"Nuggets" of Research from the
Purdue Multimedia Support Infrastructure Project

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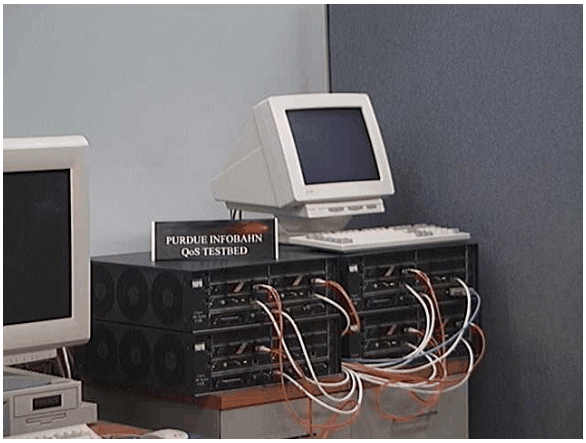
Databases We have been able to build a truly multidisciplinary group among medical practitioners, medical educators, software developers, software vendors, and computer science researchers. As a result of this project we were able to receive additional funding from the State of Indiana to establish an incubator for the development of ideas resulting from this research. NCR and Wal-Mart jointly donated a large NCR Teradata system (see below). A patent application is already on the way. We have also been able to participate in research in other areas of computer science, such as image processing, that enhance the efficacy and usefulness of our work.

Networking The NSF RI grant has been instrumental in facilitating implementation, testing, and benchmarking of the QoS provisioning architecture developed by co-PI Park and his co-workers at the Network Systems Lab. This was achieved by building a dedicated IP-over-SONET backbone network comprised of Cisco 7206 VXR routers and collaborative support from Cisco Systems (technical contact: Fred Baker), which allows modification of the Cisco router operating system IOS to implement the QoS switching algorithms developed at the lab. A picture of a four-router testbed is shown below. The in-house QoS work is further leveraged in the Internet2 QoS Backbone (QBone) project where Park is a member of the QBone Architecture Design Team and QoS Working Group.



Security Related to the network QoS project, the expansion of QoS provisioning to encompass security and fault-tolerance issues—a key challenge of the integrated QoS management objective of MSI and its scope—was achieved with assistance from the NSF RI grant. In particular, a new approach to distributed denial-of-service (DDoS) attack prevention called route-based distributed packet filtering was developed by co-PI Park and his team that allows scalable and proactive prevention of DDoS attacks on the global Internet. This research will be further funded by a new DARPA grant (PI: Park) from the FTN program, and expanded collaboration with Cisco Systems is being explored for possible IETF standardization and BGP-based implementation in inter-domain routing. A picture of a 30-node subgraph of the 3015-domain 1997 Internet autonomous system topology with route-based filters marked in red is shown below.