The Tao of IETF:  
A Novice's Guide to the Internet Engineering Task Force

RFC 3160  
August 2001

The Secretariat would like to thank Susan Harris for all her efforts to update the Tao... and for providing this html-ized version of the document, with help from Paul Hoffman.

Abstract

For the benefit of users who are new to the Internet Engineering Task Force, this document describes the inner workings of IETF meetings and Working Groups, discusses organizations related to the IETF, and introduces the standards process.

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Introduction

Over the last several years, attendance at Internet Engineering Task Force (IETF) face-to-face meetings has grown phenomenally. Many of the attendees are new to the IETF at each meeting, and many of those go on to become regular attendees. When the meetings were smaller, it was relatively easy for a newcomer to get into the swing of things. Today, however, a newcomer meets many more new people, some previously known only as the authors of documents or thought-provoking e-mail messages.

This document describes many aspects of the IETF, with the goal of explaining to newcomers how the IETF works. This will give them a warm, fuzzy feeling and enable them to make the meeting and the Working Group discussions more productive for everyone.

Of course, it's true that many IETF participants don't go to the face-to-face meetings at all. Instead, they're active on the mailing list of various IETF Working Groups. Since the inner workings of Working Groups can be hard for newcomers to understand, this FYI provides the mundane bits of information that newcomers will need in order to become active participants.

Many types of IETF documentation are mentioned in the Tao, from BCPs to RFCs and FYIs. (BCPs make recommendations for Best Current Practices in the Internet; RFCs are the IETF's main technical documentation series, politely known as "Requests for Comments;" and FYIs provide topical and technical overviews that are introductory or appeal to a broad audience. See Section 6 for more information.)

The acronyms and abbreviations used in this document are usually expanded in place, and are explained fully in Section 9.

Acknowledgements

The original version of this document, published in 1994, was written by Gary Malkin. His knowledge of the IETF, insights, and unmatched writing style set the standard for this later revision, and his contributions to the current draft are also much appreciated. Paul Hoffman wrote significant portions of this revision and provided encouragement, expertise, and much-needed guidance. Other contributors include Scott Bradner, Michael Patton, Donald E. Eastlake III, the IETF Secretariat, and members of the User Services Working Group.

1. What Is the IETF?

The Internet Engineering Task Force is a loosely self-organized group of people who contribute to the engineering and evolution of Internet technologies. It is the principal body engaged in the development of new Internet standard specifications. The IETF is unusual in that it exists as a collection of happenings, but is not a corporation and has no board of directors, no members, and no dues.

Its mission includes:

- Identifying, and proposing solutions to, pressing operational and technical problems in the Internet;
- Specifying the development or usage of protocols and the near-term architecture to solve such technical problems for the Internet;
- Making recommendations to the Internet Engineering Steering Group (IESG) regarding the standardization of protocols and protocol usage in the Internet;
- Facilitating technology transfer from the Internet Research Task Force (IRTF) to the wider Internet community; and
Providing a forum for the exchange of information within the Internet community between vendors, users, researchers, agency contractors, and network managers.

The IETF meeting is not a conference, although there are technical presentations. The IETF is not a traditional standards organization, although many specifications are produced that become standards. The IETF is made up of volunteers, many of whom meet three times a year to fulfill the IETF mission.

There is no membership in the IETF. Anyone may register for and attend any meeting. The closest thing there is to being an IETF member is being on the IETF or Working Group mailing lists (see Section 1.3). This is where the best information about current IETF activities and focus can be found.

Of course, no organization can be as successful as the IETF is without having some sort of structure. In the IETF's case, that structure is provided by other organizations, as described in BCP 11, "The Organizations Involved in the IETF Standards Process." If you participate in the IETF and only read one BCP, this is the one you should read.

1.1 Humble Beginnings

The first IETF meeting was held in January, 1986, at Linkabit in San Diego, with 21 attendees. The 4th IETF, held at SRI in Menlo Park in October, 1986, was the first that non-government vendors attended. The concept of Working Groups was introduced at the 5th IETF meeting at the NASA Ames Research Center in California in February, 1987. The 7th IETF, held at MITRE in McLean, Virginia in July, 1987, was the first meeting with over 100 attendees.

The 14th IETF meeting was held at Stanford University in July 1989. It marked a major change in the structure of the IETF universe. The IAB (then Internet Activities Board, now Internet Architecture Board), which until that time oversaw many "task forces," changed its structure to leave only two: the IETF and the IRTF. The IRTF is tasked to consider long-term research problems in the Internet. The IETF also changed at that time.

