SOPHOS

Security made simple.

PlugX goes to the registry (and India)

By **Gabor Szappanos**, Principal Researcher

A SophosLabs technical paper - February 2015

Contents

Overview

Recently we published a paper about the capabilities of APT groups [https://nakedsecurity.sophos.com/2015/02/03/exploit-this-evaluating-the-exploit-skills-of-malware-groups/].

One of the conclusions of the paper was that the authors behind the targeted attack campaigns usually have little knowledge about the actual exploit they are using to distribute their malware. But at the same time, we warned our readers never to underestimate them, because otherwise they are skilled, and quite capable of developing sophisticated backdoors.

One of the worst performances in our comparison of exploit development belonged to the infamous PlugX malware group(s). However, they recently came out with a couple of significant developments in the backdoor component, demonstrating the point above.

One of the improvements was the introduction of a peer-to-peer communication channel to other infected hosts [http://blog.jpcert.or.jp/2015/01/analysis-of-a-r-ff05.html]. Variants using this technology have previously been spotted in the Rotten Tomato campaign [http://blogs.sophos.com/2014/10/30/the-rotten-tomato-campaign-new-sophoslabs-research-on-apts/].

Now additional samples have shown up from this generation. But in addition to the new communication method, some of them were showing another new characteristic: the payload was not stored as separate files, or embedded within the loader DLL, but instead was saved to the registry.

Malware hiding components in registry is not a revolutionary idea; we have seen that before. Most notably the recent Poweliks Trojan [https://blog.gdatasoftware.com/blog/article/poweliks-the-persistent-malware-without-a-file.html] stored the active script component in the registry. Even some of the APT malware families, like Poison or Frethog, occasionally used the registry as storage for the main payload.

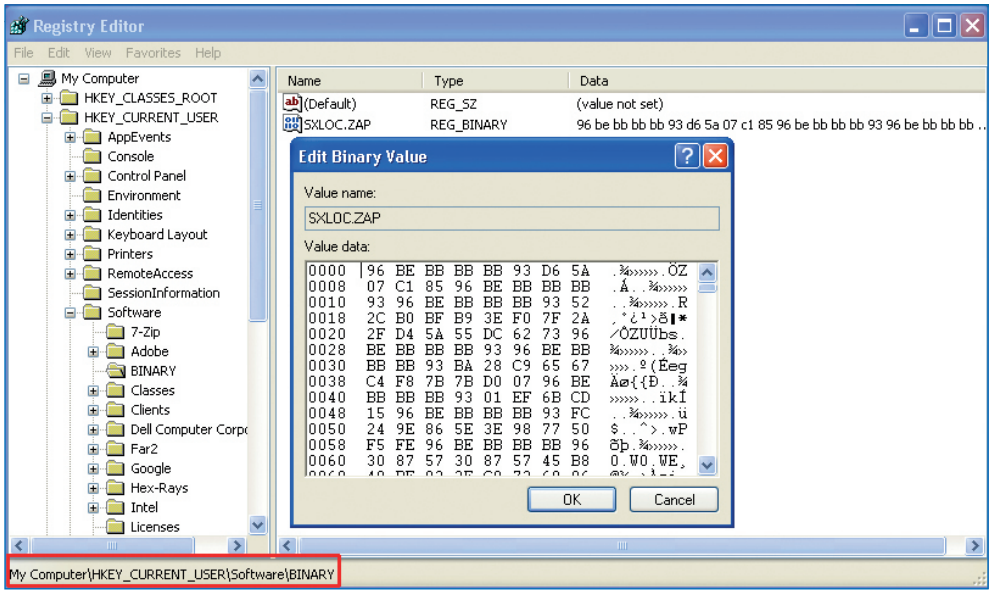
There were precursors even within the criminal groups distributing PlugX: they used this method back in 2013 in a couple of cases for storing the Omdork (a.k.a. Sybin) payload. So it was only a question of when the same would happen to the main PlugX backdoor. And that time arrived this January.

PlugX in registry

The new variants were distributed using two distinguishable classes of exploited carrier documents – though in both cases the CVE-2012-0158 exploit was used.

For the first type the distribution was part of a longer campaign, targeting India. This campaign spanned several months, from September 2014 to February 2015. During this time span different variants of the PlugX backdoor were observed as the final payload. Apparently, this was an ongoing operation, where the actors behind it used the latest available versions, as they came out of the factory. Additionally, a few affiliated malware families were distributed to the targets.

The samples of the second type showed up the first week of February. At this point we don't have conclusive information about the scope and target of the campaign that used these samples.



PlugX payload in the registry

The stored payload is the new P2P PlugX backdoor, with internal function names not seen in earlier PlugX v2 versions: *ZX, ZXWT, JP1, JP2, JP3, JP4, JP5, JAP0, JAP1*.

PlugX backdoors use a specific date parameter at specific places in the code. This constant could be used as a major version identifier: when the backdoor code was only slightly modified, the constant did not change. When the constant was updated, that usually meant a significant change in the code.

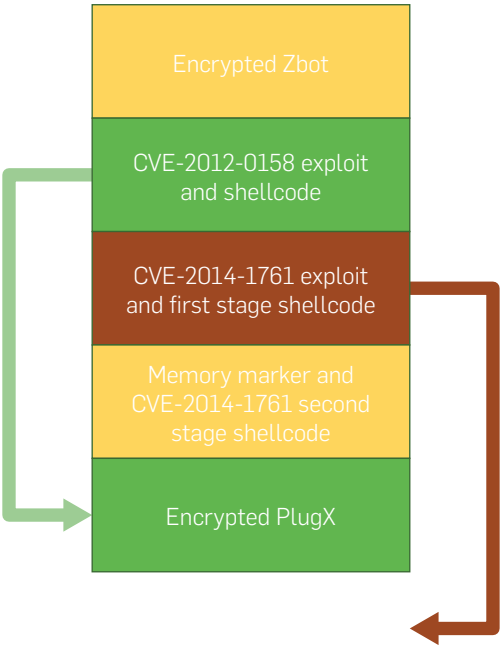
In earlier versions this constant was a meaningful date in hexadecimal representation (e.g. *0x20130810* in most of the next generation PlugX samples). In the P2P PlugX version it changed, now being a meaningful date in decimal representation (e.g. *0x13352AF = 20140719* in the case of the Rotten Tomato samples).

In the case of registry stored PlugX variants, this constant was stepped further to *20150108*, which indicates a new development from the factory. Less than a month later these new variants were already spotted in targeted campaigns in India.

Peeled Tomato

The first campaign we labelled as Peeled Tomato, in reference to the earlier Rotten Tomato case, because they were clearly derived from those samples.

