

Welcome to the OpenMP ARB

Welcome to the OpenMP® Architecture Review Board (ARB), a voluntary, nonprofit organization set up to specify, manage, support, and promote the OpenMP API in the supercomputing and other industries. The OpenMP ARB works with the officers of the company to steer the corporation, approve the budget, approve the reelection of directors and officers, and vote on various items relating to the ongoing operation of the ARB.

The strength of the organization comes from its diverse representation from across its member companies, all working together to ensure that the OpenMP® API continues to grow and provide the stable basis for computing that it has provided for more than 15 years.

OpenMP membership is held by organizations, which assign one or more individuals to participate in the ARB and the Language Committee. Ideally representatives in the ARB should be senior company staff members with managerial or leadership experience, and Language Committee representatives should be technical experts in that domain.

OpenMP Overview

The OpenMP API has the distinction of being one of the oldest still-relevant multiprocessor programming languages in use today, with implementations by many major vendors on three General Purpose Programming Languages. It is used in High Performance Computing, government research labs, and industry. It is also used in education as a tool to further research and to develop industrial applications, and used universally in many schools to train the next generation of computer scientists and engineers.



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OpenMP History

SGI and Cray merged in the mid-90s in an attempt to seek commonality across products. At that same time, KAI, a supercomputing ISV, was looking for a larger market, and ASCI, looking for an alternative to recoding for SMPs, urged vendors to standardize. Individuals from these organizations, heavily influenced by PCF and ANSI X3H5, collaborated to write a straw man API. In 1997, DEC, IBM, and Intel started with this straw man and together formed the OpenMP ARB to formalize the API for Fortran, and then in 1998 for C/C++. In 2005, Fortran and C/C++ support was combined in a single API with OpenMP version 2.5.

The API continued to be updated as the hardware and industry matured. Recent updates include better support for C++, irregular parallelism, task final, affinity, atomics, and C/C++ min/max reduction.

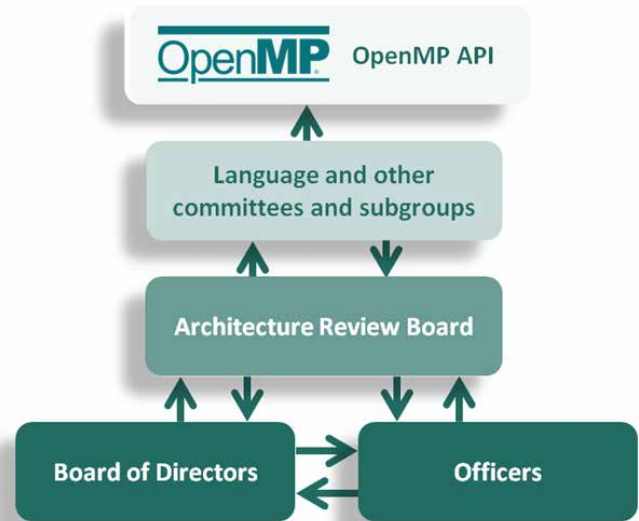
OpenMP API Today

Today the OpenMP API is forging into the accelerator space, and is also entering the embedded computing market with growing involvement by embedded-focused member organizations. Users now find the OpenMP API included on all laptops, desktops, and supercomputers. It is part of GNU GCC and included in virtually all major vendor compilers.

It doesn't stop there. As we work toward expanding into other industries such as oil and gas, financial, biotech, graphics, and more, we continue to maintain our leadership position in HPC.

The OpenMP ARB Organization

The OpenMP membership comprises the OpenMP ARB and the committees, subcommittees, and groups that direct the organization and the OpenMP API, as shown in the figure. The OpenMP Board of Directors directs the corporate governance of the OpenMP ARB, while the OpenMP Officers run the organization and conduct the business of the OpenMP ARB organization. The Architecture Review Board works with officers on following the by-laws and votes on budgets, language changes, and other membership matters. Together, these three groups form the support for governing the organization. The goal of the organization is to foster the growth and adoption of the OpenMP API by supporting the work of the Language, Tools, and Marketing committees, as well as the various subcommittees and groups involved with maintaining and evolving the OpenMP API.



