

February 29, 2016

VIA ECFS

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Michael B. Hazzard

Partner
202.857.6029 DIRECT
202.857.6395 FAX
michael.hazzard@arentfox.com

Re: Twilio Supplement to the Record – WT Docket No. 08-7

Dear Ms. Dortch:

Twilio Inc. (“Twilio”), through counsel, submits the attached Declaration of Emily DenAdel Emery to supplement the record concerning the increasing prevalence of wireless carrier blocking of lawful messaging services traffic, as previously detailed by Twilio in its Petition for Expedited Declaratory Ruling filed on August 28, 2015 in this docket. Ms. Emery’s Declaration also describes two recent spikes in blocking that resulted from wireless carriers unilaterally implementing new blocking filters, without any notification to affected parties. Before the filtering changes were ultimately rescinded, approximately 9 million lawful and expected communications were blocked from reaching their intended recipients over a five-day period. Separate and apart from these two spikes in blocking, Twilio estimates that the wireless carriers’ standard blocking practices have resulted in over 50 million lawful messages being blocked by the wireless carriers between in-service North American Number Plan telephone numbers since June 2015.

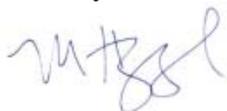
As further detailed by Ms. Emery, the types of communications being blocked by the wireless carriers include critical notifications to doctors and other essential medical personnel after a patient initiates the dialogue; dispatch notifications to service technicians; and two-factor authentication text messages that contain the information necessary for a new customer to sign up for a company’s service. In the worst case scenario, the wireless carriers are blocking communications involving potentially life-threatening medical emergencies. In the “best” case scenario, businesses are unable to enroll new customers or send help to an existing customer. In either case, the blocking by the wireless carriers takes place without notification to the individuals attempting to communicate with each other (or to Twilio). As a result, the non-wireless subscriber to the conversation believes his or her messages are going through, while wireless subscribers assume they are being ignored. Indeed, no one has reason to suspect that the

wireless carriers are themselves blocking the lawful communications their subscribers expect to receive, particularly when the wireless carriers are promising *unlimited* messaging plans.

Because the wireless carriers are in fact unilaterally limiting their subscribers' access to the lawful communications they expect to receive, and this unilateral blocking has only worsened, Twilio reiterates its request that its Petition receive expedited consideration. In fact, as the Commission's General Counsel Jonathan Sallet recently stated, "the FCC must play an important role in ensuring that competition is not artificially blocked or hindered" and "pro-competition provisions were written into the DNA of Title II."¹ With respect to messaging services, the wireless carriers are not only blocking competition, but are blocking their own subscribers from the unlimited messaging experience they were promised. Indeed, as Twilio has previously established, the Commission has already brought messaging services into the Title II fold over a decade ago by declaring a text message a "call" for Title II TCPA purposes, and has recently clarified that carriers can block messages only if the "consumer makes the choice to do so."²

Expedited resolution is particularly appropriate here where the record in this docket contains unrebutted evidence that the wireless carriers are even blocking emergency messages from first responders or messages to doctors potentially involving life threatening situations. Just like a 911 call that cannot reach the PSAP, "unblocking" these messages at a later time is not a solution. Twilio thus respectfully requests that the Commission act on Twilio's Petition without delay given the potential harm these wireless carrier practices can cause.

Sincerely,



Michael B. Hazzard

Attachment

¹ See Remarks of Jon Sallet, General Counsel of Federal Communications Commission, as prepared for delivery at, Incompas 2016 Policy Summit at 3-4 (Feb. 10, 2016), available at <http://www.berrybest.com/relay9.asp?df=021016&pf=DOC-337681A1.pdf&emxxx=bowser.adam@arentfox.com>.

² *In the Matter of Rules and Regulations Implementing the Telephone Consumer Protection Act of 1991*, Declaratory Ruling and Order, FCC 15-72, ¶ 156 (rel. Jul. 7, 2015).

Attachment

Declaration of Emily DenAdel Emery

I, Emily DenAdel Emery, declare pursuant to 28 U.S.C. § 1746:

1. I am the Government Relations Manager for Twilio Inc. (“Twilio”). I have been with Twilio since 2011, and in my capacity have knowledge of the Twilio messaging platform, technical operations and relationships with aggregators. I have personally investigated the non-delivery of legitimate, lawful text messages that were requested by wireless consumers. I submit this declaration to explain the impact of message blocking, as previously detailed by Twilio and other affected entities in this docket,¹ as well as to detail two recent spikes in unilateral message blocking that occurred without notification.