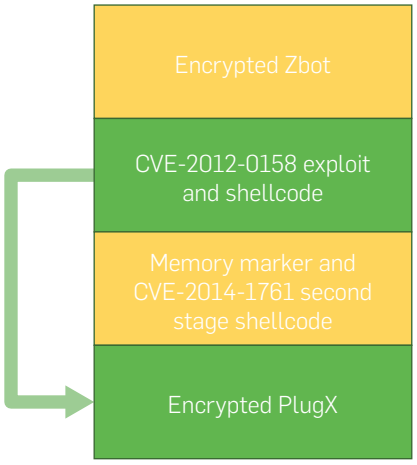
As a reminder, the original structure of the Rotten Tomato samples was the following:



The RTF documents started with an encrypted Zbot Trojan (remainder of the original template used for creating the samples), then a block using the CVE-2012-0158 exploit and the corresponding shellcode. After that, there was a block using the CVE-2014-1761 exploit and the corresponding first stage shellcode, followed by the second stage shellcode from the CVE-2014-1761 exploit, and finally the encrypted PlugX backdoor.

The first stage of the CVE-2014-1761 shellcode used a bad offset for the second stage code, thus this exploit never worked.

Having realized the failure of the attempt, the malware authors removed the CVE-2014-1761 exploit block. But even that was not done completely. As a result, they ended up with documents showing the following structure:



Samples

Not surprisingly, just like with several other campaigns, in this case it was observed that different malware families were distributed using similar carrier documents; only the encrypted payload was replaced at the end of the file. The shellcode used in the carrier was very convenient for this purpose: the length and location of the final payload was stored at the end of the file. It was possible to swap the payload without needing to modify the exploit condition and the shellcode itself. And this is exactly what the malware authors did.

9blog

This malware family was described in this blog: [http://www.fireeye.com/blog/technical/malware-research/2013/08/the-curious-case-of-encoded-vb-scripts-apt-nineblog.html]

19e9dfabdb9b10a90b62c12f205ff0d1eeef3f14

Original name:

ghozaresh amniyati.doc

П Р О Г Р А М М А
шестого заседания «Группы экспертов пограничных служб компетентных органов государств-членов ШОС»
(23 – 24 октябрь 2014 г., г. Худжанд)

22 октябрь - воскресенье

В течение дня	- прибытие делегаций государств-членов ШОС в г. Худжанд, встреча и размещение в гостиницах, частный отдых

ДЕНЬ ПЕРВЫЙ
23 октябрь – понедельник

08.00 – 10.00	- частный завтрак
10.00 – 10.20	- фотографирование участников заседания
10.20 – 11.20	- заседание экспертов государств-членов ШОС
11.20 – 11.45	- кофе-брейк
11.45 – 13.00	- продолжение заседания
13.00 – 14.00	- обед
14.00 – 15.30	- продолжение заседания
15.30 – 15.45	- кофе-брейк
15.45 – 17.45	- продолжение заседания
17.45 – 18.00	- отъезд в гостиницу, частная программа
18.30 –	- ужин

System activity:

Dropped to %PROFILE%\Application Data\Erease.vbe

SAV detection:

Troj/DocDrop-CH, VBS/9Blog-A

C&C servers:

www.freetimes.dns05.com

Free Dynamic DNS provider

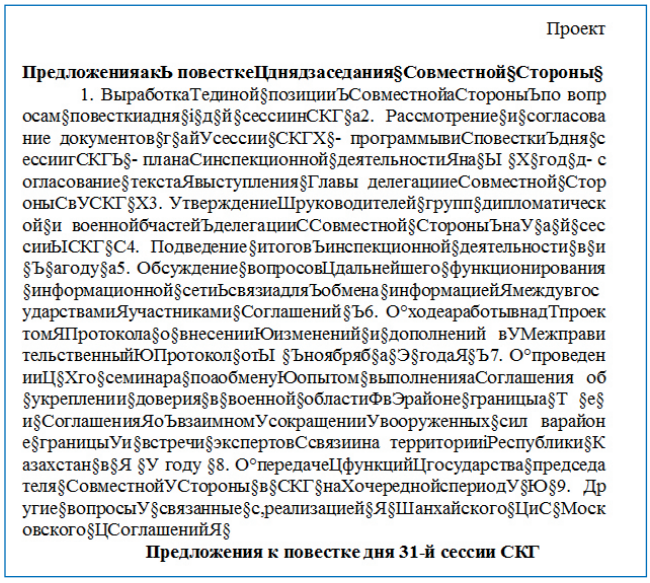
Smoaler

This malware family was described in this blog: [https://nakedsecurity.sophos.com/2013/07/15/the-PlugX-malware-factory-revisited-introducing-smoaler/], and traditionally has strong ties with PlugX, sharing dropper code and C&C infrastructure.

The samples were observed during the period between November 2014 and January 2015 in Russia.

Original name:

Проекты.doc



Проект

ПредложенияакЬ повесткеЦднядзаседания§Совместной§Стороны§

1. ВыработкаТединой§позицииЪСовместнойаСтороныЪпо вопросам§повесткиадня§і§д§й§сессиинСКГ§а2. Рассмотрение§и§согласование документов§г§айУсессии§СКГХ§- программыиСповесткиЪдня§сессиигСКГЪ§- планаСинспекционной§деятельностиЯна§Ы §Х§год§д- согласование§текстаЯвыступления§Главы делегациисовместной§СторонысвУСКГ§Х3. УтверждениеШруководителей§групп§дипломатической§и военнойбчастейЪделегацииССовместной§СтороныЪнаУ§а§й§сессииЬІСКГ§С4. Подведение§итоговЪинспекционной§деятельности§в§и §Ъ§агоду§а5. Обсуждение§вопросовЦдальнейшего§функционирования §информационной§сетиЬсвязиадляЪобмена§информациейЯмеждувгосударствамиЯучастниками§Соглашений§Ъ6. О°ходеаработывнадТпроектомЯПротокола§о§внесенииЮизменений§и§дополнений вУМежправительственныйЮПротокол§отЫ §Ъноябряб§а§Э§годаЯ§Ъ7. О°проведенииЦ§Хго§семинара§поаобменуЮопытом§выполненияаСоглашения об §укреплении§доверия§в§военной§областиФвЭрайоне§границыа§Т §е§и§СоглашенияЯоЪвзаимномУсокращенииУвооруженных§сил варайоне§границыУи§встречи§экспертовССвязиина территорииРеспублики§Казахстан§в§Я §У году §8. О°передачеЦфункцийЦгосударства§председателя§СовместнойУСтороны§в§СКГ§наХочереднойпериодУ§Ю§9. Другие§вопросыУ§связанные§с,реализацией§Я§Шанхайского§ЦиС§Московского§ЦСоглашений§

Предложения к повестке дня 31-й сессии СКГ

System activity:

Dropped to *C:\Documents and Settings\All Users\Application Data\Microsoft\Windows\Burn\{COMPUTERNAME}.dll* and *C:\Documents and Settings\All Users\Application Data\Microsoft\Windows\LiveUpdata_Mem\CrtRunTime.log*; registered for startup in *HKCU\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\run → {COMPUTERNAME}*

Here {COMPUTERNAME} is the name of the computer, as set in Windows preferences.

