

Network Working Group
Internet Draft
Document: [draft-black-newtrk-proposals-00.txt](#)
Expires: November 2004

D. Black
EMC Corporation
B. Carpenter
IBM
May 2004

Proposals for a New IETF Standards Track

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Abstract

Discussions in the IETF's "problem" working group reached consensus that the current IETF 3-stage standards track, as implemented, is not working. This draft proposes various alternative multi-step standards tracks for debate in the "newtrk" working group.

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1. Introduction

By way of preamble, note that this is a discussion document and not a firm or fully worked out proposal. Once the "newtrk" working group reaches consensus on the general direction to follow, this document will have served its purpose and a revision or update of [[RFC2026](#)] will be needed.

The consensus in the "problem" working group was that the current IETF three stage standards track, described in [RFC 2026](#) [[RFC2026](#)] and summarized below in Appendix 1, is not working as originally intended. The problem statement document [[RFC3774](#)] says:

The current hierarchy of Proposed, Draft, and Full Standard maturity levels for specifications is no longer being used in the way that was envisioned when the stratification was originally proposed. In practice, the IETF currently has a one-step standards process that subverts the IETF's preference for demonstrating effectiveness through running code in multiple interoperable implementations. This compresses the process that previously allowed specifications to mature as experience was gained with actual implementations:

The document then goes on to list various observations including:

- 1/ Few documents actually progress after being published as Proposed Standard (PS).
- 2/ There is a perception that the IESG raised the quality requirement for approval as PS beyond the intention of [[RFC2026](#)].
- 3/ In spite of the raised quality requirement, running code is not required to achieve PS status.
- 4/ There seems to be a reinforcing feedback loop involved: vendors implement and deploy PS specifications, so increasingly the IESG tries to make the PS documents better.

[RFC3774] concludes that the three-stage process is excessive.

An alternative interpretation of these observations is that a three-step standards process still operates, but the existing standards levels have been shifted upwards so that PS is no longer the initial step. Vendors will often implement, and their customers deploy, technology based on Internet Drafts as soon as they seem to be stable. Thus, Internet Drafts have, in effect, replaced PS as the first stage of the IETF standards process, PS has become the second stage, and Draft Standard (DS) the hard-to-achieve third stage.

But there are significant problems with using Internet Drafts as standards documents. Most importantly, Internet Drafts are not stable, and their actual degree of instability varies widely. Internet Drafts have short lifetimes with most of them being replaced by new versions or expiring within a few months. If a vendor decides to implement from an Internet Draft they have to be sure that they are implementing the same version of the Internet Draft as other vendors with whom they want to interoperate. Many examples show that this is far from being the normal case. Also, of course, Internet Drafts tend to have bugs and gaps by their very nature.

Objectively, over time, the IESG has raised the bar for the publication of Proposed Standard documents. The current level of review, except for not having a requirement for interoperable implementations, is close to what is described for Draft Standard in [RFC2026]. Thus PS has, in effect, replaced DS as the second stage in the IETF standards process, with the first stage being an ill-defined choice of Internet Draft. So few specifications are now advanced to final Internet Standard status that this stage has been, in practice, removed. Few specifications are promoted to the level requiring interoperability (Draft Standard) and any revision of the IETF standards process should try to correct that.

[2.](#) Some Proposals for New Standards Tracks

This section gives a short summary of a number of possible proposals to resolve the above issues by tuning or changing the standards track process. More suggestions are welcome. The following section discusses pros and cons.

[2.1](#) No More Mr. Nice Guy - make the current system work

This proposal would confirm the intention of [RFC2026] and implement strict operational procedures to make it work. This would mean:

- * reducing the strictness of IESG review for PS to a defined minimum,
- * enforcing the two year "dwell time" at PS by automatically demoting PS documents to Historic if no interoperability evidence is offered after two years or unless active work on a

- revised specification is under way, and
- * introducing a similar "dwell time" for DS to be considered for Internet Standard status or die (back to PS for another two years?).

The dwell time could be adjusted from its current value of two years.

[2.2](#) Prune

The number of standards levels is pruned to two (we could call them Proposed Standard and Internet Standard). The threshold for PS would be roughly as today (stricter than in [\[RFC2026\]](#) but not requiring proof of interoperability). The threshold for IS would be a minimum period at PS, plus evidence of interoperability and reasonable deployment experience.

