

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION**

In the Matter of Resilient Networks	§	
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Amendments to Part 4 of the Commission’s Rules Concerning Disruptions to Communications	§ § §	PS Docket No. 21-346 PS Docket No. 15-80
<i>New Part 4 of the Commission’s Rules Concerning Disruptions to Communications</i>	§ §	ET Docket No. 04-35

COMMENTS OF FAILSAFE COMMUNICATIONS, INC.

FailSafe Communications, Inc. (“FailSafe”) hereby tenders a fresh perspective on proposed DIRS reporting rules governing cable, wireline, wireless, and interconnected VoIP providers.¹

The primary focus of FailSafe is to provide licensees the ability to detect and report outages that result in callers not being able to reach their 911 or 988 provider. During our development, we encountered capabilities that are useful and relevant to this proceeding. The purpose of our comments is four fold:

- First, to describe how *Intelligent Signaling Networks* in common use by carriers and service providers can be employed to produce outage information for DIRS on an automated basis.
- Second, to illustrate how Intelligent Signaling Networks can serve as a “Check Engine” light to alert 911 providers and the FCC when a situation develops that warrants further investigation.
- Third, to illustrate how these equipment and processes help gauge the scope of carrier outages, as well as in many cases, pinpoint individual 911 callers including phone number, location, and other lifesaving information.
- Fourth, to present a live demonstration by means of two phone numbers, one in Washington DC and one in Hawaii. When dialed, an automated email Alert will be generated in real time and can be viewed by following the instructions in these comments.² Any Party with an ex officio interest (carrier, service provider, 911/988 center, attorney, media or regulator) is also invited to participate in the demonstration.

¹ These Comments take no position regarding whether TV and radio broadcasters, satellite providers, and broadband Internet access service (BIAS) providers should report to NORS or DIRS. Additional reporting may be useful in some instances. These Comments urge the FCC to go beyond reports to actual customer-centered monitoring of the networks.

² The demonstration generates an automated Alert simulating a 911 center experiencing an all-circuits busy condition. The two numbers to dial as well as instructions to participate in the demonstration are included in these Comments.

Introduction

On April 11, 2024, the National Emergency Number Association (NENA) released its second annual State of the Industry Survey which outlined ongoing challenges faced by Emergency Communications Centers (ECCs) and 9-1-1 professionals across North America. The primary concerns expressed in the survey centered around employee recruitment, retention, training, and job burnout in a profession where lives so often hang in the balance. Even more alarming however, according to this report over 75% of ECCs have experienced service outages that impeded 9-1-1 calls.³

Perhaps it is time to change the narrative regarding the way regulators, service providers, and the 911 industry look at the issue. Ask yourself this question. Is it more important to identify *carriers* experiencing network outages, or rather, *callers* affected by those outages? We submit that it is the latter. When you get right down to it, the whole purpose of DIRS really centers on people, not carriers:

*“DIRS also provides important information regarding which and how many Public Safety Answering Points (PSAPs) are unable to receive incoming emergency information from **consumers in need.**”* (Emphasis Added)⁴

DIRS centers around public welfare. Measuring carrier performance has simply been the most convenient way to gauge the impact of disruptions on that public welfare. Outage reporting by service providers has therefore historically been the most accurate way to size up how many people were impacted. Up until now it has been the only way. Even so, this Commission has become increasingly aware that existing metrics based on “minutes of traffic lost” are becoming less meaningful in today’s carrier ecosystem.⁵ The reporting systems presently in use like DIRS and NORS have been a convenient means to an end, but the impact on actual callers can only be inferred indirectly from them alone.

*“It has been sixteen years since the Commission launched DIRS, and the time is ripe to take steps to improve the efficacy of the system.”*⁶

³ On the very day of writing these comments, April 18, 2024 emergency services experienced a widespread outage across all of South Dakota and in parts of Nebraska, Nevada and Texas. Source: Reuters News Agency and other outlets.

⁴ Source: Resilient Networks; Amendments to part 4 of the Commission’s Rules Concerning Disruptions to Communications; New Part 4 of the Commission’s Rules Concerning Disruptions to Communications at 21.

⁵ As the FCC has already taken notice, reporting requirements for service providers are becoming antiquated. Presently, communications providers generally submit a Notification to the Commission within 120 minutes of discovering outages that affect least 900,000 user minutes, or 667 OC3 minutes. With the exception of 911 which is still largely voice-based, these metrics are in need of updating in order to be relevant to end uses that employ other technologies.

