February 21, 2015

Via ECFS

Marlene Dortch, Secretary
Federal Communications Commission
445 12th Street NW
Washington, DC 20554

RE: Notice of Ex parte, Docket WC 13-39

Dear Ms. Dortch,

On February 19, 2015 David Frankel, CEO of ZipDX LLC met with the following individuals in the Wireline Competition Bureau: John Visclosky, Richard Hovey, Randy Clark (partial attendance); and Margaret Dailey from the Enforcement Bureau.

The discussion focused on the attached materials.

Regards,

/s/
David Frankel
CEO, ZipDX LLC
Monte Sereno, California
1-800-372-6535 / dfrankel@zipdx.com

cc: Meeting Participants, via E-mail

Rural Call Completion WC 13-39

David Frankel (dfrankel@zipdx.com)

19-Feb 2015

© Copyright 2015 ZipDX LLC

Rural Call Completion: Moving Target

- Intermittent failures hardest kind to resolve
- Typical resolution process involves test calls and real-time tracing
- Root cause is usually something very nuanced, such as:
  - Hardware failure affecting a tiny group of call paths among many
  - Configuration/logic issue arising only under specific circumstances (cost, time of day, point of origin)
  - Timing problem triggered by variation in signaling delays
  - Mis-handling of overflow condition
- Repeatability is problematic because many networks are purposefully engineered with a measure of randomness:
  - Round-robin path assignment; % allocation to underlying carriers; load-balancing
  - Network conditions change constantly; least-cost-routing models update automatically

© Copyright 2015 ZipDX LLC

Diagnosing with 10 or 20% failure rates

- Of course the network is expected to complete 100% of calls correctly
- Failure rates of 10 or 20% are huge
- But with a 10% failure rate, you can make 20 test calls and there's still a 1 in 8 chance you won't see the failure
  - Is there something wrong with your test? Did the problem clear up?
- Placing dozens or hundreds of test calls can be impractical
  - Human end user may not be available to answer & confirm quality of call
  - Human end user may not tolerate the annoyance
  - Not always possible to originate test call identical to origination in failing case
  - Limits on automated test tools to: place calls; interpret tones/announcements; recognize noise, echo, delay, or other impairments, especially if asymmetric

© Copyright 2015 ZipDX LLC

Example Failure Modes I've Encountered

- Configuration did not route-advance on trunk busy/OOS condition
- Underlying carrier A misrouted call (sometimes) to their ULC X, which had no route to destination, with only in-band failure indication (no cause code)
- Bad set of 24 echo cancellers affecting a single T-1 on path from LD carrier to end-office (but not when call went via Tandem to EO)
- High bit error rate (dirty fiber) on one member of Link Aggregation Group only selected when Source IP Addr/Port and Dest IP Addr/Port hashed to a certain value
- Misconfigured call timer (calls disconnected after specific length of time)
- Call rejected (deemed not routable) due to errant assessment of validity of calling line ID
- Call improperly deemed too expensive

© Copyright 2015 ZipDX LLC

Can’t discern failures from bulk signaling data

- Too many “false positives” (call abandoned because called party not home)
- Too many “false negatives” (false answer supervision)
- Too many unknowns (in-band tones/announcements)
- Too much elapsed time (LCRs, trunk configurations changed by the time data is reviewed and analyzed)
- Bias (ULC Q bids low and thus gets bulk of “hard to complete” calls through now fault of their own)
- NO visibility to call-path impairments (noise, echo, one-way or zero-way, drop-outs, premature disconnect)
- Among the universe of ALL (rural) CALLS, these variables swamp what we are looking for (“improper” failures)

© Copyright 2015 ZipDX LLC

The Merits of Complaint Data

- Data universe contains only failed calls
  - Even if there are some errant reports, we are still looking at 95% failures
  - Not a “sweep” or data mining
  - Get privacy release, if required, as part of problem report
- Law of Large Numbers says even if only 1 in 1000 failures result in a complaint, we still get a lot of complaints (enough to drive analysis)
- Complaints are near-real-time; we can grab DETAILED signaling data
- We can start by solving the “easy” problems
- As the fog clears, it becomes easier to find & fix the remaining issues
- Opportunity for near-term results at relatively low cost

© Copyright 2015 ZipDX LLC

Carriers Need "Encouragement"

- Regulatory attorney DNA resists all suggestions from regulators
- Finance exec DNA sees the expense side a project and not the savings
- Neither does anything on their own initiative
- Network Engineers are proud of their high-performing networks
- Engineers like to solve problems
- New precedents for government / industry data-sharing cooperation
- Carriers can opt-in (we need some anchors); hold-outs will succumb to peer pressure (eg., from inter-carrier agreements)

© Copyright 2015 ZipDX LLC

Discussion

© Copyright 2015 ZipDX LLC