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## Change Process for Multiprotocol Label Switching (MPLS) and Generalized MPLS (GMPLS) Protocols and Procedures

### Status of This Memo

This document specifies an Internet Best Current Practices for the Internet Community, and requests discussion and suggestions for improvements. Distribution of this memo is unlimited.

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### Abstract

This document provides guidelines for applying or extending the MPLS or GMPLS ((G)MPLS) protocol suites and clarifies the IETF's (G)MPLS working groups' responsibility for the (G)MPLS protocols. This document is directed to multi-vendor fora and Standards Development Organizations (SDOs) to provide an understanding of (G)MPLS work in the IETF and documents the requisite use of IETF review procedures when considering (G)MPLS applications or protocol extensions in their work. This document does not modify IETF processes.

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## 1. Introduction

The MPLS and GMPLS technology is developed in two main tracks in the IETF. "MPLS" refers to the work done for packet switched networks, while "GMPLS" refers to the efforts to apply the MPLS protocols to all types of networks including packet and non-packet technologies.

Though GMPLS by definition is a superset of MPLS, the term "(G)MPLS" is used in this document to indicate both of these tracks. A terminology section that covers the use of terms and concepts used in this document is found in Section 2.6.

[RFC4775] discusses procedural issues related to the extension or variation of IETF protocols by other SDOs. It provides the guidelines and procedures to be used by other SDOs when considering the requirements for extensions to IETF protocols. [RFC4775] recommends that major extensions to, or variations of, IETF protocols only take place through normal IETF processes or in coordination with the IETF.

The (G)MPLS protocol families were developed within the IETF and constitute significant protocol suites within the Internet standards. The (G)MPLS suites of protocols have become popular for a number of new applications and deployment scenarios. There have been concerns with regards to other technology fora developing, using, and publishing non-standard protocol extensions as a standard not only for use within their community, also for wider use by the industry. Especially concerning is the development of extensions, without consulting the (G)MPLS working groups, which are in conflict with efforts on-going in the (G)MPLS working groups, and then presented to the (G)MPLS working group as 'fait accompli'.

The definition and publishing of non-standard extensions by other fora, without IETF review, and outside of the IETF publication process, regardless if rationalized as limited to use among fora vendors, or limited to a particular application, or rationalized as allowing timely demos, has the unfortunate potential to hinder interoperability and increase complexity of the protocol, sows confusion in the industry, and circumvents the Internet standards process that exists to ensure protocol implementability. As described in [RFC4775], non-standard extensions, including experimental values, are not to be portrayed as industrial standards whether by an individual vendor, an industry forum, or a standards body.

This document clarifies the IETF's MPLS and Common Control and Measurement Plane (CCAMP) working groups' roles and responsibilities for the (G)MPLS protocols and documents the requisite use of, and how

to apply, the [RFC4775] procedure of using the IETF review processes, [RFC2026] and [RFC2418], for fora wishing to apply or extend the (G)MPLS protocols. Use of the IETF review processes will ensure an open process for protocol development and ensure a non-harmful evolution for these IETF protocols, which will benefit the larger industry users' community. IETF itself cannot enforce a forum to use the (G)MPLS change procedure, though any forum not following it, when applying for IANA assignment or IETF publication, will be delayed until this procedure has been completed.

This document does not change the formal IETF standards process as defined in [RFC2026] and [RFC2418]. It is consistent with the general procedures for protocol extensions defined in [RFC4775] and shows how they are applied in the case of (G)MPLS. Any procedures described in this document are to be implemented in a way consistent with these three documents. They MUST be used when other SDOs and fora wish to propose (G)MPLS changes. They SHOULD be used internally within the IETF unless the changes concerned are considered non-controversial by the responsible Area Director(s) (e.g., covered by the working group charter), in which case other aspects of the normal IETF standards process cover the necessary procedures.

### 1.1. Document Source

This document is the joint work of the IETF Routing Area Directors, the IETF MPLS and CCAMP Working Group Chairs, and the IETF's liaisons to the ITU-T. It had considerable review and comment from key members of the ITU-T who have given their time and opinions based on experience for which the authors are grateful. The IESG has also provided valuable input to arrive at the process documented here. The acknowledgements section lists those whose contributions have been particularly helpful.

### 1.2. Conventions Used in This Document

Although this document is not a protocol definition, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119]. This usage is chosen to make the steps and procedures completely clear.

## 2. Overview of (G)MPLS within the IETF

This section describes the key IETF working groups developing the (G)MPLS technology and provides information on IETF working groups using the (G)MPLS technology.