This could be combined with some form of Snapshot ([Section 2.5](#)) to provide an initial level with better stability than an arbitrary Internet-Draft.

Specific proposals can be found in Appendix 2 (with Snapshot) and [\[TSS\]](#) (without Snapshot, but the [\[WGS\]](#) Snapshot proposal is intended to be complementary to [\[TSS\]](#)).

[2.3](#) Slash and Burn

The number of levels is reduced to one, called Internet Standard. The threshold would be roughly the same as for Proposed Standard today (roughly what is described in [\[RFC2026\]](#) for Draft Standard, but *without* the interoperability requirement).

In addition, a separate "Interoperability and Deployment Register" would be maintained by the IETF Secretariat. This would be a public record of demonstrated interoperability and deployment experience. Either the IESG, or better perhaps a special IETF Interoperability Committee, would approve the publication of such a record. An Internet Standard would get a gold star when it had such a public record.

This could be combined with some form of Snapshot ([Section 2.5](#)) to provide an initial level with better stability than an arbitrary Internet-Draft.

[2.4](#) Placeholder for another idea ...

[2.5](#) Snapshot

It seems inevitable that there will be a noticeable time lag from when a working group believes that a specification is done until it gets finally published, whatever changes are made to the standards

track. Mechanically, the processes of IETF Last Call, IESG review, IANA action if needed, and RFC Editor action will take time, even if no issues are found that need to be referred back to the WG. During this wait, early implementers need to know which version of the document to work from. Also, WGs may reach intermediate stages in developing a complex specification when it is useful for all trial implementations to be using the same version. For these two reasons, a snapshot mechanism has been suggested, in at least two variants:

- a) Working Group Snapshot. In this model WGs are authorized to declare (by WG rough consensus) that a particular draft is a WG Snapshot. No IESG or even Area Director approval would be required – this would be a simple statement to the world that the WG has declared a snapshot, along with a statement of the purpose for which the snapshot was declared. As far as implementers are concerned, 'caveat emptor' applies. The only procedural issue is that an Internet Draft that has been declared a WG Snapshot could get a life extension beyond the normal six months, even if a later version number is published. A specific proposal is in [\[WGS\]](#).
- b) IETF Stable Snapshot. Similar, but AD or IESG approval is required. A lightweight cross-area technical review (lighter than [\[RFC2026\]](#) intended even for PS) would be made. A specific proposal is in Appendix 2.

There are a variety of options in the possible level (depth and cross-area breadth) of technical review that could be part of declaring a Snapshot; the required level could vary based on the stated purpose of the snapshot.

None of the current Snapshot proposals contain new measures for retiring snapshots. It is unclear whether allowing Snapshots to expire (as Internet Drafts do) is an effective impetus for implementers to move on to a subsequent stable version (which may contain significant technical improvements). Higher levels of approval (e.g., IESG) for a Snapshot may make this more difficult to accomplish.

[3.](#) Discussion of Pros and Cons

This section will be filled in after initial discussion on the working group mailing list.

[4.](#) Security Considerations

This document relates to IETF process, not any particular technology, thus it raises no particular security concerns.

[5.](#) Acknowledgements

Substantial text was taken directly from an earlier draft by Scott

Bradner. Ideas were lifted from mailing list discussions. Comments and contributions were made by <your name could be here>.

6. Appendix 1: Summary of Current IETF Standards Track

[Section 4.1 \[RFC2026\]](#) defines the stages on the IETF standards track as follows:

4.1 Standards Track Maturity Levels

Internet specifications go through stages of development, testing, and acceptance. Within the Internet Standards Process, these stages are formally labeled "maturity levels".

This section describes the maturity levels and the expected characteristics of specifications at each level.

4.1.1 Proposed Standard

The entry-level maturity for the standards track is "Proposed Standard". A specific action by the IESG is required to move a specification onto the standards track at the "Proposed Standard" level.

A Proposed Standard specification is generally stable, has resolved known design choices, is believed to be well-understood, has received significant community review, and appears to enjoy enough community interest to be considered valuable. However, further experience might result in a change or even retraction of the specification before it advances.

