RFC Publication of Errata of Standards Track Documents Considered Harmful
draft-klensin-newtrk-8540style-harmful-00

Abstract

There appear to be some recent trends in the IETF, involving both published documents and proposals, to use Informational Documents to effectively update Standards Track ones, presenting documents as normative while avoiding the requirements for a higher level of community review and consensus and relationship tracking that would be required, in practice, for Standards Track updates RFC 4460, titled "Stream Control Transmission Protocol (SCTP) Specification Errata and Issues" and RFC 8540, titled "Stream Control Transmission Protocol: Errata and Issues in RFC 4960", were published as Informational documents although their clear intent is to update, or posit alternatives to some of the provisions of, RFcs 2960 and 4960 respectively. This critique suggests that it is undesirable for the IETF to publish documents of that type and form, explains the reasons, and identifies several alternatives.

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This Internet-Draft will expire on December 9, 2019.
1. Introduction

Recent developments strongly suggest that IETF procedures and criteria for accepting and publishing documents, particularly Informational documents that appear to modify Standards Track ones, are in need of review. This document is a critique of those criteria, using two recent published documents as examples of styles and practices that should, in the opinion of the author, not be repeated. It does not alter or update the content of the RFCs mentioned in this document as examples, nor does it address the substantive content of those RFCs. The intention of this document is to encourage the IETF (and any relevant related bodies) to address any issues around using Informational RFCs to demonstrably update Standards track RFCs in a different way in the future.
RFC 4460, titled "Stream Control Transmission Protocol (SCTP) Specification Errata and Issues" [RFC4460] and RFC 8540, titled "Stream Control Transmission Protocol: Errata and Issues in RFC 4960" [RFC8540], were Informational documents although their clear intent was to update RFCs 2960 [RFC2960] and 4960 [RFC4960] respectively or at least to posit alternatives to some of the specifications in those documents in a way that calls them into doubt. This critique suggests that it is undesirable for the IETF to publish documents of that type and form, explains the reasons, and identifies several alternatives.

This document does not alter or update the content of RFCs 2960 or 4960 in any way, nor does it address the substantive content of RFCs 4460 or 8540. While it includes an analysis of the structure, organization, and some of the statements of the latter two (focusing on RFC 8540 as the more recent example), those documents are only particular examples.

2. Identifying Issues with Informational Updates or Reflections on Standards Track Documents

There have been many discussions in the IETF over the years about people who have confused RFCs, including Informational and Experimental ones, with IETF Standards. Other discussions -- which some see as related and others do not -- have focused rather more on how readers, implementers, and others who depend on standards are expected to figure out exactly what documents or portions of documents are normatively part of a given standard (see the discussion of the NEWTRK effort in Section 3). While it would be difficult to characterize the overall community consensus on these points in any simple way, three things are clear. First, no significant changes have been made in this area in the last decade (and probably not in the more than two decades since RFC 2026 [RFC2026] was published). Second, there is little the IETF or RFC Editor can do in terms of procedures or document structure that will prevent any confusion that is caused deliberately by organizations trying to trick others into believing that their non-standards track RFCs (or, for that matter, Internet-Drafts) are actually IETF standards. And finally, that Informational documents that appear to be Standards Track ones or updates to them are almost certainly an invitation to confusion about what, exactly, is the standard.

Using the recently-published RFC 8540 as an example, this section identifies and discusses several of the issues with updates or apparent updates to standards track documents, especially Informational ones. It is worth reiterating that, while RFC 8540 is the example used, there are other RFCs that have been published (as well as future works that might be introduced) that fall into these
areas of concern. Those include, in particular, RFC 4650, mentioned above, which apparently acted as the inspiration and justification for 8540.

2.1. Use of Normative Language

The text of RFC 8540 uses standardized, BCP 14, IETF normative language [RFC2119] [RFC8174] in many places. Although most or all are quotations from suggested text in errata (see below), Section 2 of the RFC specifies use of those terms and their interpretation in the usual normative sense.

Even when explicit terminology conforming to RFC 2119 is not used, the document strongly implies that the changes it suggests are normative and replace text in the earlier document. For example, even the abstract says "It provides deltas to RFC4960", which is consistent with approved updates to that document, not just suggestions in the relevant errata (see Section 2.2 and Section 2.4).

Given the long history of concerns and complaints about confusion of Informational and Experimental documents with standards track ones, use of normative language in RFCs that are not on standards track is almost certainly undesirable. If such use in a particular document cannot be avoided, the use should almost certainly be associated with clear, document-specific, explanations about the status of the document and that terminology, rather than just relying on generic boilerplate that few people read carefully.

2.2. Failure to Explicitly Update Predecessor Documents

The documents in the RFC Series have always been considered to be archival: for historical and other reasons, documents, once issued, may be replaced or updated by other documents but are not, themselves, ever changed (RFC 4844 Section 4.3 [RFC4844]). In some ways, that principle is in conflict with generally recognized good practices for standards documents where it is an advantage to have only one current document describing a standard and for references to that standard to be stable and point to the latest version. There has, so far, been clear consensus in the IETF that the tradeoffs required for an archival series are worth it although there have been various efforts to mitigate the perceived conflicts with alternate numbering overlays such as BCP and STD numbers and the former FYI series.