It should be remembered that the IETF environment is highly dynamic. Working groups and whole areas come and go. The overview of the relevant working groups within the IETF is only a snapshot in time.

## 2.1. IETF Working Groups Developing (G)MPLS Technology

Two working groups in the IETF's Routing Area are responsible for work related to developing the (G)MPLS technologies: Multiprotocol Label Switching (MPLS) working group and the Common Control and Measurement Plane (CCAMP) working group.

The following sections provide brief overviews of the chartered work of these two IETF working groups.

### 2.1.1. Multiprotocol Label Switching Working Group

The Multiprotocol Label Switching (MPLS) working group is responsible for standardizing the base technology that uses label switching, and for describing the implementation of Label Switched Paths (LSPs) over various packet and frame-based link level technologies. The working group charter includes procedures and protocols for the distribution of labels between routers, as well as encapsulations, operation and management, traffic engineering, and multicast considerations.

This document assumes that the MPLS working group remains the chartered authority on MPLS technologies, but notes that the IETF may appoint another working group (refer to [RFC2418]) to handle specific extensions or changes to the protocols. Further, in the event that the MPLS working group completes its work and is closed, the IETF will use the non-working group standards track document process (described in [RFC2026]) using designated experts from the community [RFC2434] for the MPLS protocols.

### 2.1.2. Common Control & Measurement Plane Working Group

The IETF Common Control and Measurement Plane (CCAMP) working group coordinates the work within the IETF defining common control and measurement planes for ISP and SP core tunneling technologies. This includes, but is not limited to, defining signaling protocols and measurement protocols such that they support multiple physical path and tunnel technologies using input from technology-specific working groups such as the MPLS working group. It also includes the development of protocol-independent metrics and parameters for describing links and paths that can be carried in protocols.

The technology that the CCAMP working group focuses on is called Generalized MPLS (GMPLS), indicating that CCAMP addresses a generalized technology, where labels are defined in such a way that

they will be compatible with the technology over which the data is transported. While the MPLS working group focuses on packet- and frame-switched technologies, the CCAMP working group work focuses on common methods across a broad spectrum of switching technologies including packet and frame technologies. In this respect, GMPLS can be viewed as a superset of MPLS.

The procedures in this document assume that the CCAMP working group remains the authority on GMPLS technologies, but acknowledges that the IETF may appoint another working group (refer to [RFC2418]) to handle specific extensions or changes to the protocols. Further, in the event that the CCAMP working group completes its work and is closed, the IETF will use the non-working group standards track document process (described in [RFC2026]) using designated experts from the community [RFC2434] for the GMPLS protocols.

### 2.1.3. MPLS and CCAMP Division of Work

From time to time, the MPLS and CCAMP working groups decide to divide work between themselves in a way that does not strictly follow the split between the working groups as defined in the working group charters. This is the case, e.g., for P2MP TE LSPs, where the MPLS working group is specifying requirements and base technology for all of the (G)MPLS technologies.

An entity or individual that wishes to propose extensions or changes to (G)MPLS should first decide to which working group (MPLS or CCAMP) it will bring the proposal. However, the MPLS and CCAMP working group chairs, in conjunction with their Area Directors, may redirect the proposal to another working group.

## 2.2. Other (G)MPLS Technology-Related Working Groups

Problem statements and requirements for (G)MPLS technology have been produced by several working groups in addition to the MPLS and CCAMP working groups. IETF working groups are defined for the management of specific tasks by their charter. Their charter defines their role, relationship with other working groups, and the applicable procedures to follow when extensions to (G)MPLS may be needed. This section provides an overview of the (G)MPLS-related groups and their responsibilities. Additional information describing the working groups and their charters is available on the IETF web pages.

The IP over Optical (IPO) working group and the Internet Traffic Engineering working group (TEWG) are examples of working groups which focus on problem statements and requirements for (G)MPLS to be considered by the (G)MPLS working groups. These working groups have not specified any protocols.

The Bidirectional Forwarding Detection (BFD) working group, also may use the (G)MPLS protocols and mechanisms. The BFD working group is chartered for requirements evaluation and protocol specification related to BFD. If the working group needs to extend or change the (G)MPLS protocols, the procedures specified by its charter and the IETF's standard processes are applicable.

The Layer 2 VPN (L2VPN) and Layer 3 VPN (L3VPN) working groups have been chartered to specify a limited number of solutions for Provider Provisioned VPNs. Both working groups are in the Internet Area. Much of the work of the L2VPN and L3VPN working groups does not include specifying new protocols or extensions to existing protocols. Where extensions are needed, the procedures as specified by their charters and the IETF's standard processes are applicable.

