Balancing security and performance tradeoffs for secure Internet videoconferencing

For years, experts have predicted that ubiquitous videoconferencing was just ahead. Now, several videoconferencing trends — including improved quality, reduced cost and the economy — have fueled demand. However, university network planners with H.323 and SIP videoconferencing equipment commonly deployed behind firewalls/NATs must balance trade-offs between network security for data and performance of voice and video.

"The primary challenge is in configuring firewalls to allow voice and video traffic in and out of the internal network's ports, while limiting malicious access of internal-network data," said Prasad Calyam, Ph.D., a senior system developer/engineer at the Ohio Supercomputer Center. "Improper policy decisions and misconfigurations in firewalls could result in vulnerable networks and slow data transfers, as well as voice and video performance problems."

Recently, several new standards (e.g., ITU-T H.460.18, H.460.19) and vendor (Polycom, GNU Gatekeeper, Cisco) solutions have emerged. The Ohio Board of Regents directed OSC to extensively evaluate these developments and to identify the limitations and caveats that exist in their deployment in campus and enterprise networks. The study analyzed interoperability, load tolerance and robustness-against-vulnerabilities, as well as the complex signaling-and-multimedia flow architectures that result from heterogeneous systems. Based on these studies, OSC developed a list of best practices for deploying small- to large-scale secure videoconferencing.

"OSC's experiment results clearly identify the deployment limitations and tradeoffs involved in balancing security of data and performance of video in today's networks," said Kurt Peterson, a regional director at Polycom. "The best-practices for secure video-conferencing proposed by OSC also provide sound advice to network engineers." ■

above: As the use of videoconferencing technologies swells, network planners must make important decisions to balance performance with security.

Project leads:
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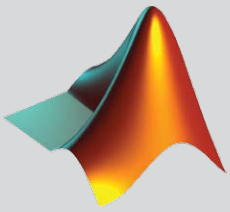
Steve Gordon, Ph.D., OSC
Research title:
Balancing security & performance tradeoffs in Internet videoconferencing
Funding source:
Ohio Board of Regents

Improving researcher access to Parallel MATLAB technologies

Benchmarking tests will evaluate the performance, memory use and code complexity of the leading high-level languages.

Project lead:
Ashok Krishnamurthy, Ph.D., OSC
Research title:
Applications in parallel MATLAB
Funding source:
Ohio Supercomputer Center



Researchers need look no further than the Ohio Supercomputer Center for a convenient way to access the MATLAB Parallel Computing Toolbox and ParaM, two versions of Parallel MATLAB technologies.

Parallel MATLAB enables researchers to access remote supercomputers within MATLAB, a user-friendly computer-programming language developed by The MathWorks. The Parallel Computing Toolbox is a commercial product from the MathWorks, while ParaM, an open-source addition to MATLAB, was developed by MIT Lincoln Laboratories and OSC. These technologies allow researchers to increase their productivity through the use of parallel computing without needing to re-write their MATLAB codes in a more typical parallel computing language.

"The Center's work with the Department of Defense High Performance Computing Modernization Program, combined with OSC's top-notch training programs, fortifies our national reputation as experts in deploying Parallel MATLAB. Our goal is to share our knowledge," said Ashok Krishnamurthy, Ph.D., senior director of research at OSC.

The service will support a number of concurrent remote users, offering access to multiple nodes on the Center's IBM Cluster 1350. User manuals, training courses and real-world examples of production code will round out its offerings.

"While our initial focus is serving Ohio's user community, the project will expand to businesses and national participants," Dr. Krishnamurthy added.

For example, scientists using the Teragrid, the world's largest distributed cyber-infrastructure for open scientific research, soon will have access to OSC's Parallel MATLAB services as part of Pittsburgh Supercomputer Center's pending award (Track2C) from the National Science Foundation. This prestigious grant supports acquiring, deploying and operating a high performance computing system for the national science and engineering community. ■