



CSEC Counter-CNE

Target Analytics thread SIGDEV Conference NSA – June 2010

Safeguarding Canada's security through information superiority Préserver la sécurité du Canada par la supériorité de l'information



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The need for Counter-CNE...

- Foreign and friendly actors often encountered
- CNE operators do not pursue them beyond their targets
- Reporting groups need to be made aware
- OPSEC evaluation is needed
- Active pursuit of CNE actors: a different ballgame





Outline

- Introduction CCNE at CSEC
- CCNE tools and methods
- **SNOWGLOBE**
- De-confliction





CCNE Group at CSEC

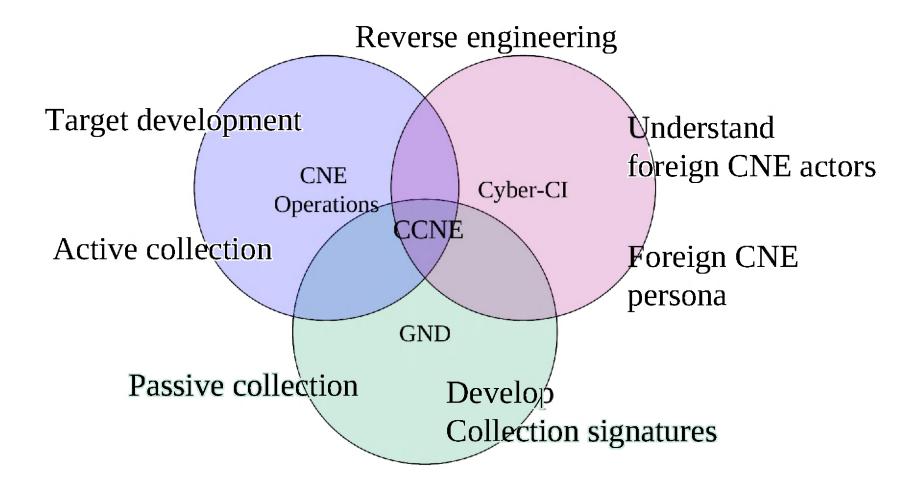
- Part of CSEC CNE operations (K0)
- Recently formed matrix team
- Analysts and operators from CNE Operations, IO Reporting Lines and Global Network Detection
- Mandate:
 - Provide situational awareness to CNE operators
 - Discover unknown actors on existing CNE targets
 - Detect known actors on covert infrastructure
 - Pursue known actors through CNE
 - Review OPSEC of CNE operations







CCNE team





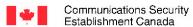
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CNE Toolkit: WARRIORPRIDE

- WARRIORPRIDE (WP):
 - Scalable, Flexible, Portable CNE platform
 - Unified framework within CSEC and across the 5 eyes
 - Do more with less effort
 - Common framework for sharing code/plugins across the 5 eyes
 - WARRIORPRIDE is an implementation of the "WZOWSKI" 5-eyes API
 - WARRIORPRIDE@CSE/etc. == DAREDEVIL@GCHQ
- WARRIORPRIDE
 - xml command output to operators
 - Several plugins used for machine recon / OPSEC assessment

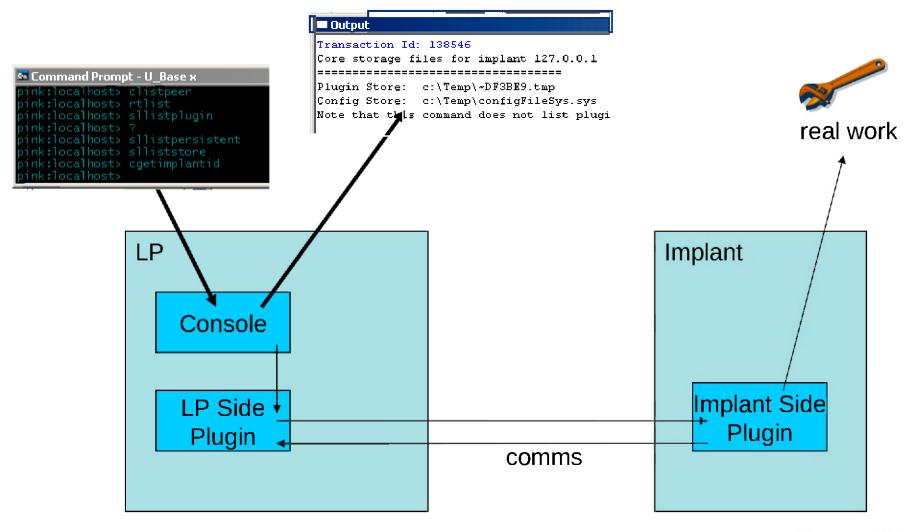




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WARRIORPRIDE



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WARRIORPRIDE plug-ins and output