After the Internet Society (ISOC) was formed in January, 1992, the IAB proposed to ISOC that the IAB's activities should take place under the auspices of the Internet Society. During INET92 in Kobe, Japan, the ISOC Trustees approved a new charter for the IAB to reflect the proposed relationship.

The IETF met in Amsterdam, The Netherlands, in July 1993. This was the first IETF meeting held in Europe, and the US/non-US attendee split was nearly 50/50. One in five IETF meetings are now held in Europe or Asia, and the number of non-US attendees continues to be high -- about 50%, even at meetings held in the US.

1.2 The Hierarchy

1.2.1 ISOC (Internet Society)

The Internet Society is an international, non-profit, membership organization that fosters the expansion of the Internet. One of the ways that ISOC does this is through financial and legal support of the other "I" groups described here, particularly the IETF. ISOC's oversight of the IETF is remarkably hands-off, so many IETF participants don't even know about it. ISOC provides insurance coverage for many of the people in the IETF process, and acts as a public relations channel for the times that one of the "I" groups wants to say something to the press. The ISOC is one of the major unsung (and underfunded) heroes of the Internet.
1.2.2 IESG (Internet Engineering Steering Group)

The IESG is responsible for technical management of IETF activities and the Internet standards process. It administers the process according to the rules and procedures that have been ratified by the ISOC Trustees. However, the IESG doesn't do much direct leadership, such as the kind you will find in many other standards organizations. The IESG ratifies or corrects the output from the IETF's Working Groups, gets WGs started and finished, and makes sure that non-WG drafts that are about to become RFCs are correct.

The IESG consists of the Area Directors ("ADs"), who are selected by the Nominations Committee (which is usually called "Nomcom") and are appointed for two years. The process for choosing the members of the IESG is detailed in BCP 10, "IAB and IESG Selection, Confirmation, and Recall Process: Operation of the Nominating and Recall Committees."

The current areas and abbreviations are:

- Applications (APP) - Protocols seen by user programs, such as e-mail and the Web
- General (GEN) - Catch-all for WGs that don't fit in other areas (which is very few)
- Internet (INT) - Different ways of moving IP packets and DNS information
- Operations and Management (OPS) Administration and monitoring
- Routing (RTG) - Getting packets to their destinations
- Security (SEC) - Authentication and privacy
- Transport (TSV) - Special services for special packets
- User Services (USV) - Support for end users and user support organizations

Because the IESG has a great deal of influence on whether Internet Drafts become RFCs, many people look at the ADs as somewhat godlike creatures. IETF participants sometimes reverently ask an Area Director for their opinion on a particular subject. However, most ADs are nearly indistinguishable from mere mortals and rarely speak from mountaintops. In fact, when asked for specific technical comments, the ADs may often defer to members at large whom they feel have more knowledge than they do in that area.

The ADs for a particular area are expected to know more about the combined work of the WGs in that area than anyone else. On the other hand, the entire IESG votes on each Internet Draft that is becoming an RFC, and it only takes two IESG members to block a draft from moving forward. This ensures that an AD's "pet project" doesn't make it onto the standards track if it will have a negative effect on the rest of the IETF protocols.

This is not to say that the IESG never wields power. When the IESG sees a Working Group veering from its charter, or when a WG asks the IESG to make the WG's badly designed protocol a standard, the IESG will act. In fact, because of its high workload, the IESG usually moves in a reactive fashion. It approves most WG requests for Internet Drafts to become RFCs, and usually only steps in when something has gone very wrong. Another way to think about this is that the ADs are selected to think, not to just run the process. The quality of the IETF standards comes both from the review they get in the Working Groups and the review that the WG review gets from the ADs.

The IETF is run by rough consensus, and it is the IESG that decides if a WG has come up with a result that has a real consensus. Because of this, one of the main reasons that the IESG might block something that was produced in a WG is that the result did not really gain consensus in the IETF as a whole, that is, among all of the Working Groups in all areas. For instance, the result of one WG might clash with a technology developed in a different Working Group. An important job of the IESG is to watch over the output of all the WGs to help prevent IETF protocols that are at odds with each other. This is why ADs are supposed to review the drafts coming out of areas other than their own.
1.2.3 **IAB (Internet Architecture Board)**

The IAB is responsible for keeping an eye on the "big picture" of the Internet, and focuses on long-range planning and coordination among the various areas of IETF activity. The IAB stays informed about important long-term issues in the Internet, and brings these topics to the attention of people they think should know about them. IAB members pay special attention to emerging activities in the IETF. When a new IETF working group is proposed, the IAB reviews its charter for architectural consistency and integrity. Even before the group is chartered, the IAB members are more than willing to discuss new ideas with the people proposing them.