Additional Support for the OpenMP API

OpenMP ARB invites everyone to be involved and to contribute, regardless of means and experience. In addition to the internal organizations, the external groups IWOMP (International Workshop on OpenMP) and cOMPunity (The Community of OpenMP users) support the OpenMP API, facilitating involvement from research and student communities. Finally, the OpenMP Forum (www.openmp.org) supports input from users who are not part of any of these communities.

The International Workshop on OpenMP (IWOMP)

The International Workshop on OpenMP (IWOMP) is an annual conference dedicated to the promotion and advancement of parallel programming with the OpenMP API. The workshop serves as a forum to present the latest results and research ideas related to OpenMP, and offers the opportunity to interact with OpenMP users, developers, and OpenMP ARB members.

This is a refereed conference with proceedings published in Springer Verlag's Lecture Notes in Computer Science series, and often results in research that can be used to advance the OpenMP API or parallel computing, or indicate future directions. Learn more about IWOMP at www.womp.org.

The Community of OpenMP Users (cOMPunity)

cOMPunity is the community of OpenMP students, researchers, and developers in academia and non-profit organizations. It allows a vote within the ARB and provides a forum for the dissemination and exchange of information about the OpenMP API among the student community, developers, and non-profit organizations of all means. Learn more about cOMPunity at www.compunity.org.



Why Join the OpenMP ARB?

One of the best reasons for joining the OpenMP ARB is the OpenMP API itself. The OpenMP API is an important industry standard implemented by nearly a dozen major vendors, and unlike many other parallel languages, has survived for more than 15 years with a commitment to continue to innovate with the industry. It elevates the abstraction to ease the burden of programming, allowing programmers to focus on their own domains instead of programming at a low level assembler-like level.

Another of our greatest strengths is our common support on three major general purpose languages: C, C++, and Fortran. In an environment where software components routinely mix and match and with library support coming from many different directions, the choice of language should not be a main concern.

The Benefits

In an industry permeated by rapid change, membership in the OpenMP ARB consortium gives you strength and security knowing that the specification supports three major general-purpose programming languages, and is implemented by nearly all major compiler vendors. The OpenMP API is ubiquitous in many applications, industry, and research, and in hardware ranging from supercomputers to laptops, embedded systems, and handheld devices.

If you or your customers have developed products which use or depend upon the OpenMP API, you will want to influence the API's future direction so that it will support and add value to your products and services. Membership in the OpenMP ARB gives your organization a voice in the progress and direction of the OpenMP API standard and the future plans for the API, helping ensure that new versions of the specification support your implementation and enhance your hardware.

An open specification fosters wider community acceptance and enables a more thorough adoption than a proprietary one. Pooling technical ideas, experience, and viewpoints from many member companies improves on the single-company design process, reducing the likelihood of

mistakes or of missing functionality, and ensures the long term viability of a specification. It also improves on official ISO standards by being faster to market, with new revisions of the OpenMP API specification released approximately every 2-3 years. In this way, OpenMP can be responsive to changes in industry trends while being less prone to being ignored or discounted, as would a single company's specification or entity's technical design contributions.

Co-Marketing Opportunities

Beyond influencing the API, members can benefit from co-marketing opportunities. The OpenMP ARB participates in events throughout the world. Members are invited to participate as well, providing an opportunity to bring demos of their equipment or software utilizing the OpenMP API. Members are also encouraged to use OpenMP trademarks and logos in their literature and packaging to promote their OpenMP API-supported products and services. Non-members may use the OpenMP trademark, but the use of the logo requires explicit written permission by the Office of the CEO. For more information about using OpenMP trademarks, see <http://openmp.org/wp/trademarks>.

