RSA CHARGE 2019

SCRIPTING WITH NWCONSOLE AND AUTOMATION VIA API & SDK

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ABOUT ME

- Senior Security Consultant @ ipss inc.
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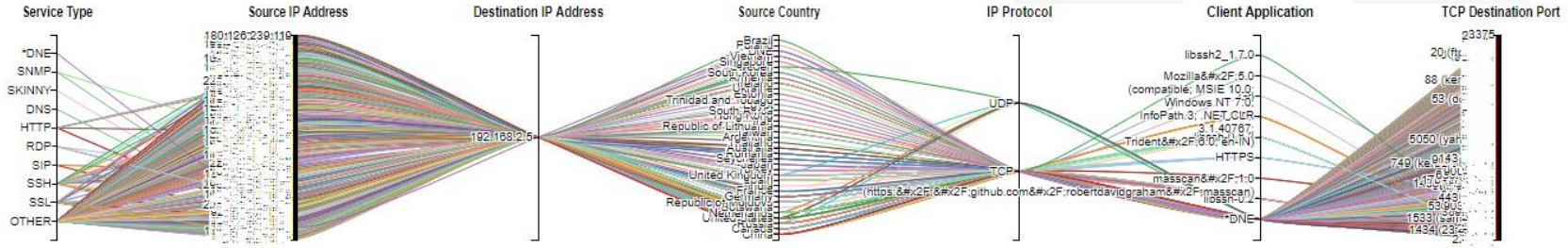
- Experience: planned, deployed, and used NetWitness 8.x to 11.3.x in medium and large enterprise

AGENDA



- NwConsole
  - Scripting for automation
  - String & Regex search
  - Exporting pcap from a metadata search
  - Exporting pcap or files from a Session ID
  - Post-Analysis: Importing large amounts of pcap data
- API
  - Loading feeds to multiple Decoders via a script
  - Query metadata from other tools
- SDK
  - Query and save metadata to CSV

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NW & COMMAND-LINE OPTIONS

- NwConsole
  - Scripting to automate recurring jobs
  - Importing packets into a Decoder
- NetWitness SDK search
  - String or Regex search
- NetWitness SDK content
  - Extract SessionID to a pcap file
  - Extract all files from a SessionID to disk
- NetWitness SDK with nwsdk_csv.py
  - Query meta of interest and save the result to a CSV file
- API
  - Upload multiple feeds to multiple Decoders via a script
  - Right-click query from a SIEM to NetWitness Broker

AUTOMATION WITH NWCONSOLE

- Retrieve and save a list of files
  - EXE, ISO, ZIP, PDF, DOCX, etc
- Hash files of interest
  - Send result back to Log Decoder or SIEM of your choice
- Build script with the following options:
  - sdk open nw://admin:netwitness@concentrator:50005 (Broker:50003/Concentrator:50005)
  - sdk output /home/guy/executables
  - sdk content session=now-u where="filetype='zip','cab','exe'" render=files maxDirSize=1000000
- Script → NwConsole -f script &
  - Load <pathname> with a line delimited list of commands and execute them in order

```
>sdk open ...
>sdk output /home/guy/executables
New output directory set to /home/guy/executables
>sdk content session=now-u where="filetype='zip','cab','exe','pdf','docx'" render=files maxDirSize=1000000
17:39:47: Sessions 37692494 to 37692494 have meta range 2412346217 to 2412346217
17:39:47: Running in continuous mode...
17:39:47: New session range 1 to 37691310 has meta range 2412346218 to 2412266778
```


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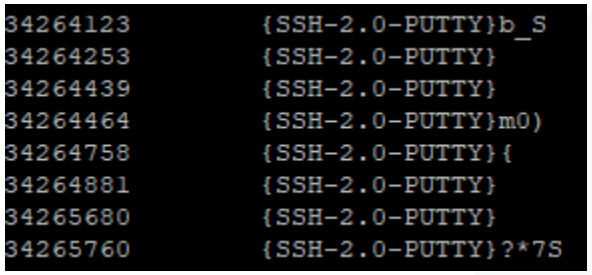
NWCONSOLE → STRINGS SEARCH

