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The IEEE 802/IETF Relationship
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Abstract

This document describes the standardization cooperation between Project 802 of the Institute of Electrical and Electronic Engineers (IEEE) and the Internet Engineering Task Force (IETF). This document obsoletes RFC 4441.

Note: This document was collaboratively developed by authors from both the IEEE 802 and IETF leadership and is to be reviewed and approved by the IEEE 802 Executive Committee prior to publication.

Table of Contents

1. Introduction

This document contains a set of principles and guidelines that serve as the basis for coordination between Project 802 of the Institute of Electrical and Electronics Engineers (IEEE 802) and the Internet Engineering Task Force (IETF), a program under the Internet Society (ISOC) organizational umbrella [BCP101]. The objective is to encourage timely development of technical specifications that facilitate maximum interoperability with existing (fixed and mobile) Internet systems, devices, and protocols. Each organization will operate according to their own rules and procedures including rules governing IPR policy, specification elaboration, approval and maintenance.

While this document is intended to improve cooperation between the two organizations, it does not change any of the formal practices or procedures of either organization.

1.1. Why Cooperate?

IEEE 802 and the IETF are independent standards organizations that each use standards produced by the other organization, and develop standards dependent on those produced by the other organization. This dependency may extend to carrying attributes in protocols that reflect technologies defined by the other organization.

The dependencies between IEEE 802 and IETF standards are a motivation for cooperation between the organizations. However, since the benefits of cooperation come at the cost of coordination overhead, the benefits of coordination must outweigh the cost.

The IETF benefits from coordination by obtaining improved access to IEEE 802 expertise in the widely-deployed and widely-used IEEE 802 Local Area Network architecture [ARCH802].

IEEE 802 benefits from coordination by obtaining improved access to IETF expertise on IP datagram encapsulation, routing, transport, and security as well as specific applications of interest to IEEE 802.

2. Organization, Participation and Membership

IEEE 802 and IETF are similar in some ways, but different in others. When working on projects of interest to both organizations, it is important to understand the similarities and differences.

2.1. IEEE 802

The IEEE Standards Association (IEEE-SA) is the standards setting body of the IEEE. The IEEE-SA Standards Board oversees the IEEE standards development process.

The IEEE-SA Standards Board supervises what IEEE calls "sponsors" - IEEE entities that develop standards. The IEEE 802 LAN/MAN Standards Committee is a sponsor that develops and maintains networking standards and recommended practices for local, metropolitan, and other area networks, using an open and accredited process, while advocating for them on a global basis. Areas of standardization work include Ethernet, Bridging and Virtual Bridged LANs, Wireless LAN and Wireless PAN, Wireless MAN, Wireless Coexistence, Media Independent Handover Services, and Wireless RAN. Within IEEE 802, a Working Group provides the focus for each of these areas.

In IEEE 802, work is done in Working Groups operating under an Executive Committee. Each Working Group is led by a Working Group Chair. Most Working Groups have one or more Task Groups. A Task Group is responsible for a project or group of projects.

The Executive Committee is comprised of the Executive Committee Chair, Executive Committee Officers (e.g., Vice-Chairs, Secretaries, Treasurer) and Working Group Chairs.

A good place to learn more is the IEEE 802 Home Page, at <http://www.ieee802.org/>. An IEEE 802 Orientation for new participants that gives an overview of IEEE 802 process is available from the home page.

The IEEE 802 Executive Committee and all Working Groups meet three times per year at plenary sessions. Plenary sessions are held in March, July and November. Most Working Groups hold interim meetings, usually in January, May and September. The meeting schedule can be found at <http://www.IEEE802.org/meeting/index.html>.

A Study Group is a group formed to consider starting a new project and, if new work is found to be suitable, to develop an IEEE Project Authorization Request (PAR - similar in purpose to an IETF working group charter). A Study Group may operate under a Working Group or under the Executive Committee depending on whether the new work under consideration falls within the scope of an existing Working Group. Study Groups are expected to exist for a limited time, usually for one or two plenary cycles, and must be authorized to continue at each plenary if they have not completed their work.

Participation in IEEE 802 Working Groups is at the level of

individuals - participants are human beings and not companies. While participation is open, individuals are required to declare their affiliation (i.e., any individual or entity that financially or materially supports the individual's participation in IEEE 802).

Working Groups maintain membership rosters, with voting membership attained on the basis of in-person meeting attendance. Retention of voting membership generally requires continued attendance and responsiveness to letter ballots. Voting membership allows one to vote on motions and on Working Group Ballots of drafts. All drafts are also balloted by a Sponsor ballot pool before approval as standards. Joining a Sponsor ballot pool does not require participation in meetings. It is not necessary to be eligible to vote in order to comment on drafts and the Working Group is required to consider and respond to all comments submitted during Working Group and Sponsor ballots.

To foster ongoing communication between IEEE 802 and IETF, it is important to identify and establish contact points within each organization. IEEE 802 contact points may include:

IEEE 802 Working Group Chair: An IEEE 802 Working Group chair is an individual who is assigned to lead the work of IEEE 802 in a particular area. IEEE 802 Working Group chairs are elected by the Working Group and confirmed by the Executive Committee for a 2 year term. The Working Group Chair provides a stable contact point for cooperation between the two organizations for a given topic.

IEEE 802 Task Group (or Task Force) Chair: An IEEE 802 Task Group chair is an individual who is assigned to lead the work on a specific project or group of projects within a Working Group. The Task Group Chair often serves for the duration of a project. The Task Group chair provides a stable contact point for cooperation between the two organizations on a particular project.

IEEE 802 Study Group Chair: An IEEE 802 Study Group Chair is an individual assigned to lead consideration of new work and development of an IEEE 802 Project Authorization Request (PAR). The Study Group chair provides a stable contact point for cooperation between the two organizations on a study group topic.

IEEE 802 Liaisons: It may be beneficial to establish liaisons as additional contact points for specific topics of mutual interest. These contact points should be established early in the work effort. The IEEE 802 and IETF projects may

select the same individual as their contact point, but this is not required, so that two individuals each serve as contact points for one project participating in the liaison relationship.