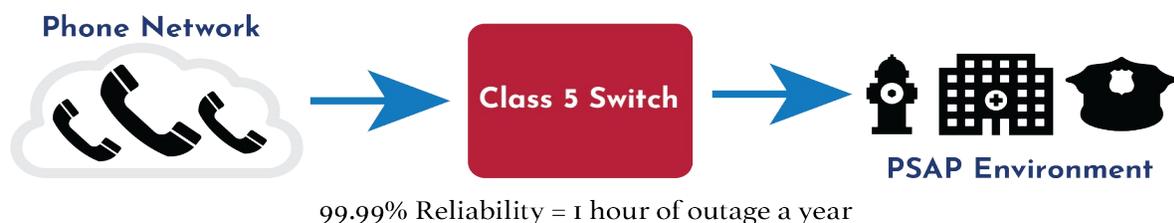
⁶ Source: Resilient Networks; Amendments to part 4 of the Commission’s Rules Concerning Disruptions to Communications; New Part 4 of the Commission’s Rules Concerning Disruptions to Communications at 21.

Automation and Reliability of Alerts and Reports

We opined in previous filings that, *Intelligent Signaling Networks* are an under-utilized technology that addresses many concerns about Alerts and Reporting.⁷ These systems are also among the most reliable technologies on the planet. After over 140 years of development, classical telephone switching systems (Diagram 1) have evolved to “four nines” (99.99%) reliability, or 53 minutes of outage a year. In fact, the standard design criteria for a Class 5 telephone office is for less than an hour of outage per year.⁸

Diagram 1

Traditional Phone Network



I/P connections, as well as wireless technologies like 4G, 5G, Diameter, etc, have different reliability numbers. This is not to imply that these technologies are inferior, only that they have not had 140 years to develop the standards and practices necessary for “four nines” availability.⁹

⁷ Failsafe Comments, April 14, 2023 <https://www.fcc.gov/ecfs/document/104143031400844/1>

FailSafe *ex parte* letter, June 20, 2023, <https://www.fcc.gov/ecfs/document/1062099699039/1>

FailSafe Supplemental *ex parte* letter, July 14, 2023 <https://www.fcc.gov/ecfs/document/1071513465683/1>

FailSafe Second Supplemental *ex parte* letter, Sept. 6, 2023; <https://www.fcc.gov/ecfs/document/10906728330583/1>

FailSafe Third Supplemental *ex parte*, October 18, 2023; <https://www.fcc.gov/ecfs/document/10183004215540/1>

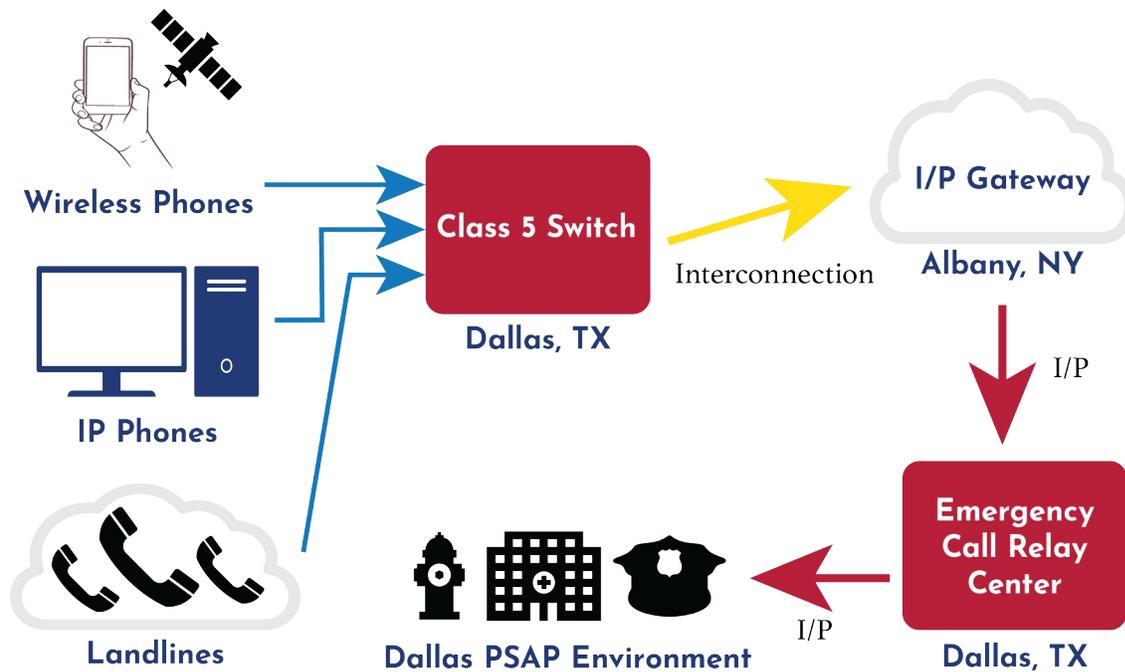
FailSafe Fourth Supplemental *ex parte*, January 16, 2024; <https://www.fcc.gov/ecfs/document/101160243030301/1>