The Layer 1 VPN (L1VPN) working group is chartered to specify mechanisms necessary for providing Layer 1 VPN services (establishment of layer 1 connections between CE devices) over a GMPLS-enabled transport service-provider network. Protocol extensions required for L1VPN will be done in cooperation with MPLS, CCAMP, OSPF, IS-IS, IDR, L3VPN, and other WGs where necessary. That is, the L1VPN working group will not develop GMPLS protocol extensions in isolation, but will develop requirements and propose extensions that will be reviewed and approved by the (G)MPLS working groups.

The Pseudo Wire Emulation End to End (PWE3) working group is a working group that may use the (G)MPLS protocols in its specifications. Should the PWE3 specifications require extension or changes to the (G)MPLS protocols, the procedures as specified by its charter and the IETF's standard processes are applicable.

### 2.3. Organizations Outside the IETF

A number of standards development organizations (SDOs) and industrial forums use or reference the (G)MPLS protocols in their specifications. Some of these organizations have formal or informal liaison relationships with the IETF [RFC4052]. The IETF exchanges information with these organizations about what is happening on both sides, including plans and schedules, using liaison statements [RFC4053]. More details about the cooperation relationship between the IETF and the ITU-T can be found in [RFC3356].

The procedures in this document are applicable to all organizations outside the IETF whether or not they have formal liaison relationships with the IETF. If any organization outside the IETF has a requirement for extensions or modifications to the (G)MPLS protocols then the procedures in this document apply.

### 3. Overview of (G)MPLS Change Process

This is a non-normative section, as it is intended to provide a high-level view of [RFC4775] procedures for protocol extensions. Application of these procedures for (G)MPLS are defined in detail in Section 4.

Whenever there is reason to believe that a particular problem may be solved by use of or extensions to the (G)MPLS protocols, a communication using the formal liaison process, or, for a forum without a formal relationship, an informal communication, may be used to discuss the problem with the IETF ([RFC4052] and [RFC4053]). Collaboration with the IETF in the early discussion phase will facilitate a timely understanding of whether the problem has already been solved, may be outside the scope of the (G)MPLS protocols, or may require more investigation.

Whenever any extension or change to the (G)MPLS protocols is desired, a problem statement and/or requirements statement must be produced and must be submitted to IETF as an Internet-Draft. When the requirements come from an external organization, informal communications, such as e-mail to working group mailing lists, is strongly encouraged as it facilitates timely and cooperative work. However, if desired, the Internet-Draft, containing the requirement(s), may be submitted to the working group using a formal liaison statement. IETF's response to the request will be given as a reply to the liaison. This use of formal communication reduces the risk of confusing an individual participant's opinion for that of the group as can happen on mailing lists, though it does introduce a more lengthy communication cycle. If there is no formal liaison relationship, a communication may be sent directly to the (G)MPLS working group, a relevant Area Director, or the IESG.

The IETF, through the appropriate Area Director, and the chairs of the MPLS and CCAMP working groups for (G)MPLS related work, will direct the requirements draft to an appropriate working group for assessment and comment. This process may require communication and discussion for clarification, but the IETF undertakes to perform the assessment in a timely manner.

In assessing the requirements statement I-D, the IETF may determine:

- that the requirements can be satisfied without modifications to the (G)MPLS protocols



- that the requirements are not sufficiently general or there is not sufficient interest to do a standards-track solution to warrant a Standards-track change to the (G)MPLS protocols
- that the requirements justify a standards-track change to the (G)MPLS protocols
- that the requirements might not be possible to satisfy without violating the (G)MPLS architecture in a way that would harm the (G)MPLS technology
- that the requirements should be combined with other requirements to solve a more general problem or solve the same problem in a more flexible way.

In the event that the IETF agrees to develop a solution, the IETF will set milestones that would result in timely delivery of the solution in a timely manner. If the IETF rejects the requirements, this will only be done with clear explanation and full discussion with the source of the requirements.

The solutions that are developed within the IETF may be sourced from external organizations and presented for review, discussion, modification, and adoption as Internet-Drafts. Such solutions drafts may be presented to the IETF in advance of the completion of the requirements work, but all solutions will be processed through the normal IETF process with other proposed solutions. Solution drafts are adopted as an IETF working group draft when the requirements are stable, and not before the protocol-responsible working group has a charter item to cover the solutions work. It is strongly recommended for interested parties to start informal discussion in the IETF, as early as possible, and to co-author in the IETF's work. It is not recommended for the source forum to continue to work on solutions in parallel with on-going work in the IETF. If the protocol-responsible working group is unable to accept the work (e.g., due to current work load), the IETF processes ([RFC2418]) provide alternate options for ensuring the work is completed.