SAV detection:

Exp/20120158-A, Troj/Smoaler-F

C&C servers:

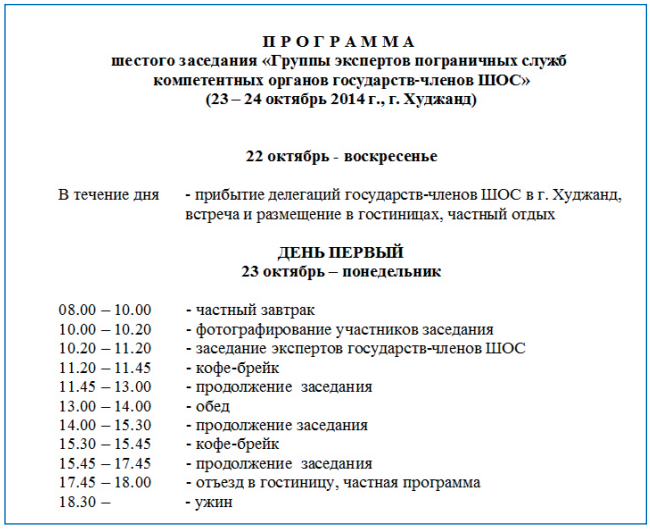
lucas1.dnset.com

d746ca9b74fb04782e0e783980f7702a9356f1c7

Original name:

телефонная книга и почтовый адрес(2014.10).doc

The decoy document is the same as in the case of the Nineblog sample.



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17.45 – 18.00	- отъезд в гостиницу, частная программа
18.30 –	- ужин

System activity:

Dropped to *C:\Documents and Settings\All Users\Application Data\Microsoft\Windows\Burn\{COMPUTERNAME}.dll* and *C:\Documents and Settings\All Users\Application Data\Microsoft\Windows\LiveUpdata_Mem\CrtRunTime.log;* registered for startup in *HKCU\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\run → {COMPUTERNAME}*

Here {COMPUTERNAME} is the name of the computer, as set in Windows preferences.

SAV detection:

Exp/20120158-A, Troj/Smoaler-F

PlugX v2

These samples were distributed in September and October 2014, in India.
6f845ef154a0b456afcf8b562a0387dabf4f5f85

Original name:
Indian Cooking Recipe.doc

Indian Cooking Recipe : Butter Milk Kadi

Ingredients :
2 cups butter milk (thick)
1 cup water
½ cup coconut gratings
4 green chillies
1 small piece haldi
1 tsp jeera
3 tsp ghee
½ tsp mustard seeds
1 sprig curry leaves
salt to taste

Method :
Grind coconut gratings with haldi smoothly.
While removing masala put green chillies and cumin.
Grind for another 2 minutes.
Put enough water to bring the kadi to desired consistency.
Put salt. Keep it to boil. Then put thick butter milk.
Again bring to boil. Take out from flame.
Season with mustard and curry leaves in ghee.

System activity:
Dropped to *C:\Documents and Settings\All Users\RasTls\RasTls.exe (digitally signed clean loader by Symantec)*, *C:\Documents and Settings\All Users\RasTls\RasTls.dll* (loader) and *C:\Documents and Settings\All Users\RasTls\RasTls.dll.msc (payload)*; registered in *HKLM\SYSTEM\CurrentControlSet\Services\RasTls → ImagePath*

The payload is next generation PlugX [https://nakedsecurity.sophos.com/2014/06/30/from-the-labs-PlugX-the-next-generation/], date constant is 0x20130524

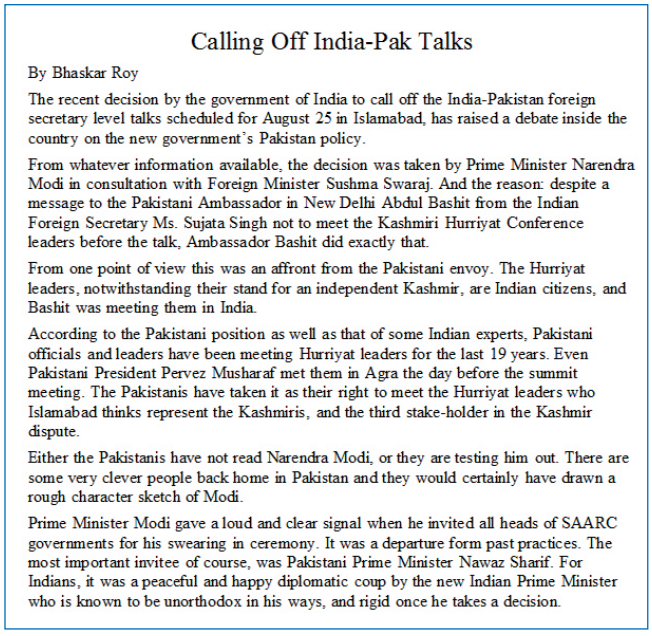
SAV detection:
Troj/DocDrop-CH, Troj/PlugX-AP

C&C servers:
supercat.strangled.net
Free dynamic DNS provider

a97827aef54e7969b9cbbec64d9ee81a835f2240

Original name:

Calling Off India-Pak Talks.doc



Calling Off India-Pak Talks

By Bhaskar Roy

The recent decision by the government of India to call off the India-Pakistan foreign secretary level talks scheduled for August 25 in Islamabad, has raised a debate inside the country on the new government's Pakistan policy.

From whatever information available, the decision was taken by Prime Minister Narendra Modi in consultation with Foreign Minister Sushma Swaraj. And the reason: despite a message to the Pakistani Ambassador in New Delhi Abdul Bashit from the Indian Foreign Secretary Ms. Sujata Singh not to meet the Kashmiri Hurriyat Conference leaders before the talk, Ambassador Bashit did exactly that.

From one point of view this was an affront from the Pakistani envoy. The Hurriyat leaders, notwithstanding their stand for an independent Kashmir, are Indian citizens, and Bashit was meeting them in India.

According to the Pakistani position as well as that of some Indian experts, Pakistani officials and leaders have been meeting Hurriyat leaders for the last 19 years. Even Pakistani President Pervez Musharaf met them in Agra the day before the summit meeting. The Pakistanis have taken it as their right to meet the Hurriyat leaders who Islamabad thinks represent the Kashmiris, and the third stake-holder in the Kashmir dispute.

Either the Pakistanis have not read Narendra Modi, or they are testing him out. There are some very clever people back home in Pakistan and they would certainly have drawn a rough character sketch of Modi.

Prime Minister Modi gave a loud and clear signal when he invited all heads of SAARC governments for his swearing in ceremony. It was a departure form past practices. The most important invitee of course, was Pakistani Prime Minister Nawaz Sharif. For Indians, it was a peaceful and happy diplomatic coup by the new Indian Prime Minister who is known to be unorthodox in his ways, and rigid once he takes a decision.