⁸ Mean Time Between Failure (MTBF) is usually a calculated prediction using the Telcordia parts count method originally developed by Bell Labs for telecommunications systems.

⁹ “Traditional 911 services typically operate over standard voice-based telephone networks and use software, such as computer-aided dispatch systems, that operate on closed, internal networks with little to no interconnections with other systems. The limited means of entry into the traditional 911 network significantly limited potential attack vectors, and what little cyber risk existed could be easily managed. NG911’s interconnections enable new response capabilities, ... However, they also represent new vectors for attack that can disrupt or disable PSAP operations, broadening the concerns of - and complicating the mitigation and management of - cyber risks across all levels of government.” Source: <https://www.911.gov/assets/Cyber-Risks-to-Next-Generation-911.pdf> Cyber Risks to Next Generation 911, by U.S. Department of Homeland Security,

Diagram 2

Next Gen I/P and e911 Network



Intelligent Signaling Networks are also a “four nines” technology and can be employed as a “Check Engine” light for more complex I/p-based systems, particularly those that affect 911. Like a check engine light, FailSafe’s approach alerts carriers and PSAPs that they may need to perform additional examination of the network.¹⁰ FailSafe’s approach is another tool in the toolbox.¹¹ Likewise, Intelligent Signaling Networks that utilize the traditional SS7 environment can be employed to send automated Alerts of network troubles. Alerts can be set up to trigger based on carrier outages. Alerts can also be set up to trigger on actual callers that are not getting through due to all-circuits-busy or other conditions. Both kinds are easily set up.¹² The following is an example of one of our alerts:

¹⁰ FailSafe’s approach does not diagnose the problem or attempt to correct it. It is a network monitoring tool that can provide real-time information to carriers, PSAPs and potentially regulators.

¹¹ The patented FailSafe family of products and methodologies have been trade named TeleSentient® and rely almost solely on tried-and-true technology used by Intelligent Signaling Networks which have been in use for decades.

¹² Carrier outage Alerts using Tekno Telecom and GL Communications probes have been described in previous comments. The technology being demonstrated here is called *Rollover*. Rollover uses similar Intelligent Signaling Network technology to identify callers to 911 that do not get through due to all-circuits-busy conditions. Rollover Alerts take place in an automated manner, via email or text and are summarized in a daily report. Availability is nationwide, as described in the How It Works section that follows.

Diagram 3



Possible 911 / 988 Outage in Your Area

You are receiving this **Alert** because the TeleSentient® system has detected a possible service-affecting outage in your area. Like the "Check Engine" light on your car, these indications merit further investigation by your company.

If your organization is a TeleSentient® licensee, please consult the outage detail report that was sent to it minutes ago. If you are not a current licensee call 1 (214) 214-SAFE for further instructions, or visit www.fail safecomunications.com to sign up.

* THIS IS A TIME-SENSITIVE NOTIFICATION. Pursuant to regulations by the Federal Communications Commission your organization is required to report outages that affect 911 and 988 services within 30 minutes. Failure to report these outages may result in significant fines or other sanctions to your company. If you are not sure what to do, please forward this Alert to your legal and regulatory department immediately.



