three hours after infection, and deploying Cobalt Strike as well as the legitimate AnyDesk and DameWare remote access tools. The attacker used a Scheduled Task named WindowsSensor15 as a persistence mechanism for Cobalt Strike. Additional tools deployed by the threat actor included pshashes.txt, which is likely a script for conducting Kerberoasting attacks; a batch script to dump the contents of the Active Directory database; and a network scanning utility (netscanold.exe). These tools were dropped in the C:\ProgramData directory. Network defenders detected the activity and disrupted access before the attacker achieved their objective, which was likely to deploy ransomware.

To mitigate this and similar threats, organizations should ensure that software installers and updates are only downloaded from known and trusted websites. Users should not have privileges to install software and run scripts on their computers. Tools such as AppLocker can prevent malware from being executed even if it is inadvertently downloaded.

CTU researchers identified numerous indicators associated with this threat (see Table 1). Due to the large number of C2 IP addresses extracted from the Bumblebee malware configuration data, the table only lists a subset. However, all identified indicators have been applied to Secureworks customer protections. Note that IP addresses can be reallocated. The IP addresses and domains may contain malicious content, so consider the risks before opening them in a browser.

Indicator	Type	Context
appcisco.com	Domain name	Bumblebee malware staging server
e4a5383ac32d5642eaf2c7406a0f1c0f	MD5 hash	MSI file (cisco-anyconnect-4_9_0195.msi) containing Bumblebee malware
3e5637d253c40aefdb0465df15bc057ed5c26186	SHA1 hash	MSI file (cisco-anyconnect-4_9_0195.msi) containing Bumblebee malware
d99b63e1740aa4f779b91d22f508a4792f237f09413d24b51144e0694af5d34f	SHA256 hash	MSI file (cisco-anyconnect-4_9_0195.msi) containing Bumblebee malware
522c0b0d445c62cdeb0a80bcce645d57	MD5 hash	MSI file (ProductCitrix.msi) containing Bumblebee malware
5dad52c67d114f7a3a5a1e7ae5b15b581054d468	SHA1 hash	MSI file (ProductCitrix.msi) containing Bumblebee malware
957639998125a31c998b0104dba7f463d0659716a0a5b62fcc82eb28a0c0477b	SHA256 hash	MSI file (ProductCitrix.msi) containing Bumblebee malware
6f7e07b84897cccab30594305416d36f	MD5 hash	MSI file (ChatGPT_Setup.msi) containing Bumblebee malware
6d1d531c921a17b36e792e2843311e27b9aa77a4	SHA1 hash	MSI file (ChatGPT_Setup.msi) containing Bumblebee malware
9982330ae990386cd74625f0eaa26ae697574694eb2ec330c2acac5e0149fdc0	SHA256 hash	MSI file (ChatGPT_Setup.msi) containing Bumblebee malware
711482ca4d5dcaf0aec4c7c4b3e1bef1	MD5 hash	MSI file containing Bumblebee malware
77b9050f2b974bc67996b6435520b557a6ad1303	SHA1 hash	MSI file containing Bumblebee malware
e10dbd4a903b0fa82db9794df6496afe17c98a166253d425f3535959110909a3	SHA256 hash	MSI file containing Bumblebee malware

Indicator	Type	Context
173.44.141.131	IP address	C2 server associated with Bumblebee malware activity (February 2023)
baveyek.com	Domain name	Cobalt Strike C2 server
23.82.140.131	IP address	Hosting Cobalt Strike C2 server (baveyak.com) (February 2023)
172.93.193.3:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
23.81.246.22:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
95.168.191.134:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
104.168.175.78:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
172.93.193.46:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
157.254.194.104:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
37.28.157.29:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
23.106.124.23:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
194.135.33.182:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
54.38.139.94:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)

Indicator	Type	Context
192.119.65.175:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
107.189.8.58:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
205.185.114.241:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
104.168.171.159:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
103.144.139.159:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
91.206.178.204:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
198.98.58.184:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
172.241.27.120:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
23.106.223.197:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
23.108.57.83:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
54.37.131.232:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
23.82.128.11:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)

Indicator	Type	Context
160.20.147.91:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
103.175.16.10:443	IP address:port	C2 server extracted from Bumblebee configuration data (February 2023)
45.61.187.225	IP address	C2 server extracted from Bumblebee configuration data (March 2023)
91.206.178.68	IP address	C2 server extracted from Bumblebee configuration data (March 2023)
193.109.120.252	IP address	C2 server extracted from Bumblebee configuration data (March 2023)

Table 1. Indicators for this threat.

If you need urgent assistance with an incident, contact the Secureworks Incident Response team.

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