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VIA ECFS

February 20, 2014

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W., Room TW-A325
Washington, D.C. 20554

Re: Technology Transitions, GN Docket No. 13-5; Numbering Policies for Modern Communications, WC Docket No. 13-97.

Dear Ms. Dortch:

InCharge Systems ("ICS") hereby submits these comments to the above referenced proceedings in response to FCC 14-5.[1]

1. Introduction. In FCC 14-5, the Commission announced the launching of voluntary experiments to "measure impact on customers of technology transitions in communications networks."[2] In particular, the areas for these experiments included service-based experiments and a numbering testbed.[3] Furthermore, the Commission stressed the importance of the fundamental values of public safety, ubiquitous and affordable access, competition, and consumer protection.[4] The Commission invited initial expressions of interest in service-based experiments and comments on further testbed research.[5]

2. Suggestions. As InCharge Systems has noted previously, signing and validation can support solutions for problems affecting consumer protection and public safety such as spoofing Caller ID and swatting.[6] Accordingly, ICS offers the following suggestions:

- The numbering testbed should include, as a research and development topic, ways in which trust references for telephone number-related digital certificates can be incorporated into numbering databases;

[1] Order, Report and Order and Further Notice of Proposed Rulemaking, Report and Order, Order and Further Notice of Proposed Rulemaking, Proposal for Ongoing Data Initiative, FCC 14-5 (rel. Jan. 31, 2014), http://apps.fcc.gov/ecfs/document/view?id=7521070313.
[2] FCC News Release (Jan. 30, 2014), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-325345A1.pdf.
[3] FCC 14-5, par. 22 (service-based experiments), par. 151 (numbering testbed).
[4] FCC 14-5, par. 1.
[5] FCC 14-5, par. 81 (service-based experiments), par. 169 (testbed).
[6] InCharge Systems comments re GN 13-5 on Jul. 7, 2013 (http://apps.fcc.gov/ecfs/document/view?id=7520927869) and Aug. 7, 2013 (http://apps.fcc.gov/ecfs/document/view?id=7520936614).

- Signing and validation related to the use of telephone numbers should be included in a service-based experiment at the appropriate time; and

- Since progress on signing and validation will give rise to operational, policy, and consumer issues and concerns, in addition to technical issues, there should be a data collection effort to identify and assess such issues.

3. Discussion. Many aspects of technology to support signing and validation are widely understood, while others are subject to active work (e.g., in the IETF's STIR Working Group and the M[3]AAWG VTA SIG).[7] However, work to implement, deploy, and operate such functions is still in very early stages. Nonetheless, it is important to explore how issues, possibly complex ones, may arise as these functions become available. For example, some calling party number spoofing is appropriate and legitimate,[8] analogous to some robocalling being legitimate.[9]

There are possible operational, policy, and consumer issues for which technology is part of the solution, but is not itself sufficient to address them. A suitable service-based experiment that incorporates the use of relevant numbering-related databases could help identify and assess these other-than-technology aspects. That such issues will arise is certain: a similar discussion of related issues may be found in the ICS submission to the FTC's Robocall Challenge.[10]

4. Hypothetical Signing/Validation Experiment. A hypothetical signing/validation experiment is discussed in an appendix to these comments. It outlines a scenario for a signed and validated call, and it mentions two examples of issues arising from the use of signing and validation.

- Called Party Notification and Handling: When validation is available, how could the different possible results available to the called party be presented or handled?

- Calling Party Notification: If validation of a call fails, how would the calling party be notified that there is a problem?

5. Areas of investigation. In addition to the two examples mentioned above, issues can arise in other areas as well.

- The possible roles of one or more numbering databases for holding or pointing to information for signing and validation is a vital issue. Technical matters, industry work, and progress on policy will all be involved in getting to a workable infrastructure.

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[7] For the STIR WG, see https://datatracker.ietf.org/wg/stir/. For the M[3]AAWG VTA SIG see http://www.maawg.org/page/m3aawg-voice-and-telephony-abuse-special-interest-group-and-anti-robocall-and-telephony-worksho.

[8] See for example http://www.ietf.org/id/draft-ietf-stir-problem-statement-03.txt.

[9] See for example Report and Order, FCC 12-21 (rel. Feb. 15, 2012), http://apps.fcc.gov/ecfs/document/view?id=7021898593.

[10] See http://inchargesys.com/wp-content/uploads/2013/01/ICSRobocallTechnicalProposal1.pdf.

- Concerning number assignment and management, what are the relationships between a number assignee (number holder), a caller using the number, and an entity that could sign a call? Who may use a number, and who may sign calls from that number?

- Also, what might occur when different features apply simultaneously to a call? As a current example, a calling party may choose to suppress presentation of the calling number while a called party may choose to block anonymous calls – signing and validation will introduce other situations. For example, must a validated call present a calling number, or is an indication of validation sufficient?

6. Next steps. ICS suggests that signing and validation functions be given consideration in the design of the numbering testbed. As mentioned above, there are at least three major sets of issues for discussion: number assignment and possible delegation of authority for calling and signing, trust references and suitable databases for validation, and identification and assessment of policy and other issues. In addition, the coordination of work leading to signing and validation being included in an appropriate service-based experiment should be considered.

7. Conclusion. InCharge Systems is greatly encouraged by the possibilities offered by the current proceedings, and is grateful for the opportunity to provide input. ICS looks forward to the numbering testbed work and to potential trials of signing and validation.

Thank you for considering our comments.

Respectfully submitted,

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Appendix: Discussion of a Hypothetical Signing/Validation Experiment

This appendix looks at a hypothetical signing/validation experiment, and it identifies some issues affecting both the calling and called parties that arise from considering the possible results of using signing and validation.

A. Signing/Validation Scenario. This is a rough outline of a signed and validated call.

- A calling number has previously been associated with a private key and a certificate containing the public key.
- At call origin, the Caller ID and other information is signed with the private key.
- Call processing/terminating entities can validate the signature using the public key.
- A validated call is completed, and a call that fails validation may be cleared.

B. Signing/Validation Planes. In a hypothetical infrastructure for signing/validation, different entities could provide different aspects of such an infrastructure. These could fall into three planes.

- Reference Plane - Numbering Database: A validator could use a numbering database that contains trust references, e.g., data elements (such as URIs) that point to a telephone number certificate authority for a calling number.
- Certificate Authority Plane - Telephone Number Certificate Authority: A validator could retrieve the certificate for the calling number from the referenced telephone number certificate authority, possibly via a service provider or a trusted third party.
- User Plane - Signer/Validator: A signer signs call requests with the private key associated with the telephone number certificate. A validator extracts the public key for the calling number from the retrieved certificate, attempts to validate the signed information, and then acts on the results of the validation.

C. Potential Issues. Here are some end-user issues that could arise during a validation experiment.

- Called Party Notification and Handling: When validation is available, a number of different possible results are potentially available to the called party. How could such choices be presented or handled? The user might choose to answer validated calls, clear calls that fail validation, and send unsigned calls to voicemail. This could be pre-configured, or alternatively, on a per-call basis, a voice announcement could notify the called party and ask for a response, e.g., “Press 1 to take this call, press 2 to clear this call, or press 3 to send it to voicemail.”
- Calling Party Notification: A calling party’s calls might fail for a number of reasons. How would a calling party who is presumably not at fault determine that there is a problem and then proceed to resolve it?