Informal Contact points: Other informal contacts can provide useful cooperation points. These include project editors who are responsible for editing the drafts and work with the Task Group Chairs to lead tracking and resolution of issues. Joint members who are active in both the IEEE 802 and IETF projects in an area can also aid in cooperation.

2.2. IETF

The IETF Standards Process is defined in [BCP9]. [BCP11] is a helpful description of organizations involved in the IETF standards process. It can still be useful as an overview, although details have changed since 1996.

In the IETF, work is done in Working Groups (WGs), and is mostly carried out through open, public mailing lists rather than face-to-face meetings. The IETF Working Group process is defined in [BCP25].

WGs are organized into areas, and each area is managed by one or more Area Directors. Collectively, the Area Directors constitute the Internet Engineering Steering Group (IESG) [RFC3710].

To foster ongoing communication between IEEE 802 and IETF, it is important to identify and establish contact points within each organization. IETF contact points may include Area Directors, Working Group chairs, and other points of contact who can help communicate between IEEE 802 and IETF Working Groups.

The Internet Architecture Board (IAB) charter [RFC2850] assigns the IAB several responsibilities relevant to this document:

1. IESG Appointment Confirmation [BCP10]
2. Architectural Oversight
3. Standards Process Oversight and Appeal
4. Appointment of the RFC Series Editor [RFC6635] and Independent Submission Editor [RFC6548]
5. Appointment of the Internet Assigned Number Authority (IANA) operator [RFC6220]
6. Oversight of External Liaisons for the IETF [BCP102]

IESG and IAB members are selected using the Nomcom process defined in [BCP10]. Working Group chairs serve at the pleasure of their Area Directors, as described in [BCP25].

The IETF is designed to be a "bottom-up" protocol engineering organization - the leadership steers and manages, but does not direct work in a top-down way. Technical agreements with "the IETF" are based on the consensus of working group participants, rather than negotiated with IETF leadership.

IETF meets in plenary session three times per year. Some Working Groups schedule additional interim meetings, which may be either face-to-face or "virtual". Information about IETF meetings is available at <http:// www.ietf.org/meeting/upcoming.html>. Information about IETF Working Group interim meetings is available on the IETF-Announce mailing list (see <http://www.ietf.org/list/announcement.html> for archives and subscription information).

The preferred way to develop specifications is to do work on mailing lists, reserving face-to-face sessions for topics that have not been resolved through previous mailing list discussion.

Participation in the IETF is open to anyone (technically, anyone with access to e-mail sufficient to allow subscription to one or more IETF mailing lists). All IETF participants act as individuals. There is no concept of "IETF membership".

A good place to learn more is the IETF Home Page, at <http://www.ietf.org/>, and especially the "About the IETF" page at <http://www.ietf.org/about>, selectable from the IETF Home Page.

The "Tao of the IETF" is also very helpful, especially for IEEE 802 participants who will also be participating in IETF Working Groups and attending IETF meetings. It is available at <http://www.ietf.org/tao.html.

The current list of IETF Area Directors and Working Group chairs can be found in the IETF Working Group charters, at <http://datatracker.ietf.org/wg/>.

2.3. Structural Differences

IEEE 802 and IETF have similar structures, but the terms they use are different, and even conflicting. For example, both IEEE 802 and IETF use the term "Working Group", but this means very different things in the two organizations.

Thumbnail comparison between IETF and IEEE 802 entities

IETF Area	is similar to	IEEE 802 Working Group
IETF Working Group	is similar to	IEEE 802 Task Group
IETF BOF	is similar to	IEEE 802 Study Group

Both IEEE 802 Working Groups and IETF Areas are large, long-lived, and relatively broadly scoped, containing more narrowly chartered entities (IEEE 802 Task Groups and IETF Working Groups), which tend to be short-lived and narrowly chartered. IEEE 802 uses Study Groups to develop proposals for new work, and these are analogous to IETF Birds of a Feather ("BOF") sessions.

Several IETF Areas also have one or more directorates to support the work of the Area Directors. Area Directors often ask directorate members to review documents or provide input on technical questions. These directorates are often a source of expertise on specific topics. The list of Area Directorates is at: <http://www.ietf.org/iesg/directorate.html>. IEEE 802 does not have a corresponding organizational entity.

2.4. Cultural Differences

IEEE 802 and IETF have cultures that are similar, but not identical. Some of the differences include:

Consensus and Rough Consensus: Both organizations make decisions based on consensus, but in the IETF, "consensus" can mean "rough consensus, as determined by Working Group chairs". In practice, this means that a large part of the community being asked needs to agree. Not everyone has to agree, but if someone disagrees, they need to convince other people of their point of view. If they're not able to do that, they'll be "in the rough" when "rough consensus" is declared. Although IEEE Working Groups ultimately rely on voting for decision making, they vary widely in their use of consensus versus voting in the course of a meeting, and in their attention to Robert's Rules [RONR].

Running Code: David Clark coined the phrase "We reject kings, presidents and voting. We believe in rough consensus and running code" in 1992, to explain IETF culture. Although that's not always true today, the existence of "running code" as a proof of feasibility for a proposal often carries weight during technical discussions. IEEE 802 considers both technical and economic feasibility when deciding whether to approve new work, as noted in Section 4.1.7.

Decision making: IEEE 802 Working Groups vary in their reliance upon voting versus consensus, and in the breadth of coverage of an individual motion, but ultimately, all rely upon a 75 percent vote to decide technical issues, and a 50 percent +1 vote to decide other issues. IETF Working Groups do not use voting. Working Group chairs may ask for a "show of hands" or "take a hum" to judge backing for a proposal and identify technical concerns and objections, but this is not considered "voting". IETF consensus and humming is discussed further in [draft-resnick-on-consensus].

Balance between mailing lists and meetings: Both organizations make use of mailing lists. IETF Working Groups rely heavily on mailing lists, where work is done, in addition at formal meetings. The IETF requires all working group decisions to be made (or, often in practice, confirmed) on mailing lists - final decisions aren't made in meetings. IEEE 802 Working Groups typically meet face-to-face about twice as often as IETF Working Groups (three IEEE 802 plenaries plus three IETF 802 interim meetings each year, compared to three IETF plenaries per year) and teleconferences are more common in IEEE 802 than in most IETF Working Groups. Most major decisions in IEEE 802 are made during plenary or interim meetings, except for procedural decisions. Attendance at meetings is critical to influencing decisions and to maintaining membership voting rights.

