

**Raytheon**  
**Blackbird Technologies**

**20150814-260-Eset**  
**Potao**

**For**  
**SIRIUS Task Order PIQUE**

**Submitted to:**  
**U.S. Government**

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## **1.0 (U) Analysis Summary**

(S//NF) The following report discusses malware used in the Operation Potao Express Campaign first seen in 2011. The campaign uses the Potao malware family with many similarities to the BlackEnergy malware. The attackers have also used a trojanized version of Truecrypt to infect computers. In both cases the malware required user interaction/installation to activate.

(S//NF) The Potao malware was delivered through executable email attachments appearing as word documents, wedding invitations, and postal tracking links sent via email or SMS messages. These links directed victims to malicious landing pages to infect victim computers. In the case of the trojanized version of Truecrypt the executable was delivered through a Russian software download website.

(S//NF) The malware was installed using a two stage dropper methodology. Before the final DLL is dropped however the name of the Enter export function is patched to be the LUID value and therefore each dropped instance of the DLL will have a unique binary hash. Once dropped it maintains persistence through the creation of a registry key.

(S//NF) The Potao Trojan is a modular architecture which injects itself into the explorer.exe process. It does not store its modules on the hard drive. Instead the modules are re-downloaded every time the malware is activated on the system. Modules mentioned include the ability to collect system info, file enumeration, keylogging, and screen capture. It also has the ability to decrypt and steal passwords and settings from different browsers and email clients. No detailed information is provided on how this is accomplished.

(S//NF) The Trojan communicates using various hardcoded IP Address/Port combinations communicating via HTTP or HTTPS on ports 80 and 443 respectively. This communication is performed using two stages of encryption. The first stage is a key exchange in which the bundled private key is replaced with a new one generated by the C&C server. The second stage then contains the exchange of data encrypted with AES256.

(S//NF) The Potao malware has the ability to spread via USB. It copies itself to the root directory of the USB drive changing its filename to match the disk label of the drive using the removable drive icon. All existing files on the drive are marked as hidden. Therefore the user only sees a single drive icon to click on when opening up the drive.

(S//NF) Anti-reverse engineering techniques are also employed by this malware. The MurmurHash2 algorithm is used to compute the hashes for the WinAPI functions instead of using their names. Furthermore all strings are encrypted using an XOR operation with a 4-byte length key.

(S//NF) In conclusion, this Trojan does not demonstrate any new or notable techniques. As such no PoC is recommended.

## **2.0 (U) Description of the Technique**

(S//NF) No techniques are recommended for PoC development.

## **3.0 (U) Identification of Affected Applications**

(U) Windows

## **4.0 (U) Related Techniques**

(S//NF) Trojan

## **5.0 (U) Configurable Parameters**

(U) None

## **6.0 (U) Exploitation Method and Vectors**

(S//NF) No exploitation methods were discussed in this report.

## **7.0 (U) Caveats**

(U) None.

## **8.0 (U) Risks**

(S//NF) Not applicable because we do not recommend any techniques for PoC development.

## **9.0 (U) Recommendations**

(S//NF) No PoCs recommended.