The IAB also sponsors and organizes the Internet Research Task Force, and convenes invitational workshops that provide in-depth reviews of specific Internet architectural issues. Typically, the workshop reports make recommendations to the IETF community and to theIESG. The IAB also:

- Approves Nomcom's IESG nominations
- Acts as the appeals board for appeals against IESG actions
- Appoints and oversees the RFC Editor
- Approves the appointment of the IANA
- Acts as an advisory body to the ISOC
- Oversees IETF liaisons with other standards bodies

Like the IESG, the IAB members are selected for multi-year positions by the Nomcom, and are approved by the Board of Trustees of the ISOC.

1.2.4 **IANA (Internet Assigned Numbers Authority)**

The core registrar for the IETF's activities is the IANA. Many Internet protocols require that someone keep track of protocol items that were added after the protocol came out. Typical examples of the kinds of registries needed are for TCP port numbers and MIME types. The IAB has designated the IANA organization to perform these tasks, and the IANA's activities are financially supported by ICANN, the Internet Corporation for Assigned Names and Numbers.

Five years ago, no one would have expected to ever see the IANA mentioned on the front page of a newspaper. IANA's role had always been very low key. The fact that IANA was also the keeper of the root of the domain name system forced it to become a much more public entity, one which was badly maligned by a variety of people who never looked at what its role was. Nowadays the IETF is generally no longer involved in the IANA's domain name and IP address assignment functions, which are overseen by ICANN.

Even though being a registrar may not sound interesting, many IETF participants will testify to how important IANA has been for the Internet. Having a stable, long-term repository run by careful and conservative operators makes it much easier for people to experiment without worrying about messing things up. IANA's founder, Jon Postel, was heavily relied upon to keep things in order while the Internet kept growing by leaps and bounds, and he did a fine job of it until his untimely death in 1998.

1.2.5 **RFC Editor**

The RFC Editor edits, formats, and publishes Internet Drafts as RFCs, working in conjunction with the IESG. An important secondary role is to provide one definitive repository for all RFCs (see [http://www.rfc-editor.org](http://www.rfc-editor.org)). Once an RFC is published, it is never revised. If the standard it describes changes, the standard will be re-published in another RFC that "obsoletes" the first. One of the most popular
misconceptions in the IETF community is that the role of the RFC Editor is performed by IANA. In fact, the RFC Editor is a separate job, although both the RFC Editor and IANA involved the same people for many years. The IAB approves the organization that will act as RFC Editor and the RFC Editor's general policy. The RFC Editor is funded by ISOC and can be contacted by e-mail at rfc-ed@rfc-editor.org.

1.2.6 IETF Secretariat

There are, in fact, a few people who are paid to maintain the IETF. The IETF Secretariat provides day-to-day logistical support, which mainly means coordinating face-to-face meetings and running the IETF-specific mailing lists (not the WG mailing lists). The Secretariat is also responsible for keeping the official Internet Drafts directory up to date and orderly, maintaining the IETF Web site, and for helping the IESG do its work. The IETF Secretariat is financially supported by the fees of the face-to-face meetings.

1.3 IETF Mailing Lists

Anyone who plans to attend an IETF meeting should join the IETF announcement mailing list, "ietf-announce@ietf.org." This is where all of the meeting information, Internet Draft and RFC announcements, and IESG Protocol Actions and Last Calls are posted. People who would like to "get technical" may also join the IETF discussion list, "ietf@ietf.org." This is where discussions of cosmic significance are held (Working Groups have their own mailing lists for discussions related to their work).

Subscriptions to these and other IETF mailing lists are handled by a program called Majordomo. Majordomo tends to be somewhat finicky about the format of subscription messages, and interacts poorly with email programs that make all email messages into HTML files. Majordomo will treat you well, however, if you format your messages just the way it likes. To join the IETF announcement list, for example, send email to:

ietf-announce-request@ietf.org

Enter the word 'subscribe' (without the quotes) in the Subject line of the message and in the message body. To join the IETF discussion list, send email to:

ietf-request@ietf.org

and enter the word 'subscribe' as explained above. If you decide to withdraw from either list, use the word 'unsubscribe.' Your messages to Majordomo should have nothing other than the commands 'subscribe' or 'unsubscribe' in them.