- NwConsole
- sdk open nws://sdk:password@IP:port (Broker:56003/Concentrator:56005)
- sdk output /home/guy
- sdk search session=l-now where="$META && $TIME" search="keyword ='$STRING' $OPTIONS" pathname=$OUTPUTDIR/$FILE.txt"
- $META && $TIME
  - "netname = 'proxy dst' && streams = 2 && time='2019-09-16 19:29:36'-'2019-09-16 20:27:45'"
- $STRING
  - SSH-2.0-PUTTY
- $OPTIONS
  - sp cs nsm nds
    - search packets, case sensitive, do not search meta, do not decode session when searching



NWCONSOLE → REGEX SEARCH

- NwConsole
- sdk open nws://sdk:password@IP:port (Broker:56003/Concentrator:56005)
- sdk output $HOME
- sdk search session=l-now where="$META && $TIME" search="keyword ='$REGEX' $OPTIONS" pathname=$OUTPUTDIR/$FILE.txt"
- $META && $TIME
  - "netname = 'proxy dst' && streams = 2 && time='2019-09-16 19:50:33'-'2019-09-16 20:49:44'"
- $REGEX
  - SSH.*
- $OPTIONS
  - sp ci nsm ds
    - search packets, case insensitive, do not search meta, decode session then search

```
37326728        SSH-2.0-Liquor<5&v-}kxscurve25519-sha256@lib{ssh.org,ecdh-sha2-nistp256,ecdh-sha2-
nistp384,ecdh-sha2-nistp521,diffie-hellman-group14-sha1,diffie-hellman-group1-sha1,diffie-hellman-
group-exchange-sha1,diffie-hellman-group-exchange-sha256-v01@openssh.com,ecd}
37326731        SSH-2.0-Liquor< |.n9lycurve25519-sha256@lib{ssh.org,ecdh-sha2-nistp256,ecdh-sha2-n
istp384,ecdh-sha2-nistp521,diffie-hellman-group14-sha1,diffie-hellman-group1-sha1,diffie-hellman-g
roup-exchange-sha1,diffie-hellman-group-exchange-sha256v01@openssh.com,ecd}
```

NWCONSOLE → IMPORTING PACKETS

- IMPORTANT! Imported pcap files retains original capture time
- Decoder configuration
  - Create a new Roles import_packets group on the Decoder
    - decoder.manage
    - sdk.manage
    - sdk.packets
  - Create *sdk* account with import_packets group
  - Decoder packet capture must be stopped
- Copy NwConsole to a compatible workstation (i.e. CentOS 7)
  - cd to location of packets and login
- NwConsole
  - login 127.0.0.1:50004 username password
    - import *.pcap

```
> login 192.168.25.33:50004 sdk netwitness
Successfully logged in to 192.168.25.33:50004 as session 4336
[192.168.25.33:50004] /> import *.pcap
```

NWCONSOLE → EXPORTING PACKETS

- Login to the Broker or Concentrator
- login 192.168.25.34:ssl username password (Concentrator)
- login 192.168.25.30:50003 username password (Broker)
- cd /sdk
- packets where= "$META && $TIME" pathname=$OUTPUTDIR/FILE.pcap append=1
- $META && $TIME
  - "netname = 'proxy dst' && streams = 2 && time='2019-09-16 19:00:00'-'2019-09-16 20:00:00'"
- $OUTPUTDIR = where to save the pcap

```
>login ...
Successfully logged in to 192.168.25.30:50003 as session 17968
>cd /sdk
[192.168.25.30:50003] /sdk
>packets where="netname = 'proxy dst' && streams = 2 && service = 22 && time='2019-07-12 21:10:48'-'2019-07-
12 22:03:51'" pathname=/root/NWdata/root-charge2019-2019-07-12_22:03.pcap append=1
Writing packets to /root/NWdata/root-charge2019-2019-07-12_22:03.pcap (100%)
25 packets successfully written to /root/NWdata/root-charge2019-2019-07-12_22:03.pcap in 0 seconds (2.21 KB
 0 B/sec)
Done processing, output in /root/NWdata/root-charge2019-2019-07-12_22:03.pcap...
Press ENTER to continue...
```