- Several WP plugins are useful for CCNE:
 - Slipstream : machine reconnaissance
 - ImplantDetector : implant detection
 - RootkitDetector : rootkit detection

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- Chordflier/U ftp : file identification / retrieval
- NameDropper : DNS
- WormWood: network sniffing and characterization
- Already used for CNE OPSEC
- Used for precise identification and heuristics





WP xml output (raw)

<?xml version="1.0" encoding="UTF-8"?>

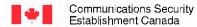
<response xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"</pre>

xsi:noNamespaceSchemaLocation="U_FileCollectorLp/U_FileCollectorLp_2.15.xsd"><implantld>51.1.2.160</implantld><transaction><transactionSource>50.0.0.101</transactionSource><transactionId>320453</transactionId></transaction><timestamp><TLT>2010-02-

23T15:53:06.366</TLT><UTC>2010-02-

23T15:47:43.448</UTC></timestamp><errors><errorPlugin>0</errorPlugin><errorOs>0</errorOs>0</errorS><commandInfo>fcstart</commandInfo><responseDetails><fcstart><status>Successss</status><standbyMode>FALSE</standbyMode></fcstart></responseDetails></response>





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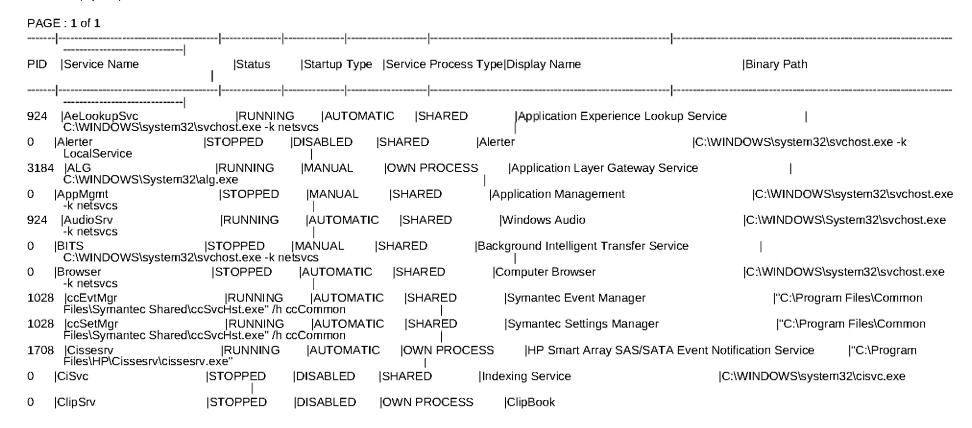
WP SLIPSTREAM output (parsed)

[2010/05/18 - 16:28:05 (UTC)] Transaction Id: 582966

U_SLIPSTREAM - <ssservices>

ImpiantId: <51.8.1.13>

Timestamp (UTC): 2010/02/09 06:42:42







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WP SLIPSTREAM output... drivers

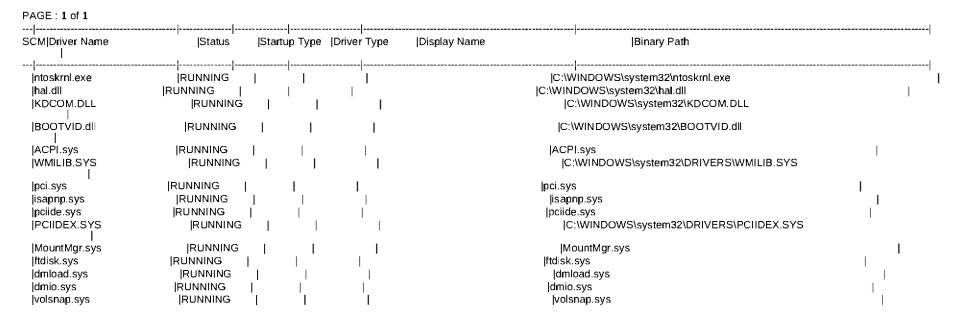
[2010/05/18 - 16:28:06 (UTC)] Transaction Id: 582968

U SLIPSTREAM - <ssdrivers>

Impiantid: <51.8.1.13>

Timestamp (UTC): 2010/02/09 06:42:43

(parsed)