Both lists are archived on the IETF web site.

Do not, ever, under any circumstances, for any reason, send a request to join a list to the list itself! The thousands of people on the list don't need, or want, to know when a new person joins. Similarly, when changing e-mail addresses or leaving a list, send your request only to the "-request" address, not to the main list. This means you!!

The IETF discussion list is unmoderated. This means that anyone can express their opinions about issues affecting the Internet. However, it is not a place for companies or individuals to solicit or advertise, as noted in "IETF Discussion List Charter," RFC 3005. It is a good idea to read the whole RFC (it's short!) before posting to the IETF discussion list. Only the Secretariat can send messages to the announcement list.

Even though the IETF mailing lists "represent" the IETF membership at large, it is important to note that attending an IETF meeting does not mean you'll be automatically added to either mailing list.
2. IETF Meetings

The computer industry is rife with conferences, seminars, expositions, and all manner of other kinds of meetings. IETF face-to-face meetings are nothing like these. The meetings, held three times a year, are week-long dweebfests whose primary goal is to reinvigorate the WGs to get their tasks done, and whose secondary goal is to promote a fair amount of mixing between the WGs and the areas. The cost of the meetings is paid by the people attending and by the corporate host for each meeting, although ISOC kicks in additional funds for things like the multicast simulcast of some Working Group sessions.

For many people, IETF meetings are a breath of fresh air when compared to the standard computer industry conferences. There is no exposition hall, few tutorials, and no big-name industry pundits. Instead, there is lots of work, as well as a fair amount of time for socializing. IETF meetings are of little interest to sales and marketing folks, but of high interest to engineers and developers.

Most IETF meetings are held in North America, because that's where most of the participants are from; however, meetings are held on other continents about once every year or two. The past few meetings have had about 2,500 attendees. There have been over 49 IETF meetings so far, and a list of upcoming meetings is available on the IETF web pages, http://www.ietf.org/meetings/0mtg-sites.txt.

Newcomers to IETF face-to-face meetings are often in a bit of shock. They expect them to be like other standards bodies, or like computer conferences. Fortunately, the shock wears off after a day or two, and many new attendees get quite animated about how much fun they are having. One particularly jarring feature of recent IETF meetings is the use of wireless Internet connections throughout the meeting space. It is common to see half the people in a WG meeting reading e-mail or perusing the web during presentations they find uninteresting.

2.1 Registration

To attend an IETF meeting you have to register and you have to pay the registration fee. The meeting site and advance registration are announced about two months ahead of the meeting -- earlier if possible. An announcement goes out via e-mail to the IETF-announce mailing list, and information is posted on the IETF web site that same day.

To pre-register, you must submit your registration on the Web. You may pre-register and pre-pay, pre-register and return to the Web site later to pay with a credit card, pre-register and pay on-site at the meeting, or register and pay on-site. To get a lower registration fee, you must pay by the early registration deadline (about one week before the meeting). The registration fee covers all of the week's meetings, the Sunday evening reception (cash bar), daily continental breakfasts, and afternoon coffee breaks.

Credit card payments on the web are encrypted and secure, or, if you prefer, you can use PGP to send your payment information to the Registrar (ietf-registrar@ietf.org).

Registration is open throughout the week of the meeting. However, the Secretariat highly recommends that attendees arrive for early registration, beginning at noon on Sunday and continuing throughout the 5:00 Sunday evening reception. The reception is a popular event where you can get a bite to eat and socialize with other early arrivals.

Registered attendees (and there aren't any other kind) receive a registration packet. It contains much useful information, including a general orientation sheet, the most recent agenda, and a name tag. Attendees who pre-paid will also find their receipt in their packet.
It's worth noting that neither attendee names and addresses or IETF mailing lists are ever offered for sale.

### 2.2 Newcomers' Orientation

Newcomers are encouraged to attend the Newcomers' Orientation, which is especially designed for first-time attendees. The orientation is organized and conducted by the IETF Secretariat, and is intended to provide useful introductory information. The orientation is typically about 30 minutes long and covers what's in the attendee packets, what all the dots on name tags mean, the structure of the IETF, and many other essential and enlightening topics for new IETFers.

Immediately following the Newcomers' Orientation is the IETF Standards Process Orientation. This session demystifies much of the standards process by explaining what stages a document has to pass through on its way to becoming a standard, and what has to be done to advance to the next stage. The Standards Process Orientation also lasts about 30 minutes.

