1. Breaking Down the Walls Of The Classroom: A Tutorial on Distance Learning

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Virtual presence and mobile computing offer opportunities to redesign the “classroom” experience. This is particularly true for laboratory-oriented classes, which have traditionally not made a strong connection between lectures and lab experiences. Virtual presence and mobile computing can be used to help students collaborate with each other and to help them communicate better with instructors. This tutorial will review current use of computer mediated communication to support teaching and learning in an anyplace/anytime environment (“Asynchronous Learning Networks or “Virtual Classrooms®”), based on fifteen years of research at NJIT and elsewhere. This presentation will emphasize the research findings that the effectiveness of online courses is dependent upon the use of collaborative or team based learning, in which groups of students use computer-mediated communication to work together on projects and assignments. Then it will turn to “informed speculation” and discussion in breakout groups about the changes and improvements to online collaborative learning that might occur with the widespread availability of mobile, omnipresent multi-media computing devices.

Starr Roxanne Hiltz, Distinguished Professor at NJIT, has spent most of the last fifteen years engaged in research on applications and social impacts of computer technology. Her research interests include educational applications of computer-mediated communications, human computer interaction, and computer support for group decision making. In particular, with major funding from the Corporation for Public Broadcasting and the Alfred P. Sloan Foundation, she has created, experimented with, and studied a Virtual Classroom [TM] for delivery of courses. (See http://eies.njit.edu/~hiltz for project information).

For over two decades Murray Turoff has been active in research and development associated with the utilization of the computer to facilitate human communications. Credited as “the father of computer conferencing,” he designed the first computer conferencing system while working in the executive offices of the President of the United States. He co-authored Learning Networks: A Field Guide (with Linda Harasim, Starr Roxanne Hiltz, and Lucio Teles), 1994, MIT Press.

2. Building a Quality-of-Service Based Next-Generation Internet: A Tutorial

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Due to the success of Internet, we see two important trends: first, the Internet is evolving into a global and commercial communication infrastructure supporting applications with diverse traffic characteristics and performance requirements. Second, the IP technology is becoming the basis for not only the Internet, but also for most data communication networks, both public and private. To cope with emerging applications, business, and administrative requirements, new service models, resource management algorithms, and protocols have been developed in the last several years. This tutorial will cover some of these latest advancements. First, we will review the current best-effort TCP/IP service model and point out its deficiencies.
Then we will understand what is meant by QoS? This will include a walk-through of Voice Over IP application as a basis to further understand the performance requirements of real-time applications.

Second, we will explore new router mechanisms for congestion and traffic management (RED, Fair Queuing, ECN, WFQ, hierarchical link sharing), improvements to TCP algorithms (Vegas, SACK, new RENO, Fast ACK), services models, protocols and algorithms to support end-to-end QoS on a per flow basis (intserv, RSVP, traffic control, admission control, QoS routing) and more recently, service models and algorithms to support QoS for traffic aggregates (diffserv, WRED, traffic conditioning, SLAs). We will briefly touch upon the recent advances made in high-speed IP forwarding schemes broadly called MPLS. The tutorial will give overview of these algorithms, describe their mechanism and identify their strengths and weaknesses. We will also relate these developments with actual implementation from networking vendors and comment on the standardization efforts within the IETF, including their impact on the following important goals for next generation Internet: scalability, robustness and heterogeneity.

Who needs to attend
MIS Data Center Managers
LAN and Systems Administrators
Technical Managers
Researchers/Educators
LAN/WAN and Communication Technicians
Software Engineers
Application Developers
Anyone interested in the next-generation issues facing the Internet.

Samir Chatterjee is an Assistant Professor with the Computer Information Systems Department and Director of the Advanced Network Architecture & Systems Laboratory at Georgia State University in Atlanta. He received the B.E. degree (Hons.) in Electronics and Telecommunications Engineering from Jadavpur University, India in 1988 and MS and Ph.D. in Computer Science from the University of Central Florida in 1991 and 1994. His research interests are in the areas of computer network architecture and protocols, residential broadband services, ATM networks, performance modeling of multimedia systems and QoS networking. He has published over 25 refereed articles in respected scholarly journals such as Communication of the ACM, Computer Networks & ISDN Systems, Computer Communications, ACM Computer Communication Review and ACM and IEEE conferences. He currently leads the VBNS (NSF funded) and Internet-2 project at Georgia State. He is the PI or CO-PI on a total of $1.6 million research grants funded by National Science Foundation (NSF), Georgia’s Center for Advanced Telecommunications Technology (GCATT) and BellSouth Corporation in the last three years. He works closely with leading Telecommunication companies including Lucent, Cisco, BellSouth and Hitachi Telecom, Inc. He is the Chairman of a newly formed start up company called Voicecore Technologies Inc., in Atlanta.

