

Brihaspati: opensource free software e-learning platform

Yatindra Nath Singh
Electrical Engineering Department
Indian Institute of Technology Kanpur
<http://home.iitk.ac.in/~ynsingh>

Basic Components

- Learner
- Cotents
- Mentor/ instructor
- Framework for interaction

Opensource freeware framework

- Development governed by users
- Usually somebody makes it for his own use and then shares it.
- Advantages
 - One can modify it as per requirements
 - Availability of source code – chances of trojan horses minimal
 - Usually buildup happens in iterative way
 - Only important and required features are build earlier

- Software released continuously
- Disadvantage
 - All features may not be there in the beginning—they get added with time
 - No instant support available—usually discussion groups or mailing lists are there
 - Usually bad GUI (look and feel) in beginning, but improves with time.

E-learning frameworks

- LCMS (learning content management system)
 - Content publishing and management
 - Learner tracking- missing or very limited
- LCMS with Interaction tool
 - Features like chat, whiteboard, mail, discussion groups
 - Mentor/ instructor and learner, and learner-learner interaction feasible

LMS (learning management system)

- Learner behavior tracking feasible
- Requires content packaging
- Requires content player
- Mechanism at backend to whom content player sends behaviour updates
 - In Brihaspati-2, it is planned to use javascript in front end and backend the action and screen classes in turbine.

LMS (contd.)

- Mechanism to analyze learner behavior
 - What information can be deduced?
 - For what this information can be used.
 - Most preferred learning paths for majority of learner
 - Can be used to automatically reorganize the collection of content objects.
- SCORM compliance – is the current approach in Brihaspati development.
- Mostly LCMS develop into LMS at later stage

Live interactive classroom tools

- Conventional classroom teaching methodology ported to internet
- Students can be anywhere for attending the lectures (but at the same time)
- These interactions can be recorded and archived as content in LMS
- Usually will requires good bandwidth in networks and multicast connectivity. (IPv6 infrastructure will provide it most likely)

LCMS/LMS frameworks

- Usually build over some web application framework
 - Most popular J2EE
 - Alternative Turbine – jakarta.apache.org
- TURBINE IS OPEN SOURCE, FREEWARE WITH APACHE LICENSE.

Brihaspati

- Built using turbine framework – turbine 2.1
- Continuously tested in IITK while being developed
- Distributed via sourceforge.net site under opensource liscense.
- All basic feature for administrator, instructor and student are present