Usually, neither implementation nor operational experience is required for the designation of a specification as a Proposed Standard. However, such experience is highly desirable, and will usually represent a strong argument in favor of a Proposed Standard designation.

The IESG may require implementation and/or operational experience prior to granting Proposed Standard status to a specification that materially affects the core Internet protocols or that specifies behavior that may have significant operational impact on the Internet.

A Proposed Standard should have no known technical omissions with respect to the requirements placed upon it. However, the IESG may waive this requirement in order to allow a specification to advance to the Proposed Standard state when it is considered to be useful and necessary (and timely) even with known technical omissions.

Implementors should treat Proposed Standards as immature specifications. It is desirable to implement them in order to gain experience and to validate, test, and clarify the specification. However, since the content of Proposed Standards may be changed if problems are found or better solutions are identified, deploying implementations of such standards into a disruption-sensitive environment is not recommended.

4.1.2 Draft Standard

A specification from which at least two independent and interoperable implementations from different code bases have been developed, and for which sufficient successful operational experience has been obtained, may be elevated to the "Draft Standard" level. For the purposes of this section "interoperable" means to be functionally equivalent or interchangeable components of the system or process in which they are used. If patented or otherwise controlled technology is required for implementation, the separate implementations must also have resulted from separate exercise of the licensing process. Elevation to Draft Standard is a major advance in status, indicating a strong belief that the specification is mature and will be useful.

The requirement for at least two independent and interoperable implementations applies to all of the options and features of the specification. In cases in which one or more options or features have not been demonstrated in at least two interoperable implementations, the specification may advance to the Draft Standard level only if those options or features are removed.

The Working Group chair is responsible for documenting the specific implementations which qualify the specification for Draft or Internet Standard status along with documentation about testing of the interoperation of these implementations. The documentation must include information about the support of each of the individual options and features. This documentation should be submitted to the Area Director with the protocol action request.

A Draft Standard must be well-understood and known to be quite stable, both in its semantics and as a basis for developing an implementation. A Draft Standard may still require additional or more widespread field experience, since it is possible for implementations based on Draft Standard specifications to demonstrate unforeseen behavior when subjected to large-scale use in production environments.

A Draft Standard is normally considered to be a final specification, and changes are likely to be made only to solve specific problems encountered. In most circumstances, it is reasonable for vendors to deploy implementations of Draft

Standards into a disruption sensitive environment.

4.1.3 Internet Standard

A specification for which significant implementation and successful operational experience has been obtained may be elevated to the Internet Standard level. An Internet Standard (which may simply be referred to as a Standard) is characterized by a high degree of technical maturity and by a generally held belief that the specified protocol or service provides significant benefit to the Internet community.

A specification that reaches the status of Standard is assigned a number in the STD series while retaining its RFC number.

7. Appendix 2: Specific example of "Prune"

Scott Bradner originally proposed this alternate IETF standards track with a new stage inserted before Proposed Standard, combining Draft Standard and Internet Standard and retaining Proposed Standard as it has evolved over the years.

Part of the problem we have been seeing with getting timely publication of IETF specifications is that once people start implementing the technology it often seems counterproductive to dedicate effort to finishing off the documents. If implementations of Internet Drafts achieve success in the marketplace, as they did with MPLS, it may seem that it is not worth spending time tweaking successive generations of Internet Drafts in order to get something the IESG is willing to publish as a Proposed Standard then, if that achieves widespread success in the market, fiddle with the document again and do the bookkeeping needed to get it published as a Draft Standard. The prerequisites for getting something published as an Internet Standard seem to many people to be fuzzy at best. In addition, the current standards track steps did not do much to encourage early implementations, which are the best way to check to see that a specification is clear enough for implementers to use. This alternate set of stages tries to encourage vendors to implement specifications and the comments with the descriptions of each stage attempt to provide guidance for the IESG in implementing reviews for each stage.

[RFC 2026](#) would have to be revised in order to put any change of this type into effect. That could be done by replacing [RFC 2026](#) itself with a whole new document or by writing a short document that updates the standards track part of [RFC 2026](#).

