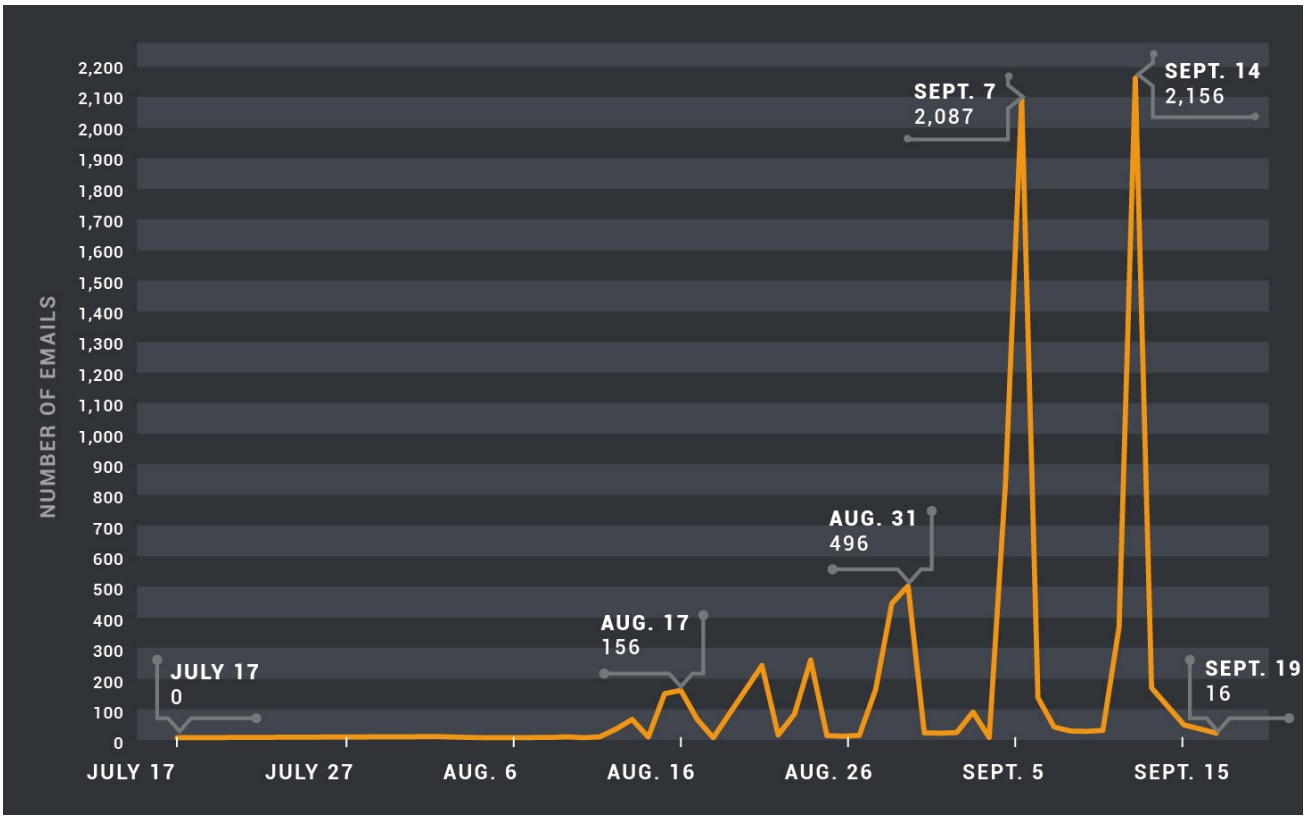
Want Tofsee My Pictures? A Botnet Gets Aggressive

blog.talosintelligence.com/tofsee-spam/

Edmund Brumaghin September 29, 2016



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Summary

Tofsee is multi-purpose malware that has been in existence for several years, operating since at least 2013. It features a number of modules that are used to carry out various activities such as sending spam messages, conducting click fraud, mining cryptocurrency, and more. Once infected, systems become part of the Tofsee spam botnet and are used to send large volumes of spam messages in an effort to infect additional systems and increase the overall size of the botnet under the operator's control.

Earlier this year, Talos published a blog post discussing how the RIG exploit kit was delivering this malware to compromised endpoints using malvertising. Malvertising is a technique commonly used by exploit kits to infect users that browse web sites that are serving compromised advertisements. This activity seemed to disappear in June, however Talos has recently observed a marked increase in the volume and velocity of spam email campaigns containing malicious attachments that are being used to distribute Tofsee.