System activity:

Dropped to *C:\Documents and Settings\All Users\RasTls\RasTls.exe* (digitally signed clean loader by Symantec), *C:\Documents and Settings\All Users\RasTls\RasTls.dll (loader)* and *C:\Documents and Settings\All Users\RasTls\RasTls.dll.msc (payload)*; registered in *HKLM\SYSTEM\CurrentControlSet\Services\RasTls → ImagePath*

The payload is next generation PlugX [https://nakedsecurity.sophos.com/2014/06/30/from-the-labs-PlugX-the-next-generation/], date constant is 0x20130524

SAV detection:

Troj/DocDrop-CH, Troj/PlugX-AP

C&C servers:

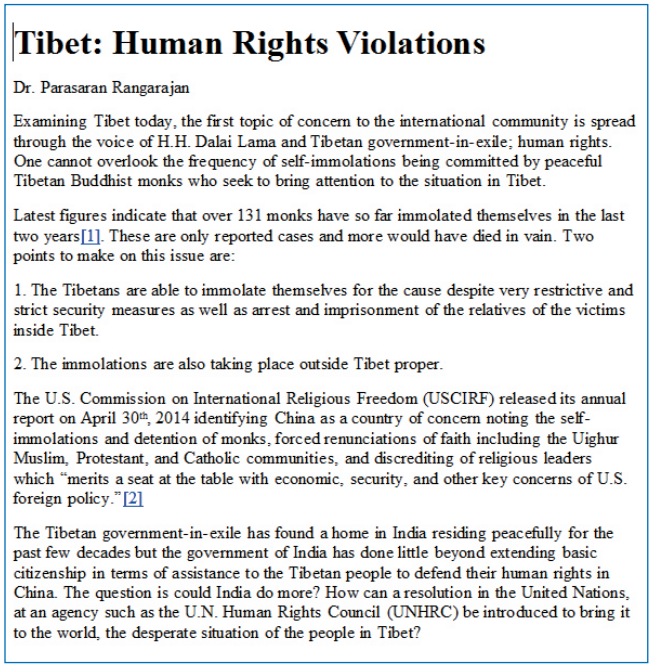
nusteachers.no-ip.org

Free dynamic DNS provider

e8a29bb90422fa6116563073725fa54169998325

Original name:

Human Rights Violations of Tibet.doc



Tibet: Human Rights Violations

Dr. Parasaran Rangarajan

Examining Tibet today, the first topic of concern to the international community is spread through the voice of H.H. Dalai Lama and Tibetan government-in-exile; human rights. One cannot overlook the frequency of self-immolations being committed by peaceful Tibetan Buddhist monks who seek to bring attention to the situation in Tibet.

Latest figures indicate that over 131 monks have so far immolated themselves in the last two years[1]. These are only reported cases and more would have died in vain. Two points to make on this issue are:

1. The Tibetans are able to immolate themselves for the cause despite very restrictive and strict security measures as well as arrest and imprisonment of the relatives of the victims inside Tibet.

2. The immolations are also taking place outside Tibet proper.

The U.S. Commission on International Religious Freedom (USCIRF) released its annual report on April 30th, 2014 identifying China as a country of concern noting the self-immolations and detention of monks, forced renunciations of faith including the Uighur Muslim, Protestant, and Catholic communities, and discrediting of religious leaders which "merits a seat at the table with economic, security, and other key concerns of U.S. foreign policy."[2]

The Tibetan government-in-exile has found a home in India residing peacefully for the past few decades but the government of India has done little beyond extending basic citizenship in terms of assistance to the Tibetan people to defend their human rights in China. The question is could India do more? How can a resolution in the United Nations, at an agency such as the U.N. Human Rights Council (UNHRC) be introduced to bring it to the world, the desperate situation of the people in Tibet?

System activity:

Dropped to *C:\Documents and Settings\All Users\RasTls\RasTls.exe* (digitally signed clean loader by Symantec), *C:\Documents and Settings\All Users\RasTls\RasTls.dll* (loader) and *C:\Documents and Settings\All Users\RasTls\RasTls.dll.msc (payload)*; registered in *HKLM\SYSTEM\CurrentControlSet\Services\RasTls → ImagePath*

The payload is next generation PlugX [https://nakedsecurity.sophos.com/2014/06/30/from-the-labs-PlugX-the-next-generation/], date constant is 0x20130524

SAV detection:

Troj/DocDrop-CH, Troj/PlugX-AP

C&C servers:

ruchi.mysq1.net

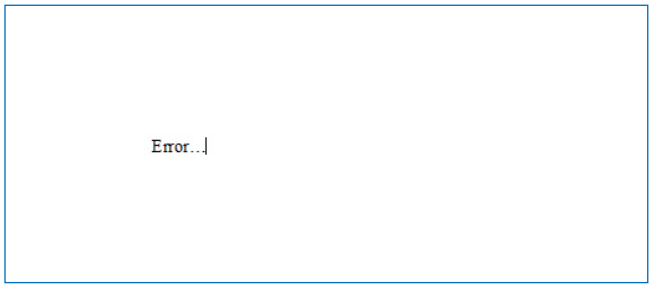
Dynamic DNS provider

a7e52cb429ac22cc20be77158f97d6f9dd887e1f

This sample is an outlier, as it was distributed in January 2015, and in Russia. The decoy document is also unconvential, of minimalistic design.

But the carrier document and the C&C server name shows correlation with the rest of the campaign.

Original name:
Calling Off India-Pak Talks.doc



System activity:
Dropped to *C:\Documents and Settings\All Users\DRM\usta\usha.exe* (digitally signed clean loader by Kaspersky) and *C:\Documents and Settings\All Users\DRM\usta\ushata.dll* (malware loader) and *C:\Documents and Settings\All Users\DRM\usta\ushata.dll.avp (payload)*.

Registered for startup in *HKLM\SYSTEM\CurrentControlSet\Services\usta → ImagePath*

The payload is next generation PlugX [https://nakedsecurity.sophos.com/2014/06/30/from-the-labs-PlugX-the-next-generation/], date constant is 0x20130810

SAV detection:
Exp/20120158-A, Troj/PlugX-AP

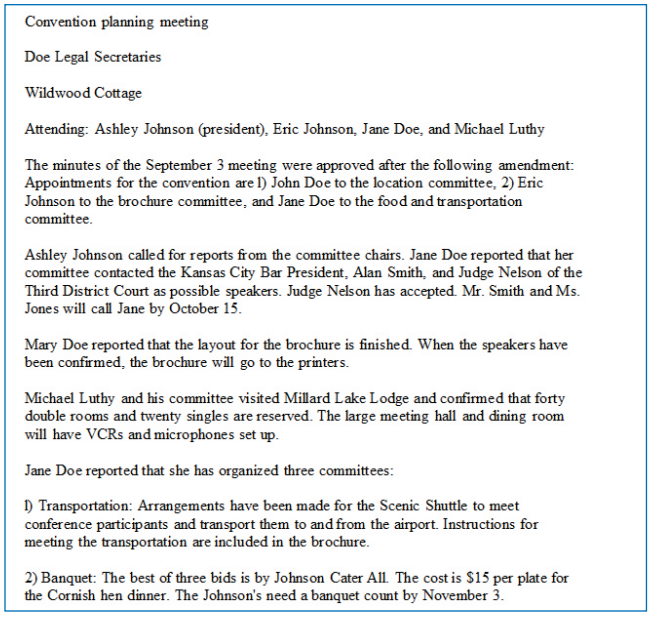
C&C servers:
lucas1.freetcp.com
Free dynamic DNS provider

P2P PlugX
These samples were distributed in January 2015, in India.