2. Since June 2015, Twilio has actively monitored and quantified the impact of the blocking practices described in Twilio’s Petition. Since filing the Petition on August 28, 2015, Twilio has continued to observe a significant *increase* in the filtering and blocking of text messages. Since filing the Petition to shed light on the wireless carriers’ message blocking practices, the problem has only worsened.

3. Throughout this proceeding,² Twilio representatives, including myself, have described how the issue of message blocking continues to harm consumers and businesses, with tens of millions of lawful messages being blocked by wireless carriers either directly or per wireless carrier directions to aggregators or interconnection partners.³ In response to requests to quantify the extent of message blocking from Wireless Bureau staff, I submit the following confirmed and estimated volumes of messages filtered by wireless carriers as observed by Twilio. This

¹ In the Matter of Petition of Twilio Inc. for an Expedited Declaratory Ruling Stating that SMS/MMS Messaging and Short Codes Are Title II Services, WT Docket No. 08-7 (the “Petition”).

² See <http://apps.fcc.gov/ecfs/comment/view?id=60001389610>.

³ When Twilio receives information from applications utilizing the Twilio API, Twilio forwards that information either directly to downstream telecommunications carriers or to so-called aggregators or interconnection partners that aggregate messaging traffic on behalf of the wireless carriers. Aggregators facilitate the transmission of information to downstream wireless carriers. In the attached “Reason for Outage” document that Twilio provided to our customers (see Exhibit A), Twilio refers to such aggregators as “mobile operators.”

declaration outlines estimates for both the full month of January as well as descriptions of two specific incidents in January 2016 and February 2016 where filtering rules were implemented without notification and then adjusted due to their unintentional effect on legitimate messages.

4. In detailing the impact of this filtering, it is important to note that Twilio and other affected entities can only provide partial estimates on the extent of message blocking. The wireless carriers and the aggregators have the best data on the results of their blocking activities. The wireless carriers and aggregators do not share comprehensive information with Twilio or others entities, nor do they have any stated criteria that would describe which messages will be blocked and for what reason. Therefore, Twilio is unable to report the precise monthly impact of the message filtering, as this information uniquely resides with the wireless carriers and aggregators themselves. Similarly, businesses attempting to send messages, and the consumers expecting to receive messages, are not notified when wireless carriers choose to filter messages based on content, or when new blocking instructions are implemented. Likewise, aggregators do not identify each message filtered, creating further opacity to impact estimates. Each wireless carrier has different message filtering processes, and not all wireless carriers use the same message filtering applications or aggregator applications. Moreover, consumers who purchase “unlimited” SMS messaging plans have no idea how many of the messages they intend to send or receive are actually being blocked by their wireless carrier. As it stands, only the wireless carriers themselves are able to individually report how many messages are filtered on their networks in a given month.

5. Based on the available data resulting from my investigation, I have been able to confirm a spike in blocking that occurred on January 11, 2016, which resulted from an aggregator filtering messages by individual message body content. As a result of the unilateral changes in the filter applied by this aggregator, messages containing a url hyperlink “goo.gl” were not delivered, and no notification or failure indicator was delivered to Twilio.

6. Based on internal reporting on the January 11th incident, I can confirm that at least 300,000 text messages were not delivered. In addition, over 1,000 Twilio customers had their

businesses damaged by the unilateral, unannounced blocking based on the content of lawful messages.

7. During the January 11th incident, Twilio escalated the specific content-based blocking to an aggregator. The aggregator confirmed that the wireless carriers set the filtering parameters, not the aggregator. This chain of command and perceived unilateral right to block any SMS message is consistent with statements made by the CTIA and wireless carriers. In conversations with Twilio and in their public responses to Twilio's Petition, the wireless carriers take the view that they can block any SMS messages they want to for any reason they want to, stated, unstated or otherwise, and regardless of the consumer's preferences.

8. Twilio experienced a second, recent blocking spike between February 11, 2016 and February 14, 2016. Again, one or more carriers implemented expanded message blocking filters through an aggregator, again without notice. Over those few days, Twilio estimated that consumers across the country had approximately 8.5 million legitimate, lawful and wanted messages blocked. The technical description of the incident's Reason for Outage document (RFO) that Twilio provided to impacted customers is attached with this declaration as Exhibit A.