NWCONSOLE SDK → EXPORT PCAP/FILES

- Export a single or multiple SessionID as a pcap file
- Export all the files included in a Session ID, zip the result and password protect it
- sdk open nws://sdk:password@IP:port (Broker:56003/Concentrator:56005)
- sdk output $HOME
- sdk content session=$SESSIONID render=files
- Provide the SessionID to extract all the files
- Scripting with Linux to zip and password the files
  - zip -P infected files.zip files/*

```
>sdk output /home/guy/NWdata/files
New output directory set to /home/guy/NWdata/files
>sdk content session=38007748 render=files
17:26:34: Sessions 38007748 to 38007748 have meta range 2431670045 to 2431670158
17:26:35: Content has finished, the last session extracted was 38007749
17:26:35: Total number of sessions extracted: 1
17:26:35: Command finished in 0 seconds
Done processing, output in /home/guy/NWdata/files...
  adding: files/38007748-107-0_1.am_delta_patch_1.297.1005.0_3c822dea607d07167fb4fa3fb41d69370296e62c.exe (stored 0%)
  adding: files/38007748-107-0_2.am_delta_patch_1.297.1005.0_3c822dea607d07167fb4fa3fb41d69370296e62c.exe (deflated 30%)

Files have been zipped and password protected with infected and saved in /home/guy/NWdata
```

LOADING FEEDS IN AN AIRGAP NETWORK

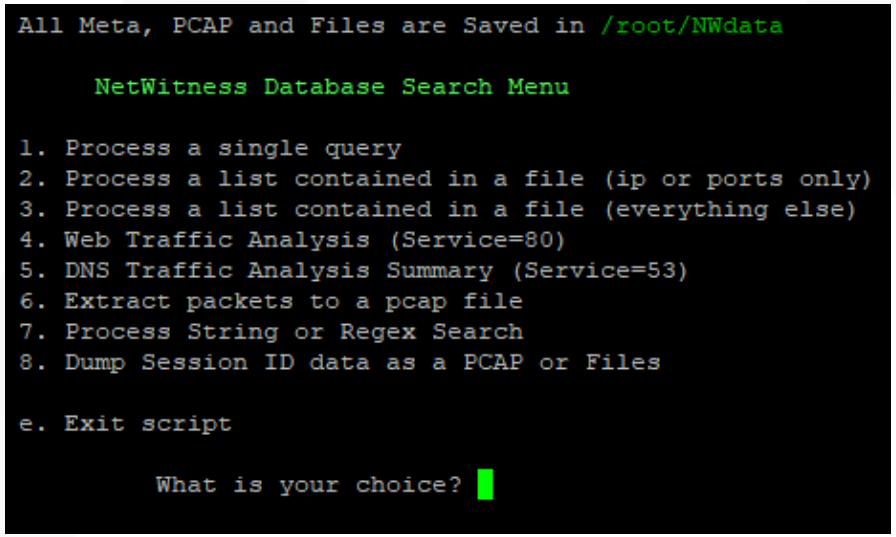
- Upload multiple feeds to multiple Decoders
- Create an IP list for log/packet decoders
- FILES=/home/guy/feeds/netwitness
  - **DLIST**=/home/guy/scripts/decoder_list.txt
  - **LLIST**=/home/guy/scripts/logdecoder_list.txt
- curl -F file=@$ {L} http://admin:netwitness@i:50104/decoder/parsers/upload/;
- curl -F file=@$ {L} http://admin:netwitness@i:50102/decoder/parsers/upload/;

```
for i in `cat $DLIST` ; do

   cd $FILES
   for L in *; do
      curl -F file=@$ {L} http://admin:netwitness@i:50104/decoder/parsers/upload/;
   done
done
```

NETWITNESS_SDK.SH SCRIPT

- Menu driven script
- Requires `nwsdk_csv.py` available at: https://community.rsa.com/message/627004
- Build to query and save the results from NetWitness
  - Metadata or Payload Inspection → Using regular expression or string search
  - Using *nwsdk_csv.py* → search metadata output to CSV
  - Files → Export SessionID files included in payload
  - Packets → Export search query results to a pcap
- Configure script variables
- Can process file with list of IP, ports & everything else
- Copy available at:
  - https://handlers.sans.edu/gbruneau/scripts/netwitness_sdk.sh