Interim meetings: Both organizations use interim meetings (between plenary meetings). IETF Working Groups schedule interim meetings on an as-needed basis. IETF interim meetings may be face-to-face or virtual. Most IEEE 802 WGs hold regularly interim meetings three times a year in the middle of the interval between two Plenary meetings. The schedules and location of these meetings are typically known many months in advance. IEEE 802 interim meetings are face-to-face only. In addition to regularly scheduled IEEE 802 interim meetings, teleconference and ad hoc meetings are held on an as-needed basis.

Remote participation: Because the IETF doesn't make decisions at face-to-face meetings, attendance is not absolutely necessary, and some significant contributors do not attend most face-to-face IETF meetings. However, finding people interested in a proposal for new work, or soliciting backing for ideas, is often more easily accomplished face-to-face, such as in a hallway or bar. Significant contributors to IEEE 802 almost always attend face-to-face meetings; participation in IEEE 802

meetings is a condition for WG membership.

Lifetime of Standards: IEEE 802 periodically reviews existing standards. IETF standards-track documents may be updated or obsoleted by newer standards-track documents, but there is no formal periodic review for existing standards-track documents. The status of specific IETF standards is available through [DATATRACKER]. Because these status changes happen independently, standards from each organization may refer to documents that are no longer standards in the other organization.

Overlapping terminology: As two independent standards development organizations, IEEE 802 and IETF have developed vocabularies that overlap. For instance, IEEE 802 "ballots" at several levels of the organization during document approval, while IETF documents are only "balloted" during IESG review. The IESG uses "ballots" to indicate that all technical concerns have been addressed, not to indicate that the IESG agrees with a document. The intention is to "discuss" technical issues with a document, and "no" is not one of the choices on an IESG ballot.

2.5. Mailing Lists

All IETF Working Groups and all IEEE 802 Working Groups have associated mailing lists. Most IEEE 802 Task Groups also have mailing lists, but in some cases (e.g., the IEEE 802.1 Working Group), the Working Group mailing list is used for any Task Group matters.

In the IETF, the mailing list is the primary vehicle for discussion and decision-making. It is recommended that IEEE 802 experts interested in particular IETF Working Group topics subscribe to and participate in these lists. IETF WG mailing lists are open to all subscribers. The IETF Working Group mailing list subscription and archive information are noted in each Working Group's charter page.

In IEEE 802, mailing lists are typically used for meeting logistics, ballot announcements, reports and some technical discussion. Most decision making is at meetings, but in cases where a decision is needed between meetings, this may be done over the mailing list. Most technical discussion occurs at meetings and by generating comments on drafts which are compiled with responses in comment resolution documents.

Most IEEE 802 mailing lists are open to all subscribers. For the few IEEE 802 mailing lists that are not open, please see the working

group chair to arrange for access to the mailing list.

Some IEEE 802 participants refer to mailing lists as "reflectors".

3. Document Access and Cross Referencing

During the course of IEEE 802 and IETF cooperation, it is important to share internal documents among the technical working groups. In addition, drafts of IEEE 802 standards, Internet Drafts, and RFCs may also be distributed.

3.1. Access to IETF Documents

IETF Internet-Drafts may be located using the IETF "Datatracker" interface (see [DATATRACKER]), or via the IETF tools site at <http://tools.ietf.org>. RFCs may be found at either of the above sites, or via the RFC Editor web site at <http://www.rfc-editor.org>.

3.2. Access to IEEE 802 Standards

IEEE 802 standards, once approved, are published and made available for sale. They can be purchased from the IEEE Standards Store, at <http://www.techstreet.com/IEEEgate.html>. They are also available from other outlets, including the IEEE Xplore digital library, at <http://IEEExplore.IEEE.org>.

The Get IEEE 802 program, at <http://standards.ieee.org/about/get>, grants public access to download individual IEEE 802 standards at no charge (although registration is required). IEEE 802 standards are added to the Get IEEE 802 program six months after publication. This program is approved year-by-year, but has been in place for several years.

3.3. Access to IEEE 802 Working Group Drafts

The IEEE owns the copyright to drafts of standards developed within IEEE 802 standardization projects. The IEEE-SA grants permission for an IEEE 802 draft to be distributed without charge to the participants for that IEEE 802 standards development project. Typically, access is provided over the the Internet under password protection, with the password provided to members of the participating WG. Requests to the relevant WG chair for access to a draft for purposes of participation in the project are typically granted.

An alternative access mechanism which may more easily enable document access for IETF WGs cooperating with IEEE 802 was established by a liaison statement sent to the IETF in July 2004 by Paul Nikolich,

Chair of IEEE 802 (available at <https://datatracker.ietf.org/documents/LIAISON/file41.pdf>), describing the process by which IETF WGs can obtain access to IEEE 802 work-in-progress. IEEE 802 WG Chairs have the authority to grant membership in their WGs, and can use this authority to grant membership to an IETF WG chair upon request. The IETF WG chair will be provided with access to the username/password for the IEEE 802 WG archives, and is permitted to share that information with participants in the IETF WG. Since it is possible to participate in IETF without attending meetings, or even joining a mailing list, IETF WG chairs will provide the information to anyone who requests it. However, since IEEE 802 work-in-progress is copyrighted, copyright restrictions prohibit incorporating material into IETF documents or postings.

In addition to allowing IETF participants to access documentation resources within IEEE 802, IEEE 802 can also make selected IEEE 802 documents at any stage of development available to the IETF by attaching them to a formal liaison statement. Although a communication can point to a URL where a non-ASCII document can be downloaded, sending attachments in proprietary formats to an IETF mailing list is discouraged.