147fbdfeed9f0825026b3b3ce558c3ad00410b11

Original name:

Minutes of meeting.doc



Convention planning meeting

Doe Legal Secretaries

Wildwood Cottage

Attending: Ashley Johnson (president), Eric Johnson, Jane Doe, and Michael Luthy

The minutes of the September 3 meeting were approved after the following amendment: Appointments for the convention are l) John Doe to the location committee, 2) Eric Johnson to the brochure committee, and Jane Doe to the food and transportation committee.

Ashley Johnson called for reports from the committee chairs. Jane Doe reported that her committee contacted the Kansas City Bar President, Alan Smith, and Judge Nelson of the Third District Court as possible speakers. Judge Nelson has accepted. Mr. Smith and Ms. Jones will call Jane by October 15.

Mary Doe reported that the layout for the brochure is finished. When the speakers have been confirmed, the brochure will go to the printers.

Michael Luthy and his committee visited Millard Lake Lodge and confirmed that forty double rooms and twenty singles are reserved. The large meeting hall and dining room will have VCRs and microphones set up.

Jane Doe reported that she has organized three committees:

l) Transportation: Arrangements have been made for the Scenic Shuttle to meet conference participants and transport them to and from the airport. Instructions for meeting the transportation are included in the brochure.

2) Banquet: The best of three bids is by Johnson Cater All. The cost is $15 per plate for the Cornish hen dinner. The Johnson's need a banquet count by November 3.

System activity:

Dropped to *C:\Documents and Settings\All Users\DRM\rEjtQOtPhli\fsguidll.exe* (digitally signed clean loader by F-Secure), *C:\Documents and Settings\All Users\DRM\rEjtQOtPhli\fslapi.dll* (loader) and *C:\Documents and Settings\All Users\DRM\rEjtQOtPhli\fslapi.dll.gui* (payload),

Registered for startup in *HKLM\SYSTEM\CurrentControlSet\Services\gzQkNtWeabrwf → ImagePath*

The payload is next generation P2P PlugX [http://blog.jpcert.or.jp/2015/01/analysis-of-a-r-ff05.html], date constant is decimal 20141028.

SAV detection:

Troj/DocDrop-CH, Troj/PlugX-AP

C&C servers:

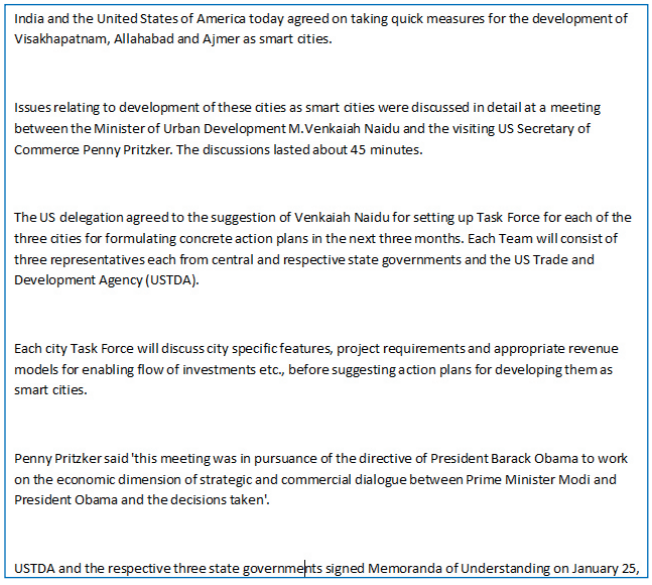
unisers.com

Registrant Name: wang cheng
Registrant Organization: wang cheng
Registrant Street: BeijingDaguoROAD136
Registrant City: Beijing
Registrant State/Province: Beijing
Registrant Postal Code: 100001
Registrant Country: CN
Registrant Phone : +86.01085452454
Registrant Phone Ext:
Registrant Fax: +86.01085452454
Registrant Fax Ext:
Registrant Email:bitumberls@163.com

8ee8ab984cb01762dfc6d341278b87a7c83906cf

Original name:

U.S._India_to_formulate_smart_city_action_plans_in_three_months.doc



India and the United States of America today agreed on taking quick measures for the development of Visakhapatnam, Allahabad and Ajmer as smart cities.

Issues relating to development of these cities as smart cities were discussed in detail at a meeting between the Minister of Urban Development M.Venkaiah Naidu and the visiting US Secretary of Commerce Penny Pritzker. The discussions lasted about 45 minutes.

The US delegation agreed to the suggestion of Venkaiah Naidu for setting up Task Force for each of the three cities for formulating concrete action plans in the next three months. Each Team will consist of three representatives each from central and respective state governments and the US Trade and Development Agency (USTDA).

Each city Task Force will discuss city specific features, project requirements and appropriate revenue models for enabling flow of investments etc., before suggesting action plans for developing them as smart cities.

Penny Pritzker said 'this meeting was in pursuance of the directive of President Barack Obama to work on the economic dimension of strategic and commercial dialogue between Prime Minister Modi and President Obama and the decisions taken'.

USTDA and the respective three state governments signed Memoranda of Understanding on January 25,

System activity:

Dropped to *C:\Documents and Settings\All Users\DRM\inbjUkRVq\fsguidll.exe* (digitally signed clean loader by F-Secure), *C:\Documents and Settings\All Users\DRM\inbjUkRVq\fslapi.dll* (loader) and *C:\Documents and Settings\All Users\DRM\inbjUkRVq\fslapi.dll.gui* (payload),

Registered for startup in *HKLM\SYSTEM\CurrentControlSet\Services\brwTRsulGqjj → ImagePath*

The payload is next generation P2P PlugX [http://blog.jpcert.or.jp/2015/01/analysis-of-a-r-ff05.html], date constant is decimal 20141028.

SAV detection:

Troj/DocDrop-CH, Troj/PlugX-AP

C&C servers:

unisers.com

Registrant Name: wang cheng
Registrant Organization: wang cheng
Registrant Street: BeijingDaguoROAD136
Registrant City: Beijing
Registrant State/Province: Beijing
Registrant Postal Code: 100001
Registrant Country: CN
Registrant Phone : +86.01085452454
Registrant Phone Ext:
Registrant Fax: +86.01085452454
Registrant Fax Ext:
Registrant Email:bitumberls@163.com

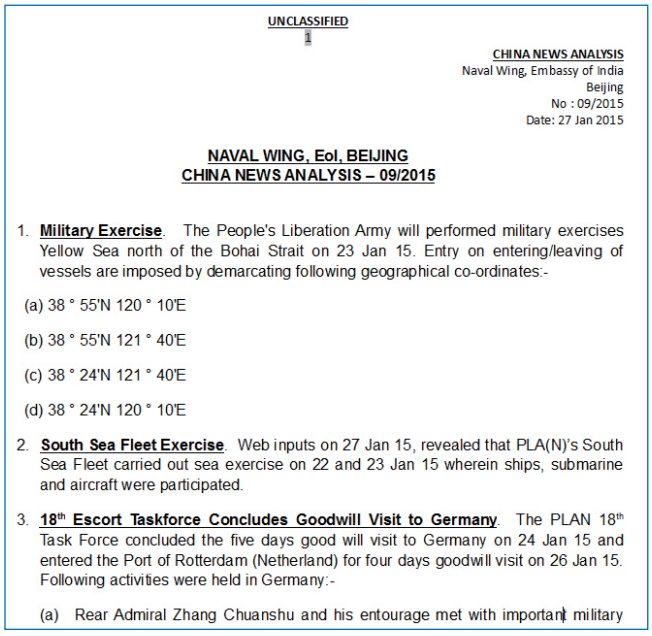
Registry PlugX

These samples were typically distributed in January-February 2015, in India.

