

IETF Hackathon "QUIC Measurements" spindump

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Hackathon Plan



- Implement different loss detection proposals in the spindump tool
 - They use the Reserved bits in the sort header
 - New Spin bit enabled measurements with one or two more bits
 - draft-cfb-ippm-spinbit-new-measurements-01
 - The QUIC Loss Bits
 - draft-ferrieuxhamchaoui-quic-lossbits-00
- Create a unified handling of QUIC versions and experimental uses of Reserved bits
- Ask the draft authors to insert their code there
- Test the new implementation with the experimental quic versions

What got done

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- Table-driven version and experimental extensions support
- The two drafts are implemented
- Reporting the loss events is under development
- Integration to testing environment is under development
 - Spindump integrated into the Mininet test VM
- (Some bug fixes also)



Table-driven version and experimental extensions support

```
static const struct spindump quic versiondescr versions[] = {
          version number
                                                basename supported? LongCIDs? getmessage
                                                                                              parselengths
                                                                                                              getspinbit getextrameas
                                     get name
   spindump quic version rfc,
                                    fixednamefn,
                                                  "RFC",
                                                                             messagefunc17,
                                                                                             parselengths17,
                                                                                                               spinbit17, 0
    spindump quic version draft22, fixednamefn,
                                                  "v22",
                                                                             messagefunc17,
                                                                                             parselengths17,
                                                                                                               spinbit17, 0
                                                                            messagefunc17,
   spindump quic version draft21, fixednamefn,
                                                                                                               spinbit17, 0
                                                  "v21",
                                                                                             parselengths17,
   spindump quic version draft20, fixednamefn,
                                                  "v20",
                                                                             messagefunc17,
                                                                                             parselengths17,
                                                                                                               spinbit17, 0
   spindump quic version draft19, fixednamefn,
                                                                                             parselengths17,
                                                  "v19",
                                                                             messagefunc17,
                                                                                                               spinbit17, 0
    spindump quic version draft18, fixednamefn,
                                                                                             parselengths17.
                                                  "v18".
                                                                             messagefunc17.
                                                                                                               spinbit17, 0
                                                                                             parselengths17,
    spindump quic version draft17, fixednamefn,
                                                  "v17",
                                                                             messagefunc17,
                                                                                                               spinbit17, 0
    spindump quic version draft16, fixednamefn,
                                                                             messagefunc16,
                                                                                             Θ,
                                                                                                               spinbit16, 0
                                                  "v16",
    spindump quic version draft15, fixednamefn,
                                                                             Θ.
                                                  "v15".
    spindump quic version draft14, fixednamefn,
                                                  "v14".
    spindump quic version draft13, fixednamefn,
                                                  "v13".
    spindump quic version draft12, fixednamefn,
                                                  "v12",
    spindump quic version draft11, fixednamefn,
                                                  "v11",
    spindump quic version draft10, fixednamefn,
                                                  "v10",
    spindump quic version draft09, fixednamefn,
                                                   "v09",
    spindump quic version draft08, fixednamefn,
                                                   "v08",
                                                                             Θ.
    spindump quic version draft07, fixednamefn,
                                                   "vΘ7".
                                                             Θ.
   spindump quic version draft06, fixednamefn,
                                                             Θ.
                                                                             Θ,
                                                   "v06".
    spindump quic version draft05, fixednamefn,
                                                  "v05",
    spindump quic version draft04, fixednamefn,
                                                  "v04",
    spindump quic version draft03, fixednamefn,
                                                  "v03",
    spindump quic version draft02, fixednamefn,
                                                  "v02",
    spindump quic version draft01, fixednamefn,
                                                   "v01",
    spindump quic version draft00, fixednamefn,
                                                  "v00",
    spindump quic version quant22, fixednamefn,
                                                  "v.gn22", 1,
                                                                             messagefunc17,
                                                                                             parselengths17,
                                                                                                               spinbit17, 0
    spindump quic version quant21, fixednamefn,
                                                  "v.qn21", 1,
                                                                             messagefunc17,
                                                                                             parselengths17,
                                                                                                               spinbit17, 0
    spindump quic version quant20, fixednamefn,
                                                                             messagefunc17,
                                                                                             parselengths17,
                                                  "v.qn20", 1,
                                                                                                               spinbit17, 0
    spindump quic version quant19, fixednamefn,
                                                                             messagefunc17,
                                                                                             parselengths17.
                                                  "v.qn19", 1,
                                                                                                               spinbit17, 0
    spindump quic version huitema, fixednamefn,
                                                                             messagefunc17,
                                                                                             parselengths17,
                                                                                                               spinbit17, 0
                                                  "v.huit", 1,
                                                                             messagefunc17,
    spindump quic version mozilla, fixednamefn,
                                                  "v.moz", 1,
                                                                                             parselengths17,
                                                                                                               spinbit17, 0
    spindump quic version google, googlenamefn,
                                                                             messagefuncgo,
    spindump quic version titrlo1, fixednamefn,
                                                                             messagefunc17,
                                                                                                               spinbit17, emtrloss1
                                                  "v.till", 1,
                                                                                             parselengths17,
    spindump quic version orgrlos, fixednamefn,
                                                  "v.orql", 1,
                                                                             messagefunc17,
                                                                                             parselengths17,
                                                                                                               spinbit17, emgrloss
    spindump quic version unknown, 0,
};
```

Loss detection proposals

```
3
```

```
struct spindump extrameas extrameas;
spindump extrameas init(&extrameas);
// check whether the Reserved bits are used in this version
if (spindump analyze quic parser getextrameas(udpPayload,
                                              size udppayload,
                                              mayHaveSpinBit,
                                              connection->u.quic.version,
                                              fromResponder,
                                              spin,
                                              &extrameas)) {
  if (extrameas.isvalid & spindump extrameas rtloss1) {
    spindump rtloss1tracker observeandcalculateloss(state,
                                                    packet,
                                                    connection,
                                                    &packet->timestamp,
                                                    fromResponder,
                                                    extrameas.extrameasbits & spindump extrameas rtloss1?1:0,
                                                    isFlip);
  if (extrameas.isvalid & spindump extrameas qrloss bit1) {
    spindump grlosstracker observeandcalculateloss(state,
                                                    packet,
                                                    connection,
                                                    &packet->timestamp,
                                                    fromResponder,
                                                    extrameas.extrameasbits);
```

What we learned



- Supporting all the versions is demanding
- Both loss detection proposals have measurements in real networks
- The two reserved bits in the short header might get overused ©

Wrap-up



- Team members
 - Marcus Ihlar
 - Jari Arkko
 - Szilveszter Nadas
 - Fabio Bulgarella
 - Mauro Cociglio
 - Alexandre Ferrieux

- Spindump github repo
 - https://github.com/EricssonResearch/spin dump
- New Spin bit enabled measurements with one or two more bits
 - <u>https://tools.ietf.org/html/draft-cfb-ippm-spinbit-new-measurements-01#section-6.1</u>
- The QUIC Loss Bits
 - <u>https://tools.ietf.org/html/draft-ferrieuxhamchaoui-quic-lossbits-00</u>