7.1 Alternate Standards Track Maturity Levels

Internet specifications go through stages of development, testing, and acceptance. Within the Internet Standards Process, these stages are formally labeled "maturity levels".

This section describes a set of alternate maturity levels and the expected characteristics of specifications at each level.

7.2 Stable Snapshot

The entry-level maturity for the standards track is "Stable Snapshot". A specific action by the IESG is required to move a specification onto the standards track at the "Stable Snapshot" level.

A Stable Snapshot specification is generally stable, has resolved known design choices, is believed to be well-understood, has received significant community review, and appears to enjoy enough community interest to be considered valuable. However, further experience might result in a change or even retraction of the specification before it advances.

A Stable Snapshot should have no unknown technical omissions with respect to the requirements placed upon it. Any such omissions must be noted in the document. No such omission can endanger the security or stability of the Internet or of networks where the technology might be used.

Implementers should treat Stable Snapshots as immature, pre-standard, specifications. It is desirable to implement them in order to gain experience and to validate, test, and clarify the specification. However, since the content of Stable Snapshots will be changed if problems are found or better solutions are identified, and will be changed as the technology is finalized, deploying implementations of such technologies into a disruption-sensitive environment is not recommended.

Commentary:

This stage is designed to institutionalize and encourage the current practice of vendors implementing from Internet Drafts while providing a way that a working group can indicate that they feel that a technology is stable enough to be so implemented and to provide a long-lived, unlike Internet Drafts, snapshot that the vendors can implement. Having vendors implement technology is an important quality check and meets the "running code" requirement of our motto. We want to encourage implementations whenever we can but this does need to be balanced with some level of maturity and stability of the protocol.

This is almost the same definition as [RFC 2026](#) has for Proposed Standard. The major difference is that some of the technical

requirements might not have yet been met. This is OK as long as any such holes in the specification are carefully noted in the document, except that there needs to be a complete enough security component so as to not endanger the networks where the technology is to be used, and that the technology not endanger the wellbeing of the network it will be run on. The exact guidelines for the level of security required for a Stable Snapshot will evolve over time.

In reviewing an Internet Draft for publication as a Stable Snapshot the IESG only needs to be sure that the working group has a reason to think that the technology is at a mature enough level that implementers can start to play with it and that the minimum security and 'health of the net' requirements have been met. The IESG should not try to ensure that the text is clear and unambiguous, the vendors will find that out while implementing and provide feedback to the working group. The IESG should not do a careful technology review as a precondition for publication as a Stable Snapshot. This process should be lightweight, not taking too much time on the part of the IESG or effort on the part of the working group and authors.

The name, "Stable Snapshot" was chosen to clearly indicate that this is a pre-standard stage and to ensure that marketing people cannot easily misrepresent the status but there may be a better name that accomplishes the same goals.

[7.3](#) Proposed Standard

A Proposed Standard specification is generally stable, has resolved known design choices, is believed to be well-understood, has received significant community review, and appears to enjoy enough community interest to be considered valuable.

Usually, neither implementation nor operational experience is required for the designation of a specification as a Proposed Standard. However, such experience is highly desirable, and will usually represent a strong argument in favor of a Proposed Standard designation.

Generally some documented level of implementation and/or operational experience is required prior to granting Proposed Standard status. However, the IESG may waive this requirement in order to allow a specification to advance to the Proposed Standard state when it is considered to be useful and necessary (and timely) even without any known implementations.

A Proposed Standard should have no known technical omissions with respect to the requirements placed upon it.

Implementers should treat Proposed Standards as stable, but perhaps not final, specifications. A Proposed Standard must be well-understood and known to be quite stable, both in its semantics and as a basis for developing an implementation. A Proposed Standard may still require additional or more widespread field experience, since it is possible for implementations based on Proposed Standard specifications to demonstrate unforeseen behavior when subjected to large-scale use in production environments.

Commentary:

The requirements for publication as a Proposed Standard are mostly the same as currently in [RFC 2026](#) for Proposed Standard with the addition of a requirement for at least some implementation experience.

The IESG review for Proposed Standard could stay just like it is. The IESG should do the same careful technical review and a review to ensure that the language of the document is clear and precise as it has been doing for quite a while.