However, one of the long-standing consequences with the archival policy that RFCs, once issued, are never modified and reissued under the same number is that one cannot look at a document and tell whether it has been replaced or updated by others or not. If one has
access to an RFC index (and thinks to look), "updated by" and "obsoleted by" information is available there or one can search newer documents to see the relationship to earlier ones. However, if an Informational RFC is issued that merely summarizes suggested changes, whether based on errata or not, there are no such metadata threads -- the only way one can start with the original document and find the commentary involves searching for document numbers in titles, a procedure that is notoriously unreliable (in part because such titles have been discouraged in the past). So, whatever the intention was for issuing such a document, it is unlikely to be helpful except to those who find out about the relationship by other means.

2.3. Usability: Organization by Erratum Date and Number

Possibly as a result of wanting to get documents published quickly as Informational ones, some of the documents that are the subject of this critique are inconsistent with the tradition of the RFC Series publishing documents that are comprehensible and useful to the reader.

For example, RFC 8540 is organized in sequential order by errata number, which is equivalent in most or all cases to sequential by date. While that may provide a useful historical record (or not), it makes it nearly impossible to understand from a protocol or implementation perspective unless readers carefully go through all pages (more than ninety in the case of 8540) and make their own notes. The RFC actually identifies the most serious part of that problem in the last paragraph of the introduction (Section 1) which says that the reader "must use care to ensure that a field or item is not updated later on within the document." In some cases, e.g., at the end of Section 3.1.2, partial cross-references appear and mitigate the problem somewhat, but many of the cross-references that could make the document easier to follow are either missing or merely provide a strong hint that the reader must study the entire document.

Similarly, even with the ordering of material as described above, the document could have been made considerably more useful if it had indexes by topic and by section of the base documents (RFC 4960 in the case of 8540). The IESG has asserted in the past that their obligations to the community for documents that they intended to publish in the IETF’s name included requiring that indexes be added when doing so was needed for document clarity or usability. Such indexes were not provided. Unless the IESG has changed its position on its responsibilities and authority, that is, at best, a lost opportunity.
2.4. IETF Consensus and "Verified" Errata

The status boilerplate for RFC 8540 indicates that it "represents the consensus of the IETF community". That is fine, but it is unclear what IETF consensus represents in the case of a document that appears to be normative. If it is just consensus that the document should be published, that should be clear and should be clear in text, not just in boilerplate. Certainly it does not represent consensus that all "verified" errata have been accepted by the IETF community as a correct description of the listed issues and appropriate fixes for them: verification of errata normally involves only authors, WG Chairs (if the document was produced by a still-active WG), and relevant Area Directors.

There is, of course, also the very old question of whether a document that is approved for publication by the IESG with one "yes" vote and the rest of the IESG being on record as having no objection (in several cases, after expressing one or more), abstaining, or not recording a position (see Section 5).

Contrary to the apparent claim in the documents that their contents simply reproduce the verified errata and the changes they specified, the ballot report on the RFC-to-be strongly implies that IESG members felt it was entitled to second-guess that text and suggest other solutions [LC8540-Ballot]. That suggests another difficulty with the approach used in RFC 8540: if the IESG members are correct and the proposals in the errata should be adjusted to reflect the IETF community's best understanding, then the document is no longer an (Informational) errata summary; if the errata contents are preserved, then the document probably does not represent IETF consensus about what should be done.

3. Problem Statement and Alternatives

The discussion above strongly suggests that publishing Informational documents in the RFC Series that appear to update Standards Track ones is not a good idea. The WG suggested in its summary for IETF Last Call for what became RFC 8540 that an errata listing like that provided by RFCs 4460 and 8540 is helpful in producing replacements for the original documents [LC8540-Statement] but there is no evidence that the same purpose could not be served by retaining the same list as an Internet-Draft until the actual replacement document is ready to be published and then either discarding that I-D or, if the WG felt a need to do so, incorporating the errata listing as an appendix in the final document. Keeping the errata summary as an Internet-Draft, rather than publishing it as an RFC would also eliminate some of the questions about consensus discussed in Section 2.4.
In addition to the "just don’t do this" approach that is at least implicitly suggested above, the IETF has considered several other approaches to the problem of Standards Track documents that have accumulated extensive errata or otherwise require minor or major upgrades. One thing all of them seem to have in common is that all of these alternatives involve Standards Track documents, allowing the traditional "updates" and "obsoleted" mechanisms to be used, thereby addressing at least some of the concerns described in Section 2.2. After that, those proposals diverge, at least in part based on the specific view they have of the problem or how much of the problems they have wished to take on.

One recent draft addresses minor (or "non-major") replacements to existing documents [ID.draft-roach-bis-documents], but it has become clear from discussions on the IETF mailing list (and the document itself) that there is disagreement about the circumstances to which it is applicable. At least in its initial draft, Section 4 of that Internet-Draft argues strongly for avoiding incremental updates rather than generating and publishing replacement documents.