There is ample time at the end for questions. The Secretariat also provides handouts that include an overview of the IETF, a list of important files available online, and hard copies of the slides of the "IETF Structure and Internet Standards Process" presentation. These very useful slides are also available online at www.ietf.org under "Additional Information."

The orientation is held on Sunday afternoon before the 5:00 p.m. reception (check the agenda for exact time and location). Be advised that attending the orientation does NOT mean you can go to the reception early!

### 2.3 Dress Code

Since attendees must wear their name tags, they must also wear shirts or blouses. Pants or skirts are also highly recommended. Seriously though, many newcomers are often embarrassed when they show up Monday morning in suits, to discover that everybody else is wearing t-shirts, jeans (shorts, if weather permits) and sandals. There are those in the IETF who refuse to wear anything other than suits. Fortunately, they are well known (for other reasons) so they are forgiven this particular idiosyncrasy. The general rule is "dress for the weather" (unless you plan to work so hard that you won't go outside, in which case, "dress for comfort" is the rule!).

### 2.4 Seeing Spots Before Your Eyes

Some of the people at the IETF will have a little colored dot on their name tag. A few people have more than one. These dots identify people who are silly enough to volunteer to do a lot of extra work. The colors have the following meanings:

- **Blue** - Working Group/BOF chair
- **Green** - Host group
- **Red** - IAB member
- **Yellow** - IESG member
- **Orange** - Nominating Committee member

(Members of the press wear orange-tinted badges.)

Local hosts are the people who can answer questions about the terminal room, restaurants, and points of interest in the area.

It is important that newcomers to the IETF not be afraid to strike up conversations with people who wear
these dots. If the IAB and IESG members and Working Group and BOF chairs didn't want to talk to anybody, they wouldn't be wearing the dots in the first place.

### 2.5 Terminal Room

One of the most important (depending on your point of view) things the host does is provide Internet access for the meeting attendees. In general, wired and wireless connectivity is excellent. This is entirely due to the Olympian efforts of the local hosts, and their ability to beg, borrow and steal. The people and companies who donate their equipment, services and time are to be heartily congratulated and thanked.

While preparation far in advance of the meeting is encouraged, there may be some unavoidable "last minute" things that can be accomplished in the terminal room. It may also be useful to people who need to make trip reports or status reports while things are still fresh in their minds. The terminal room provides workstations, one or two printers, and ports for laptops.

### 2.6 Meals and Other Delights

Marshall Rose once remarked that the IETF was a place to go for "many fine lunches and dinners." While it is true that some people eat very well at the IETF, they find the food on their own; lunches and dinners are not included in the registration fee. The Secretariat does provide appetizers at the Sunday evening reception (not meant to be a replacement for dinner), continental breakfast every morning, and (best of all) cookies, brownies and other yummies during afternoon breaks.

If you prefer to get out of the hotel for meals, the local host usually provides a list of places to eat within easy reach of the meeting site.

### 2.7 Social Event

Another of the most important things organized and managed by the host is the IETF social event. Sometimes, the social event is a computer or high-tech related event. At the Boston IETF, for example, the social was dinner at the Computer Museum. Other times, the social might be a dinner cruise or a trip to an art gallery.

Newcomers to the IETF are encouraged to attend the social event. Everyone is encouraged to wear their name tags and leave their laptops behind. The social event is designed to give people a chance to meet on a social, rather than technical, level.

### 2.8 Agenda

The agenda for the IETF meetings is a very fluid thing. It is sent, updated, to the IETF announcement list three times prior to the meeting, and is also available on the web. The final agenda is included in the registration packets. Of course, "final" in the IETF doesn't mean the same thing as it does elsewhere in the world. The final agenda is simply the version that went to the printer. The Secretariat will post agenda changes on the bulletin board near the IETF registration desk (not the hotel registration desk).

Assignments for breakout rooms (where the Working Groups and BOFs meet) and a map showing the room locations are also shown on the agenda. Room assignments can change as the agenda changes. Some Working Groups meet multiple times during a meeting and every attempt is made to have a Working Group meet in the same room for each session.

### 2.9 Where Do I Fit In?
The IETF is different things to different people. There are many people who have been very active in the IETF who have never attended an IETF meeting. You should not feel obligated to come to an IETF meeting just to get a feel for the IETF. The following guidelines (based on stereotypes of people in various industries) might help you decide whether you actually want to come and, if so, what might be the best use of your time at your first meeting.

