Areas of Activity

The central goal of the Internet2 Middleware Initiative (I2-MI, or Glueworks) is to foster the deployment of a "middle layer" of national network connectivity, one that sits on top of the machine-to-machine connectivity of IP, connecting people and objects to the network. The core elements of this layer are identifiers, authentication, directories, authorization and PKI. I2-MI's task is to build from these components a middleware infrastructure that has a coherent architecture, that enables applications and provides data for network operations, that is interoperable within higher education and research, and that sheds light on how to build a middleware fabric for the wider society. The major activities of the initiative include the following.

Middleware Architecture Committee for Education (MACE). This group of leading campus IT architects is the overarching management structure for I2-MI. Functioning as an informal IAB for middleware, MACE provides both technical and programmatic direction for the rest of the initiative, and will play a critical role in middleware development within higher education. MACE is establishing working groups in three areas: directories, PKI, and web authentication and authorization.

Early Harvest and Early Adopters. The Early Harvest technical workshop brought together leading campus IT practitioners to establish a set of best practices for identifiers, authentication and directories. Early Adopters, the campus testbed phase of Early Harvest, is pushing forward the deployment of core middleware at eleven US campuses. Based on this experience, Early Adopters will develop roadmaps for other campuses to follow in their own deployments. Both Early Harvest and Early Adopters are funded by the NSF.

PKI Activities. I2-MI is working with the federal government in both fPKI and PKI-for-NGI developments. We are also working with our partners (Educause, CREN and CNI) to establish a coherent vision for a PKI for higher education. In order to catalyze research and establish testbeds for interoperability, I2-MI is also beginning to define higher-education-specific research issues within PKI.

Shibboleth. A shibboleth is a word (or other identifier) by which one group of people (or computers) can recognize another. In the Shibboleth project, I2-MI is working with IBM to define the functional requirements for an inter-institutional resource-sharing infrastructure. If the functional specifications point to a solution, that solution will be implemented, allowing users from one campus to use their local credentials to access restricted resources on the web servers of other, remote campuses. This work is intended to lead to the broad distribution of an Apache module that will permit resource sharing, requiring only that participating institutions maintain a standard deployment of authentication and directory services.

The Beta Grid. The Beta Grid is an NSF PACI effort that will deploy 20 to 100 advanced computational and storage nodes at a similar number of universities, and that will interconnect these servers into a seamless computing environment. This will enable distributed computations, coscheduling of network resources, high-volume data flows, and real-time manipulation of data. I2-MI will work to anchor these advanced services in the emerging common campus middleware infrastructure.

Medical middleware. One "vertical" market of particular interest to higher education involves the complex of issues associated with medical schools. As important parts of both campus and health service environments, medical schools present significant challenges to middleware deployment. Through Early Adopters, among whose eleven campuses are eight with medical schools, and through working with national medical organizations (such as NIH and NLM) and (through CORBA-MED) corporate medical software providers, I2-MI is developing approaches to core middleware services that will meet the demanding requirements of medical schools.

Directories. With their loose management structures, need for inter-institutional interoperability, and complex public regulations, directories within higher education present major design and implementation issues. Efforts are underway to evaluate the need for a common database and directory subschema for education (an "eduPerson") and a unified white-pages service.

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