3.3.1. IEEE 802 Documentation System

Each IEEE 802 standardization project is assigned to a Working Group (WG) for development. In IEEE 802, the working methods of the WGs vary in their details. The documentation system is one area in which WG operations differ, based on varying needs and traditions. In some cases, the WGs assign the core development to a subgroup (typically known as a Task Group or Task Force), and the documentation procedures may vary among the subgroups as well. Prior to project authorization, or on topics not directly related to development of a standard, the WG may consider and develop documents itself, or using other subgroups (standing committees, ad hocs, etc.).

IEEE 802 also supports Technical Advisory Groups (TAGs) that conduct business and develop documents, although not standards. References here to WGs apply to TAGs as well.

3.3.2. Access to Internal IEEE 802 Working Group Documents

Generally, the archives of minutes and contributions to IEEE 802 groups are publicly and freely available.

Many IEEE 802 groups use a documentation system provided by IEEE and known as "Mentor". The list of these groups is available at the IEEE 802 Mentor Home Page: <https://mentor.ieee.org/802>. Mentor provides the following features:

1. The documentation system is structured and ordered, with documentation tags and unique numbering and versioning.

2. On-line documentation is available.

3. Limited search functionality is provided, and publicly-available search engines index the data.

4. The ability to submit documents to Mentor is limited but is generally available to any interested party. An IEEE web account is required but can be easily and freely established using the IEEE Account Request page, at <http://www.ieee.org/go/create_web_account>. If submission is protected, the privilege can be requested via the Mentor system (using the "Join group" link on each WG Mentor page) and would typically be granted by the WG documentation manager in a manual approval.

5. Submitted documents are immediately available to the general public at the same instant they become available for consideration by the group.

IEEE 802.1 and IEEE 802.3 do not use Mentor.

IEEE 802.1 documents are organized in folders by year at: <http://www.ieee802.org/1/files/public/>. The file names indicate the relevant project, author, date and version. The file naming conventions and upload link are at: <http://www.ieee802.org/1/files/public/>. Upload is moderated.

IEEE 802.3 documents are accessed from the home pages of the IEEE 802.3 subgroups (i.e., Task Force or Study Group) and are organized in folders by meeting date. These home pages are available from the IEEE 802.3 home page, at: <http://www.ieee802.org/3/>. Files are uploaded by emailing to the subgroup chair.

3.3.3. Contributions to IEEE 802 Working Groups

In general, development of standards in IEEE 802 is contribution-driven. In many cases, a WG or subgroup will issue a call for contributions with a specific technical solicitation, including deadlines and submission instructions. Some groups maintain specific submission procedures and specify a contribution cover sheet to clarify the status of the contribution.

Content for drafts of standards is submitted to WGs by individual participants, or groups of participants. Content toward other group documents (such as, for example, external communication statements or foundation documents underlying a draft of a standard) might also be

contribution-driven. At some point, the group assembles contributed material to develop group documents, and revision takes place within group meetings or by assignment to editors. For the most part, the contributions toward discussion as well as the group documents (including minutes and other reports) are openly available to the public.

3.4. Cross-Referencing

IETF and IEEE 802 each recognize the standards defined by the other organization. Standards produced by each organization can be used as references in standards produced by the other organization.

IETF specifications may reference IEEE 802 work in progress, but these references should be labeled "Work in Progress". If the references are normative, this will block publication of the referring specification until the reference is available in a stable form.

IEEE 802 standards may normatively reference non-expired Internet-Drafts, but IEEE 802 prefers that this be avoided if at all possible.

Informative references in IEEE 802 Standards are placed in a bibliography, so may point to either approved IETF standards or IETF Internet-Drafts, if necessary.

When an IEEE 802 Standard is revised, it normally retains the same number and the date is updated. Therefore, IEEE 802 Standards are dated with the year of approval, e.g IEEE 802 Std 802.1Q-2011. There are two ways of referencing IEEE 802 Standards: undated and dated references. IEEE 802 practice allows undated reference to be used when referencing a whole standard. An undated reference indicates that the most recent version of the standard should be used. A dated reference refers to a specific revision of an IEEE 802 standard. Since clauses, subclauses, tables, figures, etc. may be renumbered when a standard is revised, a dated reference should be used when citing specific items in a standard.

IETF standards may be cited by RFC number, which would also be a dated reference. If an undated reference to an IETF Internet Standard is desired, a number is also assigned in the "STD" series [BCP9], and these references refer to the most recent version of an IETF Internet Standard.

4. Guidance on Cooperation

This section describes how existing processes within the IETF and IEEE 802 may be used to enable cooperation between the organizations.

Historically, much of the work of coordination has fallen on individuals attending meetings of both organizations. However, as noted in "Transferring MIB Work from IETF Bridge MIB WG to IEEE 802.1 WG" [RFC4663], downward pressure on travel budgets has made it increasingly difficult for participants to attend face-to-face meetings in both organizations. That pressure has continued in the intervening years. As a result, the coordination mechanisms described in this section typically do not require meeting attendance.

4.1. Exchange of Information About Work Items

The following sections outline a process that can be used to enable each organization to stay informed about the other's active and proposed work items.

Early identification of topics of mutual interest allows the two organizations to cooperate in a productive way, and helps each organization avoid developing specifications that overlap or conflict with specifications developed in the other organization. Where individuals notice a potential conflict or need for coordination, the issue should be brought to the attention of the relevant Working Group chairs and/or Area Directors.

4.1.1. How IEEE 802 is Informed About Active IETF Work Items

The responsibility is on IEEE 802 Working Groups to review current IETF Working Groups to determine if there are any topics of mutual interest. Working Group charters and active Internet- Drafts can be found on the IETF web site (<http:// datatracker.ietf.org/wg/>). If an IEEE 802 working group identifies a common area of work, the IEEE 802 Working Group leadership should contact both the IETF Working Group chair and the Area Director(s) responsible. This may be accompanied by a formal liaison statement (see Section 5.2).

4.1.2. How IETF is Informed About Active IEEE 802 Work Items

It is the responsibility of IETF Working Groups to periodically review the IEEE 802 web site to determine if there is work in progress of mutual interest.

IEEE 802 Working Group status reports are published at the beginning and end of each plenary at <http://IEEE802.org/minutes>. Each Working Group includes a list of their active projects and the status.

