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Change Process for the Session Initiation Protocol (SIP) and the Real-time Applications and Infrastructure Area

Abstract

This memo documents a process intended to organize the future development of the Session Initiation Protocol (SIP) and related work in the Real-time Applications and Infrastructure (RAI) Area. As the environments in which SIP is deployed grow more numerous and diverse, modifying or extending SIP in certain ways may threaten the interoperability and security of the protocol; however, the IETF process must also cater to the realities of existing deployments and serve the needs of the implementers working with SIP. This document therefore defines the functions of two long-lived working groups in the RAI Area that are, respectively, responsible for the maintenance of the core SIP specifications and the development of new efforts to extend and apply work in this space. This document obsoletes RFC 3427.

Status of This Memo

This memo documents an Internet Best Current Practice.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on BCPs is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at <http://www.rfc-editor.org/info/rfc5727>.

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1. History and Development

The Session Initiation Protocol (SIP) [RFC3261] has grown well beyond its origins in Internet-based multimedia sessions and now enjoys widespread popularity in Voice-over-IP or IP telephony applications, both inside IETF and within other standards groups. One result of this popularity has been a continual flood of proposals for SIP modifications and extensions. The challenge for IETF management of SIP has been to preserve baseline interoperability across its many implementations

In order to defend SIP against changes that might reduce interoperability, the working group chairs and Area Directors responsible for its management authored the SIP change process [RFC3427]. That document defined the role of the SIP and SIPING Working Groups (WGs) in shepherding ongoing work on the SIP standard. It also defined ways that external working groups or bodies can define extensions intended for limited usage, especially through the "P-" header field mechanism.

Over time, however, the management structure of RFC 3427 has demonstrated some limitations. The first and most significant of these concerns "P-" header fields. While "P-" header fields require expert review and IESG shepherding, in practice IETF oversight of these header fields is quite limited, and the value added by the IETF supervising their development remains unclear. More importantly, the presence of a "P-" in front of a header field name does nothing to prevent a popular header field from seeing deployment outside of the original "limited usage" it envisioned; a prominent example of this today is the P-Asserted-Identity (PAID) header field, described in RFC3325 [RFC3325].

Consequently, this document obsoletes RFC 3427 and describes a new structure for the management of deliverables in the Real-time Applications and Infrastructure Area.

1.1. The IETF SIPCORE Working Group

Historically, the IETF SIP Working Group (sip) was chartered to be the "owner" of the SIP protocol [RFC3261] for the duration of the working group. All changes or extensions to SIP were first required to exist as SIP Working Group documents. The SIP Working Group was charged with being the guardian of the SIP protocol for the Internet, and therefore was mandated only to extend or change the SIP protocol when there were compelling reasons to do so.

The SIPCORE Working Group replaces the function of the SIP Working Group in the original [RFC3427] account. Documents that must be handled by the SIPCORE Working Group include all documents that update or obsolete RFCs 3261 through 3265 or their successors. All SIP extensions considered in SIPCORE must be Standards Track. They may be based upon requirements developed externally in other IETF working groups.

Typical IETF working groups do not live forever; however, SIPCORE's charter is open-ended in order to allow it to remain the place where core SIP development will continue. In the event that the SIPCORE Working Group has closed and no suitable replacement or follow-on working group is active (and this specification also has not been superseded), then when modifications to the core SIP protocol are proposed, the RAI Area Directors will use the non-working-group Standards Track document process (described in Section 6.1.2 of RFC 2026 [RFC2026]) using the SIPCORE mailing list and Designated Experts from the SIP community for review.

It is appropriate for any IETF working group to develop SIP event packages [RFC3265], but the working group must have charter approval to do so. The IETF will also require [RFC5226] IETF Review for the registration of event packages developed outside the scope of an IETF working group. Instructions for event package registrations are provided in Section 4.1.

1.2. The IETF DISPATCH Working Group

Historically, the IETF Session Initiation Protocol Proposal Investigation (sipping) Working Group was chartered to be a filter in front of the SIP Working Group. This working group investigated requirements for applications of SIP, some of which led to requests for extensions to SIP. These requirements may come from the community at large or from individuals who are reporting the requirements as determined by another standards body.

The DISPATCH Working Group replaces the function of the SIPPING WG, although with several important changes to its functionality -- the most notable being that its scope expands beyond just SIP to the entire work of the RAI Area. Like SIPPING, DISPATCH considers new proposals for work in the RAI Area, but rather than taking on specification deliverables as charter items itself, DISPATCH identifies the proper venue for work. If no such venue yet exists in the RAI Area, DISPATCH will develop charters and consensus for a BoF, working group, or exploratory group [RFC5111] as appropriate. Unlike the previous change structure, a DISPATCH review of any proposed change to core SIP is not required before it progresses to SIPCORE;

however, any new proposed work that does not clearly fall within the charter of an existing RAI Area effort should be examined by DISPATCH.