9. Upon detecting this sudden and unexplained spike in message blocking, Twilio's technical team worked with both aggregators and wireless carriers to identify and reverse the effects of the new blocking rule unilaterally applied by the aggregator. Conversations with both aggregators and wireless carriers confirmed that while wireless carriers dictate which blocking levels and profiles are set in place, only the aggregator's spam filter vendor could reverse the filtering behavior, and only with the permission of the wireless carriers. Upon receiving "permission to have the filter removed," the aggregator experienced technical difficulties in fully reversing the new filtering behavior. Even after agreement to reverse the filtering behavior, it took a full 24 hours to resolve the issue and return filtering levels to the previous baseline.

10. As described above, Twilio receives only partial data on when messages are filtered. Where possible, Twilio passes this information on a per message basis to our customers. I have analyzed the volume of messages where Twilio received notification on message filtering and

provide the following estimates based on this partial data. The February 11 - 14th incident affected approximately 1,000 individual customers of Twilio. During this incident: two Twilio customers had at least half a million messages blocked in a single day; at least 14 Twilio customers had at least 10,000 messages blocked in a single day; and over 70 Twilio customers had more than 1,000 messages blocked in a single day.

11. The February 11 - 14th incident had a significant impact on Twilio's customers and tens of thousands of consumers whose messages were blocked without their knowledge or consent. Before it was reversed by wireless carriers and aggregators, the message filtering rule resulted in the improper blocking of legitimate, business-critical messages. The businesses initiating these messages have use cases that include appointment reminders, shift alerts, transportation and delivery notifications, person-to-person conversations, and responses to messages texted in by the wireless end user. When new blocking rules are added by aggregators or wireless carriers, they are added without notification. Additionally, in the two instances described above, misapplied rules were modified after Twilio urgently raised the issue with aggregators and wireless carriers, but only after considerable effort, time and impact on businesses and consumers. This message filtering can in certain cases lead to a full disruption of businesses' traffic and disrupts the functionality of their phone numbers.

12. The wireless carriers' blocking practices run counter to the reasonable expectation of both consumers and businesses that they are free to communicate with one another in the manner that they choose using valid 10-digit, North American Number Plan telephone numbers. In addition to the non-delivery of individual messages, the February 11 - 14th message filtering incident described above resulted in the aggregator disabling message functionality for over 43,000 in-service NANP telephone numbers. In ultimately reversing the block, the aggregator confirmed to Twilio's technical team that in implementing the message filtering action, they rendered the individual numbers incapable of sending any messages for a time period set by the aggregator. This disablement of in-service NANP telephone numbers took place without warning or notification. Further, Twilio's technical team learned from the aggregator that reversing the disablement of functionality required manual restoration. Part of the prolonged outage was due to an impartial and manual recovery. It took over 24 hours to recover functionality for these

erroneously blocked phone numbers. This unilateral, non-transparent blocking of in-service telephone numbers harms the bedrock foundation of a network built to enable consumers to send and receive the communications they want to send without the unwelcomed and unwanted interference of the carriers. The ubiquity and seamlessness of the network is at risk.

13. As part of Twilio's ongoing investigation into the impact of message filtering, I have worked closely with Twilio's Customer Support and Account Management teams. For the February 11 - 14th incident described above, dozens of Twilio customers contacted us to report the issue, inquire why their messages weren't being delivered, and express their concerns. We submit the following remarks to demonstrate the scope and impact not just on Twilio, but to the businesses who depend on messaging services to connect with their employees, stakeholders and customers.

14. Twilio customers described the impact of the non-transparent filtering to business-critical communication, for example: *"...this is a big inconvenience ... we run a 24/7 answering service and depend on Twilio for notifications to Dr's and other essential personnel"; "We're an on-demand company dispatching jobs to our technicians and realized nothing went through since this morning"; "We use this service for our service techs to advise if they are working alone"; "We have 70 technicians that are currently not able to use this service"; and "We have a report that our text messages to medical staff are not going out"*.

15. Twilio customers remarked that in some cases the filtering caused a complete disruption of their business model. Sample remarks include: *"We need these codes to be sent out for users to sign up"; "We are currently unable to send service-critical SMSs to users"; and "My clients are not getting your SMS and therefore they can't confirm their accounts... I can't acquire users if this issue persists"; and "Our customers aren't able to login because our Multi-factor authentication system isn't delivering SMS"*.