The charter of an IEEE 802 project is defined in an approved Project Authorization Request (PAR). PARs are accessible in IEEE Standards

myProject, at <https://development.standards.ieee.org/my-site>. Access requires an IEEE web account which is free and has no membership requirement.

In myProject, a search on "View Active PARs" for 802 will bring up a list of all active IEEE 802 PARs.

If an IETF working group identifies a common area of work or a need for cooperation, the working group leadership should contact the IEEE 802 Working Group chair and Task Group chair. This may be accompanied by a formal liaison statement (see Section 5.2).

4.1.3. Overview of New Work Proposal Notification

These principles describe the notification process used by both organizations:

1. For both organizations, the technical group making a proposal for new work that may conflict with, overlap with, or be dependent on the other organization is responsible for informing the top-level coordination body in the other organization that cooperation may be required.

2. For both organizations, the top-level coordination body receiving that notification is responsible for determining whether cooperation is, in fact, required, and informing the specific groups within the organization who may be affected by the proposal for new work.

These direct notifications will be the most common way that each organization is informed about proposals for new work in the other organization. Several other ways of identifying proposed new work are described in the following sections. These additional ways act as "belt and suspenders" to reduce the chances that proposals for new work in one organization escapes notice in the other organization when cooperation will be required.

4.1.4. The New-Work Mailing List

Several standards development organizations ("SDOs"), including IETF and IEEE 802, have agreed to use a mailing list for the distribution of information about proposals for new work items among these SDOs.

Rather than having individual IEEE 802 participants subscribe directly to New-Work, a single IEEE 802 mailing list is subscribed. Leadership of the IEEE 802 Working Groups may subscribe to this "second-level" IEEE 802 mailing list, which is maintained by the Executive Committee (EC).

This mailing list is limited to representatives of SDOs proposing new work that may require cooperation with the IETF. Subscription requests may be sent to the IAB Executive Director.

4.1.5. How IEEE 802 is Informed About Proposed New IETF Work Items

Many proposals for new IETF work items can be identified in proposed Birds-of-a-Feather (BOF) sessions, as well as draft charters for Working Groups. The IETF forwards all such draft charters for new and revised Working Groups and BOF session announcements to the IETF New-Work mailing list.

4.1.6. How IEEE 802 Comments on Proposed New IETF Work Items

Each IEEE 802 Working Group chair, or designated representative, may provide comments on these charters by responding to the IESG mailing list at iesg@ietf.org clearly indicating their IEEE 802 position and the nature of their concern.

It should be noted that the IETF turnaround time for new Working Group charters can be as short as two weeks, although the call for comment period on work items that may require cooperation with IEEE 802 can be extended to allow more time for discussion within IEEE 802. This places a burden on both organizations to proactively communicate and avoid "late surprises" to either organization.

Although an IEEE 802 Working Group may not be able to develop a formal consensus response unless the notification arrives during that Working Group's meeting, the IEEE 802 Working Group chair can informally let the IETF know that IEEE 802 may have concerns about a proposed work item. The IETF will consider any informal comments received without waiting for a formal liaison statement.

4.1.7. How IETF is Informed About Proposed New IEEE 802 Work Items

An IEEE 802 project is initiated by approval of a Project Authorization Request (PAR) which includes a description of the scope of the work. Any IEEE 802 PARs which introduce new functionality are required to be available for review no less than 30 days prior to the Monday of the IEEE 802 plenary session where they will be considered.

IEEE 802 considers Five Criteria when deciding whether to approve new work: Broad Market Potential, Compatibility, Distinct Identity, Technical Feasibility and Economic Feasibility. The criteria are defined in the IEEE 802 LAN/MAN Standards Committee (LMSC) Operations Manual. The PARs are accompanied by responses on the 5 Criteria.

IEEE 802 posts proposed PARs to the New-Work mailing list, prior to

the IEEE 802 meetings where the PARs will be discussed. The IETF coordination body will notify technical groups about PARs of interest.

4.1.8. How IETF Comments on Proposed New IEEE 802 Work Items

Any comments on proposed PARs should be submitted to the Working Group chair and copied to the Executive Committee chair by e-mail not later than 5:00 PM Tuesday of the plenary session (in the time zone where the plenary is located).

4.1.9. Other Mechanisms for Coordination

From time to time, IEEE 802 and IETF may agree to use additional mechanisms for coordination between the two groups. The details of these mechanisms may vary over time, but the overarching goal is to communicate effectively as needed.

As examples of such mechanisms, at the time this document was written, the two organizations are holding periodic conference calls between representatives of the IETF and IEEE 802 leadership teams, and are maintaining a "living list" of shared interests between the two organizations, along with the status of these interests and any related action items. At the time this document was written, the "living list" included about 20 topics being actively discussed, with more expected. These conference calls help the two organizations coordinate more effectively by allowing higher-bandwidth discussions than formal liaison statements would allow, and permitting more timely interactions than waiting for face-to-face meetings.

Minutes for these conference calls, and the "living lists" discussed on each call, are available at <http://www.iab.org/activities/joint-activities/iab-ieee-coordination/>.

4.2. Document Review and Approval

During the course of IEEE 802 and IETF cooperation, it is important for technical experts to review documents of mutual interest and, when appropriate, to provide review comments to the approving body as the document moves through the approval process.

4.2.1. IEEE 802 Draft Review and Balloting Processes

IEEE 802 drafts are reviewed and balloted at multiple stages in the draft. Any ballot comments received from non-voters before the close of the ballot are required to be considered in the comment resolution process. The Editors, Task Group Chairs or Working Group Chairs responsible for the project will facilitate the entering of comments

from non-voters.

IEEE 802 draft reviews and ballots sometimes produce a large volume of comments. In order to handle them efficiently, spreadsheets or a comment database tool are used. It is highly recommended that balloters and others submitting comments do so with a file that can be imported into these tools. A file with the correct format is normally referenced in the ballot announcement or can be obtained from the Editor, Task Group Chair or Working Group Chair responsible for the project. Comments on a draft should be copied to the Editor, Task Group Chair and Working Group Chair.

4.2.1.1. Task Group Review

During draft development, informal task group reviews (task group ballots) are conducted. Though these are called "ballots" by some Working Groups, the focus is on collecting and resolving comments on the draft rather than on trying to achieve a specific voting result.