The Cost

For membership in the OpenMP ARB, your organization pays a one-time initiation fee of US\$5,000, plus an annual fee of US\$3,000. Dues are on a calendar-year basis and are not pro-rated.

The initiation amount pays for the additional advertising required to adjust banners, logos, websites, flyers and other publications for new member inclusion. The annual dues fund the cost of running the corporation and setting up face-to-face meetings to bring together working group experts to enhance the specification.

Language Committee members are expected to attend weekly Language Committee teleconferences and optional subgroup teleconferences, travel to three face-to-face meetings per year, prepare presentations, collaborate, and contribute work to further the group's technical documents. One of these meeting is co-located with IWOMP.

The face-to-face meeting venues are chosen based on the location of OpenMP members, users, researchers, and communities. When you join as a member, you can invite OpenMP to your location and host a meeting of the OpenMP experts at a face-to-face meeting, while demonstrating your product, facility, and local hospitality. As OpenMP ARB is a global community, these meetings are distributed globally with, at least in principle, one meeting in Europe and one in North America. As the global membership increases, we expect to host meetings in Asia, Oceania, and South America as well.

Becoming a Member

Upon joining the OpenMP ARB, the lead representative from the organization signs the Membership Agreement. This document details the member rights and responsibilities, rules regarding dues and assessments, the process for resignation or removal, intellectual property rights, and additional miscellaneous amendments.

You will be asked to provide your logo as well as the name of your company as you would like it to appear in OpenMP ARB marketing materials.

When the membership application is completed, an organization designates an individual to represent your organization on the ARB. The same individual can represent your company in the Language committee, or you may designate one or more individuals from your organization as technical members to participate in the Language committee discussions and activities. Participation in committees, while not required, is highly encouraged as it is the return on your investment. Note that each member organization gets one vote in the ARB, regardless of the number of individual members from the organization who participate.

There is no limit to the number of representatives that can participate in committees, but usually only one member is allowed on the ARB. Participation in the ARB is highly encouraged, as otherwise an organization misses its opportunity to vote or may impede voting issues from moving forward. In some cases, time zone differences can excuse active participation in the ARB, but minutes should still be read and votes will still need to be tendered.

Permanent and Auxiliary Memberships

Membership in the OpenMP ARB may be Permanent or Auxiliary, determined by the ARB based on various criteria. Typically, Permanent members are implementers of the language, such as those who write and market OpenMP API-compliant compilers and tools. Auxiliary members are typically research organizations, academic institutions, programmers, users of the OpenMP API, or others with a non-commercial interest in the OpenMP API.

A Permanent membership is self-renewing in perpetuity until and unless the member resigns, stops paying dues, or is removed by vote of the ARB. These members have additional voting rights involving the management of the OpenMP organization. Auxiliary memberships expire and must be renewed annually each year. Both member types pay the same initiation fee and annual dues.

Member Rights and Responsibilities

The OpenMP ARB and its members are committed to fostering open competition in the development of products and services. Cooperation between the members to further the OpenMP API specification is intended to foster and promote such competition. Members should understand that there may be times when they are working with direct competitors, so it is important that they conduct their business within the OpenMP ARB in a manner which does not violate any antitrust laws and regulations.

During discussions, members may contribute valuable technical information to the specification. Members should ensure that there are no patents or other IP impediments in any such contributed information, or else ensure that if they disclose any technical information, that they are releasing the Intellectual Property (IP) right of such information to the OpenMP ARB. Members should ensure that such IP does not infringe on any third party accidentally. In addition, members may not take IP that has been discussed in the context of the OpenMP API outside into a separate entity that is not the OpenMP ARB without permission, although members are allowed to freely use such IP to build products. In essence, OpenMP ARB assumes that IP is released and used in a Fair, Reasonable, and Non-Discriminatory manner.

A Member may resign as such at any time by tendering such resignation in writing or emailing to the Chief Executive Officer of the OpenMP ARB. However there will be no refund of the initiation fee or dues.