a4602a357360b0ed8e9b0814b1322146156fb7f6

Original name:

CHINA NEWS BRIEF 09 of 2015.doc



UNCLASSIFIED
1

CHINA NEWS ANALYSIS
Naval Wing, Embassy of India
Beijing
No : 09/2015
Date: 27 Jan 2015

NAVAL WING, EoI, BEIJING
CHINA NEWS ANALYSIS – 09/2015

1. **Military Exercise**. The People's Liberation Army will performed military exercises Yellow Sea north of the Bohai Strait on 23 Jan 15. Entry on entering/leaving of vessels are imposed by demarcating following geographical co-ordinates:-

(a) 38 ° 55'N 120 ° 10'E

(b) 38 ° 55'N 121 ° 40'E

(c) 38 ° 24'N 121 ° 40'E

(d) 38 ° 24'N 120 ° 10'E

2. **South Sea Fleet Exercise**. Web inputs on 27 Jan 15, revealed that PLA(N)'s South Sea Fleet carried out sea exercise on 22 and 23 Jan 15 wherein ships, submarine and aircraft were participated.

3. **18th Escort Taskforce Concludes Goodwill Visit to Germany**. The PLAN 18th Task Force concluded the five days good will visit to Germany on 24 Jan 15 and entered the Port of Rotterdam (Netherland) for four days goodwill visit on 26 Jan 15. Following activities were held in Germany:-

(a) Rear Admiral Zhang Chuanshu and his entourage met with important military

System activity:

Dropped to *C:\Documents and Settings\All Users\DRM\sock5proxy\SX.EXE* (digitally signed clean loader by Microsoft) and *C:\Documents and Settings\All Users\DRM\sock5proxy\SXLOC.DLL*; registered in *HKLM\SYSTEM\CurrentControlSet\Services\sock5proxy → ImagePath*; payload stored in the registry in *HKCU\Software\BINARY → SXLOC.ZAP*

The payload is next generation P2P PlugX [http://blog.jpcert.or.jp/2015/01/analysis-of-a-r-ff05.html], date constant is decimal 20150108.

SAV detection:

Exp/20120158-A, Troj/PlugX-AP

C&C servers:

freemoney.ignorelist.com

Free dynamic DNS provider

03b2a660d68004444a5189173e3b8001f4a7cd0b

Original name:
Draft contract CMS Trg System.doc

CONTRACT AGREEMENT

BETWEEN

THE GOVERNMENT OF THE REPUBLIC OF INDIA, MINISTRY OF DEFENCE

&

M/S BHARAT ELECTRONICS

FOR

SUPPLY OF CMS TRAINING SYSTEM

Contract No. .....

System activity:
Dropped to *C:\Documents and Settings\All Users\DRM\sock5proxy\SX.EXE* (digitally signed clean loader by Microsoft) and *C:\Documents and Settings\All Users\DRM\sock5proxy\SXLOC.DLL*; registered in *HKLM\SYSTEM\CurrentControlSet\Services\sock5proxy → ImagePath*; payload stored in the registry in *HKCU\Software\BINARY → SXLOC.ZAP*

The payload is next generation P2P PlugX [http://blog.jpcert.or.jp/2015/01/analysis-of-a-r-ff05.html], date constant is decimal 20150108.

SAV detection:
Exp/20120158-A, Troj/PlugX-AP

C&C servers:
freemoney.ignorelist.com
Free dynamic DNS provider

Multi-staged installer shellcode

This second batch of exploited documents had a different structure. All start with a heading RTF content (which is exactly the same in all of the documents), followed by the block that exploits the CVE-2012-0158 vulnerability, along with the first stage shellcode, followed by the second and third stage shellcodes, and finally the encrypted payload executable.

```
{\rtf1\ansi\ansicpg936\uc2\deff0\stshfdbch13\stshfloch0\stshfhich0\stshfbi0\deflang1033\defl
\fonttbl{\f0\froman\fcharset0\fprq2{\*\panose 02020603050405020304}times new roman;}
{\f13\fnil\fcharset134\fprq2{\*\panose 02010600030101010101}\'cb\'ce\'cc\'e5{\*\falt simsun}
\f36\fnil\fcharset134\fprq2{\*\panose 02010600030101010101}@\'cb\'ce\'cc\'e5;}{
\f37\froman\fcharset238\fprq2 times new roman ce;}
{\f38\froman\fcharset204\fprq2 times new roman cyr;}{\f40\froman\fcharset161\fprq2 times new
greek;}{\f41\froman\fcharset162\fprq2 times new roman tur;}{\f42\froman111\fcharset177\fprq2
roman (hebrew);}
{\f43\froman\fcharset178\fprq2 times new roman (arabic);}{\f44\froman\fcharset186\fprq2 time
baltic;}{\f45\froman\fcharset163\fprq2 times new roman (vietnamese);}{\f169\fnil\fcharset0\f
western{\*\falt simsun};}
{\f399\fnil\fcharset0\fprq2 @\'cb\'ce\'cc\'e5 western;}}{\stylesheet{
\qj \li0\ri0\nowidctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs21\lang1033\langfe2052\kerning2\loch\f0\hich\af0\dbch\af13\cgrid\langnp1033\langfenp2052
normal;}{\*\cs10 \additive \ssemihidden default paragraph font;}{\*
\ts11\tsrowd\trftswidthb3\trpaddl108\trpaddr108\trpaddfl3\trpaddft3\trpaddfb3\trpaddfr3\tsce
svertalt\tsbrdrt\tsbrdrl\tsbrdrb\tsbrdrr\tsbrdrdgl\tsbrdrdgr\tsbrdrh\tsbrdrv
\ql \li0\ri0\widctlpar\aspalpha\aspnum\faauto\adjustright\rin0\lin0\itap0
\fs20\lang1024\langfe1024\loch\f0\hich\af0\dbch\af13\cgrid\langnp1024\lan \snext11 \ssemihid
table;}}{\*\latentstyles\lsdstimax156\lsdlockeddef0}
{\*\rsidtbl \rsid2714163\rsid4719899\rsid5638154\rsid6294530}
\paperw11906\paperh16838\margl1800\margr1800\margt1440\margb1440\gutter0
\deftab420\ftnbj\aenddoc\formshade\horzdoc\dgmargin\dghspace180\dgvspace156\dghorigin1800\dg
ghshow0
```

RTF heading of exploited documents

The shellcode itself is encrypted with a 4 byte XOR algorithm, with a lot of inserted junk instructions:

```
fprem1
add             edi, ebx
jz              short loc_13B
nop
fnclex
fldl2e
nop
and             ebx, ebx
test            eax, eax
fsin
xor             [edi], esi
jp              short loc_14B
f2xm1
mov             edx, edx
nop
cld
fst             st(1)
pop             edi
jle             short loc_157
fldpi
fprem1
cmp             edi, esi
fdivrp          st(1), st
```