Because most specifications for which publication as a Proposed Standard is requested will have been implemented I would expect that the IESG review will generally take less effort since the implementers experience will have uncovered unclear language and some or all technical issues, at least for the parts of the specification that had been implemented.

There should be some documentation to show that there has been at least one implementation of a specification before the IESG authorizes the publication of the specification as a Proposed Standard. But the documentation does not need to be so detailed that it shows which individual options have been implemented. A list of the names of people or companies who have said they had implemented the specification should be sufficient.

Before adoption of a new description of Proposed Standard the IPR-related aspects should be revisited in list of the work in the IPR working group but I have not done that here.

[7.4](#) Internet Standard

A specification from which at least two independent and interoperable implementations from different code bases have been developed, and for which sufficient successful operational experience has been obtained, may be elevated to the "Internet Standard" level. For the purposes of this section, "interoperable" means to be functionally equivalent or interchangeable components of the system or process in which they are used. If patented or otherwise controlled technology is required for implementation, the separate implementations must

also have resulted from separate exercise of the licensing process. Elevation to Internet Standard is a major advance in status, indicating a strong belief that the specification is mature and will be useful.

The requirement for at least two independent and interoperable implementations applies to all of the options and features of the specification. In cases in which one or more options or features have not been demonstrated in at least two interoperable implementations, the specification may advance to the Internet Standard level only if those options or features are removed.

The Working Group chair is responsible for documenting the specific implementations which qualify the specification for Draft or Internet Standard status along with documentation about testing of the interoperation of these implementations. The documentation must include information about the support of each of the individual options and features. This documentation should be submitted to the Area Director with the protocol action request.

A Internet Standard (which may simply be referred to as a Standard) must be well-understood and known to be stable, both in its semantics and as a basis for developing an implementation. An Internet Standard is characterized by a high degree of technical maturity and by a generally held belief that the specified protocol or service provides significant benefit to the Internet community.

An Internet Standard is considered to be a final specification, and changes should only be made to solve specific problems encountered.

Commentary:

The description here is a combination of the descriptions of Draft Standard and Internet Standard in [RFC 2026](#).

One issue we have had over the years is just what does a working group chair have to do to show multiple implementations of the base specification and all of the features. I have always felt that a simple spread sheet showing each feature, how many vendors claim to have the feature, and a checkbox to indicate that two or more vendors claim that they have tested implementations of the feature, would be just fine. But this turns out to be quite complex in some cases (see the Implementer's report for http 1.1 as an example). It is not clear if this turns out to be actually too much of an effort or just seems like too much of an effort. It still seems like about the right thing but the barrier to reach Internet Standard should be just as high as it needs to be but no higher.

Since, in reality, there was little difference between the requirements in [RFC 2026](#) for Draft Standard and Internet Standard, mostly a need to show market acceptance in some way, there seems to be no technical reason to preserve the different labels.

[7.5](#) Minimum time in each stage.

It seems that there needs to be a minimum time that a document must sit at a stage before it can move onward (as is the case in [RFC 2026](#)) just to be sure that any problems are uncovered.

It is unclear how to figure out the ideal time so it is suggested that 6 months would be enough (as long as the rest of the requirements for the next level have been met).

[8.](#) Informative References

[RFC2026] Bradner, S. Ed., "The Internet Standards Process -- Revision 3," October 1996, [RFC 2026](#)

[RFC3774] Davies, E. Ed., "IETF Problem Statement," May 2004, [RFC 3774](#)

[TSS] Dawkins, S., et. al., "Two Stage Standardization," work in progress, [draft-dawkins-pstmt-twostage-02.txt](#)

[WGS] Dawkins, S., et al, "Working Group Snapshot (WGS)," work in progress, [draft-dawkins-newtrk-wgs-00.txt](#)

[9.](#) Authors' Addresses

David Black
EMC Corporation
176 South Street
Hopkinton, MA 01748
Email: black_david@emc.com

Brian E. Carpenter
IBM Zurich Research Laboratory
Saeumerstrasse 4 / Postfach
8803 Rueschlikon
Switzerland
Email: brc@zurich.ibm.com

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Acknowledgment

Funding for the RFC Editor function is currently provided by the Internet Society.