#### 4. MPLS and GMPLS Change Process

This section defines the (G)MPLS change process and the rules that must be followed in order to make extensions or changes to the (G)MPLS protocols. The language of [RFC2119] is used in order to clarify the required behavior of the IETF and the originator of the change request. It is consistent with the general procedures for protocol extensions defined in [RFC4775]. Any interpretation of procedures described in this document and their implementation are to be in a way consistent with [RFC4775].

Anyone who intends to use one of the existing (G)MPLS protocols, but thinks that it will not satisfy their needs MUST use the procedures described in this document. They SHOULD be used internally within the IETF unless the changes concerned are considered non-controversial by the responsible Area Director(s) (e.g., covered by the working group charter), in which case other aspects of the normal IETF standards process apply. Changes or extensions to the (G)MPLS protocols MUST NOT be made by any other mechanism. The IETF MUST NOT endorse any publications (including RFCs, whether on the Standards Track, Informational, or Experimental) that change or extend the (G)MPLS protocols except for those that arise through the correct execution of the procedures in this document. The IETF MUST NOT endorse any IANA action that allocates (G)MPLS protocol codepoints, except as a result of actions arising from the correct execution of the procedures in this document.

#### 4.1. Flow Diagram

Figure 1 gives a visual overview to illustrate the roles of a (G)MPLS requirements evaluation working group (REWG) and (G)MPLS protocol solutions working group (PSWG). The figure presents two alternatives for a requestor: (1) contact the IETF early in the problem definition phase (preliminary investigation), or, (2) later, with a requirements statement. The figure is for illustration only; it does not contain all of the possible interactions and IETF procedure alternatives. The text in the subsequent sections describes the process.