Tofsee Spam Campaigns

In June 2016, following the disappearance of the Angler exploit kit from the threat landscape, other major exploit kits began to shift to different payloads. The RIG exploit kit moved from distributing Tofsee to other payloads, possibly because distributing them was more attractive to cybercriminals from a monetization standpoint or simply because different actors began using this exploit kit as a distribution mechanism for their malware.

Given the volume of spam messages that infected hosts attempt to distribute, new nodes are quickly added to DNS-based Blackhole Lists (DNSBL) and most of the major email service providers will not accept new message transmissions once this occurs. In order to keep spam levels consistent new nodes must be added constantly. When RIG stopped distributing Tofsee payloads, those responsible for Tofsee switched to alternative distribution methods.

While the Tofsee botnet has been known for sending spam messages, the messages have historically contained links to adult dating and pharmaceutical websites. Starting in August, Talos began to observe a change in the nature of the spam messages being sent by this botnet. The Tofsee spam botnet has begun utilizing malicious attachments that function as malware downloaders. This activity has increased in velocity and volume.

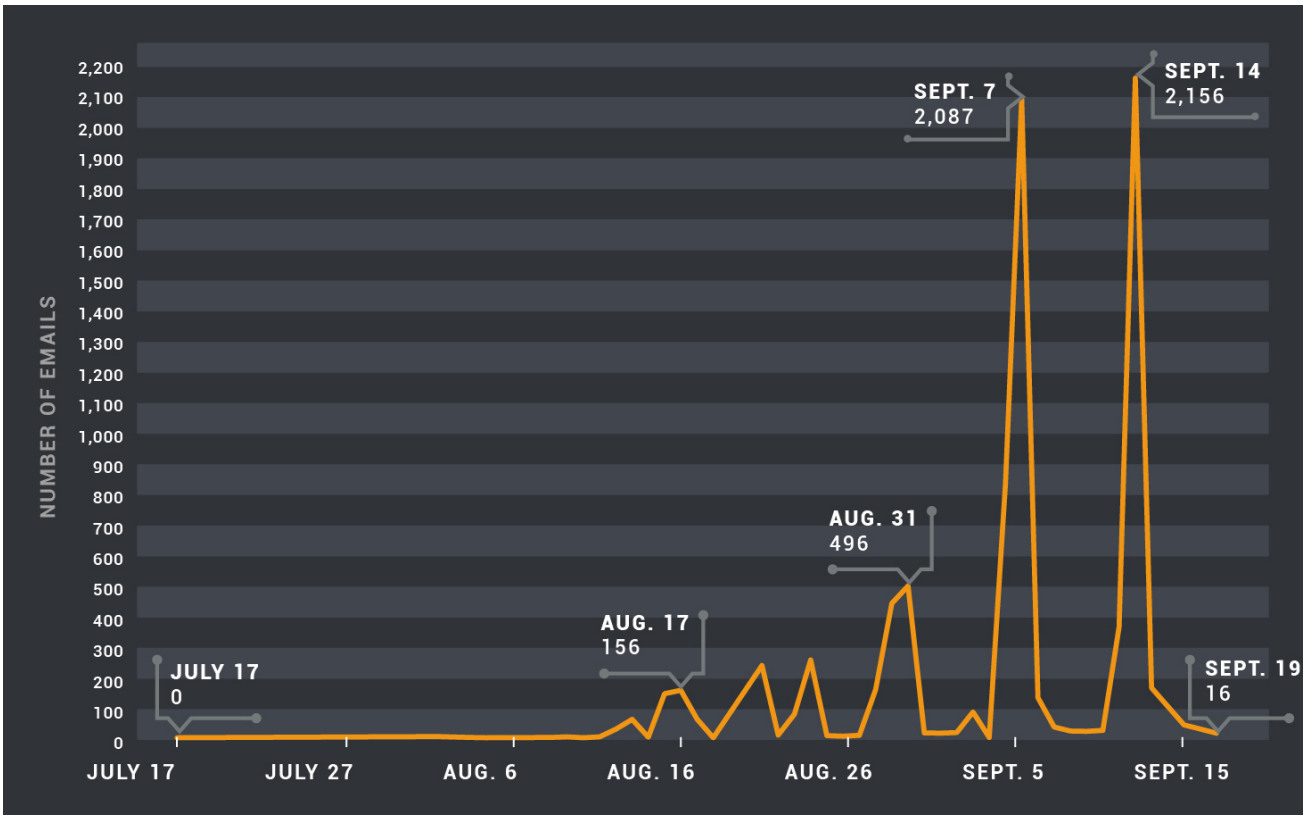

Figure 1: Number of Emails Containing Malware Downloaders

Initial Infection Vector

The initial infection for this variant of Tofsee appears to be accomplished by convincing users to open malicious attachments that are delivered via phishing emails. The phishing emails purport to be from women in Eastern Europe (namely Russia and Ukraine) and the theme of the emails is adult dating. Each email contains slightly different text, however the same format is used across all of the messages Talos analyzed. The messages purport to contain an attached zip archive with pictures of the sender as well as links to a Russian adult dating website. Here is an example of a Tofsee message body:

Excuse me dear = =3D]
Would = you mind to finding a young = and nice girl?
My name = is Dierdre. I am = from Ukraine = !
Have you ever = heard that the = loveliest = girls in the = world live in my = country? Don't even = doubt!
The page is over = there: http://igamrzdh.datingsd&#= 12290;ru