2.9.1 IS Managers

As discussed throughout this document, an IETF meeting is nothing like any trade show you have attended. IETF meetings are singularly bad places to go if your intention is to find out what will be hot in the Internet industry next year. You can safely assume that going to Working Group meetings will confuse you more than it will help you understand what is happening, or will be happening, in the industry.

This is not to say that no one from industry should go to IETF meetings. As an IS manager, you might want to consider sending specific people who are responsible for technologies that are under development in the IETF. As these people read the current Internet Drafts and the traffic on the relevant Working Group lists, they will get a sense of whether or not their presence would be worthwhile for your company or for the Working Groups.

2.9.2 Network Operators and ISPs

Running a network is hard enough without having to grapple with new protocols or new versions of the protocols with which you are already dealing. If you work for the type of network that is always using the very latest hardware and software, and you are following the relevant Working Groups in your copious free time, you might find attending the IETF meeting valuable. The closer you are to the bleeding edge of networking, particularly in the areas of routing and switching, the more likely it is that you will be able to learn and contribute at an IETF meeting.

2.9.3 Networking Hardware and Software Vendors

The image of the IETF being mostly ivory tower academics may have been true in the past, but the jobs of typical attendees are now in industry. In most areas of the IETF, employees of vendors are the ones writing the protocols and leading the Working Groups, so it's completely appropriate for vendors to attend. If you create Internet hardware or software, and no one from your company has ever attended an IETF meeting, it behooves you to come to a meeting if for no other reason than to tell the others how relevant the meeting was or was not to your business.

This is not to say that companies should close up shop during IETF meeting weeks so everyone can go to the meeting. Marketing folks, even technical marketing folks, are usually safe in staying away from the IETF as long as some of the technical people from the company are at the meeting. Similarly, it isn't required, or likely useful, for everyone from a technical department to go, particularly if they are not all reading the Internet Drafts and following the Working Group mailing lists. Many companies have just a few designated meeting attendees who are chosen for their ability to do complete and useful trip reports.

2.9.4 Academics

IETF meetings are often excellent places for computer science folk to find out what is happening in the way of soon-to-be-deployed protocols. Professors and grad students (and sometimes overachieving undergrads) who are doing research in networking or communications can get a wealth of information by following Working Groups in their specific fields of interest. Wandering into different Working Group meetings can
have the same effect as going to symposia and seminars in your department.

2.9.5 Computer Trade Press

If you're a member of the press and are considering attending IETF, we've prepared a special section of the Tao just for you -- please see Section 8.2.

2.10 Proceedings

IETF proceedings are compiled in the two months following each meeting, and are available on the web, on CD, and in print. Be sure to look through a copy -- the proceedings are filled with information about IETF that you're not likely to find anywhere else. For example, you'll find snapshots of most WG charters at the time of the meeting, giving you a better understanding of the evolution of any given effort.

The proceedings usually start with an informative (and highly entertaining) message from Steve Coya, the Executive Director of the IETF. Each volume contains the final (hindsight) agenda, an IETF overview, area and Working Group reports, and slides from the protocol and technical presentations. The Working Group reports and presentations are sometimes incomplete, if the materials haven't been turned in to the Secretariat in time for publication.

An attendee list is also included, and contains names, affiliations, work and fax phone numbers, and e-mail addresses as provided on the registration form. For information about obtaining copies of the proceedings, see the Web listing at http://www.ietf.org/proceedings/directory.html.

2.11 Other General Things

The IETF Secretariat, and IETFers in general, are very approachable. Never be afraid to approach someone and introduce yourself. Also, don't be afraid to ask questions, especially when it comes to jargon and acronyms!

Hallway conversations are very important. A lot of very good work gets done by people who talk together between meetings and over lunches and dinners. Every minute of the IETF can be considered work time (much to some people's dismay).

A "bar BOF" is an unofficial get-together, usually in the late evening, during which a lot of work gets done over drinks. Bar BOFs spring up in many different places around an IETF meeting, such as restaurants, coffee shops, and (if we are so lucky) pools.

It's unwise to get between a hungry IETFer (and there isn't any other kind) and coffee break brownies and cookies, no matter how interesting a hallway conversation is.

IETFers are fiercely independent. It's safe to question opinions and offer alternatives, but don't expect an IETFer to follow orders.

The IETF, and the plenary session in particular, are not places for vendors to try to sell their wares. People can certainly answer questions about their company and its products, but bear in mind that the IETF is not a trade show. This does not preclude people from recouping costs for IETF-related t-shirts, buttons and pocket protectors.

