



February 22, 2013

Via ECFS

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

Re: WC Docket 13-39, *Rural Call Completion NPRM*

Dear Ms. Dortch:

I submit the following comments in response to the FCC 13-18 Notice of Proposed Rulemaking.

My business, ZipDX, is primarily a provider of information services involving voice and data collaboration delivered over PSTN and IP networks. Thus, the RCC issue does not have a direct bearing on us. However, we do encounter a number of call completion and quality issues, many of which we have investigated in great detail, and our findings may shed some light on RCC.

Furthermore, we have recently submitted a proposal in the FTC's "Robocall Challenge" (see <http://robocall.challenge.gov>). We believe that the methodology we have proposed for combatting the robocall scourge could be helpful for RCC, and that there is an opportunity to "kill two birds with one stone." In these comments, we:

- Highlight select points made in the NPRM that we believe are drivers of the problem
- Introduce our approach, adapted from our Robocall Challenge submission (attached)
- Summarize the merits and potential actions

RCC Drivers and Issues

Economics are the primary driver of RCC problems. The NPRM points out at (6) that in general, an originating carrier's cost to complete calls to rural areas is relatively high, thanks to the high terminating access charges imposed by the rural carriers (NPRM-37). The FCC (NPRM-7, 9) forces carriers to terminate these calls in a non-discriminatory manner. At the same time, market pressures force carriers to offer "unlimited" long distance, or long distance bundled with other service (e.g., mobile) or "buckets" of long-distance minutes which are priced based on an average cost. Then the budget is broken by spikes in volume to "expensive" rural areas. Per-minute costs to rural areas can easily exceed 10X that to "commodity" destinations (and in a few cases are further inflated by rural carriers that specify circuitous routing paths in order to pad the fees they can collect).

We re-state this here to make it clear that the existing structure puts a very unpleasant squeeze on originating carriers, asking capitalist businesspeople to just "suck it up" and somehow make the system work (for consumers that want the lowest possible rates, and rural providers that want the economic security of access charges). This situation is going to remain unpleasant until the access charge disparity is resolved, but that's years away. (Presumably rural carriers that accelerated their own transition to bill-and-keep would find their call completion issues significantly mitigated, but we don't count on that being an accepted near-term solution.)

So originating carriers work hard to bring down their rural call expense, doing whatever they feel they can to balance revenue and expense. They turn to intermediate carriers (NPRM-6), shopping for the lowest prices to reach high-cost areas. They often enlist multiple intermediaries and perform "least-cost routing," which can exacerbate the problem as follows.

An originating carrier X may contract with intermediaries A, B, and C to carry their traffic to rural destination R. To a particular destination, A may offer a per-minute rate of 4 cents, while B charges 5 and C charges 6. Thanks to LCR, Carrier X will try to reach R first via A, then via B, and finally via C.

Carrier A may, in turn, use other intermediaries to reach R. (In fact, an intermediate carrier could have no transit facilities of its own, and instead may act only as a broker, trying to eek a few millicents out of each call.) Rates and routing tables contain tens of thousands of entries (or more) and can change rapidly – perhaps as often as airline fares.

When Carrier X routes a particular call via A, A (or one of its downstream partners) may find that it is unable to complete that call. This may be due to a capacity constraint, or it may be because the economics don't work. A has committed to X that it will carry the call for 4 cents, but it turns out that last night, A's partner upped their rate to reach R to 4.2 cents. A must reject the call or lose money on it. We have heard that some carriers encounter "answer/seizure ratios" (or perhaps more properly "Network Effectiveness Ratios") as low as 20%, meaning that 4 out of 5 call attempts are rejected. But they maintain the route so they can save money whenever possible.

If A rejects the call back to X, X will "route advance" to B, and then finally to C, and hopefully the call will go through. But sometimes nobody is really sure how the call actually routes. Most carriers are opaque about their downstream partners; C doesn't want X to know that a call placed with C is actually going via A. And nobody really knows how much capacity there is – intermediaries may not disclose exactly what facilities they have in place. Plus, since many intermediaries are using other intermediaries, capacity may be double-counted.

These economic complications tie into technical complications. The NPRM notes (14) that sometimes, callers are signaled that a call is ringing when in fact it is not. This is of course misleading to the caller, but may be done because the routing is so circuitous that the lengthy call set-up delay is disconcerting. Importantly, it has a further impact in the LCR scheme. Because the originating carrier sees that the call is "alerting" it may fail to "route advance" to the next carrier in the sequence. The same can be true with other improper cause codes such as "user busy" or "unassigned number."