It's my = photo-
3D"Dierdre95"=
I have = much more sexy pics for = you, my love :-) Welcome!

Figure 2: Sample Tofsee Spam Message

Javascript Downloader

The attachment is a zip archive named [Sender First Name]-photos.zip that contains a Javascript file. In all cases analyzed, the filename of the javascript file is a woman's first name. The filename and hash changes across groups of emails with several being sent on any given day. The code in javascript attachment is obfuscated in an attempt to make analysis more difficult.

```
var ubulagsagq5 = new Array("phammage", "13732", "10473", "ing");
var fjotyfevhy = new Array("19473", "te");
var rqehavsy = new Array('us', "12595");
var omefatar2 = new Array("mlugegudynk", "fihabitdun", 599, "20164", "lbasoqnespu");
var ycighanr4 = new Array("Write", "zlomxervoz");

function uxagky() {
    var xzohoqu1 = [];
    xzohoqu1["fcopqavim"] = "zubze";
    xzohoqu1["ecwulwyw"] = "e /";
    return xzohoqu1["ecwulwyw"];
}
var ycwekjokwul3 = new Array("em0", "sqivyndyguw", "18978", "24328", "tyvotelr");
var lubkormow = new Array("MS", "yfofaj");
var nbekyxwak = new Array("13048", "now", "22055");

function waqexo2() {
    var wxutul0 = new Array("ame", "15265", "11240");
    return wxutul0[0];
}
function epyvsajo() {
    var rvyxymre = new Array("el", "uqullutijm", "ufoqjez", "20847");
    return rvyxymre[0];
}
var nbykcodo = new Array("uzysyl", "21746", "ipt", "opribijpif", "14953");

function rpuhhijexf8() {
    var ksittyqi1 = new Array("21685", "16180", "20986", "ltG", "hfewzoram");
    return ksittyqi1[3];
}
var oladgufb0 = new Array("ifmucuryv", "20050", "B.St");
var yjkorgelr = new Array("pisryxnapgyp", "10282", 218);
var ujgadleco = new Array("ydebkeju", "ipt", "19944", "12696", "14924");
var derurmafg1 = new Array("17765", "23278", "TP", "14275");
var ofexypbo = new Array("21070", "ti", "20459");
var punidaqh = new Array("23911", "pwupxabti", "14763", "Adu", "16917");
```

Figure 3: Sample Obfuscated Javascript Downloader

The above Javascript obfuscates a WScript downloader, which is used to retrieve and execute a malicious PE32 executable from an attacker controlled web server. When executed, the downloader retrieves a malicious executable and runs it, infecting the system with Tofsee.

Infection Details

The malware drops a randomly named PE32 executable into the %USERPROFILE% directory.