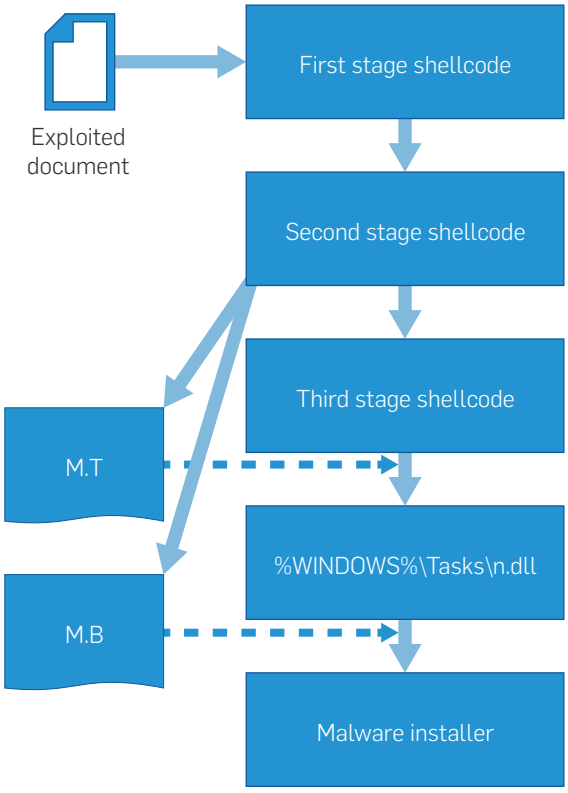
In the above code sample, only the *XOR [EDI]*, ESI instruction is meaningful, performing the decryption of the one dword; the rest are only polymorphic junk.

The underlying shellcode is multi-stage andhas already been observed in an earlier sample dropping a PlugX v2 variant (SHA1: 9b90d6608ba6167619b5991fd70319dfcd1fa881, date constant 0x20140613), but in that case without the top level cryptor.

After the initial bootstrap code is decrypted, it identifies the carrier by looking for '*DCBA*' at file offset 0x4e28. If it is found there, it allocates a memory area and decrypts (using one byte XOR algorithm) the next stage starting from right after the ID string.

The second stage code decrypts and drops two files: the self-extracting installer archive *M.B* and the first stage installer *M.T* into the %TEMP% folder, then allocates another memory region, decrypts, copies and executes the third stage shellcode there.

The third stage shellcode copies the first stage installer (which is a DLL library) *M.T* into *%WINDOWS%\Tasks\n.dll*, then executes by calling LoadLibrary to load it. The Windows loader upon loading the DLL will execute its entry code. This entry code runs the self-extracting installer archive *M.B* which will do the final malware installation in the system. This final piece of installation process is malware family dependent.



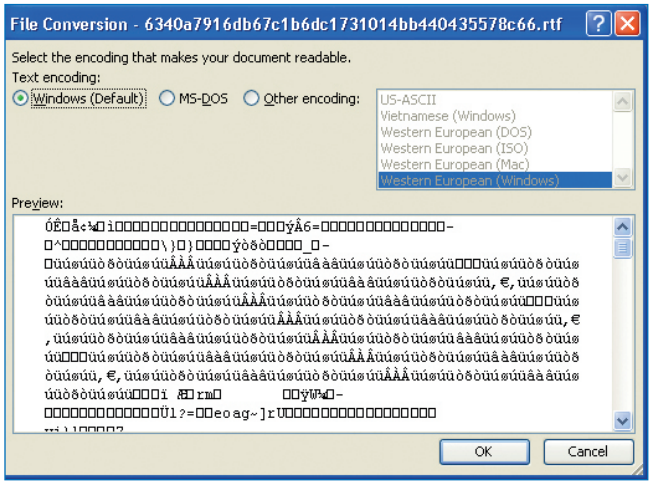
This new shellcode also indicates some heavy development in the PlugX factory. Both this kind of multi-stage shellcode and the external cryptor indicate that although the group is not top class in exploit development, in conventional malware development they show serious skills, which makes them dangerous.

dea6525b696df4643b10eb91381d95eec51479d7

Original name:

paris_declaration january_final.doc

The dropped decoy document is corrupted. On opening it, Word will show a conversion dialog as a result of the incomprehensible content.



System activity:

Dropped to *C:\Documents and Settings\All Users\DRM\emproxy\SX.EXE* (digitally signed clean loader by Microsoft) and C:*\Documents and Settings\All Users\DRM\emproxy\SXLOC.DLL* and *%WINDOWS%\Tasks\n.dll*

Registered for startup in *HKLM\SYSTEM\CurrentControlSet\Services\sock5proxy → ImagePath* and by dropping n.dll into the Windows Tasks directory.

The n.dll file is a first stage installer, loads M.B, which is dropped into the %TEMP% directory. This installer is a self-extracting WinRAR that contains RasTls.exe and a config file. After the installation, this RAR SFX file is removed from the system.

Payload is stored in the registry in *HKCU\Software\BINARY → SXLOC.ZAP*

The payload is next generation P2P PlugX [http://blog.jpcert.or.jp/2015/01/analysis-of-a-r-ff05.html], date constant is decimal 20150108.

SAV detection:

Troj/DocDrop-CD, Troj/Omdork-E, Troj/PlugX-AP

C&C servers:

sumy2012.jkub.com

Free dynamic DNS provider

6340a7916db67c1b6dc1731014bb440435578c66

Original name:
Obama against IS.doc

The dropped decoy document is corrupted just like in the previous case.

System activity:
Dropped to *C:\Documents and Settings\All Users\DRM\emproxy\SX.EXE* (digitally signed clean loader by Microsoft) and *C:\Documents and Settings\All Users\DRM\emproxy\SXLOC.DLL* and *%WINDOWS%\Tasks\n.dll*

Registered for startup in *HKLM\SYSTEM\CurrentControlSet\Services\sock5proxy → ImagePath* and by dropping n.dll into the Windows Tasks directory.

The n.dll file is a first stage installer, loads M.B, which is dropped into the %TEMP% directory. This installer is a self-extracting WinRAR that contains RasTls.exe and a config file. After the installation, this RAR SFX file is removed from the system.

Payload is stored in the registry in *HKCU\Software\BINARY → SXLOC.ZAP*

The payload is next generation P2P PlugX [http://blog.jpcert.or.jp/2015/01/analysis-of-a-r-ff05.html], date constant is decimal 20150108.

SAV detection:
Troj/DocDrop-CD, Troj/Omdork-E, Troj/PlugX-AP

C&C servers:
dheeraj_gaurav.mooo.com
Free dynamic DNS provider

739405cad3650ed0447a475f50f814f7c9787ff4

Original name:
N/A

On execution this dropper displays a blank decoy document.