Thus, the status quo is fraught with peril. A further complication is "alternative providers" such as Skype, MagicJack, GoogleVoice and others that seem to exist in a zone of regulatory uncertainty. Like other flat-rate providers, these operators have a strong economic incentive NOT to complete rural (high-cost) calls. A rural customer may complain that they can't receive calls from relatives, friends, or businesses in major metro areas, but that rural resident often doesn't have any idea how those calls are being originated. Customers of the alternative providers may have no idea that their provider discriminates in (not) completing calls to economically unfavorable destinations; their customer support personnel won't always address complaints by admitting: "You're trying to call an expensive location and that doesn't fit our business model. It's illegal, but what do you expect at these prices (or for free)?" Confusion reigns.

No self-respecting network engineer would allow such insanity, but this world is ruled by the financiers and the regulators. (Why else would some USA-to-USA calls be routed OVERSEAS – should that be legal? No citizen would expect their call to be routed like that, but it may be the cheapest way.)

Instituting rigorous quarterly reporting will no doubt confirm that there is a problem, but I'm not convinced it will go very far to fix it. Carriers will jockey to not be at the bottom of the list when their RCC rates are benchmarked against their peers. (Perhaps they will try to artificially lower their completion rates to non-rural carriers, since the NPRM suggests a relative measure.) Because rates and routing tables are changing so frequently, the completion data will be stale by the time it is published and won't be useful for corrective action. Knowing that Carrier X had trouble completing calls to R only tells us that at some point during that reporting period, one or more of their intermediaries performed poorly. We have heard stories about technicians removing an intermediary for poor performance, only to be ordered to re-instate them two weeks later by the CFO, thanks to their attractive rates.

Adapting Our Robocall Solution

The FTC receives over 200,000 complaints MONTHLY about robocalls and do-not-call list violations. They get more of these complaints than everything else COMBINED. This is despite the fact that these calls are, for the most part, against the law and punishable by large fines under both FTC and FCC regulations.

The FTC launched the Robocall Challenge at the conclusion of their Summit on this topic last fall. At the Summit, experts explained that finding the sources of the calls, which pour into the PSTN by the billions, is extremely difficult thanks to shortcomings of the signaling systems and the number of carriers (including intermediaries) that are involved. Most illegal robocallers know they are violating the rules, and purposefully route their calls and obfuscate their identities to evade enforcement.

The difficulty with tracing a robocall to its source lies in the specifics of the SS7 and SIP signaling used on the PSTN. As currently deployed, there is little or no validation of the identifying information associated with a given call (the "Calling Party ID" and other parameters can trivially be spoofed), and there is no "bread crumb trail" when the call hops from provider to provider as it makes its way to its destination. By the time a robocall reaches the carrier serving the unsuspecting victim, there is little to differentiate it from a legitimate call, and no reliable way to know where it came from.

In our Challenge Submission to address robocalls, we propose leveraging:

- The steady stream of complaints already being received by the FTC
- The call signaling data already captured and retained by many carriers
- Web-based APIs and analytics

Specifically, we propose linking these elements together as follows:

- A robocall is received by a frustrated consumer
- Consumer files a complaint with FTC, that includes the phone number on which the subscriber received the call and the approximate time of the call
- Complaint is electronically transmitted to our proposed analysis system, which identifies and queries the "egress" (last) carrier, asking it to search its signaling database for the target call
- Egress carrier sends back to the analysis system signaling details associated with that call, including the source carrier from which it (the egress carrier) received the call
- The analysis system iterates through the query process, asking each carrier in turn where it got the target call
- The source (Ingress) carrier is identified and captured, with related details, in our database

With automation, the steps described above can take place in seconds or minutes. The database grows with each successful trace attempt, and simple database analytics can be used to rank-order the problem sources. Illegal robocallers can be identified before they get an opportunity to flood the network. Additional best practices and enforcement steps complete the solution.

A similar approach can go a long way in addressing the RCC problem. The NPRM notes (11) that the FCC already has a web-based complaint process in place for RCC. For "failure to complete" problems, the search would proceed in the "forward" direction, starting with the originating (ingress) carrier and iterating to the carrier to which that carrier sent the call. For "poor call quality" problems, the analysis could be done in either direction (starting with the ingress or egress carrier). Test calls placed via various originating carriers can augment the consumer complaint data.

While our robocall solution emphasizes the capture and analysis of call set-up (SS7 Initial Address Message and SIP INVITE), we would expand the scope for RCC to Call Proceeding, Alerting, Release and similar messages so that our analyzer could determine at what point in the sequence the call actually failed, and pinpoint the carrier(s) involved. Due to the nature of the LCR process, there may be multiple instances of these messages for a single call attempt.

The NPRM (22) proposes a requirement that carriers keep records of signaling data associated with placed calls. In fact, many carriers already do this (although perhaps not with the retention period specified in the NPRM) and this is the data we leverage in our robocall solution. We would suggest that the data items recorded be expanded to include the detail mentioned above, and that the entire messaging sequence (including attempts with multiple intermediaries) be captured.

Also important is that INTERMEDIATE carriers keep signaling data (and of course many already do). This is necessary so that a call can be followed as it hops from one carrier/provider to the next.