In reaction to a proposal, the DISPATCH Working Group may determine that:

1. these requirements justify a change to the core SIP specifications (RFCs 3261 through 3265) and thus any resulting work must transpire in SIPCORE;
2. these requirements do not change the SIP core specifications but require a new effort in the RAI Area (be that a working group, a BoF, or what have you);
3. these requirements fall within the scope of existing chartered work in the RAI Area; or
4. the proposal should not be acted upon at this time.

Because the SIP protocol gets so much attention, some application designers may want to use it just because it is there, such as for controlling household appliances. DISPATCH should act as a filter, accepting only proposals that play to the strengths of SIP, not those that confuse its applicability or ultimately reduce its usefulness as a means for immediate personal communications on the Internet.

In practice, it is expected that the DISPATCH WG behaves as a RAI "Open Area" working group, similar to those employed in other areas of the IETF. While it does not have the traditional deliverables of a working group, DISPATCH may, at the discretion of its chairs and Area Directors, adopt milestones in accordance with standard working group milestone-adoption procedures, such as the production of charter text for a BoF or working group, a "-00" problem statement document that explicates a proposed work effort, or a document explaining why a particular direction for standards development was not pursued.

2. Terminology

In this document, the key words "MAY", "MUST", "MUST NOT", "SHOULD", and "SHOULD NOT", are to be interpreted as described in [RFC2119]. This document additionally uses [RFC5226] language to describe IANA registrations.

3. Introducing New Work to RAI

As with any new work in the IETF, proposals are best formulated in individual Internet-Drafts. New ideas arising within the chartered scope of a RAI Area working group naturally should be treated as candidates for adoption as a working group item there. Experience has demonstrated that authoring a problem statement or set of initial requirements prior to (or at least separately from) submitting a protocol mechanism speeds the consensus-making process significantly. A problem statement should explain what problem needs to be solved, why existing mechanisms are insufficient, and, for proposals to modify SIP, why SIP is the appropriate solution for this problem. A problem statement must also detail any security issues that may result from meeting these requirements. When proposed new work does not fall within the bounds of existing RAI Area working group charters, the DISPATCH Working Group assists the authors of proposals, the RAI Area Directors and the RAI community to decide the best way to approach the problem. Authors of proposals may submit their problem statements to the DISPATCH Working Group for community consideration and review.

The DISPATCH Working Group chairs, in conjunction with the RAI Area Directors, will determine if the particular problems raised in the requirements problem statement are indeed outside the charter of existing efforts and, if so, if they warrant a DISPATCH milestone for the definition of a new effort; this DISPATCH deliverable may take the form of a problem statement Internet-Draft, charter, or similar milestone that provides enough information to make a decision, but must not include protocol development. The DISPATCH Working Group should consider whether the requirements can be merged with other requirements from other applications, and refine the problem statement accordingly.

Once a new effort has been defined in DISPATCH and there is working group consensus that it should go forward, if the new effort will take the form of a working group or BoF, then the ADs will present the proposed new effort charter to the IESG and IAB, in accordance with the usual chartering process. If the new effort involves the rechartering of an existing working group, then similarly the existing working group rechartering functions will be performed by the appropriate WG chairs and ADs. If the IESG (with IAB advice) approves of the new charter or BoF, the DISPATCH Working Group has completed its deliverable and the new effort becomes autonomous.

Anyone proposing requirements for new work is welcome to jointly develop, in a separate Internet-Draft, a mechanism that would meet the requirements. No working group is required to adopt the proposed solution from this additional Internet-Draft.

Work overseen by the SIPCORE Working Group is required to protect the architectural integrity of SIP and must not add features that do not have general use beyond the specific case. Also, SIPCORE must not add features just to make a particular function more efficient at the expense of simplicity or robustness.

The DISPATCH process is not the sole place that requirements for new work are considered in the RAI Area. For example, some working groups generate requirements for SIP solutions and/or extensions. At the time this document was written, groups with such chartered deliverables include SIP for Instant Messaging and Presence Leveraging Extensions (simple), Basic Level of Interoperability for SIP Services (bliss) and Session Peering for Multimedia Interconnect (speermint). The work of these and similar groups is not affected by the DISPATCH process.

Of course, the RAI Area Directors may accept charter revisions from existing working groups that add new milestones or scope to their charters at their discretion, in the standard IETF manner, without any actions on the part of the DISPATCH Working Group. DISPATCH exists to assist new work in finding a home expeditiously in those cases where it does not naturally fall into an existing bucket.