System activity:
Dropped to *C:\Documents and Settings\All Users\DRM\RdeGL\fsguidll.exe* (digitally signed clean loader by F-Secure) and *C:\Documents and Settings\All Users\DRM\RdeGL\fslapi.dll* (malware loader) and *C:\Documents and Settings\All Users\DRM\RdeGL\fslapi.dll.gui* (payload) and *%WINDOWS%\Tasks\n.dll*

Registered for startup in *HKLM\SYSTEM\CurrentControlSet\Services\dUuNvGfDQkAll* → *ImagePath* and by placing n.dll in the Windows Tasks directory.

The payload is next generation P2P PlugX [http://blog.jpcert.or.jp/2015/01/analysis-of-a-r-ff05.html], date constant is decimal 20141028.

The n.dll file executes a backup installer, M.B, which is dropped into the %TEMP% directory. The only problem is that this file is never created.

SAV detection:
Troj/DocDrop-CD, Troj/Omdork-E, Troj/PlugX-AP

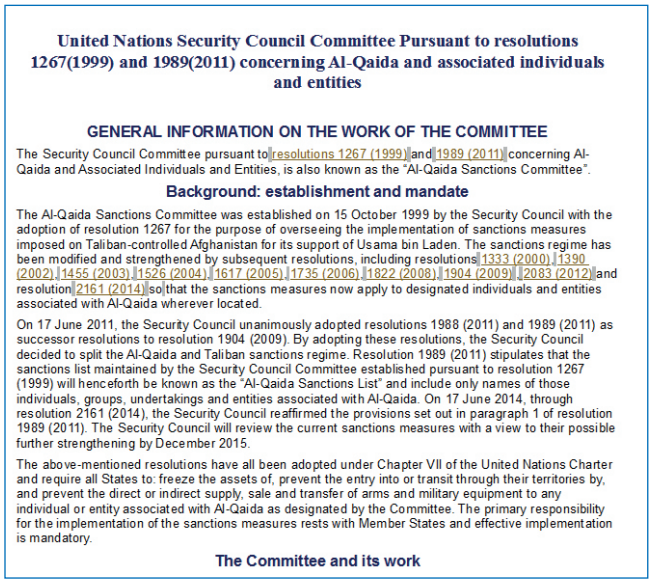
C&C servers:
www.notebookhk.net
Registrant Name: lee stan
Registrant Organization: lee stan
Registrant Street: xianggangdiqu
Registrant City: xianggangdiqu
Registrant State/Province: xianggang
Registrant Postal Code: 796373
Registrant Country: HK
Registrant Phone : +0.04375094543
Registrant Phone Ext:
Registrant Fax: +0.04375094543
Registrant Fax Ext:
Registrant Email:stanlee@gmail.com

56b3f0f03ae12b56c000df67c1153d518c8a66fc

This sample is an outlier. It does not distribute PlugX, but uses a strikingly similar persistence method, with exactly the same file names that are used with PlugX installations. Only the final payload is a different backdoor, Omdork, which has earlier been observed in PlugX related distribution channels.

Original name:

United Nations Security Council Committee Pursuant to Resolutions1267.doc



United Nations Security Council Committee Pursuant to resolutions 1267(1999) and 1989(2011) concerning Al-Qaida and associated individuals and entities

GENERAL INFORMATION ON THE WORK OF THE COMMITTEE

The Security Council Committee pursuant to resolutions 1267 (1999) and 1989 (2011) concerning Al-Qaida and Associated Individuals and Entities, is also known as the "Al-Qaida Sanctions Committee".

Background: establishment and mandate

The Al-Qaida Sanctions Committee was established on 15 October 1999 by the Security Council with the adoption of resolution 1267 for the purpose of overseeing the implementation of sanctions measures imposed on Taliban-controlled Afghanistan for its support of Usama bin Laden. The sanctions regime has been modified and strengthened by subsequent resolutions, including resolutions 1333 (2000), 1390 (2002), 1455 (2003), 1526 (2004), 1617 (2005), 1735 (2006), 1822 (2008), 1904 (2009), 2083 (2012) and resolution 2161 (2014) so that the sanctions measures now apply to designated individuals and entities associated with Al-Qaida wherever located.

On 17 June 2011, the Security Council unanimously adopted resolutions 1988 (2011) and 1989 (2011) as successor resolutions to resolution 1904 (2009). By adopting these resolutions, the Security Council decided to split the Al-Qaida and Taliban sanctions regime. Resolution 1989 (2011) stipulates that the sanctions list maintained by the Security Council Committee established pursuant to resolution 1267 (1999) will henceforth be known as the "Al-Qaida Sanctions List" and include only names of those individuals, groups, undertakings and entities associated with Al-Qaida. On 17 June 2014, through resolution 2161 (2014), the Security Council reaffirmed the provisions set out in paragraph 1 of resolution 1989 (2011). The Security Council will review the current sanctions measures with a view to their possible further strengthening by December 2015.

The above-mentioned resolutions have all been adopted under Chapter VII of the United Nations Charter and require all States to: freeze the assets of, prevent the entry into or transit through their territories by, and prevent the direct or indirect supply, sale and transfer of arms and military equipment to any individual or entity associated with Al-Qaida as designated by the Committee. The primary responsibility for the implementation of the sanctions measures rests with Member States and effective implementation is mandatory.

The Committee and its work

System activity:

Dropped to *C:\Documents and Settings\All Users\FlashUpdate\RasTls.exe* and *C:\Documents and Settings\All Users\FlashUpdate\msi.dll.mov (encrypted payload) and %WINDOWS%\Tasks\n.dll*.

The persistence is achieved by two methods: RasTls.exe is registered in *HKCU\Software\Microsoft\Windows\CurrentVersion\Run → msusr*, and the n.dll is dropped to the Windows Tasks directory for automatic execution.

While the file names are the same as in the case of many PlugX deployments, the files themselves are very different.

RasTls.exe is not digitally signed, it is the loader Trojan, that loads the encrypted payload from a resource. This payload itself contains a loader code, and an embedded executable, that is the final payload.

The n.dll file executes a backup installer, M.B, which is dropped into the %TEMP% directory. This installer is a self-extracting WinRAR that contains RasTls.exe and a config file.

There are still reasons to believe that this malware is strongly connected to the PlugX group:

- It uses the same filenames as some of the PlugX deployments
- It uses the same carrier document as the other PlugX variants in this campaign, including the unique shellcode
- The same n.dll is used in both the Omdork and PlugX deployments

SAV detection:

Troj/DocDrop-CD, Troj/Omdork-E

C&C servers:

www.togolaga.com

Registrant Name: wang feng
Registrant Organization: wang feng
Registrant Street: beijingshi
Registrant City: beijingshi
Registrant State/Province: beijing
Registrant Postal Code: 100000
Registrant Country: CN
Registrant Phone : +86.01090888962
Registrant Phone Ext:
Registrant Fax: +86.01090888962
Registrant Fax Ext:
Registrant Email:battuya_2002@yahoo.com

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Tel: +44 (0)8447 671131
Email: sales@sophos.com

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Email: nasales@sophos.com

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Email: sales@sophos.com.au

Asia Sales
Tel: +65 62244168
Email: salesasia@sophos.com

Oxford, UK | Boston, USA

1180-06.14DD.tpna.simple