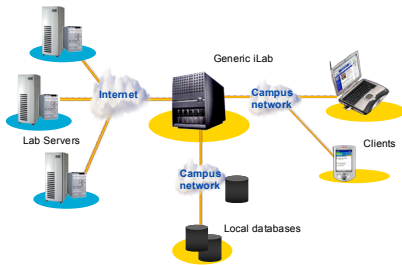# iLab

Real labs anywhere, anytime

an MIT iCampus Project

iLabs architecture

Heat exchanger lab

iLab is dedicated to the proposition that online laboratories – real laboratories accessed through the Internet - can enrich science and engineering education by greatly expanding the range of experiments that students are exposed to in the course of their education. Unlike conventional laboratories, iLabs can be shared across a university or across the world. The iLab vision is to share expensive equipment and educational materials associated with lab experiments as broadly as possible within higher education and beyond.

iLab will provide access to selected MIT laboratory instrumentation for use by other students and faculty around the world; and is developing an efficient software architecture to bring online and manage complex laboratory experiments. The iLab toolkit is designed to:

- Scale to large numbers of users worldwide;

- Allow multiple universities with diverse network infrastructures to share access;

- Minimize development and management effort for users and providers of remote labs

- Provide secure access to research tools through the web

About iLab

Sharing Labs: The iLab team has created remote laboratories in MIT in microelectronics, chemical engineering, polymer crystallization, structural engineering, and signal processing. Developed as case studies, these experiments were used to understand the complex requirements of operating remote lab experiments and scaling their use to large groups of students at MIT. MIT is freely sharing excess lab instrumentation capacity with other higher education institutions for the microelectronics lab.

iLab Architecture: Three distinct modules are connected by a Web service architecture. The Lab Server is operated by the lab's owner and deals with the actual operation of the lab hardware. The Lab Client runs on the end user's computer, and provides the interface to the operation of the lab. Finally, the Service Broker mediates exchanges between the Lab Client and the Lab Server and provides storage and administrative services that are generic and can be shared by multiple labs within a single university, or, multiple Lab Servers among universities.

Exploring and using iLab

Visit MIT iCampus Outreach to:

- Explore curriculum materials and demonstration use of working remote labs through *MIT OpenCourseWare*
- Integrate the MIT microelectronics lab into your class
- Review the iLab architecture & software
    Download the iLabs toolkit source code and documentation
- Create and share your iLabs
- Join the iLab community to register for iLabs faculty workshops, and become an MIT iCampus Affiliate

About MIT iCampus

MIT iCampus Outreach, sponsored by Microsoft Research, aims to achieve broad, substantial, and sustainable impact on higher education through information technology. iCampus incubates innovations for laboratories, classrooms, and campus communities at MIT and promotes their dissemination around the world.

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