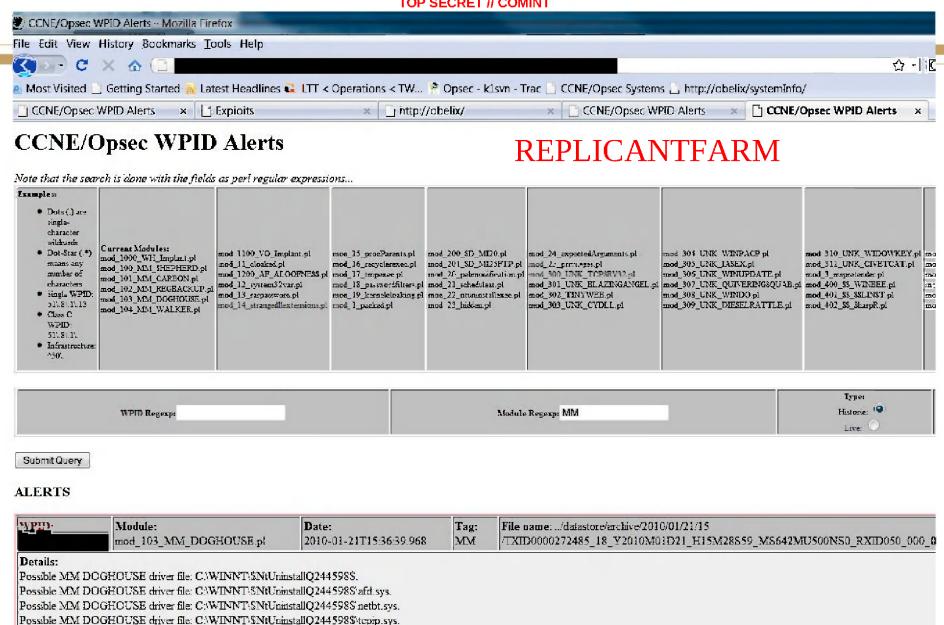


REPLICANTFARM

- Extend WP output to a signature based system: REPLICANTFARM
- Module based parser/alert system running on real-time **CNE** operational data
- Custom/module based analysis:
 - Actors
 - Implant technology
 - Host based signatures
 - Network based signatures



TOP SECRET // COMINT



Possible MM DOGHOUSE driver file: C/WINNT\\$NtUninstallQ244598S\hotfix.inf.

---PULLEDPORK----

TOP SECRET // COMINT



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CCNE/Opsec Mondumpprtracker viewer - Mozilla Firefox	
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CCNE/Opsec Mondumpprtracker viewer

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- Examples

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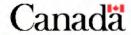


REPLICANTFARM generic modules

- Cloaked
- Recycler
- Rar password
- Tmp executable
- Packed
- Peb modification
- Privileges
- MS pretender
- System32 "variables"
- Strange DLL extensions

- Kernel cloaking
- Schedule at
- Ntuninstall execution
- hidden

Other ideas....



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Generic modules : example

```
my @runningProcs = xml isProcessRunning( $xml, 'svchost.{1,3}\\.exe',
             'winlogon.{1,3}\\.exe',
                                  'services.{1,3}\\.exe',
                                  'lsass.{1,3}\\.exe',
                                  'spoolsv.{1,3}\\.exe',
                                  'autochk.{1,3}\\.exe',
                                  'logon.{1,3}\\.scr',
                                  'rundll32.{1,3}\\.exe',
                                  'chkdsk.{1,3}\\.exe',
                                  'chkntfs.{1,3}\\.exe',
                                  'logonui.{1,3}\\.exe',
                                  'ntoskrnl.{1,3}\\.exe',
                                  'ntvdm.{1,3}\\.exe',
                                  'rdpclip.{1,3}\\.exe',
                                  'taskmgr.{1,3}\\.exe',
                                  'userinit.{1,3}\\.exe',
                                  'wscntfy.{1,3}\\.exe',
                                  'tcpmon.{1,3}\\.dil' );
  foreach my $runningProc (@runningProcs)
    $alertText .= "Suspicious process detected, legitimate exe named appended with string: " . $runningProc . ".\n";
```





RF specific signatures

- KNOWN actor filenames, processes, covert stores:
 - MAKERSMARK / FANNER
 - SEEDSPHERE / BYZANTINE
 - ALOOFNESS
 - SNOWGLOBE
 - VOYEUR
 - SUPERDRAKE
 - GOSSIPGIRL
- Infrastructure
 - Known IP addresses
 - Known DNS queries
- Other tools