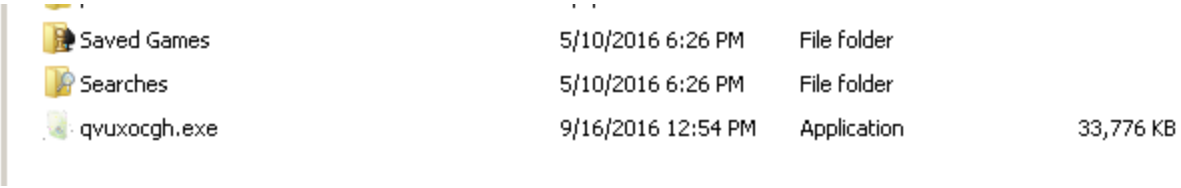

Figure 4: Dropped Tofsee Binary

The dropped executable is registered to start whenever the infected user logs onto the system. This is performed by adding an entry to HKCU\Software\Microsoft\Windows\CurrentVersion\Run.

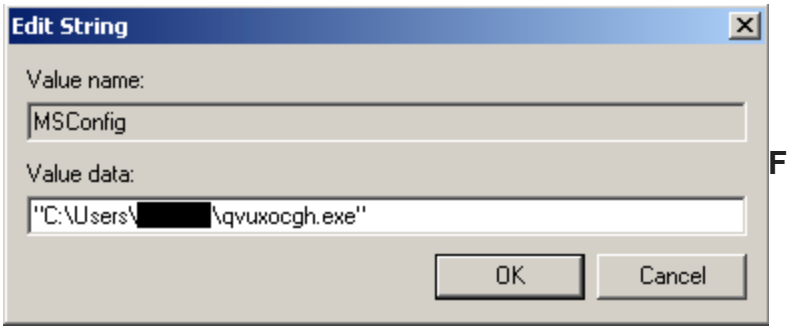

Figure 5: Persistence Mechanism

It also deletes the initial binary using a batch file that is temporarily stored inside the %TEMP% directory.

```
1  @echo off
2  :next_try
3  del "C:\Users\[redacted]\Desktop\tofsee.exe">nul
4  if exist "C:\Users\[redacted]\Desktop\tofsee.exe" (
5  ping 127.0.0.1 >nul
6  goto next_try
7  )
8  del "%0"
```

Figure 6: Batch File Stored in Temp

Once infected, systems will begin connecting to various SMTP relays and sending spam email messages.

Waiting connections	[redacted]	2583	65.55.37.88	25	TCP	Time wait
Waiting connections		2584	144.160.159.21	25	TCP	Time wait
Waiting connections		2585	98.138.112.33	25	TCP	Time wait
Waiting connections		2586	mtain-a-mtc-a.mx.aol.com	25	TCP	Time wait
Waiting connections		2587	64.233.160.27	25	TCP	Time wait
Waiting connections		2589	98.138.112.33	25	TCP	Time wait
Waiting connections		2590	65.54.188.94	25	TCP	Time wait
Waiting connections		2591	65.55.92.136	25	TCP	Time wait
Waiting connections		2592	144.160.159.21	25	TCP	Time wait
Waiting connections		2593	98.138.112.32	25	TCP	Time wait
Waiting connections		2595	98.138.112.32	25	TCP	Time wait
Waiting connections		2596	65.54.188.126	25	TCP	Time wait
Waiting connections		2597	vq-in-f27.1e100.net	25	TCP	Time wait
Waiting connections		2598	65.55.37.88	25	TCP	Time wait
Waiting connections		2599	144.160.159.21	25	TCP	Time wait
Waiting connections		2601	173.194.219.27	25	TCP	Time wait
Waiting connections		2602	152.163.0.99	25	TCP	Time wait
Waiting connections		2604	98.138.112.32	25	TCP	Time wait
Waiting connections		2605	64.233.160.27	25	TCP	Time wait
Waiting connections		2606	65.54.188.94	25	TCP	Time wait
Waiting connections		2607	144.160.159.21	25	TCP	Time wait
Waiting connections		2608	98.138.112.33	25	TCP	Time wait

Figure 7: SMTP Connections

Additionally, HTTP GET requests are generated periodically as the malware attempts to simulate clicking on ads as part of its click fraud routine:

```
GET http://ticketsnow.com/InventoryBrowse/Hamilton-Tickets-at-Richard-Rodgers-Theatre-NY-in-New-York-9-13-2016?
PID=1816075&ts=1472670103 HTTP/1.1
Proxy-Authorization: Basic Og==
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/48.0.2564.109
Safari/537.36
Connection: close
Host: www.ticketsnow.com
Connection: keep-alive
Pragma: no-cache
Cache-Control: no-cache
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Referer: http://www.ticketsnow.com/
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8

HTTP/1.1 200 OK
```

Figure 8: HTTP Connections

Conclusion

Threats are constantly evolving as attackers change the way in which they attempt to distribute malware and attack systems. Threat actors also constantly strive to expand their presence by taking advantage of the ever increasing number of Internet users and devices. By leveraging our vast visibility into the threat landscape, Talos is able to effectively monitor these threats and quickly detect changes in the tactics, techniques, and procedures attackers are using so that we can continually protect our customer's networks and data.

