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Standards

Taking a High-Tech Approach to Standards

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T he Internet Engineering Task Force—the primary organization for Internet standards—is experiencing phenomenal growth, which implies a vote of confidence in its approach to standards-making. IETF (www.ietf.org) is similar to the IEEE in that both organizations focus on participation by individual engineers rather than by organizations. Moreover, both organizations strive to ensure that their standards are developed in an open, accessible forum with policies structured to minimize barriers to participation.

The IETF compares itself to the IEEE and to other standards-making organizations such as ANSI and ISO while taking pride in the ways in which IETF is unique. One remarkable feature of the IETF standards process is its demand for actual implementations of a standard. In fact, the existence of two independently developed, interoperable implementations of a specification is a firm requirement for the specification to be given draft standard status.

IETF'S PROCESS

A specification destined to become an Internet standard passes through four states:

- Internet draft,
- proposed standard,
- draft standard, and
- standard.

When there is sufficient interest in developing a standard for a particular area, IETF, like many other standards organizations, forms a working group. The working group begins developing a document called an Internet draft, which is made available by anonymous FTP for informal review and comments for up to six months. As the working group revises the document, the updated Internet draft is posted on the FTP server. When six months pass without an update to a draft, it is automatically dropped from the FTP server to keep inactive Internet drafts off the server.

To become a proposed standard, a specification must be nearly complete, represent a rough consensus, and have demonstrated interest from the Internet community. Such interest is gauged by working group members' attendance at meetings, the existence of a prototype implementation, and other factors. The Internet Engineering Steering Group, an IETF steering committee made up of IETF area directors, must approve a specification as a proposed standard. Though it is not required, IETF recommends that there be a working prototype implementation of the specification before it becomes a proposed standard. Once it has become a proposed standard, a specification is assigned one of the familiar request-for-comments (RFC) document numbers. (A URL for the index of RFCs is included at the end of this article.) The IETF has produced more than 2,000 RFC documents.

For a specification to move from proposed standard to draft standard, at least two independent implementations of the specification must exist. At this point the interoperability of the different implementations must be demonstrated, and the working group developing the specification must submit documentation to support its claim of interoperability. Once a specification is a draft standard,

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the only remaining changes will most likely be due to problems identified as additional vendors implement the specification.

The final step is for the specification to become an Internet standard. This means that the specification will have had a very high degree of operational experience—preferably in production environments. Ideally, the product will have a wide range of implementations, and any interoperability issues will have been identified and resolved. Fewer than 60 RFC specifications have been designated as Internet standards.

The entire approach is designed to keep engineers in the standards development process while strongly emphasizing real-world testing of products that implement the specification. *Continued on page 116*

BENEFITING FROM TECHNOLOGY

It is not surprising that, as an Internet standards organization, the IETF uses the Internet extensively to produce its standards. All IETF specifications, from Internet drafts through Internet standards, are available online at ftp.ietf.org and viewable by any Web browser. Electronic mail lists, archived and available on the FTP server, reduce much of the effort in developing a standard.

Approximately 700 people attend each of IETF's three annual meetings. Audio and video of some of these meetings is sent live across the Internet to 500 sites in 20 countries, using multicast (Mbone) technology. Like other Internet uses throughout specification development, this effort allows talented engineers around the world to participate regardless of their travel budgets. IETF met in San Jose, California, in December and has meetings scheduled for April 7-11, 1997, in Memphis, Tennessee, and August 11-15, 1997, in Munich, Germany.

COOPERATING ORGANIZATIONS

The Internet Society and the Internet Architecture Board (IAB) also participate in Internet standardization efforts. The Internet Society (www.isoc.org) is dedicated to global cooperation and coordination for the Internet. Both individuals and organizations may join. The society,

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whose seventh annual conference takes place in Kuala Lumpur, Malaysia, June 24-27, 1997, offers services and support to facilitate the work of the IETF.

The Internet Architecture Board cooperates with the IETF and provides a group to handle any appeals relating to IETF specifications. IAB members are elected by the IETF and approved by the Internet Society.

GROWING PAINS

IETF has recently become concerned that its processes are too informal and therefore open to abuse by vendors ("Movement Is Afoot To Muzzle Vendors: IETF battles unfounded standards claims," *Web Week*, Dec. 2, 1996, p. 1). More specifically, the concern is that vendors claim conformance to an IETF specification that is not a standard and may never become a standard. To prevent these false claims of IETF standard certification, the organization is considering a new process that would create a registered trademark to indicate full Internet standard status.

Regardless of these growing pains, the IETF remains the driving force behind the standards that are used to make the worldwide Internet function. ❖

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For more Information
ftp://ftp.ietf.org/—the FTP server for the IETF, including Internet drafts, mail archives, meeting minutes, and proceedings
http://www.ietf.org/—the IETF home page
http://www.isoc.org/papers/—a series of papers on the IETF process
ftp://ds.internic.net/rfc/rfc2026.txt—the Internet standards process
http://ds.internic.net/ds/rfc-index.html—index of the request-for-comments specifications
http://www.internic.net/std/—index of Internet standards