Our robocall solution requires that carriers make their data available for query via a secure connection to our analysis engine. This engine is the “glue” that stitches together all of the signaling data for a particular call. While there is effort required on the part of each carrier to implement this capability, the effort is fairly small compared to the benefits enabled. And the nature of our solution is such that a software “shim” can normalize the disparate formats used internally by different providers so that a level of consistency can be achieved across the carrier universe, allowing failed call data to flow into a database that can then be readily analyzed.

With these elements in place, we can now collect end-to-end (or end-to-dead-end, in the “failure to complete” case) signaling data in near-real-time. Even if we’re only successful in gathering the complete dataset for a fraction of the failing calls, we will be able to identify, in a matter of hours or at most days, where calls are failing – in what network, with what signaling sequence, under what circumstances. This root cause identification then drives appropriate corrective action.

Summary and Next Steps

We support the mandates in the NPRM (41) to improve signaling accuracy. However, we think that energies required by the record-keeping and reporting requirements in the NPRM would be better spent in a timelier, proactive trouble-isolation and root-cause-identification system such as what we have described above. While all carriers complain about any additional work imposed on them by regulation, we know that RCC is a problem that needs to be solved and believe that ultimately the carrier community is interested in the most efficient solution.

Our solution for RCC is particularly attractive if it piggybacks on a toolset implemented to address robocalling. We know that all stakeholders want quick progress on both issues. The FTC is committed to announcing their robocall solution in April, and if they find an alternative more attractive than ours, it may not make sense to pursue this for RCC only.

If the FTC does select our approach (or something similar), we suggest the following:

- Guided by a panel of industry advisors, the FCC could oversee the implementation of the inter-carrier call tracking system we have described above for both RCC and robocalls.
- A timeline would be established with the goal of having rudimentary functionality in a matter of months.
- With respect to RCC, participation would be required by providers that hold themselves out to the public as offering call completion service to United States Public Network telephone numbers.
- Participating providers would be required to keep records somewhat along the lines suggested in the NPRM (22). Our solution suggests that they capture the actual signaling data as described earlier; they need not make a rural/non-rural distinction as that can be done in the analysis phase. We need the data retained for far less than six months.
- Participating providers would be required to respond to authorized secure electronic queries regarding calls transiting their network, including identifying the entity(ies) to which they handed off the call. If a downstream entity is not a “214 Carrier” then the intermediate provider

would have to be a participating provider, or the original participating provider would have to capture the handoff information from that downstream entity and deliver it in response to the query. The point of this is to cause providers to encourage their downstream partners to participate, and to not engage with potential downstream partners that fly “under the radar.”

- Other (non-originating) 214 Carriers would be required to participate as well, except that any carrier could be exempted if it was involved in no complaint calls or had a complaint level (according to some metric based on call volume and subscriber count) below a certain threshold. Originating Carriers could also potentially be exempted if they had a minimal level of complaints relative to their number of originations.
- The FCC would itself operate the complaint-intake and analysis function, or it would engage with a third party to do so. Appropriate measures would insure confidentiality and data security.

Armed this way, in response to consumer complaints and/or test calls, it will be possible to see RCC failures in near-real-time and get problems corrected. The data accumulated from this approach will put a laser focus on the real problems. We believe this is more productive and more efficient than the more general reporting requirements detailed in the NPRM, which will not be actionable to the extent necessary to quickly solve the problem. The parties will continue to point fingers and blame each other.

To the providers complaining that such an approach is overly burdensome, we ask: Is the effort required here greater than that which you already expend responding to customer and regulator complaints about RCC, including time spent manually tracking calls and trying to find and fix problems? Wouldn't it be more efficient for the industry to have a cross-carrier platform that automates the data gathering process and uses analytics to find the real problem sources?

Certainly some work is required. But we aren't asking for changes to switching systems or new signaling elements or additional administrative staff. We're asking that carriers implement adjustments to their existing call logging, and provide an automated interface to our secure Internet-based queries. Then we'll leverage that to find and fix problems.

In his comments announcing the NPRM, the FCC Chairman acknowledges the complexities involved and the difficulty in tracing the calls. He says, “This has got to stop. The FCC has a fundamental responsibility to ensure phone calls complete reliably.”

Commissioner Pai, in his comments, explains how the network is supposed to work but admits that it doesn't, and states “The reason is not clear.” He suggests that the NPRM “will help us figure out the root of the problem” but we believe that an approach more along the lines of what we have proposed here is required. “Hundreds of rural carriers and long-distance providers already are working together to troubleshoot issues,” he says. He is being diplomatic; the evidence suggests otherwise. The Commissioner references a letter from NTCA, et al., and that letter makes clear that the issues are not being effectively addressed. Our scheme goes to the core of many of the concerns expressed in the letter and can make good on Commissioner Pai's vision for a rapid return to a reliable, ubiquitous Public Telephone Network.

I'm happy to discuss this further with FCC Staff and other interested parties.

Regards,



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