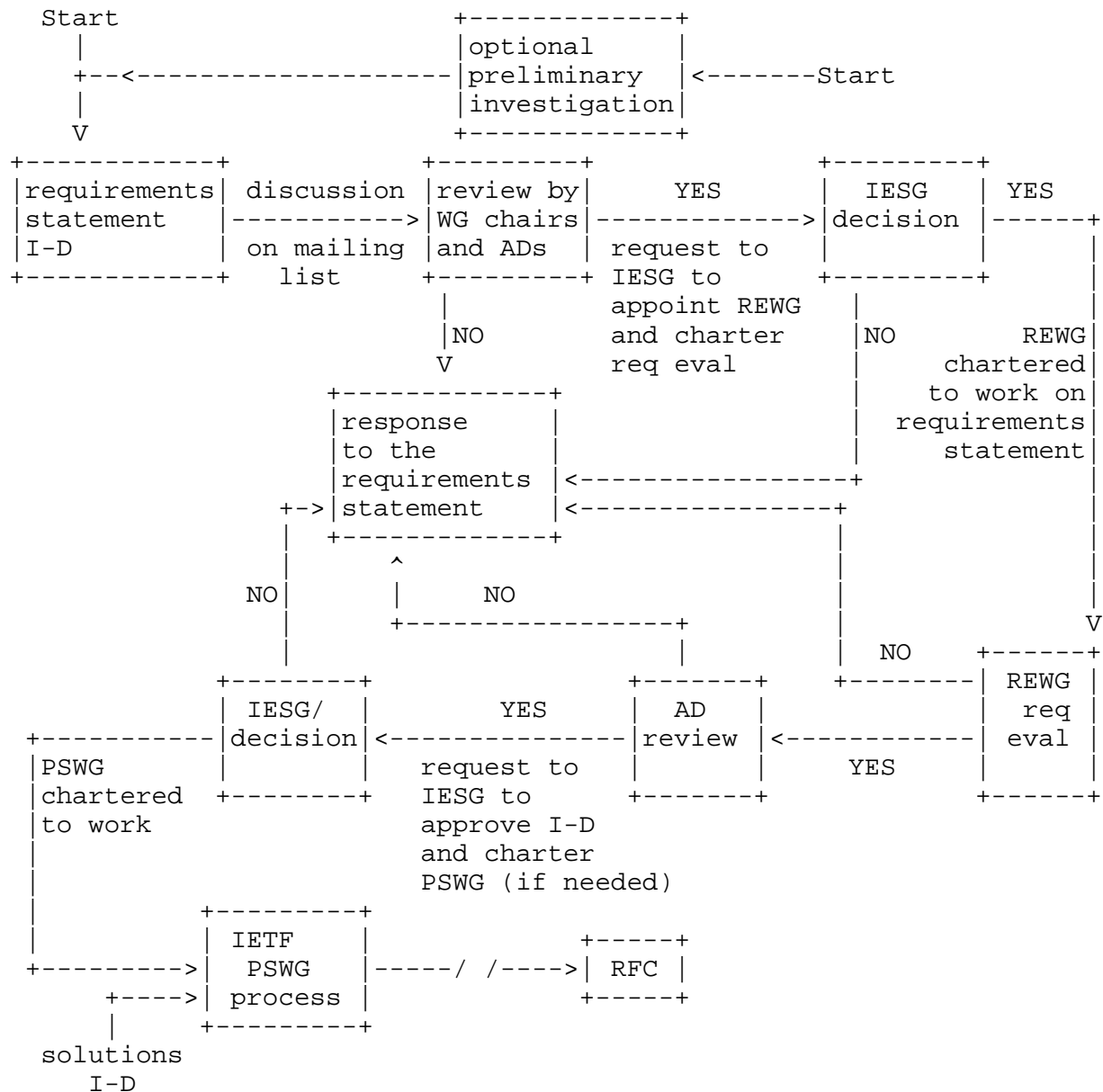


Figure 1: Change Process Overview

#### 4.2. Description of Process Stages

This section describes how the (G)MPLS change process works, what is expected from individuals or organizations that want to extend or change the (G)MPLS protocols, and the responsibilities of the IETF.

#### 4.2.1. Preliminary Investigation

This step is OPTIONAL, and is intended to provide a lightweight way to "feel out" the IETF's position on a proposal without going to the effort of writing an Internet-Draft. The intention is to determine whether the problem has been examined already, whether the problem is in scope for the IETF, and whether solutions are already known.

Although the preliminary investigation phase is optional it is RECOMMENDED that the originator of any requirements consult and discuss the issues concerned as early as possible to avoid any wasted effort, and the preliminary investigation phase provides a mechanism to do this.

Useful discussions may be held at this stage in order to ensure that the problem statement and requirements statement Internet-Drafts contain the right material. This step is described as lightweight because no Internet-Draft is required and because the step largely involves offline discussions. However, it may be the case that this step involves considerable technical discussions and may, in fact, involve an extensive, substantive exchange of ideas and opinions.

This step SHOULD be carried out informally on the mailing list of the REWG or on the Routing Area discussion mailing list, and MAY be initiated by any individual, group of individuals, external organization, or IETF working group.

When an external SDO has a liaison relationship with the IETF, it MAY carry out this step using a formal liaison. The liaison SHOULD be sent to the designated liaison manager who is responsible for forwarding them to the IESG who will assign a Responsible AD. The initiators of the liaison SHOULD make themselves available for discussion on the selected mailing list. If a formal liaison is used, the IETF will respond using the procedures of [RFC4053].

At this stage, a problem statement I-D MAY be produced to help further the discussions and to clarify the issues being addressed.

A possible outcome of this preliminary investigation is that the requirements and problem are understood, but agreed to be out of scope for the IETF. Alternatively, it may be that the problem can be solved with existing protocols. The full list of outcomes from the preliminary investigation phase are similar to those for the requirements statement evaluation phase described in Section 4.2.2, but the requirements statement evaluation phase that allows wider IETF community participation in developing a complete requirement set MUST form part of the process if the IETF is to consider to develop protocol solutions. The process cannot move direct from the

preliminary investigation phase to the development of solutions unless the working group agrees (e.g., the problem is minor).

#### 4.2.2. Requirements Statement Evaluation

Before the IETF can formally pronounce on requests to change or extend the (G)MPLS protocols, a requirements statement I-D MUST be written per [RFC2026].

The requirements statement I-D MUST be introduced by the authors to the IETF through an email to the REWG mailing list, to the Routing Area discussion mailing list, or by a formal liaison from an external SDO which will result in the IETF introducing the requirements statement I-D to the REWG mailing list. If the requirements statement I-D is brought to the IETF through a formal liaison, the initiators of the liaison SHOULD make themselves available for discussion on the designated IETF mailing lists.

After discussion on the IETF mailing lists, the responsible Area Director MUST decide whether the requirements will be formally evaluated by the IETF, and MUST deliver a response to the per [RFC4053] and [RFC4775]. If a formal liaison was not used, the response SHOULD be delivered to the appropriate contact as listed on the communication.