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TeleSentient® is a registered trademark for services provided under U.S. Patents

Try It Right Now

- Dial 1-202-920-9008 or 1-808-978-9379 right now. Your call will simulate a 911 or 988 caller rolling over to a 10 digit phone number due to an all-circuits-busy condition at an emergency call center.¹³ The Intelligent Signaling Network will generate an **Alert** to any designated FCC mailbox without setting up a call. The following are instructions for the demonstration:
- Link: <https://webmail.networksolutionsemail.com/appsuite/>
Email: fccdemo@telesentient.com
Password: FailsafeDemo\$
- Any Party to this proceeding may contact James Speelman, james@telesentient.com, to use their own email or arrange a more detailed demonstration.

¹³ Since this is still a demonstration, the caller may hear a fast busy or a recording or other audible indications that the call did not go through. When implemented with an actual licensee, this will not be detectable by the caller. In other embodiments, the call may be branded with the company name of the service provider. The demonstration email may require a refresh after the call is made. Parties who have difficulties with the test are requested to contact james@telesentient.com so that FailSafe can improve the demonstration.

How TeleSentient® Technology Works

The patented technology used for these Alerts has been trade-named TeleSentient.® During this demonstration, what will happen behind the scenes when you dial this number is that your wireless carrier or landline will send a IAM (Initial Access Message) to a FailSafe number. Our system never sets up or answers an actual call but instead logs important information about the calling party based on Intelligent Signaling Network data. We then include it on the email Alert. Text alerts are also possible, allowing 911 centers to integrate Alerts seamlessly into existing or anticipated Text-to-911 systems. One does not need a smart phone for this system as landlines generate Alerts. A daily Summary Report of all callers is provided with real time alerts as described below.

Availability

There are some 7700 emergency service providers in the United States today. We have arrangements to make numbers available for every one of them if they need this service. The process is:

1. A 911 / 988 center or regulatory agency is assigned a FailSafe number.
2. The local phone company is contacted to arrange for a Call Forward Busy No Answer (CFBNA) feature to be installed in the 911 hunt group.¹⁴

Once this is completed:

3. A **Daily Report** of every missed 911 call is provided via email to municipal policymakers or regulators.
4. **Alerts** are sent in real time to the 911/988 Center, or regulatory agency, whenever a condition exists that exceeds a pre-determined threshold defined by the 911 Center, municipal policymakers, or FCC.

Cost

1. The cost of the Daily Report of “lost” 911 callers is projected to start at \$99 a month.¹⁵
2. If a City makes this service mandatory for all of its citizens we anticipate a \$1.00 one-time setup fee, followed by an ongoing monthly cost of ten cents a month. Both amounts are per citizen, based on the population of the entity as per the most recent U.S. Census data.

¹⁴ If a 911 center has four lines for example, when a fifth caller attempts to call in, they “rollover” to the FailSafe number. This does not set up a call and there is no long distance charge since we reject the call but log the caller. Once implemented by PSAPs, after the call is rejected by FailSafe, the call will be rolled over to the back-up answering system designated by the PSAP. The rollover will not be detectable by the caller.

¹⁵ The Daily Report is also a tool for municipal budgetary planning by spotting trends and weaknesses in 911. The Inventor is also a former Mayor with direct experience in earmarking billing surcharges or municipal impact fees to fund projects of public benefit.

Summary

The FailSafe approach can provide additional information for the Commission. There is also no reason that the FCC must continue to rely (solely) on carrier outage reports in order to quantify the impact of 911 outages on the public welfare. The Daily Report pinpoints the exact number of lost of 911 callers and is a useful check and balance against the present DIRS reporting. If a reporting carrier estimates 100 affected callers, but the report shows 1000, further investigation may be warranted. The Commission can follow traditional wisdom contained in an old proverb, “*Trust But Verify.*”¹⁶

Moreover, if that Report is combined with the LERG or an ALI database, affected Agencies and ECCs can see exactly who was impacted and where they were when their call failed.¹⁷ This could be an indispensable check and balance on DIRS, NORS and other existing mechanisms.

Municipalities and regulators also stand to strengthen existing systems like DIRS and NORS in the best way possible, by showing the *impact on actual people* rather than depending solely on inferences and estimates based solely on carrier outage reporting. FailSafe encourages the Commission to explore new technological solutions like these that may alter the need for some entities to file reports.

Respectfully submitted,

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¹⁶ https://en.wikipedia.org/wiki/Trust,_but_verify

¹⁷ A comparison of LERG and ALI data is also a way to spot database errors and minimizes mis-routing of 911 calls.