4.2.1.2. Working Group Ballot

Once the draft is substantially complete, Working Group ballots are conducted. Working Group voting members are entitled and required to vote in Working Group ballots. Any disapprove votes are required to be accompanied by comments that indicate what the objection is and a proposed resolution. Approve votes may also be accompanied by comments. The comments submitted with a disapprove vote may be marked to indicate which comments need to "be satisfied" to change the vote.

Initial Working Group ballots are at least 30 days. Recirculation ballots to review draft changes and comment resolutions are at least 10 days.

In order to submit a Working Group ballot, contact the WG chair for the submission tool currently in use, as the tools may change over time.

4.2.1.3. Sponsor Ballot

When a draft has successfully completed Working Group ballot, it proceeds to Sponsor ballot. One may participate in IEEE 802 Sponsor ballots with an individual membership in the IEEE Standards Association (IEEE-SA) or by paying a per-ballot fee. Participants are also required to state their affiliation and the category of their relationship to the scope of the standards activity (e.g., producer, user, general interest).

Information about IEEE-SA membership can be found at <http://standards.ieee.org/membership/>.

Sponsor ballot is a public review. An invitation is sent to any parties known to be interested in the subject matter of the ballot. One can indicate interest in IEEE myProject (<https://development.standards.ieee.org/myproject/bp/StartPage>). An IEEE web account is freely available, and is required for login. To select interest areas, go to the Projects tab and select Manage Activity Profile and check any areas of interest. IEEE 802 projects are under Computer Society; LAN/MAN Standards Committee.

The Sponsor ballot pool is formed from those that accept the invitation during the invitation period.

As with other ballot levels, the IETF participants who want to comment on Sponsor ballots need not be members in the Sponsor ballot pool. The Editors, Task Group Chairs or Working Group Chairs responsible for the project will facilitate the entering of comments from IETF participants who are not members in the Sponsor ballot pool.

Any "disapprove" votes are required to be accompanied by comments that indicate what the objection is, along with a proposed resolution. Approve votes may also be accompanied by comments. The comments submitted with a disapprove vote may be marked to indicate which comments need to "be satisfied" for the commenter to change the vote from "disapprove".

Initial Sponsor ballot are open for at least 30 days. Recirculation ballots to review draft changes and proposed comment resolutions are at least 10 days.

4.2.1.4. Ballot Resolution

At each level, the relevant group (Task Group for TG ballots, Working Group for WG and Sponsor ballots) examines the ballot comments and determines their disposition. The editor (or editorial team) may prepare proposed dispositions. Task Group procedures vary, but at the Working Group level, the Working Group must vote 75 percent to approve the final ballot disposition in order to advance the document.

4.2.2. IETF Draft Review and Approval Processes

The IETF Working Group Process is defined in [BCP25]. The overall IETF standards process is defined in [BCP9].

As noted in Section 2.4, IETF Working Groups do not "ballot" to determine Working Group consensus to forward documents to the IESG for approval.

Technical contributions are welcome at any point in the IETF document review and approval process, but there are some points where contribution is more likely to be effective.

1. When a Working Group is considering adoption of an individual draft. Adoption is often announced on the Working Group's mailing list.

2. When Working Group chairs issue a "Working Group Last Call" ("WGLC") for a draft, to confirm that the Working Group has consensus to request publication. Although this is not a mandatory step in the document review and approval process for Internet-Drafts, most IETF Working Groups do issue WGLCs for most Working Group documents. WGLC would be announced on the Working Group's mailing list.

3. When the Internet Engineering Steering Group issues an "IETF Last Call" ("Last Call") for a draft. IETF Last Call is a formal and required part of the review and approval process, is addressed to the larger IETF community, and is often the first time the entire community has looked at the document. IETF Last Call is signaled on the IETF-Announce Mailing List, and comments and feedback are ordinarily directed to the IETF Discussion Mailing List.

In practice, earlier input is more likely to be effective input. IEEE 802 participants who are interested in work within the IETF should be monitoring that work and providing input long before Working Group Last Calls and IETF Last Calls, for best results.

Some IETF working group charters direct the working group to communicate with relevant IEEE 802 task groups.

4.3. Solicited Review Processes

With the number of areas of cooperation between IEEE 802 and IETF increasing, the document review process has extended beyond the traditional subjects of SMI MIB modules and AAA (authentication, authorization and accounting) described in [RFC4441]. IESG members routinely solicit directorate reviews as a means to solicit the opinion of specialized experts on specific aspects of documents in IESG review (examples include security, MIB doctors, or congestion management reviews). Area Directors may also require solicited reviews from IEEE 802 or IEEE 802 Working Groups when it becomes clear that the Internet-Draft has implications that impact some area

of IEEE 802's responsibility and expertise.

IEEE 802 leadership can also solicit similar reviews, but these reviews are not included as part of the formal IEEE 802 process.

5. Liaison Managers and Liaison Statements

Both IEEE 802 and IETF work best when people participate directly in work of mutual interest, but that is not always possible, and individuals speaking as individuals may not provide effective communication between the two SDOs. From time to time, it may be appropriate for a technical body in one SDO to communicate as a body with a technical body in the other SDO. This section describes the mechanisms used to provide formal communication between the two organizations, should that become necessary.

The Internet Architecture Board (IAB) is responsible for liaison relationship oversight for the IETF. In IEEE 802, liaison relationship oversight is distributed, and each organization appointing liaison managers is responsible for oversight of its own liaison relationships.

The reader should note that the role of a liaison manager in both IEEE 802 and IETF is not to "speak for" the appointing organization. A liaison manager is most helpful in ensuring that neither organization is surprised by what's happening in the other organization, helping to identify the right people to be talking to in each organization, and making sure that formal liaison statements don't "get lost" between the two organizations. The IAB's guidance to liaison managers is available in [RFC4691]. IEEE 802 organizations appointing each liaison manager also provide guidance to those liaison managers. There is no global guidance for all IEEE 802 liaison managers.