The IETF response MUST be sufficiently explanatory to inform the requesting organization of what, if anything, the IETF has decided to do in response to the request. The following list is provided to illustrate possible responses:

- a. Requirements not understood. Further discussion is required.
- b. Requirements understood, but judged to be out of scope for the IETF. In this case, the originator of the requirements can work on requirements and solutions and will not be impeded by the IETF. The IETF may request to be kept informed of progress.
- c. Requirements understood, but no protocol extensions are needed. It may be desirable for the external SDO to cooperate with the an IETF working group in the production of an Applicability Statement Internet-Draft.
- d. Requirements understood, and the IETF would like to develop protocol extensions. This results in execution of the rest of the procedure, described below. The requirements raised in the requirements statement I-D may be combined with other requirements to produce more general extensions or changes to the (G)MPLS protocols.

#### 4.2.3. Working Group Procedures

In many cases, the problem covered by the requirements statement I-D will fall within the scope of the existing charter of a working group. In this case, the responsible Area Directors will designate the working group as the REWG and pass the requirements statement I-D to the working group for evaluation. If the problem is not covered by an existing charter, other alternatives (refer to [RFC2418]) may be used, e.g., rechartering, BOF, chartering a new working group.

If the IETF modifies its prior decision to accept the work, the IETF MUST communicate this to the requestor in a timely manner.

#### 4.2.4. REWG Evaluation of the Requirements Statement I-D

The objective of the REWG evaluation process is to determine a clear and complete statement of the requirements for changes or extensions to the (G)MPLS protocols. This will necessitate normal IETF working group procedures in the REWG and MAY include the generation of revisions of the requirements statement I-D in cooperation between the members of the REWG and the original authors of the requirements statement I-D.

The originators of the requirements statement I-D MUST make themselves available to discuss the work on the REWG mailing list. If this does not happen, the chairs of the REWG MAY determine that there is insufficient support for the work and MAY reject the requirements statement I-D.

The output of the REWG will be either:

- a completed requirements statement I-D that has been accepted by working group consensus within the REWG and has passed through working group last call;

or

- a rejection of the requirements using the response procedure as described in Section 5.

#### 4.2.5. AD Evaluation of Completed Requirements Statement I-D

As with all Internet-Drafts produced by a working group, the ADs will review the completed requirements statement I-D produced by the REWG. The ADs will then pass the document to the IESG for review. If charter changes are needed or a new PSWG needed, the appropriate process will be followed.

#### 4.2.6. IESG review of Requirements Statement I-D and PSWG Charter

As with all Internet-Drafts, the IESG will review and make a decision on the progression of the requirements statement I-D.

If the IESG rejects the requirements statement I-D, it will generate an appropriate response to the working group (and, if needed, to the originator of the request).

The IESG will review any proposed charter changes for the PSWG or, if needed, consider alternatives. This might include the formation of a new working group specifically to work on the solutions.

#### 4.2.7. Solutions Work

The appropriate PSWG will start work on solutions following the normal IETF process.

Solutions I-Ds MAY be prepared externally (such as within an external organization) or within the IETF, submitted to the IETF for draft publication using the procedures of [RFC2418], and introduced to the PSWG for consideration. Such I-Ds MAY be submitted at earlier stages in the process to assist the REWG in its development and discussion of the requirements, but no I-D will be formally considered as a solutions I-D until the PSWG has a charter item that covers the work and the REWG chairs are confident that the requirements are stable.

The IETF makes no guarantees that an externally produced solutions I-D will form the basis of the PSWG solutions I-D, but the PSWG MUST consider such an I-D for review and revision as a possible solution I-D, using the same open procedures ([RFC2418]) as for any individual submission. The IETF's procedures are based on open and fair participation, and thorough consideration of technical alternatives.

Interested parties (both implementers and users) of the SDO originating the request are strongly encouraged to participate in the PSWG to ensure appropriate interest is shown in the solutions work and to provide timely solutions development. The IETF's work, as that of any SDO, is driven by its participants. The IETF is an open community and any SDO requesting IETF solutions work SHOULD ensure appropriate industry interest in the work, or the IETF MAY discontinue its support of the work. Appropriate communication of the discontinued work will be made to the originator of the request (if the originator is reachable).

The final development of the solutions I-D is subject to the normal working group review, consensus, and last call within the PSWG.

Where the requirements originated from an external organization, the PSWG SHOULD regularly communicate its progress using a formal liaison process if one exists. This communication SHOULD also be used to request review input and comment on the development of the solutions I-D. The solutions I-D MUST be communicated to the originating organization during working group last call for final review against the requirements. When the solutions I-D is complete (normally upon completing working group last call and/or on entering the RFC Editor's queue) the PSWG MUST inform the originating organization of the completed solution.

## 5. Rejecting the Requirements Statements I-D

Rejection of the requirements statements is a sensitive matter for the authors of the requirements and MUST be handled with full disclosure and explanation by the IETF. All working group actions are taken in a public forum ([RFC2418]).