4. Extensibility and Architecture

In an idealized protocol model, extensible design would be self-contained, and it would be inherent that new extensions and new header fields would naturally have an architectural coherence with the original protocol.

However, this idealized vision has not been attained in the world of Standards Track protocols. While interoperability implications can be addressed by capabilities negotiation rules, the effects of adding features that overlap, or that deal with a point solution and are not general, are much harder to control with rules. Therefore, the RAI Area calls for architectural guardianship and application of Occam's Razor by the SIPCORE and DISPATCH Working Groups.

In keeping with the IETF tradition of "running code and rough consensus", it is valid to allow for the development of SIP extensions that are either not ready for Standards Track, but might be understood for that role after some running code or are private or proprietary in nature because a characteristic motivating them is usage that is known not to fit the Internet architecture for SIP. In the past, header fields associated with those extensions were called "P-" header fields for "preliminary", "private", or "proprietary".

However, the "P-" header field process has not served the purpose for which it was designed -- namely, to restrict to closed environments the usage of mechanisms the IETF would not (yet) endorse for general usage. In fact, some "P-" header fields have enjoyed widespread implementation; because of the "P-" prefix, however, there seems to be no plausible migration path to designate these as general-usage header fields without trying to force implausible changes on large installed bases.

Accordingly, this specification deprecates the previous [RFC3427] guidance on the creation of "P-" header fields. Existing "P-" header fields are to be handled by user agents and proxy servers as the "P-" header field specifications describe; the deprecation of the change process mechanism entails no change in protocol behavior. New proposals to document SIP header fields of an experimental or private nature, however, shall not use the "P-" prefix (unless existing deployments or standards use the prefix already, in which case they may be admitted as grandfathered cases at the discretion of the Designated Expert).

Instead, the registration of SIP header fields in Informational RFCs, or in documents outside the IETF, is now permitted under the Designated Expert (per [RFC5226]) criteria. The future use of any header field name prefix ("P-" or "X-" or what have you) to designate SIP header fields of limited applicability is discouraged. Experts are advised to review documents for overlap with existing chartered work in the RAI Area, and are furthermore instructed to ensure the following two criteria are met:

1. The proposed header field MUST be of a purely informational nature and MUST NOT significantly change the behavior of SIP entities that support it. Header fields that merely provide additional information pertinent to a request or a response are acceptable; these header fields are thus expected to have few, if any, implications for interoperability and backwards compatibility. Similarly, header fields that provide data consumed by applications at the ends of SIP's rendezvous function, rather than changing the behavior of the rendezvous function, are likely to be providing information in this sense. If the header fields redefine or contradict normative behavior defined in Standards Track SIP specifications, that is what is meant by significantly different behavior. Ultimately, the significance of differences in behavior is a judgment call that must be made by the expert reviewer.
2. The proposed header field MUST NOT undermine SIP security in any sense. The Internet-Draft proposing the new header field MUST address security issues in detail, as if it were a Standards

Track document. Note that, if the intended application scenario makes certain assumptions regarding security, the security considerations only need to meet the intended application scenario rather than the general Internet case. In any case, security issues need to be discussed for arbitrary usage scenarios (including the general Internet case).

Note that the deprecation of the "P-" header field process does not alter processes for the registration of SIP methods, URI parameters, response codes, or option tags.

4.1. SIP Event Packages

SIP events [RFC3265] defines two different types of event packages: normal event packages and event template-packages. Event template-packages can only be created and registered by the publication of a Standards Track RFC (from an IETF Working Group). Note that the guidance in [RFC3265] states that the IANA registration policy for normal event packages is "First Come First Serve"; this document replaces that policy with the following:

Individuals may wish to publish SIP Event packages that they believe fall outside the scope of any chartered work currently in RAI. Individual proposals for registration of a SIP event package MUST first be published as Internet-Drafts for review by the DISPATCH Working Group, or the working group, mailing list, or expert designated by the RAI Area Directors if the DISPATCH Working Group has closed. Proposals should include a strong motivational section, a thorough description of the proposed syntax and semantics, event package considerations, security considerations, and examples of usage. Authors should submit their proposals as individual Internet-Drafts and post an announcement to the working group mailing list to begin discussion. The DISPATCH Working Group will determine if a proposed package is

- a) an appropriate usage of SIP that should be spun into a new effort,
- b) applicable to SIP but not sufficiently interesting, general, or in-scope to adopt as a working group effort,
- c) contrary to similar work chartered in an existing effort, or
- d) recommended to be adopted as or merged with chartered work elsewhere in RAI.

