The Bro Network Security Monitor

Tools of the Trade

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Tools of the Trade

Basic Toolbox

1. `awk`
2. `head/tail`
3. `sort`
4. `uniq`
5. `bro-cut`

Tools of the Trade

`awk`

Swiss-army knife for log processing.

- Pattern-action statement: `awk 'pattern { action }'`
  - `awk '/start/, /stop/'`
  - `awk 'length($0) > 72'`
  - `awk '$1 == "127.0.0.1" && $2 ~ /foo/'`
  - `awk '$1 == "127.0.0.1" { x += $3 } END { print x }'`
  - `awk '{ x[$1] += $3 } END { for (i in x) print x[i] }'`
  - `awk 'BEGIN { x["6.6.6.6"]++ } { if ($1 in x) yikes() }`
- Useful functions: `length`, `substr`, `match`, `split`, `(g)sub`, `tolower`
- Useful variables:

  `NF` Number of fields in current record

  `NR` Number of current record

Tools of the Trade

`head`

`-n`	Output the **first** n lines

`tail`

`-n`	Output the **last** n lines

`sort`

(External) sorting, grouping, and duplicate filtering

- Useful options:

`-n`	Numerical comparison
`-r`	Reverse sort order
`-u`	Output each value only once (unique)
`-k`	Sort by column range (`from[,to]`; e.g., `-k 2,3`)
`-S`	Specify buffer size (e.g., `-S 1G`)
`-T`	Specify temporary file directory (e.g., `-T=/fast/tmp`)

- Examples:
  - `awk '{ print $3 }' conn.log | sort -S 1G -u`
  - `sort -rn -k 9 conn.log | head -n 10`

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uniq

Filter repeated lines

- `-c` Precede each line with count of occurence
- `-d` Output lines that are repeated
- `-u` Output lines that are *not* repeated

Example input

```
A
A
A
A
B
B
B
C
```

Example output

- `uniq -c`

  ```
  4 A
  3 B
  1 C
  ```

- `uniq -d`

  ```
  A
  B
  ```

- `uniq -u`

  ```
  C
  ```

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bro-cut

- New awk-based field extractor for Bro logs
- List files to extract as arguments

```
bro-cut [options] <columns>

Extracts the given columns from an ASCII Bro log on standard input. By
default, bro-cut does not include format header blocks into the output.

Example: cat conn.log | bro-cut -d ts id.orig_h id.orig_p

    -c       Include the first format header block into the output.
    -C       Include all format header blocks into the output.
    -d       Convert time values into human-readable format (needs gawk).
    -D <fmt> Like -d, but specify format for time (see strftime(3) for
             syntax).

For the time conversion, the format string can also be specified by
setting an environment variable BRO_CUT_TIMEFMT.
```

Tools of the Trade

bro-cut

-
  ```
  bro-cut ts id.orig_h id.resp_p < conn.log
  1319742168.465601 192.150.187.147 80
  1319742167.737945 192.150.187.147 80
  ```

-
  ```
  bro-cut host uri < http.log | awk '{ print $1$2 }'
  s0.2mdn.net/879366/flashwrite_1_2.js
  maps.google.com/mapfiles/home3.html
  ```

-
  ```
  bro-cut -d ts < conn.log
  2011-10-27T12:02:48-0700
  ```

-
  ```
  bro-cut -D '%s' ts orig_bytes resp_bytes \
    < conn.log \
    | sort -n  \
    | awk '{ if ($1 == ts) { size+=$2+$3 } \
              else { if (size != 0) print $1, size; \
                     ts=$1; size=0 } }'
  1319742168 33628
  1319742169 22814
  ```

Caveats

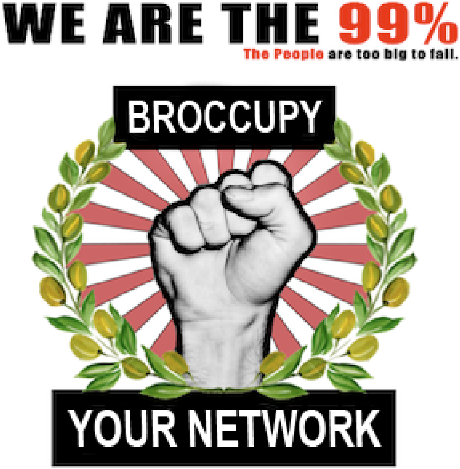
Match IP addresses correctly

- `grep 1.2.3.4 conn.log` ✗ `2102x3048`
- `fgrep 1.2.3.4 conn.log` ✗ `21.2.3.48`
- `awk '$3 == "1.2.3.4" || $5 == "1.2.3.4"' conn.log` ✓

Know your memory limits

- `awk '{ x[$1]++ } END { for (i in x) print x[i] }'` ✗
- `awk '{ print $1 } | sort -S=2G | uniq -c'` ✓

Questions?


WE ARE THE 99%
The People are too big to fail.
BROCCUPY
YOUR NETWORK

Bro