The requirements can be rejected at various stages of the process as described in the previous sections. The person or group that makes the rejection is responsible for generating an explanation of the rejection and MUST follow the [RFC4775] process. Possible reasons for rejection are described in this section.

### 5.1. Reasons for Rejection

The requirements statement I-D can only be rejected with full disclosure by the IETF. Possible reasons for rejection and possible next steps as described here.

- Requirements not understood. Either during preliminary investigation or during evaluation of the requirements statement I-D, it was not clear what the requirements are, or what the problem being addressed is.

This rejection forms part of an on-going communication and it is expected that the process will continue with further iterations.

- Out of scope for the IETF. Many stages of this process may determine that the requirements are out of scope for the IETF. In this case, the IETF MUST NOT constrain the authors of the requirements statement I-D from working on a solution. If any (G)MPLS changes are later identified, the requestor MUST reinitiate the (G)MPLS change procedure.
- No protocols extensions or changes are needed. At some stage in the evaluation of the requirements it may become clear that they can all be met through appropriate use of existing protocols. In



this case, no further evaluation of the requirements is required, but the REWG MUST explain how the protocols can be used to meet the requirements and MAY cooperate with the authors of the requirements statement I-D in the production of an Applicability Statement Internet-Draft or a Profiles Internet-Draft that explains precisely how the existing protocols can be used to meet the requirements.

- Insufficient support within the IETF. Although the work described within the requirements statement I-D is within scope for the IETF, and despite the support of the originators of the requirements statement I-D on the REWG mailing list, the chairs of the REWG have determined that there is insufficient support in the REWG to complete requirements statement I-D and initiate solutions work in the PSWG. In this case, the IETF MUST NOT restrict the authors of the requirements statement I-D from working on a solution. The solution (and/or IANA codepoints requested) SHALL be presented to the IETF's (G)MPLS PSWG for review and possible publication as an Informational or Experimental RFC, and, pending IETF review results, the IETF SHALL NOT block applications to IANA for codepoints. If IANA codepoint assignments are required, the IANA Requirements prescribed for those assignments in the relevant RFCs MUST be satisfied. It is highly recommended for the SDO to encourage its participants to participate in the IETF work to ensure appropriate industry representation in the work.
- Insufficient support for the work from the original requesters. If the authors of the requirements statement I-D do not make themselves available on the REWG mailing list for discussion of the requirements or do not contribute the completion of the requirements statement I-D, the chairs of the REWG MAY determine that there is insufficient support for the work and MAY reject the requirements statement I-D. In this case, the IETF MUST NOT grant permission for the work to be carried out in any other organization, and MUST NOT endorse the publication of any changes or extensions to the (G)MPLS protocols and MUST NOT instruct IANA to allocate any codepoints. The requirements may be reintroduced by starting the procedure again from the top.
- Satisfying the requirements would break the technology. It is possible that an assessment will be made that, although the requirements are reasonable, it is not possible to satisfy them through extensions or changes to the (G)MPLS protocols without violating the (G)MPLS architecture in such a way as would break the (G)MPLS technology. In this case, a recommendation will be made that some other technology be used to satisfy the requirements. See Section 7 for further discussions of the protection of the integrity of the (G)MPLS technology. In this case, the IETF MUST NOT grant permission for the work to be carried out in any other

organization, and MUST NOT endorse the publication of any changes or extensions to the (G)MPLS protocols and MUST NOT instruct IANA to allocate any codepoints.

## 5.2. Actions Required When Rejecting Requirements Statement I-Ds

Upon rejection, the IETF MUST make a clear statement of why the requirements statement I-D has been rejected and what next step actions are acceptable (refer to Section 5.1).

The communication of the rejection depends on the form of the original submission as follows.

- If the requirements are brought to the IETF as a preliminary investigation (see Section 4.2.1) through an email exchange then the response MUST be made as an email response copied to an IETF mailing list so that it is automatically archived.
- If the requirements are brought to the IETF as a preliminary investigation (see Section 4.2.1) through a formal liaison, the rejection MUST be delivered through a formal liaison response.
- If a requirements statement I-D has been produced and discussed on an IETF email list, the response MUST be made as an email response and copied to the email list.
- If a requirements statement I-D has been produced and brought to the IETF through a formal liaison, the rejection MUST be delivered through a formal liaison response.
- If an IETF working group has been involved in the review or production of any Internet-Drafts for the requirements or for the solutions, the working group MUST be notified of the rejection and the reasons.