There is always a "materials distribution table" near the registration desk. This desk is used to make appropriate information available to the attendees (e.g., copies of something discussed in a Working Group
session, descriptions of online IETF-related information, etc.). Please check with the Secretariat before placing materials on the desk; the Secretariat has the right to remove material that they feel is not appropriate.

3 Working Groups

The vast majority of the IETF's work is done in many "Working Groups;" at the time of this writing, there are about 115 different WGs. (The term "Working Group" is often seen capitalized, but probably not for a very good reason.) BCP 25, IETF Working Group Guidelines and Procedures," is an excellent resource for anyone participating in WG discussions.

A WG is really just a mailing list with a bit of adult supervision. You "join" the WG by subscribing to the mailing list; all mailing lists are open to anyone. Some IETF WG mailing lists only let subscribers to the mailing list post to the mailing list, while others let anyone post. Each Working Group has one or two chairs.

More importantly, each WG has a charter that the WG is supposed to follow. The charter states the scope of discussion for the Working Group, as well as its goals. The WG's mailing list and face-to-face meetings are supposed to focus on just what is in the charter, and not to wander off on other "interesting" topics. Of course, looking a bit outside the scope of the WG is occasionally useful, but the large majority of the discussion should be on the topics listed in the charter. In fact, some WG charters actually specify what the WG will not do, particularly if there were some attractive but nebulous topics brought up during the drafting of the charter. The list of all WG charters makes interesting reading for folks who want to know what the different Working Groups are supposed to be doing.

3.1 Working Group Chairs

The role of the WG chairs is described in both BCP 11 and BCP 25. Basically, their job is to keep the discussion moving forward towards the milestones in the WG charter - - usually publication of one or more RFCs. They are not meant to be taskmasters, but are responsible for assuring positive forward motion and preventing random wandering.

As you can imagine, some Working Group chairs are much better at their jobs than others. When a WG has fulfilled its charter, it is supposed to cease operations. (Most WG mailing lists continue on after a WG is closed, still discussing the same topics as the Working Group did.) In the IETF, it is a mark of success that the WG closes up because it fulfilled its charter. This is one of the aspects of the IETF that newcomers who have experience with other standards bodies have a hard time understanding. However, some WG chairs never manage to get their WG to finish, or keep adding new tasks to the charter so that the Working Group drags on for many years. The output of these aging WGs is often not nearly as useful as the earlier products, and the messy results are sometimes called "degenerative Working Group syndrome."

One important role of the chair is to decide which Internet Drafts get published as "official" Working Group drafts, and which don't. In practice, there is actually not much procedural difference between WG drafts and independent drafts; for example, many WG mailing lists also discuss independent drafts (at the discretion of the WG chair). Procedures for Internet Drafts are covered in much more detail later in this document.

WG chairs are strongly advised to go to the new chairs' training lunch the first day of the IETF meeting. If you're interested in what they hear there, take a look at the slides at http://www.ietf.org/IESG/WG-Train_files/sld1.htm.

3.2 Getting Things Done in a Working Group

One fact that confuses many novices is that the face-to-face WG meetings are much less important in the
IETF than they are in most other organizations. Any decision made at a face-to-face meeting must also gain consensus on the WG mailing list. There are numerous examples of important decisions made in WG meetings that are later overturned on the mailing list, often because someone who couldn't attend the meeting pointed out a serious flaw in the logic used to come to the decision.

Another aspect of Working Groups that confounds many people is the fact that there is no formal voting. The general rule on disputed topics is that the Working Group has to come to "rough consensus," meaning that a very large majority of those who care must agree. The exact method of determining rough consensus varies from Working Group to Working Group. The lack of voting has caused some very long delays for some proposals, but most IETF participants who have witnessed rough consensus after acrimonious debates feel that the delays often result in better protocols. (And, if you think about it, how could you have "voting" in a group that anyone can join, and when it's impossible to count the participants?)

3.3 Preparing for Working Group Meetings

The most important thing that everyone (newcomers and seasoned experts) should do before coming to a face-to-face meeting is to read the Internet Drafts and RFCs beforehand. WG meetings are explicitly not for education: they are for developing the group's documents. Even if you do not plan to say anything in the meeting, you should read the group's documents before attending so you can understand what is being said.

It's up to the WG chair to set the meeting agenda, usually a few weeks in advance. If you want something discussed at the meeting, be sure to let the chair know about it. The agendas for all the WG meetings are available in advance (see http://www.ietf.org/meetings/agenda_xx.html, where 'xx' is the meeting number), but many WG chairs are lax (if not totally negligent) about turning them in.