16. Twilio customers indicated that the message blocking has directly affected messages sent in response to an inbound text from an end user: *"A customer texts a keyword into our numbers. We respond with a message"; and "We're getting their text ins, and we see that Twilio have sent*

out our messages but the customers are not getting them. We have visual proof now. Out of 25 only 3 customers were able to receive a response.” Because consumers are not informed about the wireless carriers blocking their messages without their knowledge or consent, they have no way of knowing why the business they are attempting to communicate with is not responding. Of course, the business intends to respond, but the consumer’s message is being blocked by instructions of their wireless carrier. Because this filtering takes place without notification to consumers, it necessarily means that consumers, who are wireless subscribers, are having communication blocked without the consumers granting permission for this to occur. The lack of notification, coupled with a lack of a formal, publicized escalation path for consumers, means there is no method for consumers to identify when their access to the telephone network is being blocked.

17. Twilio customers described the impact of the message filtering on their reputation: *“We just lost a major franchise working with our wait list app”*; and *“This issue has caused many complaints from our clients. The fact that it is taking so long to restore service is casting doubts of confidence on our product”*. The lack of notification from wireless carriers and aggregators necessarily means that the filtering occurs without the permission or understanding of either the sender or the receiver of the messages. Just as consumers are harmed when they are prevented from the messages they wish to receive, businesses bear the reputational harm when their messages go undelivered due to the unpublished practices of unidentified third parties.

18. In addition to the two incidents described above, day to day message blocking is an ongoing and pervasive practice unilaterally employed by the carriers. For the month of January 2016, Twilio can positively identify 3,305,086 messages blocked by wireless carriers for unexplained “carrier violations.” This number reflects a specific error code provided to Twilio by one of the aggregators that Twilio uses to further transmit messages to wireless carriers. Further, the monthly impact to Twilio customers is both wide ranging and disproportionate. For the month of January 2016: at least 1,804 Twilio customers had messages blocked; 41 Twilio customers had at least 10,000 messages blocked; and nine Twilio customers had more than 100,000 messages blocked.

19. The number of filtered messages detailed above is not a complete estimate of the number of messages filtered by wireless carriers for “carrier violations.” Twilio estimates based on overall traffic distribution that the volume of messages filtered in the month of January 2016 exceeded five million messages and the volume of messages filtered in the month of February 2016 to date exceeds 10 million messages.

20. Twilio estimates over 50 million messages have been filtered due to “carrier violations” since June 2015.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.



Emily DenAdel Emery
Executed on February 29, 2016

EXHIBIT A



Reason for Outage: Reference 5756551042170880

Elevated filtering on Outbound SMS to US & Canadian Operators

Summary

On February 11th, 2016 at approximately 2:00 PM PDT we observed a 2-3x increase in the rate of filtering on outbound SMS messages to US & Canadian operators. On February 12th, 2016 at approximately 7:00 AM PDT the rate of filtering increased to 10-20x baseline levels. On February 12th at approximately 10:00 PM PDT we observe a drop in filtering to 5-10x baseline levels. On February 13th, 2016 at approximately 12:00 PM PDT we observed filtering rates drop even further back to the 2-3x rates that we had previously seen. Finally at 11:00 AM PDT on February 14th, 2016 service was fully restored and filtering rates were returned to our normal baseline levels.

Over the impacted time period approximately 8.5 million messages were filtered by US & Canadian operators.

Detailed timeline

- **[2015-2-11 02:00pm PDT]:** Filtering levels increase 2-3x baseline rates on outbound SMS messages. As filtering rates routinely vary due to customer content, destination, and time of day, no action is taken by Twilio on-call teams.
- **[2015-2-12 07:00am PDT]:** Filtering levels increase 10x-20x baseline rates on outbound SMS messages to US & Canadian operators.
- **[2015-2-12 08:50am PDT]:** Twilio support receives customer reports of increased filtering on outbound SMS messages to AT&T.
- **[2015-2-12 09:45am PDT]:** Twilio engages operator partners to better understand the cause of the elevated filtering as it has become clear this was not intended behavior.
- **[2015-2-12 10:06am PDT]:** Team confirms filtering impact scope includes AT&T, T-Mobile, Sprint and other US & Canadian operators. Verizon appears unimpacted.
- **[2015-2-12 10:15am - 4:30pm PDT]:** Debugging continues on the operators' side. Twilio escalates with each of the major US operators to understand the root cause of the filtering.
- **[2015-2-12 4:32pm PDT]:** Cause of the impacted messages identified as a common spam filtering appliance that is used multiple US & Canadian operators. Work begins by the operators on addressing the misconfigured appliance.
- **[2015-2-12 7:39pm PDT]:** First set of configuration updates from operators begin taking live traffic.
- **[2015-2-12 9:30pm PDT]:** Operators confirm that all configuration updates have been made and that Twilio service should be operating normally again.