Specific signatures: example



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Operations

- Routine operations for CCNE investigations on current targets
 - Execution of OPSEC related plugins

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- Collection of files
- Examination of network activity
- Blanket approvals for addition of selectors to level 4 OPs against known actors: example WATERMARK operations against MAKERSMARK
- Standard operating procedures for level 2 level 4 operataions against foreign CCNE actor infrastructures





CCNE / OPSEC page on 5-Eyes K1SVN Wiki

- Contains reverse engineering reports for CNE / IO consumption
- Even logs and notes for several actors





CCNE operations – Covert Infrastructure

- Some fusion of the WP and CCNE infrastructures
 - Dedicated ORB for CCNF

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- Unattributed dialups to the ORB
- Philosophy: use low hanging fruits against the actors (public exploits and tools if available)
- Discussions regarding repurpose of foreign toolkits
- De-confliction





SNOWGLOBE

- Provide the historical account of the activity on DOURMAGNUM (Imam Hussein University)
- Implant identified while investigating another unattributed actor
- rar archiving of emails on target

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Beaconing using HTTP to php-based listening post

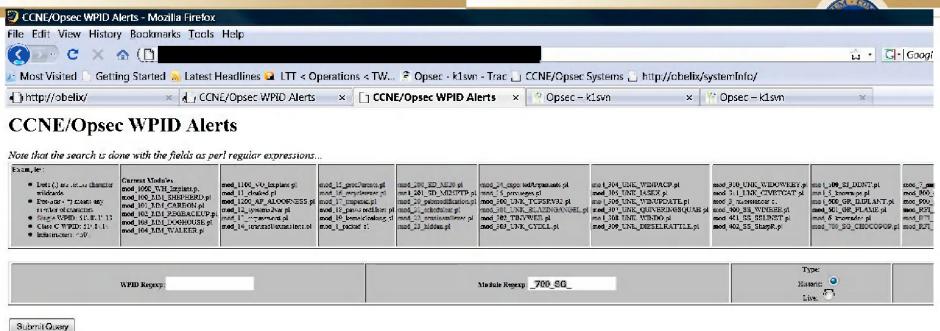




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ALERTS

WPID: Module: mod 700 SG CHOCOPOP.pl Date: 2009-09-30T10:18:41.906 File name: _/datastore/archive/2009/09/30/10/TXID0000074573_18_Y2009M09D30_H10M1 Tag: SG Details: Possible SNOWGLOBE CHOCOPOP process detected: cmd.exe /C ""c::RECYCLER\S-1-5-21-101796669-4102346875-220983236-500"rar, exe" a -r -inul -hallockless -appregrain -m1d temp-168.rar c::MDAEMON-Users ihu, a Possible SNOWGLOBE CHOCOPOP process detected: cmd.exe /C ""c: RECYCLER S-1-5-21-101796669-4102346875-220983236-500"rar.exe" a -r -inul -hplockless -aprfeghin -m1d temp 168 rar c: MDAEMON Users dana Possible SNOWGLOBE CHOCOPOP process detected: "c: RECYCLER'S-1-5-21-101796669-4102346875-220983236-500\rar.exe" a -r -inul -hplockless -apSNazarian -tn1d C: WINDOWS ITEMP\166.rar c: MIDAEMON\Usi Possible SNOWGLOBE CHOCOPOP process detected: "ci"RECYCLER\S-1-5-21-101796669-4102346875-220983236-500\rar_exe" a -r_-imil -inplockless -apSNazarian -tn1d C:\WINDOWS\TEMP\166.rar_ci\mDAEMON\Usi Possible SNOWGLOBE CHOCOPOP process detected: cmd.exe /C ""c:/RECYCLER/S-1-5-21-101796669-4102346875-220983236-500"rar, exe" a -r -inul -hplockless -apSNazarian -tn1d temp\166.rar cr/MDAEMON/Users/ib Possible SNOWGLOBE CHOCOPOP process detected: cmd.exe /C ""c: RECYCLER S-1-5-21-101796669-4102346875-220983236-500"rar.exe" a -r -inul -hplockless -apSNazarian -tn1d temp\166.rar c: MDAEMON Users th Possible SNOWGLOBE CHOCOPOP process detected: "cf/RECYCLER\S-1-5-21-101796669-4102346875-220983236-500 rar.exe" a -r -inul -hplockless -apkpnazari -tnid C.:WINDOWS: IEMP:166.rar c/:MDAEMON:User: Possible SNOWGLOBE CHOCOPOP process detected: "c::RECYCLER'S-1-5-21-101796669-4102346875-220983236-500"rar.exe" a -r -inul -hplockless -apkonazari -tn1d C::WINDOWS:TEMP\166.rar c::MDAEMON\User: Possible SNOWGLOBE CHOCOPOP process detected; cmd.exe /C ""c: RECYCLER S-1-5-21-101796669-4102346875-220983236-500 rar, exe "a -r -mul -holockless -ankonazari -tnl d temp 166 rar c: MDAEMON/Users länd. Possible SNOWGLOBE CHOCOPOP process detected; cmd.exe /C ""c:"RECYCLER:S-1-5-21-101796669-4102346875-220983236-500"rar.exe" a -r -inul -hplockless -apkpnazari -tnl d temp\166 rar c:"MDAEMON Usersida. Possible SNOWGLOBE CHOCOPOP process detected: "c::RECYCLER:S-1-5-21-101796669-4102346875-220983236-500/rar.exe" a -r -inul -hplockless -apmsaadati -tn1d C::WINDOWS:TEMP-166.rar c::MiDAEMON/User Possible SNOWGLOBE CHOCOPOP process detected: "c: RECYCLER'S-1-5-21-101796669-4102346875-220983236-500"rar.exe" a -r -fruit -hplockless -apmrsaadati -friid C: WINDOWS TEMP'166 rar c: MDAEMON User Possible SNOWGLOBE CHOCOPOP process detected: cmd.exe /C ""c::RECYCLER\S-1-5-21-101796669-4102346875-220983236-500"rar.exe" a -r -inul -hplockless -apmsaadari -in1d temp\166.rar c:\MDAEMON:Users\dhu Possible SNOWGLOBE CHOCOPOP process detected; cmd.exe /C ""c:"RECYCLER/S-1-5-21-101796669-4102346875-220983236-500"rar.exe" a -r -mul -hplockless -apmsaadati -mid tempi 166.rar c: MDAEMON Users shu =-DOURMAGNUM=



