INCITS: Consensus Leads to Development of International Computer Programming Language C++

Background

In 1980, a computer scientist at Bell Labs was seeking an efficient, flexible computer code for system programming that also provided high-level features for program organization. He turned his vision into C++ (pronounced 'see-plus-plus'), a programming language which quickly gained widespread interest at the time and would influence many innovations in programming languages to follow.

Problem

In the late 1980s the available description of C++ was somewhat vague, and various providers of C++ compilation systems interpreted the description differently. An application developed using one system was unlikely to work with another. A vendor wishing to provide an application on different computer systems had to re-write parts of the program, which in turn affected the ability to maintain or improve the application.

Approach

In 1989, industry stakeholders began spearheading the formation of a committee to standardize the C++ language. The X3 organization, now known as INCITS (the InterNational Committee for Information Technology Standards), brought together compilation system vendors, industrial and academic program developers, and academics to establish what has evolved into technical committee PL22.16 - Programming Language C++.

From the beginning, the committee operated by consensus as opposed to majority vote. Committee members felt that, for example, if only 55% of the committee agreed on something, the resulting standard could fail. By working toward consensus, whereby an acceptable resolution that, even if not the "favorite" of each individual, could be supported by all the resulting standard would likely enjoy wide support and be of higher quality.

Outcome

In 1998, the first C++ international standard was published by ISO/IEC JTC 1 SC22/WG21, *C++*, for which INCITS task group PL22.166 now serves as the U.S. Technical Advisory Group (TAG) and is comprised of companies in the computer industry, including vendors and users of compilers; government organizations, including research laboratories; and, representatives of academia, including researchers and teachers of computer programming.

As of 2014, the original C++ standard has been revised and expanded twice and is now identified as ISO/IEC 14882:2014, *Information technology - Programming languages - C++* . Each version has had wide support meeting the expectations of both C++ vendors and users. The consensus model was vitally important in achieving this result. The next major revision is planned for release in 2017, aptly nicknamed C++17.