- **[2015-2-12 9:48pm PDT]:** Twilio systems indicate that the fix was not fully effective, on-call team observes a drop in filtering but not back to baseline levels. Twilio re-escalates to the operators.
- **[2015-2-13 1:18am PDT]:** Operators confirm that filtering behavior does not appear to have returned to normal
- **[2015-2-13 11:20am PDT]:** Twilio receives confirmation that the configuration changes applied to the spam filtering appliance were only partially successful. Another configuration change is made.
- **[2015-2-13 12:00pm PDT]:** Operator configuration changes reduce filtering to the levels first observed on February 11th. Levels are still elevated and the operators continue to troubleshoot the issue.
- **[2015-2-14 7:20am PDT]:** Operators identify further configuration changes that need to be made to restore baseline filtering levels. Work begins on applying these configuration changes.
- **[2015-2-14 11:00am PDT]:** All configuration changes are fully applied to the spam filtering appliance and filtering levels return to their pre-incident levels.
- **[2015-2-14 12:00pm PDT]:** After 60 minutes without recurrence Twilio updates status.twilio.com indicating the incident is over. Twilio on-call teams continue active monitoring of filtering levels.

Impact

Between February 11th, 2016 at 2:00 PM PDT and until the return to baseline filtering rates at February 14th, 2016 at 11:00 AM PDT approximately 8.5 million legitimate, lawful and authorized messages intended for recipients on operator networks in the US and Canada were inadvertently filtered. Although impact varied by carrier, Verizon & T-Mobile notably did NOT see an increase in filtering during this time period. Twilio connectivity remained available for the entire duration of the incident and filtering happened downstream of Twilio on the operator networks.

Note: The filtering impacted all API-based ([non-CMRS](#)) SMS providers; this was not specific nor isolated to Twilio and our customers. Shortcode traffic was not impacted.

Root cause analysis

The cause of elevated filtering rates was due to a misconfiguration of SMS spam filtering appliance in use by many operators in the US & Canada. The misconfiguration caused the spam filtering engine to reclassify legitimate and wanted SMS interactions as spam resulting in non-delivery. The appliance uses algorithmic spam detection mechanisms to classify traffic. As such identifying the specific cause for a given message to be classified as spam vs legitimate is not always clear to the operators of the spam filtering appliance. The lack of operational experience lead to multiple failed attempts to limit filtering and restore service resulting in prolonged filtering behavior.



Resolution Plans

Addressing the root cause of this incident

Twilio depends on mobile operators for message delivery. A subset operators in the US and Canadian have deployed spam filtering appliances to attempt to filtering unwanted traffic from their networks. Although Twilio objects to this practice (see below) it is actively in place in at a number of mobile operators. As such Twilio will be undergoing a thorough operations review with our operator partners around their filtering practices to ensure clear change management in place. The updated operational procedures are designed to ensure that inadvertent filtering updates cannot be made either by software systems or by human operators. If and when changes occur Twilio will notify our customers proactively around filtering.

Ensuring filtering is not allowed

Twilio has also taken an active stance against operator filtering. Although this incident is an extreme event of filtering, it is not an isolated event. Operators filter messages everyday with no indication as to why a given message might have been filtered. Twilio has, and will continue to advocate on our customer's behalf to the FCC. The ongoing filtering issue is yet another example of the need for [SMS to be reclassified to the same status as voice calls](#).

Get Involved

Twilio encourages all of our customers to get involved and support our petition with the FCC against filtering of SMS content. The FCC has confirmed that comments from impacted businesses that include "detailed estimates – numerical estimates if available" will have the most impact on the actions the Commission is considering.

For those interested in supporting our petition please let the FCC know how you were impacted by filing a comment:

- Fill out a comment based on this [template](#)
- Go to the FCC website: <http://apps.fcc.gov/ecfs/upload/display>
- Enter Proceeding Number **08-7**
- Attach your comment as a pdf or a document and submit