Coverage

Additional ways our customers can detect and block this threat are listed below.

PRODUCT	PROTECTION
AMP	✔
CWS	✔
ESA	✔
Network Security	✔
WSA	✔

Advanced Malware Protection (AMP) is ideally suited to prevent the execution of the malware used by these threat actors.

CWS or WSA web scanning prevents access to malicious websites and detects malware used in these attacks.

The Network Security protection of IPS and NGFW have up-to-date signatures to detect malicious network activity by threat actors. ESA can block malicious emails sent by threat actors as part of their campaign.

Indicators of Compromise

URLs:

hXXp://franny.goadultgame[.]ru:80/js/boxun4.exe
hXXp://getfile.myadultgame[.]ru:80/js/boxun4.exe
hXXp://gsbooz.goadultgame[.]ru:80/js/boxun4.exe
hXXp://ibvl.theadultgame[.]ru:80/js/boxun4.exe
hXXp://oajwwh.goadultgame[.]ru:80/js/boxun4.exe
hXXp://picshare.adultgamemedia[.]ru:80/js/boxun4.exe
hXXp://pics.theadultgame[.]ru:80/js/boxun4.exe
hXXp://reworder.adultgamesite[.]ru:80/js/boxun4.exe
hXXp://rkeujctg.adultgamemedia[.]ru:80/js/boxun4.exe
hXXp://video.theadultgame[.]ru:80/js/boxun4.exe
hXXp://view.webadultgame[.]ru:80/js/boxun4.exe

Domains:

myadultgame[.]ru
theadultgame[.]ru
webadultgame[.]ru
adultgamesite[.]ru
goadultgame[.]ru

adultgamemedia[.]ru
datingst[.]ru
globalhotstore[.]ru
datingrg[.]ru
datingsd[.]ru
datingds[.]ru
datinghq[.]ru
datingfr[.]ru
datinghl[.]ru
dategh[.]ru

IP Addresses:

184[.]18[.]26[.]30
103[.]232[.]222[.]57
111[.]121[.]193[.]242

Downloader Filenames:

Sandi.js
Tessa.js
Dori.js
Debbie.js
Lira.js
Griselda.js
Chere.js
Jess.js
Bettie.js
Katerine.js
Karena.js
Birdie.js
Blondelle.js
Pansy.js
Thomasina.js
Nananne.js
Abigail.js
Adelaida.js

Downloader Hashes:

fe6290253a02c231c07e8604c6b2a1b298520e112e0c0ba08f76c26724b3c820
f706c9c0982c358a165c5d31b218140461e110662332c6c508a9a66305311b17
7e3e4d33b9477f4d38934fdafa2203815950bef6d3b5b1011cd433035f9c0975

83a5e5e319169ec0de90a3ffa3513bbfdcb169fcda57ee671b9c4d08893f5d86
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91e57da11ec889574aebd03f9a213d7154d899d2cf137ec7275e90201e62a170
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979ca79de2e3f3bdfa2a202824b3d6070aca61908f1413413777efeee224869f
e8072ee6e6007ba44071bee91bd25f88c3e9d5db8c49c59975946d8f421b7ab7
23a37772ff69c0da4294f858ee1b50ef8f261c007fc5ae0a1216757d0a1a4148
5d005f26295b05b7a9e8bf317c1452a616c362594e787d3bac5ecb2709059f2e

Binary Hashes:

3100af215a1dbe16be91fa5ee4fd8def2c58623e5c7b3751e2a4c4df1263c5bc
08eb7d50f070f84227ba9a7f55149bcd775d700636417c917a317248acd2f57d
0904af6c04c349dddc1cdb1e76a7c0782dd750e36c3e2e9e84ea8e40f41905c6
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