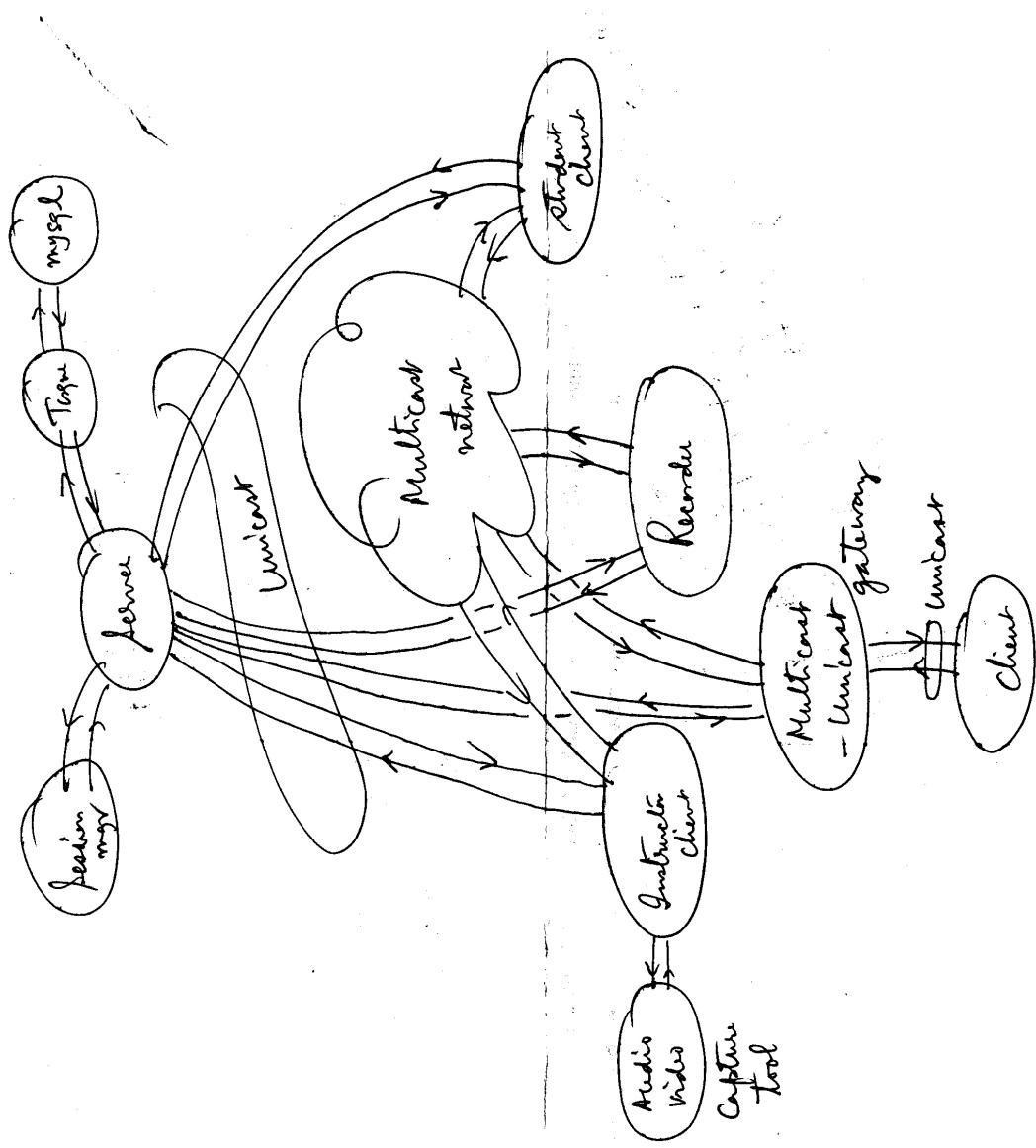
Brihaspati-2

- Learning from Brihaspati experience
- Based on turbine 2.3
- Modified structure
 - English/ Hindi/ Urdu user interface
 - content author and instructor separation
 - Content repository
 - Question bank repository
 - SCORM packager and RTE
 - Shared authoring of content (wiki)
 - Remote courses (distributed Brihaspati)

Brihaspati_sync

- Live lecture delivery over multicast network
- Delivery over unicast network using multicast to unicast gateways (proxies)
- Common database for Brihaspati-2 and Brihaspati_sync
- Layered media structure to take care of available bandwidth variations (receiver driver layered multicast technology)

Brihaspati_sync



URLS

- Downloads
 - <http://sourceforge.net/projects/brihaspati>
 - Discussion group for support and help
 - brihaspati_itk@yahooroups.com
 - Website <http://brihaspati.sourceforge.net/>
 - IITK installation <http://brihaspati.itk.ernet.in/>
 - (use login guest password guest)
 - <http://202.141.40.217:8080/brihaspati/servlet/brihaspati> for Brihaspati-2 installation.

Status

- 64 known organization using or interested in
Brihaspati
- Some of them
 - TIET, Patiala
 - NLSUI, Bangalore
 - IIT Madras
 - NPTEL programme (MHRD)
 - Punjabi University, Patiala
 - DOEACC centers (MCIT)

Future Development

- Content authoring tools for adaptive learning environments
- Instructor evaluation system
- Feedback collection (surveys) mechanism
- Maven based build (currently it is Ant based)
- Modular architecture (use of component registry)
- Component to make multiple redundant server feasible
- Certain modules will be used for revenue generation
 - for further funding of the project

Research initiatives

- Efficient codecs for layered audio-video
- Bandwidth estimation techniques and development of estimators
- Module for creation of virtual multicast network over unicast, http-tunnelling

Teachers' role

- Teaching an art
- Artist need to learn to optimally use the medium for expressing himself
- Old medium was chalk, board, speech, acting, handouts, interaction during project assignments.
- New medium – email, discussion board, text and graphical notes, multimedia content, exchange of ideas and notes (over internet) while doing project assignments – collaborative authoring.
- Document archival experts – need to find ways to filter and archive the resulting outputs for future reference – need to work closely with the new teacher.

Acknowledgement

- IIT Kanpur
- Elearning Division, DIT, MCIT
- Ernet
- Sourceforge.net
- Users, voluntary developers