Content-Aware Device Benchmarking Methodology/Terminology
(draft-ietf-bmwg-ca-bench-meth-01)

BMWG Meeting
IETF-83 Paris
March 2012

Mike Hamilton
mhamilton@breakingpoint.com
BreakingPoint Systems
Previous TODO List (Taipei)
Malformed Traffic Algorithm

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Header Field</th>
<th>Malformed %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Frames</td>
<td>Destination MAC</td>
<td>0%</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Source MAC</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Ethertype</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>CRC</td>
<td>1%</td>
</tr>
<tr>
<td>IP Version 4</td>
<td>Version</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>IHL</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Type of Service</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Total Length</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Identification</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Flags</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Fragment Offset</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Time to Live</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Protocol</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Header Checksum</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Source Address</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Destination Address</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Options</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Padding</td>
<td>1%</td>
</tr>
</tbody>
</table>
Malformed Traffic Algorithm

<table>
<thead>
<tr>
<th></th>
<th>UDP</th>
<th>TCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Port</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Destination Port</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Length</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Checksum</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reserved(3 bit)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flags(9 bit)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Window Size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Checksum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urgent Pointer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Options(Variable Length)</td>
</tr>
</tbody>
</table>
Malformed Traffic Algorithm

```c
while(more_packets){
    if(random() <= total_malformed_percent){
        for each (header){
            if(random() <= bad_header_precent){
                header_value = random() & header_length
            }
        }
        send_packet();
    }
    else{next;}
}
```
List Resolved Questions

• Traffic Composition
  • How to define a single protocol within the mix
    • Algorithmically
  • Malformed traffic
    • How to define
      • Open-source TCP/IP/UDP(sic)
  • Comments from (before) IETF 82
$MAXGEN = 10000;
$NONWORD = "\n";
$w1 = $w2 = $NONWORD; # initial state

$MAXGEN = 10000;
$NONWORD = "\n";
$w1 = $w2 = $NONWORD; # initial state

open FILE, "<", "corpus.txt";
while (<FILE>) { # read each line of input
    foreach (split) {
        push({$statetab{$w1}{$w2}}, $_);
        ($w1, $w2) = ($w2, $_); # multiple assignment
        $w1 = $w2 = $NONWORD;
    }
    for ($i = 0; $i < $MAXGEN; $i++) {
        $suf = $statetab{$w1}{$w2}; # array reference
        push({$statetab{$w1}{$w2}}, $NONWORD); # add tail
        $w1 = $w2 = $NONWORD;
    }
    for ($i = 0; $i < $MAXGEN; $i++) {
        $suf = $statetab{$w1}{$w2}; # array reference
        $w1 = $w2 = $NONWORD;
    }

}
Markov HTML

Copyright (C) 2005-2011
BreakingPoint Systems, Inc. All
Rights Reserved.

“A terrible country, Mr.?“Bickersteth and
yourself has, unfortunately”We sallied out at
onceCorcoran’s portrait may not
haveWon't you have an eggWho the deuce
is LadyI took a good lookshe gasped. Great
pals!

“he replied firmly.
And the””When he
Markov Email

Better go and see what that is, Jeeves. I'm an optimist. I wished I could have. Nothing
Next Steps

• Work left to do
  • Further define the traffic mix specification
  • Finalize algorithm for application traffic generation