5.1. Liaison Managers

The IAB appoints IETF Liaison Managers using the process described in [BCP102]. The current list of the IETF's liaison relationships, and the liaison managers responsible for each of these relationships is available at <http://www.ietf.org/liaison/managers.html>.

IEEE liaison managers are selected by the organizations they represent, either in an election or by working group or task group chair appointment. The current list of IEEE 802's liaison relationships and the liaison managers responsible for each of these relationships is available at <http://www.ieee802.org/liaisons.shtml>.

5.2. Liaison Statements

The IEEE 802 procedure for sending and receiving liaison statements is defined by the Procedure for Coordination with Other Standards Bodies in the IEEE 802 LMSC Operations Manual (<http://ieee802.org/devdocs.shtml>).

The IETF process for sending and receiving liaison statements is defined in [BCP103].

6. Protocol Parameter Allocation

Both IEEE 802 and IETF maintain registries of assigned protocol parameters, and some protocol parameters assigned in one organization are of interest to the other organization. This section describes the way each organization registers protocol parameters.

6.1. IANA

The IETF uses the Internet Assigned Numbering Authority (IANA) as a central authority that administers registries for most protocol parameter allocations. The overarching document describing this is [RFC5226]. [BCP141] discusses use of IEEE 802-specific IANA parameters in IETF protocols and specifies IANA considerations for allocation of code points under the IANA OUI (Organizationally Unique Identifier).

Requests for protocol parameter allocations from IANA are subject to assignment policies, and these policies vary from registry to registry. A variety of well-known policies are described in [RFC5226], but registries are not limited to one of the well-known choices.

The purpose of these allocations is to manage a namespace appropriately, so unless a registry has a policy that allows something like first come, first served ("FCFS") for a namespace that is effectively unbounded, requests for protocol parameter allocation will require some level of review. "Standards Action" is at the other extreme (an approved standards-track RFC is required in order to obtain an allocation). Some registries require that a request for allocation pass "expert review" - review by someone knowledgeable in the technology domain, appointed by the IESG and given specific criteria to use when reviewing requests.

6.2. IEEE Registration Authority

The IEEE Standards Association uses the IEEE Registration Authority as a central authority administering registries. The IEEE

Registration Authority Committee (IEEE RAC) provides technical oversight for the IEEE Registration Authority.

The list of Registries administered by the IEEE Registration Authority can be found on the IEEE RAC website, at <http://standards.ieee.org/develop/regauth/general.html>.

Ethertype Allocation - Some IETF protocol specifications make use of Ethertypes. Ethertypes are fairly scare resource so allocation has the following requirements. All Ethertype requests are subject to review by a consultant to the IEEE RA followed by IEEE RAC confirmation.

The IEEE RAC will not assign a new Ethertype to a new IETF protocol specification until the IESG has approved the protocol specification for publication as an RFC. In exceptional cases, the IEEE RA will consider "early allocation" of an Ethertype for an IETF protocol that is still under development when the request comes from, and has been vetted by, the IESG.

Note that "playpen" Ethertypes have been assigned in IEEE 802 [Etypes] for use during protocol development and experimentation.

While a fee is normally charged by the IEEE Registration Authority Committee (RAC) for the allocation of an Ethertype, the IEEE RAC will consider waiving the fee for allocations relating to an IETF standards track document, based on a request from the IESG.

6.3. IEEE 802 Registration at the Working Group Level

Each IEEE 802 working group has a registry of identifier values and a mechanism to allocate identifier values in its standards and approved amendments. This includes items such as Object Identifiers for managed objects and assignment for protocols defined by that Working Group, such as OpCodes. Contact the IEEE 802 working group chair for the details of a given working group registry.

6.4. Joint-use Registries

Because some registries are "joint-use" between IEEE 802 and IETF, it is necessary for each organization to review usage of registries maintained by the other organization as part of the review and approval process for standards.

If an IEEE 802 document refers to IANA registries, those references should be checked prior to Sponsor balloting. If an IETF document refers to IEEE 802 registries, those references should be checked as part of IANA Review during IETF Last Call.

7. Security Considerations

This document describes cooperation procedures and has no direct Internet security implications.

8. IANA Considerations

[RFC Editor: please remove this section prior to publication.]

This document has no IANA Actions.

9. References

RFC-Editor: please correct the BCP references in the Normative and Informative reference sections below, i.e. [BCP9], [BCP141], etc. Then please remove this note prior to publication as an RFC.

9.1. Normative References

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[BCP10] Internet Engineering Task Force, "Best Current Practice 10: IAB and IESG Selection, Confirmation, and Recall Process: Operation of the Nominating and Recall Committees, as updated", 2004.

[BCP11] Internet Engineering Task Force, "Best Current Practice 11: The Organizations Involved in the IETF Standards Process, as updated", 1996.

[BCP25] Internet Engineering Task Force, "Best Current Practice 25: IETF Working Group Guidelines and Procedures", 1998.

[BCP101] Internet Engineering Task Force, "Structure of the IETF Administrative Support Activity (IASA)", 2005.

[BCP102] Internet Engineering Task Force, "Best Current Practice 102: IAB Processes for Management of IETF Liaison Relationships", 2005.

[BCP103] Internet Engineering Task Force, "Best Current Practice 103: Procedures for Handling Liaison Statements to and from the IETF", 2005.

[BCP111] Internet Engineering Task Force, "Guidelines for Authors and Reviewers of MIB Documents", 2005.

[BCP132] "Guidance for Authentication, Authorization and Accounting (AAA) Key Management", 2007.

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[IEEE80211F] IEEE 802, "802.11F-2003 - IEEE Trial-Use Recommended Practice for Multi-Vendor Access Point Interoperability Via an Inter-Access Point Protocol Across Distribution Systems Supporting IEEE 802.11 Operation", 2003.

[IEEE-802.16-Liaison1]
Liaison letter from IEEE 802.16 to Bernard Aboba, March 17, 2005, http://ieee802.org/16/liaison/docs/L80216-05_025.pdf.

[IEEE-802.16-Liaison2]
Liaison letter from IEEE 802.16 to Bernard Aboba, May 5, 2005, http://ieee802.org/16/liaison/docs/L80216-05_039.pdf.