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SNOWGLOBE on target

Possible SNOWGLOBE CHOCOPOP process detected:

cmd.exe /C ""c:\RECYCLER\S-1-5-21-101796669-4102346875-220983236-500\rar.exe" a -r -inul -hplockless -aprfeghhi -tn1d temp\168.rar c:\MDAEMON\Users\ihu.ac.ir\rfeghhi\md5*.msg">nul.





SNOWGLOBE implant

Injects itself in svchost.exe

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- No cloaking / no hooking
- Bootstraps in service called MSDTC64 (distributed transaction coordinator 64b
- Service entry is permanent
- Executable kept on disk in system32
- Crypto: 16 byte string XOR
- http beacons and tasking
- Actor observed upgrading on target



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SNOWGLOBE activity and attribution

- Targeting is scarce but resembles CT / CP priorities
- French localisation seen in exploit PDFs (GCHQ)
- French commentary in the binary
- French binary name / developer path
- Observed in Iran, Norway, Greece, Belgium, Algeria, France, US targets
- Listening posts worldwide several French legit sites
- Now seen in passive collection, several reports





De-confliction: on CCNE operations

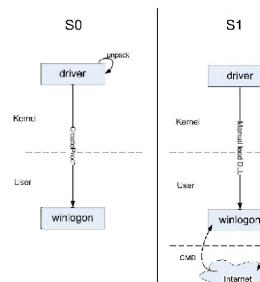
- State-sponsored landscape is very busy
- CCNE Targets are de-conflicted
- Actors on CCNE targets are not
- Covert nature of foreign (and friendly actors) make deconfliction challenging
- Often need to refer to precise technology for identification
- CNE / CCNE from SIGINT + HUMINT need to get together on this issue

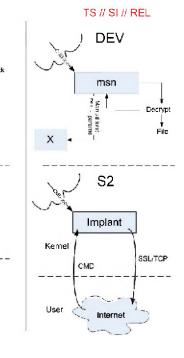




De-confliction FAIL

- Actor discovered
- 5 eyes effort
- Several cohabitations
- At CSEC: 400 man-hours:
 - Over 20 CNE Operations
 - Passive Collection
 - 4 Reports
 - Reverse engineering
 - Planning of active operations







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Conclusion

- CCNE effort essential to the national cyber mandate:
 - CNF situational awareness
 - New actor discovery
 - Tracking known actors
- Several new actors discovered using this process
- De-confliction needs to be improved





MM CCNE contacts





