



Association for  
Computing Machinery

*Advancing Computing as a Science & Profession*

## ACM and Infosys Foundation Honor Innovator in Software System Performance, Scalability, and Security

*MIT's Kaashoek to Receive \$150,000 Prize for Landmark Research  
That Led to Innovative Structures for Computer Software Systems*

**New York and Bangalore, India, March 29, 2011** – ACM (the Association for Computing Machinery) [www.acm.org](http://www.acm.org) announced today that Frans Kaashoek of the Massachusetts Institute of Technology, is the recipient of the 2010 ACM-Infosys Foundation Award in the Computing Sciences for his contributions to the structuring, robustness, scalability, and security of software systems underlying many applications. Kaashoek's advances have led to efficient, portable, and highly distributed applications of software systems, fostering wider use of portable embedded and distributed systems. He also used information flow control techniques to address a major security challenge in broadly deployed commercial systems. In addition to his groundbreaking research, Kaashoek founded commercial ventures that have enabled expanded content distribution like large, high-quality video files to travel over the Internet, and that have enhanced protection of large enterprise networks using network behavioral analysis software.

The ACM-Infosys Foundation Award <http://awards.acm.org/infosys>, established in August 2007, recognizes personal contributions by young scientists and system developers to a contemporary innovation that exemplifies the greatest recent achievements in the computing field. Financial support for the \$150,000 award is provided by an endowment from the Infosys Foundation.

ACM President Alain Chesnais said, "Kaashoek's contributions have had a deep impact on the direction of important research in software systems as well as broad implications for practical systems design. His visionary research has changed not only the structure of systems. It has had extensive practical impacts for entrepreneurial opportunities and commercial applications, making him a significant influence in the world."

Kris Gopalakrishnan, CEO and Managing Director, Infosys Technologies, said, "Dr. Kaashoek's research has had a direct impact on some of today's most popular computer applications including advancements in scalability, security, and performance. His innovations led to the founding of two commercial ventures focused on improving the performance and security of the Internet and strengthening network security for large enterprise networks. As Cloud Computing accelerates across the globe, Dr. Kaashoek's innovative research is incredibly important to companies and consumers alike. On behalf of the 127,000 people of Infosys, I am proud to recognize Dr. Kaashoek's contributions to computing."

### **Technology and Development**

Kaashoek and his collaborators at the MIT Parallel and Distributed Operating Systems group defined a new operating system structure, the Exokernel, a lightweight operating system kernel, which moved functionality out of the operating system and into applications without

significant loss of performance. Their goal was to eliminate constraints on how application designers can use a computer's resources, giving applications direct control over functions that allow hardware and software to communicate. The Exokernel innovation enabled programmers to improve program performance in enterprise-oriented software systems.

In papers describing the building blocks for peer-to-peer applications known as distributed hash tables (DHTs), Kaashoek and his colleagues showed how DHTs could be used to enhance both the scalability and robustness of distributed systems. This innovation has led to the establishment of DHTs as a core component of many products including peer-to-peer file sharing systems and content distribution systems. It also resulted in the creation of the Infrastructure for Resilient Internet Systems (IRIS) project, funded by the National Science Foundation and co-led by Kaashoek, which used DHT technology to address vulnerabilities of the Internet and other mission-critical networked applications to malicious attack.

Using Decentralized Information Flow Control (DIFC), Kaashoek and his colleagues developed an approach to computer security that provides an effective means for preserving user privacy in widely deployed commercial systems. It allows applications writers to control how data flows between the pieces of an application and the outside world, protecting a large array of privacy sensitive operations like banking servers, medical records processors, and legal software.

### **Commercial Ventures**

Kaashoek was Chief Scientist and Co-founder of Sightpath, Inc., a provider of software that lets companies distribute high-quality videos easily on their networks. The company was acquired by Cisco systems in 2000. He also helped found Mazu Networks, Inc., which employs innovative network behavioral analysis to enhance the network security of global enterprises. Kaashoek served as a director of Mazu Networks until its acquisition by Riverbed Technology, Inc. in 2009.

### **Background**

A professor of Computer Science and Engineering in MIT's Department of Electrical Engineering and Computer Science, Kaashoek, 45, is also a member of the MIT Computer Science and Artificial Intelligence Laboratory, and acknowledges the collaborative benefits of his colleagues and students. He was elected to the National Academy of Engineering in 2006, and was named an ACM Fellow in 2004. In that year, he also received the William R. Bennett Prize Paper Award from IEEE. He won the inaugural Mark Weiser Award from ACM's Special Interest Group on Operating Systems in 2001. A graduate of Vrije Universiteit in Amsterdam, the Netherlands, he earned a Doctorandus Computer Science degree (equivalent to an M.S. degree) and a Doctor Computer Science degree (equivalent to a Ph.D. degree).

ACM will present the ACM-Infosys Foundation Award at its annual Awards Banquet June 4, in San Jose, CA.

### **About ACM**

ACM, the Association for Computing Machinery [www.acm.org](http://www.acm.org), is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the

professional growth of its members by providing opportunities for life-long learning, career development, and professional networking.

**About The Infosys Foundation**

Established in 1996, the Infosys Foundation is the philanthropic arm of Infosys Technologies Ltd. and has the sole objective of fulfilling the social responsibility of the company by creating opportunities and working toward a more equitable society. The Infosys Foundation has made effective strides in the areas of healthcare, education, social rehabilitation, and the arts. The company contributes up to one percent of its profit to the foundation each year.

**About Infosys**

Many of the world's most successful organizations rely on the 127,000 people of Infosys to deliver measurable business value. Infosys provides business consulting, technology, engineering and outsourcing services to help clients in over 30 countries build tomorrow's enterprise.

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