3. INTEGRATING XML, JAVA AND CORBA AS A DISTRIBUTION MECHANISM FOR THE ENTERPRISE

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As the Internet technology matures, the demand for extending the business system applications to take advantage of the Internet increases. The advances of IT has been well felt and promoted all across the board for the Electronic Commerce (EC) industry. Major challenges in developing enterprise level systems for today or for the applications for the next generation systems can be categorized in two general fronts of the computing-processing and communication. The processing aspect of the computing has become a key to the distributed applications across the enterprise. It has transformed from distributed computing environment to distributed object-oriented computing, where multiple heterogeneous, disparate systems are interconnected via CORBA-compliant,
industry-strength middleware. This in turn, has led the concept of communication between distributed applications to become a more significant issue. CORBA, an open architecture standard formulated by Object Management Group (OMG - a non-profit consortium), has established the potential in developing heterogeneous distributed applications. Java, an object-oriented programming language for the Web, has proved to be robust in implementing enterprise systems over the Web. XML, the latest of the pack, extends the ability of information interchange or exchange across such systems. It has revolutionized the concept of messaging in enterprise applications. It provides the capability that was previously only available to large organizations via the use of EDI. It offers a bridge that connects structured and unstructured data for next generation enterprise and electronic commerce. In a nutshell, CORBA, Java, and XML together present a versatile solution to managing the information distribution across the enterprise. The distribution of information can vary from simple data to a complex document.

One simple example that can be cited at this point is that of enterprise information portals. Enterprise portals enable users to transparently access internally and externally stored application data. It would provide users with a simple way of formulating personalized information to make informed business decisions.

This tutorial initially addresses the basic concepts of XML, Java and CORBA and discusses the significance of using them in enterprise systems. The primary focus is to explore the issues faced in developing the distribution mechanism for such systems and how are they being dealt with in practice. The tutorial presents the discussion of XML servers and XMI as an interface in developing distribution mechanism for the enterprise. The tutorial finally presents a complete example of developing an enterprise portal that demonstrates the use of various technologies mentioned above. The discussion will focus on presenting various aspects of consolidating, managing, analyzing, and distributing information across and outside of an organization. The presentation is intended to explore major challenges in developing the distribution mechanism (enterprise portal) and present various steps followed in designing such a mechanism.

**Tushar K. Hazra** focuses his effort in helping companies in developing flexible, scalable, and efficient solutions for e-commerce using the Internet and other leading edge technologies. As an architect and technical leader, Dr. Hazra offers his expertise in building large-scale web-enabled enterprise systems for ACCS clients. Dr. Hazra has fifteen years of experience in the IT industry and in teaching at various universities nationwide. He has been frequently speaking and publishing in the fields of Java, CORBA, XML, and Electronic Commerce worldwide.

### 4. A Tutorial on Electronic Stock Market

**Charles Trzcinka**
SUNY at Buffalo

The purpose of this tutorial is to examine business, economic and legal developments in the electronic trading of securities. It is a non-technical discussion of the function of electronic market making, the current institutions and the regulation of electronic markets. In the process we will discuss who are the institutional traders and why they trade. We will look at Instinet’s business and the recent startups. We will talk about the reasons why the New York Stock Exchange wants to become an ordinary corporation and sell an IPO. We will also touch on retail trading and the role of the internet for e-traders. This tutorial is appropriate for those interested in the business of electronic stock markets.

**Charles Trzcinka** is a Professor of Finance and Statistics at the State University of New York at Buffalo. Dr. Trzcinka received a Ph.D. in financial economics from Purdue University in 1980 and joined the faculty of SUNY-Buffalo. From 1988 to 1990 he was a Senior Economist with the Office of Economic Analysis of the United States Securities and Exchange Commission. He has been (or is) a consultant to a variety of investment organizations such as the

He has published widely in academic journals on institutional money managers, the determination of transaction costs, the relationship between risk and return and the performance of mutual funds. His work on takeovers has been funded by the National Science Foundation. At the SEC he helped develop policy on the regulation of unit trusts, unbundled stock units and disclosure for municipal bonds, and provided evidence on insider trading cases. His work has received widespread attention in the national press New York Times, MONEY Magazine, USA Today, Business Week, Forbes and are the basis of an opinion/ editorial article in the Wall Street Journal. He is the author of the Forbes Stock Market Course.

Dr. Trzcinka teaches graduate and executive courses in derivatives, investments, portfolio management, and statistics.