Getting Started with Your Membership

Once an organization joins the OpenMP ARB, designated individuals from the organization have access to resources and discussions online and at various events, and may start exploring the resources on the web, the wiki, and on the email lists.

On the Website

The first place to start is the external website at www.openmp.org, maintained by our webmaster (webmaster@openmp.org). This website is available to the general public to download the latest OpenMP API specification, read our latest press releases and other external communications, and participate in the public user forum for the discussion of OpenMP API issues.

There is a publicly accessible calendar on this site which lists what the OpenMP ARB is doing, the events and trade shows we will attend or participate in as an exhibitor, and the schedule for our meetings. We invite our members to let our webmaster know when they will be presenting their OpenMP API-related projects at events so we can add them to the calendar. The direct URL to the calendar is <http://openmp.org/calendar.html>.

On the Wiki

The most important place to visit and to collaborate with other members is the internal wiki at <http://www.openmp.org/twiki/bin/view/OpenMP>. Contact our webmaster (webmaster@openmp.org) to request a username and password for each designated representative. There you can talk to other members, find out about meeting times and call-in numbers, or get on an email list. You can also find archives of past meeting minutes, email discussions, and background research.

The wiki provides access to the following additional internal sections:

- **OpenMPARB:** This section holds ARB documents and minutes, as well as giving access to the Marketing page and other important content of interest to new and existing members, such as:
 - This Welcome Guide
 - Guide to Meetings and Email Lists
 - Bylaws
 - Articles and Article amendments
- **OpenMPLang:** This is where most of the technical work of the organization occurs and includes Language Committee minutes and research, information about the language subcommittees, and archives of all the mailing lists. You will also find important information about how to subscribe to the email lists described below.
- **OpenMPOps:** This is where the OpenMP CEO and staff communicate.

Email Lists

Members are encouraged to participate in email lists. These informative email lists are a key method for communication between members concerning the Language committee, the subcommittees, and other matters. All but three of the email lists are moderated and allow only registered members to post. For detailed information, please refer to the document, Guide to Meetings and Email Lists, included in the member packet.

Members who request access to the wiki are automatically subscribed to the omp-lang list and sent a password. Links to the Info pages are listed on the OpenMPLang wiki page. In addition to administrative email lists available to members by invitation, there are currently eight email lists:

- **omp-arb:** Designated ARB members only; Discussions of ARB business.
- **omp-lang:** Discussions about the language and notices about special meetings
- **omp-accel:** Discussion on accelerators in the OpenMP API
- **omp-error-model:** Discussion on error-handling in the OpenMP API
- **omp-task:** Discussion on the task model in the OpenMP API
- **omp-f2003:** Discussion on Fortran 2003 base language support in the OpenMP API
- **omp-tools:** Discussion on tools support in the OpenMP API
- **omp-affinity:** Discussion on CPU affinity in the OpenMP API

Important Meetings

While the email lists provide a convenient way for members to interact, participation requires membership in one or more of the following groups within the OpenMP organization.

Architecture Review Board (ARB)

At least one individual from each member organization must be designated to participate in the ARB meetings, which meets by teleconference on the first Thursday of each month to discuss administration business.

Committees

There are several committees which meet weekly or monthly:

- **Language:** The Language committee manages all the important work of evolving, fixing, and developing the OpenMP API specification. The Language Committee breaks into the following subgroups: Accelerator, Affinity, Tasking, Error Model, and Fortran 2003 Base Language.
- **Marketing:** The Marketing committee plans and arranges trade show logistics, publications, the website, press releases, and other marketing matters for the OpenMP ARB.
- **Tools:** The Tools committee discusses OpenMP tools.

OpenMP Trademarks and Logo

The OpenMP trademarks are valuable assets. By following our usage guidelines, you are helping the OpenMP Architecture Review Board (OpenMP ARB) to safeguard these assets. Please see the usage guidelines at <http://openmp.org/wp/trademarks>.