NETWITNESS SDK WITH NWSDK_CSV.PY

- Can be run by itself but …
  - python ./nwsdk_csv.py -c https://broker:50103/ -k "time,ip.src,ip.dst,service,tcp.dstport,alias.host,client,server,directory,filename" -w "alias.host begins update,report && filename='<none>' && directory='/' && query exists && query length 100-u" --no-count --gmtime
- Called by `netwitness_sdk.sh` for items 1-5
- Output search in a CSV format
- Results with or without a count or activity time
- Three modes available
  - Search metadata as a single query
  - Search an IP or Port list contained in a file text file
  - Search a list with other type of metadata that requires quotes
- Web traffic (service = 80)
- DNS traffic (service = 53)

SCRIPTING WITH NWSDK_CSV.PY

- Query NetWitness meta and output results to a CSV file hourly via cron
  - This example use DNS
- Configured with metadata of interest
- Data can be analyze with other tools
- Copy available at:
  - https://handlers.sans.edu/gbruneau/scripts/dnsmeta.sh

```
# Account used to query the metadata
NWSDK="/usr/local/bin/nwsdk_csv.py -c http://192.168.25.30:50103 -u sdk -p netwitness"

NOW=$(date -d "now" "+%Y-%m-%d %H-:00:00")
HOUR=$(date -d "now" "+%h")
TODAY=$(date -d "TODAY" "+%Y-%m-%d")
YESTERDAY=$(date -d "yesterday" "+%Y-%m-%d %H:00:00")
LASTHOUR=$(date -d "-1 hour" "+%Y-%m-%d %H:00:00")
FILENAME=$(date -d "-1 hour" "+%H")

# Last hour query

TIME="time='$LASTHOUR'-'$NOW'"

# Check to ensure today's directory exist

OUTPUTDIR="/opt/Metadata/DNS/$TODAY"

if [[ ! -d $OUTPUTDIR ]]; then
    mkdir -p $OUTPUTDIR
fi

# Metadata keys part of the query
OUTPUT="time,ip.src,udp.srcport,ip.dst,udp.dstport,analysis.service,alias.host,direction,dns.querytype,

# NetWitness query that check the our and date
# If the time is between 0-22, data is save in today's directory
# If the time is 23, data is will be saved in the previous day's directory

if [ $FILENAME != '23' ]; then
   $NWSDK -k $OUTPUT -w "$TIME && service=53" > /opt/Metadata/DNS/$TODAY/dns$FILENAME.csv
elif [ $FILENAME == '23' ]; then
   $NWSDK -k $OUTPUT -w "$TIME && service=53" > /opt/Metadata/DNS/$YESTERDAY/dns$FILENAME.csv
fi

# Change directory permission to be readable by everyone

chmod 777 -R $OUTPUTDIR
```

URL & API QUERIES

- API query from another device
- https://192.168.25.5/1/navigate/query/email='gbruneau@ipss.ca'/date/2016-12-12T00:00:00Z/2016-12-13T00:00:00Z/
- API to get malware
- https://192.168.25.5/investigation/17/event/EventID
  - where EventID = Report number and 17 = SA device number

https://nwsa/investigation/17/malware/event/80660528

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Q&A

- My contact information
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  - gbruneau@isc.sans.edu
  - @GuyBruneau
  - https://www.linkedin.com/in/guybruneau
- Posts & Projects
  - https://isc.sans.edu/handler_list.html#guy-bruneau
  - https://handlers.sans.org/gbruneau
- RSA Global Summit 2014 → **Tips & Tricks To Achieve Ludicrous Speed**
  - https://technodocbox.com/83629123-Network_Security/Deploying-security-analytics-tips-tricks-to-achieve-ludicrous-speed-guy-bruneau-gse.html
- 2017 RSA Charge presentations → **Metadata Is Like Gold - Tips & Tricks To Mine It**
  - https://community.rsa.com/docs/DOC-83010

THANK YOU

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