The responsibility for the generation of the response lies with the person, people, or group that instigates the rejection. This may be the IESG, one or more Area Directors, one or more working group chairs, or a designated expert [RFC2434]. In the case of the use of a liaison relationship, the IETF's liaison manager has responsibility for ensuring that the procedures in this document, and particularly the rejection procedures, are followed.

## 5.3. Appeals

[RFC2026] contains additional information related to procedure disagreements and appeals. The rejection of a requirements statement I-D as described in Sections 5.1 and 5.2 may be appealed in the event

it is disputed and cannot be reversed by direct discussion between the parties. The conflict resolution and appeal mechanism is documented in [RFC2026].

## 6. Abandonment of the Solutions I-D

Once the solutions work has been started by the PSWG, it may be abandoned before completion. This can happen if the PSWG chairs determine that there is no longer working group support for doing the work. This could arise, for example, if no one (including the originators of the requirements statement I-D) is willing to contribute to the development of a solutions I-D.

In the event that the solutions work is abandoned by the PSWG, the Area Directors responsible for the PSWG MUST be consulted. The originators of the requirements statement I-D MUST be informed that the work has been abandoned using a mechanism dependent on how the requirements were introduced (as discussed in Section 5.2).

If the solution is abandoned in this way, work on solutions for the requirements MUST NOT be started in another forum. The status of extensions and changes to the (G)MPLS protocols with regard to the specific requirements returns to how it was before the process started. Any new examination of the requirements MUST commence at the top of the process.

### 6.1. Appeals

The abandonment of a solutions I-D may be appealed in the event it is disputed and cannot be reversed by direct discussion between the parties. The conflict resolution and appeal mechanism is documented in [RFC2026].

## 7. (G)MPLS Integrity and Ownership

The (G)MPLS working groups are REQUIRED to protect the architectural integrity of the (G)MPLS protocols and MUST NOT extend the GMPLS architecture with features that do not have general use beyond the specific case. They also MUST NOT modify the architecture just to make some function more efficient at the expense of simplicity or generality.

The architectural implications of additions or changes to the (G)MPLS protocols MUST consider interoperability with existing and future versions of the protocols. 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 and risk impacting the protocol as a whole. Therefore, to minimize operational and technical risks to

the (G)MPLS technology, IETF processes SHALL be followed for any requests on extensions to (G)MPLS protocols. With respect to (G)MPLS protocols, the (G)MPLS PSWG is the chartered "owner" of the (G)MPLS protocol, as long as the working group exists. All changes or extensions to (G)MPLS MUST first be reviewed by the (G)MPLS PSWG.

## 8. Security Considerations

All requirements statement I-Ds MUST give full consideration to the security impact of the proposed additional features or functions. All solutions I-Ds MUST consider the impact on the security of the protocol extensions and to the pre-existing protocol.

This documents does not itself introduce any security issues for any (G)MPLS protocols.

The IETF process is itself at risk from denial of service attacks. This document utilizes the IETF process and adds clarity to that process. It is possible, therefore, that this document might put the IETF process at risk.

Therefore, provided that the number of requirements statement I-Ds is not unreasonable, there will be no significant impact on the IETF process. The rate of arrival of requirements statement I-Ds MAY be used by the IESG to detect denial of service attacks, and the IESG SHOULD act on such an event depending on the source of the requirements statement I-D and the perceived relevance of the work. The IESG might, for example, discuss the issue with the management of external organizations.

## 9. Acknowledgements

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## 10. IANA Considerations

This document makes no specific requests to IANA for action. The procedures described in this document assume that IANA will adhere to the allocation policies defined for the (G)MPLS codepoint registries and that the IETF will not endorse allocation of codepoints from those registries except where work has been carried out in accordance with the procedures described in this document.

## 11. References

### 11.1. Normative References

- [RFC2026] Bradner, S., "The Internet Standards Process -- Revision 3", BCP 9, RFC 2026, October 1996.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC2418] Bradner, S., "IETF Working Group Guidelines and Procedures", BCP 25, RFC 2418, September 1998.
- [RFC2434] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 2434, October 1998.
- [RFC4052] Daigle, L., Ed., and Internet Architecture Board, "IAB Processes for Management of IETF Liaison Relationships", BCP 102, RFC 4052, April 2005.
- [RFC4053] Trowbridge, S., Bradner, S., and F. Baker, "Procedures for Handling Liaison Statements to and from the IETF", BCP 103, RFC 4053, April 2005.
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### 11.2. Informative References

- [RFC3356] Fishman, G. and S. Bradner, "Internet Engineering Task Force and International Telecommunication Union - Telecommunications Standardization Sector Collaboration Guidelines", RFC 3356, August 2002.

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