

# Blood, Sweat, and Tears on the Distributed Computing Trail

by Chris Shull, Noam Arzt, and Dan Updegrave

*CAUSE's Northeast Regional Conference netted some insights and advice, as well as some new resources, to help you learn more about the Open Software Foundation's Distributed Computing Environment in higher education.*

At their meeting last December, the CAUSE Board of Directors passed a motion to strongly encourage CAUSE member institutions to investigate adopting the Open Software Foundation's Distributed Computing Environment (DCE) as a campus standard, to promote interoperability across heterogeneous systems within and between institutions, to aid in the transition to client/server computing, and to facilitate sharing and leveraging our campus technology investments.<sup>1</sup> But questions remain:

- What is DCE?
- Is DCE mature enough to consider for "real" applications?
- What are technically aggressive universities doing with DCE?
- Is DCE appropriate for other types of institutions?
- What is required to deploy DCE successfully?
- What does DCE cost?

To help answer these questions, CAUSE's Northeast Regional Conference this year was devoted to "OSF DCE: Implementing a Distributed, Networked Computing Environment." Held in June on the campus of the University of Pennsylvania, the conference drew more than 100 attendees, primarily from Pennsylvania, New Jersey, and Delaware, but also from as far away as Texas, California, and Ontario, Canada. It succeeded in spotlighting DCE by first providing a day-and-a-half workshop entitled, "Getting Started With DCE: Implications for Technology Managers," presented by the University of Michigan's Center for Information Technology Integration (CITI). For the remainder of the attendees, the conference began the next day with a two-hour "DCE Overview and Tutorial." The balance of the conference was devoted to plenary and concurrent sessions describing DCE and DCE-related work in progress at Boston College, Harvard University, NASA's Langley Research Center, Ohio State University, OSF and

the OSF Research Institute, Penn State University, Transarc, the University of Michigan, and the University of Pennsylvania. A Demonstration Showcase presented work by CITI, Ohio State, and the "Big Ten," as well as products from Open Horizon, Inc. and Open Environment Corporation.

From the conference presentations, three major themes emerged.

## *DCE enables client/server computing*

The true focus of client/server computing is on collaboration: servers collaborating with desktops, various vendors' software cooperating to deliver a service to the end user, and people exploiting the power of their desktops and network connections to find and process information. DCE offers a standard, secure set of services in a world replete with heterogeneous platforms, increasing requirements for distributed computing and communications, and a diverse legacy of methodologies and products. DCE is the ultimate middleware.

For example, Ken Blythe shared the vision and experiences of the Big Ten Universities who see DCE as the only way to allow them to put their past independent directions aside and move forward to share their efforts towards common goals, even though they are dispersed among multiple campuses of multiple institutions.

## *DCE technologies require real work*

David Bianco of Computer Sciences Corporation (under contract to NASA's Langley Research Center) said, "DCE is like sushi—some of it you will like, some you will not, but either way, you can be sure it is raw." This word of caution resonated throughout the conference, suggesting that colleges and universities looking to use DCE should be prepared to do some cooking, i.e., development and programming. There is more to this distributed computing than DCE. Whether it is Transarc's Encina, DCE's application program



Chris Shull is Open Systems Specialist for Academic Computing Services in Information Systems and Computing at the University of Pennsylvania.  
shull@isc.upenn.edu



Noam Arzt is Director of Information Technology Architecture for the Office of Information Systems and Computing at the University of Pennsylvania.  
arzt@isc.upenn.edu



Dan Updegrave is Associate Vice Provost for Information Systems and Computing at the University of Pennsylvania. He recently chaired the 1995 CAUSE Northeast Regional Conference on DCE.  
danu@dccs.upenn.edu

<sup>1</sup> See "Why Your Campus Should Consider Adopting OSF's DCE Standards," by Samuel Plice, *CAUSE/EFFECT*, Spring 1995, pp. 5-7.

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interfaces (APIs) for Perl, or underlying data and databases, DCE is a foundation to build on, not a building unto itself.

The advice from the presenters almost across the board was that IT managers must lay the foundation for one to two years forward and position their organizations for DCE in the future, if not now. Specifically, managers should:

- train someone to follow OSF DCE technologies and products;
- work to create and manage a consolidated, campuswide username space in anticipation of its requirement for DCE deployment; and
- pilot and implement DCE to the limits of their ability, muddling through if necessary until they can develop clear objectives

DCE is simply too important to ignore, even though some key vendors continue to move very slowly toward adopting it or adapting it into their products.

#### *DCE can be used to enhance the Web*

The third major theme of the conference struck at the very heart of what makes the Internet such a runaway success—the World Wide Web. WWW has become more than just an information browser—it is potentially the “universal client” for a wide variety of information transactions both within and beyond the organization. Yet several presenters challenged us to be more critical of this emerging standard and raise our level of expectation about its behavior and robustness. Consider the following:

- Would you tolerate a “404 Not Found” error when you try to access a file on your Novell file server? Yet people will increasingly use WWW for file distribution and basic file services based upon a fragile foundation.
- Do you apply the same standards of information access and security within your organization as you do for external use? Yet we apply WWW technology uniformly to solve communications issues within and outside our organizations.

Steve Lewontin of the OSF Research Institute commented that in his mind the World Wide Web was a legacy application! While he quickly qualified that comment, both his “DCE Web Project” and Mic Bowman’s “File System Enhanced World Wide Web Access” presentations challenged us to think critically about WWW and how we would like it to evolve. The OSF Research Institute’s DCE Web project has developed a much richer concept of controlling access to Web resources within an enterprise or com-

munity. This notion is distinctly different from the model of “spontaneous commercial transactions with unknown parties” that is driving the development of the SSL and SHTTP protocols and products like Netscape’s Commerce Server. The “community Web” concept seems to be a good fit for university information services such as libraries.

Mic Bowman challenged us to raise our standards for the way the WWW works, pointing out that WWW and clients like Mosaic and Netscape are fantastic compared to the distinct Internet programs that preceded them, but that we routinely accept error conditions while surfing the Web that we find completely unacceptable from our file systems. Research at Transarc has demonstrated a number of ways advanced file systems can be used to improve the Web.

During the conference, participants agreed that CAUSE should maintain a Web page on DCE in higher education. That page, which among other items points to the proceedings of the presentations described in this article, can be found at <http://cause-www.colorado.edu/issues/dce.html>. In addition, a CAUSE DCE Constituent Group has been established which will meet at CAUSE95 in November in New Orleans; the group is also in the process of establishing an electronic discussion list to share challenges and solutions. To subscribe, send e-mail to [mailserv@cause.colorado.edu](mailto:mailserv@cause.colorado.edu) including the message: subscribe dce. Be sure to send that message from the e-mail account to which you wish messages from the list to be sent.

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