A difficulty with any "just replace the earlier document" approach is that the IETF has often found it to be necessary, or at least desirable, to define protocols in several different documents covering different aspects or components of the whole and sometimes updated or extended separately. Producing a complete and comprehensive revision each time would, even if desirable, simply take long enough to be inconsistent with the speed at which the Internet has historically evolved. As those documents are extended or updated in turn and documents are obsoleted without everything that points to them being replaced (or at least clearly identified and their status clarified), there are significant opportunities for confusion about what is, or is not, included in a particular standard that even a "just replace" model would not solve. In the 2003-2006 period, the IETF created a WG, called NEWTRK [NEWTRK-charter] [NEWTRK-WG]. NEWTRK was, among other things, intended to address the question of interrelationships among standards and updates and to provide a framework for documents that -- in the form of Applicability Statements [RFC2026] or otherwise -- would be able to conveniently describe (or at least identify) the component parts of a standard, the relationships among them, implementation status where appropriate, and to do so without being limited by the restrictions associated with, e.g., RFCs with STD numbers. While the WG produced multiple documents that were intended to address those issues and reached rough consensus on at least some of them, the effort never led to actual changes. The reasons for that are probably not worth too much effort or speculation now (well over a decade later) but it may be appropriate to ask questions about whether the time is now right to address the more fundamental issues raised by NEWTRK.
Even without opening up the standards process and document model as NEWTRK proposed, if a summary of issues in a standard (with or without recommendations) is needed before an update or replacement document can be generated, that is an entirely appropriate role for an Applicability Statement.

4. Conclusion

The analysis in this document suggests that Informational documents that are written with the appearance of Standards Track ones, especially when they appear to update one or more Standards Track documents, use language or references that the IETF normally reserves for requirements in standards track documents, and/or creates confusion about assertions of IETF consensus are, at best, undesirable.

As particularly problematic examples, RFCs 4460 and 8540 are written as Informational RFCs whose text strongly suggests that they provide definitive updates to Standards Track documents. That is a bad idea for many reasons of which the most important may be that they have high potential for creating confusion as to what the relevant standard actually is and what features and possible changes actually represent IETF consensus. Their problems are compounded by an organizational style --and the absence of comprehensive indexes or cross-references-- that makes it quite hard to follow them and the recommendations they are making.

The IETF has multiple alternatives to that approach. They include creating the list of errata as an Internet-Draft but publishing only a updating or replacement document in the RFC Series, publishing documents of this type only if they are extensively revised to explain exactly what they are and to eliminate any language that can be construed as either normative or making assertions about IETF consensus on technical issues, publishing one or more Applicability Statements to describe the issue with the original specification, or moving toward standards status documents as envisioned by NEWTRK. All but the last are possible today; any of them would be a better solution than Informational documents with content and structure similar to RFCs 4460 and 8540.

5. Acknowledgements

While the initial working draft of this document was largely underway before the author reviewed the IESG ballot comments on RFC 8540, the ballot comments by Ignas Bagdonas, Ben Campbell, Alissa Cooper, Suresh Krishnan, Terry Manderson, Alexey Melnikov, Eric Rescorla, Alvaro Retana, Adam Roach, and Martin Vigoureux strongly reinforced
the conclusion that this document was necessary and informed some of the text.

Spencer Dawkins and Heather Flanigan made suggestions about an intermediate draft that preceded the first posted version.

6. IANA Considerations

This memo includes no requests to or actions for IANA. However, if a Standards Track document contains specifications for IANA and an Informational one were to appear to update those instructions, that would create ambiguities for IANA as well as the broader community.

7. Security Considerations

While this critique does not address security issues directly, the security of the Internet is almost certainly improved when the IETF does not introduce confusion about the status of its protocols.

8. References

8.1. Normative References


8.2. Informative References

[ID.draft-roach-bis-documents]

[LC8540-Ballot]

[LC8540-Statement]
[NEWTRK-charter]
IETF, "New IETF Standards Track Discussion", 2006,
Retrieved 2019-06-02

[NEWTRK-WG]
IETF, "New IETF Standards Track Discussion (newtrak)",
September 2006,
<https://datatracker.ietf.org/wg/newtrak/about/>.
Retrieved 2019-06-02

[RFC2026]  Bradner, S., "The Internet Standards Process -- Revision 3",
BCP 9, RFC 2026, DOI 10.17487/RFC2026, October 1996,

[RFC2119]  Bradner, S., "Key words for use in RFCs to Indicate
Requirement Levels", BCP 14, RFC 2119,
DOI 10.17487/RFC2119, March 1997,

[RFC2960]  Stewart, R., Xie, Q., Morneault, K., Sharp, C.,
Schwarzbauer, H., Taylor, T., Rytina, I., Kalla, M.,
Zhang, L., and V. Paxson, "Stream Control Transmission
Protocol", RFC 2960, DOI 10.17487/RFC2960, October 2000,

Specification Errata and Issues", RFC 4460,
DOI 10.17487/RFC4460, April 2006,

Series and RFC Editor", RFC 4844, DOI 10.17487/RFC4844,

RFC 4960, DOI 10.17487/RFC4960, September 2007,

[RFC8174]  Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC
2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174,
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