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[RFC6756] Trowbridge, S., Lear, E., Fishman, G., and S. Bradner, "Internet Engineering Task Force and International Telecommunication Union - Telecommunication Standardization Sector Collaboration Guidelines", RFC 6756, September 2012.

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Appendix A. Current Examples of IEEE 802 and IETF Cooperation

A.1. MIB Review

Historically the MIB modules for IEEE 802.1 and IEEE 802.3 were developed in the IETF Bridge MIB and Hub MIB Working Groups respectively. With travel budgets under pressure, it has become increasingly difficult for companies to fund employees to attend both IEEE 802 and IETF meetings.

As a result, an alternative was found to past arrangements that involved chartering MIB work items within an IETF WG. Instead, the work was transferred to IEEE 802 with expert support for MIB review from the IETF. The process of transfer of the MIB work from the IETF Bridge MIB WG to IEEE 802.1 WG is documented in [RFC4663].

By standardizing IEEE 802 MIBs only within IEEE 802 while utilizing the IETF SNMP quality control process, the IETF and IEEE 802 seek to ensure quality while decreasing overhead. In order to encourage wider review of MIBs developed by IEEE 802 WGs, it is recommended that MIB modules developed in IEEE 802 follow the MIB guidelines [BCP111]. An IEEE 802 group may request assignment of a 'MIB Doctor' to assist in a MIB review by contacting the IETF Operations and Management Area Director.

A.2. AAA Review

IEEE 802 WGs requiring new AAA applications should send a liaison request to the IETF. Where new attribute definitions are sufficient, rather than defining new authentication, authorization and accounting logic and procedures, an Internet-Draft can be submitted and review can be requested from AAA-related WGs such as the RADEXT or DIME WGs.

In addition to the RADEXT and DIME WGs, a AAA Doctors team (directorate) is currently active in the OPS Area and can be consulted for more general advice on AAA issues that cross the limits of one or the other of the RADIUS or Diameter protocols, or are more generic in nature.

For attributes of general utility, particularly those useful in multiple potential applications, allocation from the IETF standard attribute space is preferred to creation of IEEE 802 Vendor-Specific Attributes (VSAs). As noted in [RFC3575]: "RADIUS defines a mechanism for Vendor-Specific extensions and the use of that should be encouraged instead of allocation of global attribute types, for functions specific only to one vendor's implementation of RADIUS, where no interoperability is deemed useful".

Where allocation of VSAs are required, it is recommended that IEEE 802 create a uniform format for all of IEEE 802, rather than having each IEEE 802 Working Group create their own VSA format. The VSA format defined in [IEEE80211F] is inappropriate for this, since the Type field is only a single octet, allowing for only 255 attributes. It is recommended that IEEE 802 Working Groups read and follow the recommendations in "RADIUS Design Guidelines" [BCP158] and "Protocol Extensions" [RFC6929] when designing and reviewing new extensions and attributes.

"Diameter Applications Design Guidelines" [DADG] explains and clarifies the rules to extend the Diameter base protocol [RFC6733]. Extending Diameter can mean either the definition of a completely new Diameter application or the reuse of commands, Attribute-Value Pairs (AVPs) and AVP values in any combination for the purpose of inheriting the features of an existing Diameter application. The recommendation for re-using existing applications as much as possible is meaningful as most of the requirements defined for a new application are likely already fulfilled by existing applications. It is recommended that IEEE 802 Working Groups read and follow the recommendations in [DADG] when defining and reviewing new extensions and attributes.

A.3 EAP Review

The Extensible Authentication Protocol (EAP), defined in [RFC3748], provides a framework within which authentication mechanisms, known as methods, can be defined. In addition to supporting authentication, EAP also provides for key derivation as described in [RFC5247]. State machines for EAP are described in [RFC4137].

As noted in [BCP132] and [RFC5247], security issues can arise in integration of EAP within lower layers. Therefore it is recommended that IEEE 802 WGs looking to incorporate support for EAP send a liaison request to the IETF, requesting assistance in carrying out a security review. As an example, a security review of IEEE 802.16 was carried out by the EAP WG, at the request of IEEE 802.16 [IEEE-802.16-Liaison1] [IEEE-802.16-Liaison2]. Where development of new EAP authentication methods is sufficient, an Internet-Draft can be submitted and review can be requested from WGs such as the EAP Method Update (EMU) WG.

Appendix B. Pointers to Additional Information

This section provides pointers to additional useful information for participants in IEEE 802 and IETF.

B.1. IEEE 802 Information

IEEE 802 Home Page: <http://IEEE802.org/>

IEEE 802 policies and procedures: <http://ieee802.org/devdocs.shtml>

The IEEE 802 WG and TAG main page URLs follow this convention: They have the one or two digit numerical designation for the WG or TAG appended after <http://IEEE802.org/>. For example the IEEE 802.1 main web page is at <http://IEEE802.org/1>, while the IEEE 802.11 main web page is at <http://IEEE802.org/11>.

B.2. IETF Information

Information on IETF procedures may be found in the documents in the informative references, and at the URLs below.

Note: RFCs do not change after they are published. Rather, they are either obsoleted or updated by other RFCs. Such updates are tracked in the rfc-index.txt file.

Current list and status of all IETF RFCs: <ftp://ftp.ietf.org/rfc/rfc-index.txt>

Current list and description of all IETF Internet-Drafts: <ftp://ftp.ietf.org/internet-drafts/1id-abstracts.txt>

Current list of IETF Working Groups and their Charters: <http://datatracker.ietf.org/wg/> (includes Area Directors and chair contacts, mailing list information, etc.)

Current list of requested BOFs: <http://trac.tools.ietf.org/bof/trac/>

RFC Editor pages about publishing RFCs: <http://www.rfc-editor.org/index.html> (including available tools and lots of guidance) <http://www.rfc-editor.org/pubprocess.html> is particularly helpful.

Current list of liaison statements: <https://datatracker.ietf.org/liaison/>

IETF Intellectual Property Rights Policy and Notices: <http://www.ietf.org/ipr/>

The Tao of the IETF: <http://www.ietf.org/tao.html>; (A Novice's Guide to the Internet Engineering Task Force)

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