"RFC Required" in conjunction with "Designated Expert" (both as defined in RFC 5226) is the procedure for registration of event packages developed outside the scope of an IETF working group, according to the following guidelines:

1. A Designated Expert (as defined in RFC 5226) must review the proposal for applicability to SIP and conformance with these guidelines. The Designated Expert will send email to the IESG on this determination. The expert reviewer can cite one or more of the guidelines that have not been followed in his/her opinion.
2. The proposed extension **MUST NOT** define an event template-package.
3. The function of the proposed package **MUST NOT** overlap with current or planned chartered packages.
4. The event package **MUST NOT** redefine or contradict the normative behavior of SIP events [RFC3265], SIP [RFC3261], or related Standards Track extensions. (See Section 4.)
5. The proposed package **MUST NOT** undermine SIP security in any sense. The Internet-Draft proposing the new package **MUST** address security issues in detail as if it were a Standards Track document. Security issues need to be discussed for arbitrary usage scenarios (including the general Internet case).
6. The proposed package **MUST** be clearly documented in an (Individual) Informational RFC and registered with IANA. The package **MUST** document all the package considerations required in Section 4 of SIP events [RFC3265].
7. If determined by the Designated Expert or the chairs or ADs of the DISPATCH WG, an applicability statement in the Informational RFC **MUST** clearly document the useful scope of the proposal, and explain its limitations and why it is not suitable for the general use of SIP in the Internet.

5. Summary

1. Documents that update or obsolete RFCs 3261 through 3265 must advance through the SIPCORE WG.
2. Standard SIP extensions that do not update RFCs 3261 through 3265, including event packages, may advance through chartered activity in any RAI Area WG or (with the agreement of the RAI ADs) any IETF working group that constitutes an appropriate venue.

3. Documents that specify Informational header fields pass through an Expert Review system.

6. Security Considerations

Complex, indeterminate, and hard-to-define protocol behavior, depending on the interaction of many optional extensions, is a fine breeding ground for security flaws.

All Internet-Drafts that present new requirements for SIP must include a discussion of the security requirements and implications inherent in the proposal. All RFCs that modify or extend SIP must show that they have adequate security, must consider the security implications of feature interactions, and most of all must not worsen SIP's existing security considerations.

7. IANA Considerations

RFC 3261 directs the Internet Assigned Numbers Authority (IANA) to establish a registry for SIP method names, a registry for SIP option tags, and a registry for SIP response codes, and to amend the practices used for the existing registry for SIP header fields. Reiterating the guidance of RFC 3261, method names, option tags, and SIP response codes require a Standards Action for inclusion in the IANA registry. Authors of specifications should also be aware that the SIP parameter registry is further elaborated in [RFC3968].

Previously in RFC 3427, all new SIP header field registrations required a Standards Action (per RFC 5226) with the exception of "P-" header fields; now, Informational registration of non-"P-" header fields is permitted if approved by a Designated Expert, as described in Section 4.

Each RFC shall include an IANA Considerations section that directs IANA to create appropriate registrations. Registration shall be done at the time the IESG announces its approval of the draft containing the registration requests.

Standard header fields and messages **MUST NOT** begin with the leading characters "P-". Existing "P-" header field registrations are considered grandfathered, but new registrations of Informational header fields should not begin with the leading characters "P-" (unless the "P-" would preserve compatibility with a pre-existing, unregistered usage of the header field, at the discretion the Designated Expert). Short forms of header fields **MUST** only be assigned to Standards Track header fields.

Similarly, [RFC3265] directs the IANA to establish a registry for SIP event packages and SIP event template-packages. For event template-packages, registrations must follow the [RFC5226] processes for Standards Action within an IETF working group. For normal event packages, as stated previously, registrations minimally require [RFC5226] "RFC Required" with "Designated Expert". In either case, the IESG announcement of RFC approval authorizes IANA to make the registration.

7.1. Clarification of RFC 3969

[RFC3969] stipulates that the (original) [RFC2434] rule of "Specification Required" applies to registrations of new SIP URI parameters; however, Section 3 of that same document mandates that a Standards Action is required to register new parameters with the IANA. This contradiction arose from a misunderstanding of the nature of the [RFC2434] categories; the intention was for the IANA Considerations to mandate that Standards Action is required.

8. Overview of Changes to RFC 3427

This section provides a high-level overview of the changes between this document and RFC 3427. It is not a substitute for the document as a whole -- the details are necessarily not represented.

This document:

1. Changes the description of the SIP and SIPPING WG functions to the SIPCORE and DISPATCH WG functions using the context of the RAI Area.
2. Deprecates the process for "P-" header field registration, and changes the requirements for registration of SIP header fields of a purely informational nature.
3. Updates IANA registry requirements, reflecting the publication of RFC 5226, clarifying the policies in RFC 3969, and clarifying that the original RFC 3237 updated the policies in RFC 3265.

9. Acknowledgments

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