The Secretariat only schedules WG meetings a few weeks in advance, and the schedule often changes as little as a week before the first day. If you are only coming for one WG meeting, you may have a hard time booking your flight with such little notice, particularly if the Working Group's meeting changes schedule. Be sure to keep track of the current agenda so you can schedule flights and hotels. But, when it comes down to it, you probably shouldn't be coming for just one WG meeting. It's likely that your knowledge could be valuable in a few WGs, assuming that you've read the drafts and RFCs for those groups.

If you're giving a presentation at a face-to-face meeting, you should probably come with a few slides prepared. Projectors for laptop-based presentations are available in all the meeting rooms. And here's a tip for your slides: don't put your company's logo on every one, even though it's common practice outside the IETF. The IETF frowns on this kind of corporate advertising, and most presenters don't even put their logo on their opening slide. The IETF is about technical content, not company boosterism.

3.4 Working Group Mailing Lists

As we mentioned earlier, the IETF announcement and discussion mailing lists are the central mailing lists for IETF activities. However, there are many other mailing lists related to IETF work. For example, every Working Group has its own discussion list. In addition, there are some long-term technical debates that have been moved off of the IETF list onto lists created specifically for those topics. It is highly recommended that everybody follow the discussions on the mailing lists of the Working Groups that they wish to attend. The more work that is done on the mailing lists, the less work that will need to be done at the meeting, leaving time for cross pollination (i.e., attending Working Groups outside one's primary area of interest in order to broaden one's perspective).

The mailing lists also provide a forum for those who wish to follow, or contribute to, the Working Groups' efforts, but can't attend the IETF meetings.
Most IETF discussion lists use Majordomo and have a "-request" address which handles the administrative details of joining and leaving the list. (See Section 1.3 for more information on Majordomo.) It is generally frowned upon when such administrivia appears on the discussion mailing list.

Most IETF discussion lists are archived. That is, all of the messages sent to the list are automatically stored on a host for anonymous FTP access. Many such archives are listed online at ftp://ftp.ietf.org/ietf-mail-archive/. If you don't find the list you're looking for, send a message to the list's "-request" address (not to the list itself!)

3.5 Interim Working Group Meetings

Working groups sometimes hold interim meetings between IETFs. Interim meetings aren't a substitute for IETF meetings, however -- a group can't decide to skip a meeting in a location they're not fond of and meet in Cancun three weeks later, for example. Interim meetings require AD approval, and need to be announced at least one month in advance. Location and timing need to allow fair access for all participants. Like regular IETF meetings, someone needs to take notes and send them to minutes@ietf.org, and the group needs to take attendance.

4. BOFs

In order to form a Working Group, you need a charter and someone who is able to be chair. In order to get those things, you need to get people interested so that they can help focus the charter and convince an Area Director that the project is worthwhile. A face-to-face meeting is useful for this. In fact, very few WGs get started by an Area Director; most start after a face-to-face BOF because attendees have expressed interest in the topic.

A BOF meeting has to be approved by the Area Director in the relevant area before it can be scheduled. If you think you really need a new WG, approach an AD informally with your proposal and see what they think. The next step is to request a meeting slot at the next face-to-face meeting. Of course, you don't need to wait for that meeting to get some work done, such as setting up a mailing list and starting to discuss a charter.

BOF meetings have a very different tone than WG meetings. The purpose of a BOF is to make sure that a good charter with good milestones can be created, and that there are enough people willing to do the work needed in order to create standards. Some BOFs have Internet Drafts already in process, while others start from scratch. An advantage of having a draft before the BOF is to help focus the discussion. On the other hand, having a draft might tend to limit what the other folks in the BOF want to do in the charter. It's important to remember that most BOFs are held in order to get support for an eventual Working Group, not to get support for a particular document.

Many BOFs don't turn into WGs for a variety of reasons. A common problem is that not enough people can agree on a focus for the work. Another typical reason is that the work wouldn't end up being a standard -- if, for example, the document authors don't really want to relinquish change control to a WG. (We'll discuss change control later in this document.) Only two meetings of a BOF can be scheduled on a particular subject; either a WG has to form, or the topic should be dropped.

5. New to the IETF? Stop Here! (Temporarily)

If you're new to the IETF and this is the only reference you plan to read before coming to the meeting, stop here -- at least temporarily. Then, on your flight home, read the rest of the Tao. By that time you'll be ready to get actively involved in the Working Groups that interested you at the meeting, and the Tao will get you