Summary of 1/10/22 subgroup meeting for handling of rejected calls

**Overview**

A large number of IPNNI members met on 1/10/22 to discuss where industry participants are thinking for the current consideration of the usage of 607 or 608 error codes and trying to better define what the requirements are that are influencing the usage of 607 and/or 608 as SIP error codes.

A presentation was provided by Chris Wendt, Somos for discussion [IPNNI-2022-00002R000] <https://access.atis.org/apps/org/workgroup/ipnni/document.php?document_id=63319>. This discussed various topics around some expressed concerns around security and other technical considerations for the usage of SIP error codes as industry practice and information that may be unintentionally signaled to indicate telephone consumers call blocking preferences and used as an attack surface for targeting some consumers or influencing illegitimate (or legitimate) robocalling campaigns.

On the call, there was a lot of agreement about the points of the presentation. It is important to note this was a brainstorming exercise around forming a consensus technical view of the use of SIP error codes and as is generally the policy of the IPNNI a legal/regulatory interpretation of what may or may not be required was not part of the analysis or discussion. That said, the participants hope that the collective feedback and potential resulting technical reports or standards may be considered as a path forward with a technically sound and security/privacy focused framework for achieving the desired outcomes.

One primary issue discussed is around the desired outcomes, in that, there doesn’t seem to be broader consensus on what the desired outcomes are for the eco-system participants. Maintaining consumer privacy and protection seem to be the obvious goal of any technical initiatives surrounding the SHAKEN standards. The handling of rejected calls is focused not on the called party, but rather the calling party for their knowledge of what the result of their call is, specific to whether or why the call is blocked, this deviates from the primary IPNNI and SHAKEN focus of integrity of the calling identity.

**Error Codes**

When reviewing the each of the error codes, there was consensus that 607 is a basic user-centric feature that is intended to signal the service provider or analytics provider that a particular call is unwanted. While this is interesting as a feature, the industry is providing different ways of doing this through apps and other mechanisms. 607 is primarily limited to a real-time decision before the caller has even picked up a call, and while interactive displays that are supported on mobile phone have more opportunity to add more functionality to the basic telephone interface, the traditional hard telephone interface simply doesn’t have the standard interface to initiate any of the pre-call, mid-call or post-call initiation of 607 (i.e. if the phone is ringing, you can only answer or not answer, or once you answer a call, generally you can only hang up). The text of RFC8197 also states,

The mechanism described here is only one of many inputs likely to be used by call-filtering algorithms operated by service providers, using data on calls from a particular identifier such as a telephone number to establish handling for future calls from the same identifier.

The current established practice of having supplemental call analytics/feature management apps that provide better user experiences for callers to identify unwanted calls as part of a call history or other future innovations on how analytics or integrated user experiences can help consumers manage calls is the likely preferred path forward.

The error code 608 is specific to rejected calls and seems to be closer to the target functionality desired by advocates of the use of SIP error codes. This error code is focused less on the user and more at terminating provider application functionality including call analytics that make call rejection decisions based on more global reputation determination. The RFC8688 gives explicit direction as follows:

This response code enables calling parties to learn that an intermediary rejected their call attempt. No one will deliver, and thus answer, the call. As a 6xx code, the caller will be aware that future attempts to contact the same User Agent Server will likely fail. The initial use case driving the need for the 608 response code is when the intermediary is an analytics engine. In this case, the rejection is by a machine or other process. This contrasts with the 607 (Unwanted) SIP response code in which a human at the target User Agent Server indicates the user did not want the call. In some jurisdictions, this distinction is important.

The discussion talked about what is really the goal that should be focused on which is the ability for the intermediary entity that made the blocking decision, beyond user’s explicit preferences, to provide a link or URL that gives the ability for the calling party to initiate a redress request to fix potential faulty association of negative reputation to a particular calling number.

There is a lot of concern, as discussed in IPNNI and other forums, about the extent that RFC8688 uses jcards and signed JSON Web Tokens, which seem to provide a more complex security framework than necessary given that it’s not clear what additional protection it would provide. If the intermediary wants to falsify their identity or a link to redress procedure, this would require the same investigation and traditional traceback procedures to identify the bad actor whether the error code information is signed or not.

**Conclusion**

In review, there was questions about whether SIP error code is the best mechanism to achieve desired outcomes. There was some after-meeting feedback that from an operational support perspective, there does seem to be a need for some way to tie a rejected call back to a responsible intermediary (i.e. analytics provider or terminating service provider) and a mechanism and process for initiating a request for redress. The IPNNI had discussed working on a profile document that could utilize 608 error code and focus on the functionality that achieves this outcome in a way that achieves these basic goals. There has been discussion about 603 as an alternative, so perhaps a way to achieve similar goals with either error code can be investigated.

There is still a legitimate concern that the general practice of mapping error codes to other error codes will likely cause issues of delivering this information to the party that needs to receive it, this is an area that will need to be discussed further.

Beyond these technical solutions, there is still some concern about some of the policy and consumer privacy/preference protection and how we make sure these tools can be used legitimately to perform their intended purpose but also do not advantage those that want to use these mechanisms to bypass consumer preferences or protections. The IPNNI as a general guideline does not address influencing policy decisions, but as a general technical framework these security and privacy concerns are noted.

Topics that are clearly beyond the scope of IPNNI have also been pointed out related to topics the RFC8688 gets into around determination of illegal calls by the intermediary. We will clearly stay away from these issues, but the general topic of the intermediary’s judgement over the reasons for blocking calls can be either user guided, local policy guided or based on legal policies, the larger redress policies will involve judgements on these decisions and are clearly complex non-technical issues, as addressed in RFC8688.

One other topic discussed is a special class(es) of calls that can no or should not be blocked, like emergency service and governmental services as an example, this is beyond scope of the work, but noted as well.

One other consideration discussed is regarding the general state we are currently in with STIR/SHAKEN. There is still a large percentage of illegally spoofed numbers, neighborhood spoofing and other techniques that will continue to exacerbate the occurrence of faulty reputation scoring for telephone numbers that are spoofed illegitimately. We may want to recognize that this situation may change once we have more “ubiquitous” signing of calls, where the reputation of calls can be more accurately determined. This also brings up the fact that even good actors have bad calling practices for outbound calling services, there needs to be recognition that redress should not be a practice that encourages calling parties to maintain bad “calling hygiene” and that reputation associated with telephone numbers may be deserved.