The architecture and a short overview

Introduction: What is Moodle?

- Moodle is a course management system (CMS) for online learning
- **MOODLE** = Modular Object-Oriented Dynamic Learning Environment
- Also: a verb that describes a lazy meandering through something, doing things as they occur, an enjoyable tinkering that often leads to insight and creativity.
Introduction: What is Moodle?

- The brainchild of Martin Dougiamas (http://dougiamas.com)
- It has been developed as an OpenSource software project
- That means that Moodle is available free of charge under the terms of the General Public License (GNU), and has no licensing cost attached

Philosophy ‘beneath’ Moodle

- The design of Moodle is based on socio-constructivist pedagogy
- This means its goal is to provide a set of tools that support an inquiry- and discovery-based approach to online learning
- It also purports to create an environment that allows for collaborative interaction among students as a standalone or in addition to conventional classroom instruction
Some other issues...

- Moodle v1.0 was introduced in August 20, 2002
- Today, the newest version is Moodle v1.5
- [http://moodle.org](http://moodle.org) - web-site which is used as a center for collecting data, discussions and for cooperation of Moodle users
- [http://moodle.com](http://moodle.com) - a company for additional commercial support

Characteristics of Moodle project

- Moodle runs without modification on every system that supports PHP (which includes almost every webhosting provider)
- Moodle is designed in a modular way, and allows a great deal of flexibility to add (and remove) functionality at many levels
- Moodle upgrades very easily from one version to the next - it has an internal system to upgrade its own databases and repair itself over time
- Moodle requires only one database (and can share it with other applications if necessary)
- Moodle includes comprehensive database abstraction that supports many major brands of database
- Emphasis on strong security throughout. Forms are all checked, data validated, cookies encrypted etc
Characteristics of Moodle project

- Moodle promotes a social constructionist pedagogy (which includes collaboration, activity-based learning, critical reflection, etc)
- Moodle is suitable for 100% online classes as well as supplementing face-to-face learning
- Moodle has a simple, lightweight, efficient, compatible, low-tech browser interface
- Course listings show descriptions for every course on the server, including accessibility to guests
- Courses can be categorized and searched - one Moodle site can support thousands of courses
- Most text entry areas (resources, forum postings, journal entries etc) can be edited using a capable, embedded WYSIWYG HTML editor

Managing a Moodle site

- Moodle project can be installed using manual which is part of project documentation
- Installation can be done on web-server which is working under Apache server, which has support for PHP and uses MySQL database
- Installation can also be done on local computer
- A site is managed by an admin user, defined during setup
Managing a Moodle site

- Plug-in “themes” allow the admin to customize the site colours, fonts, layout etc to suit local needs
- Plug-in activity modules can be added to existing Moodle installations
- Plug-in language packs allow full localisation to any language. Currently there are 43 language packs
- The code is clearly-written PHP under a GPL license - easy to modify to suit your needs

Managing Moodle User Accounts

- Goals are to reduce admin involvement to a minimum, while retaining high security
- Supports a range of authentication mechanisms
- Students can create their own login accounts, and email addresses are verified by confirmation
- IMAP, POP3 and NNTP protocols can be used
- Each person requires only one account for the whole server - each account can have different access
- An admin account controls the creation of courses and creates teachers by assigning users to courses
- A course creator account is only allowed to create courses and teach in them
Managing Moodle User Accounts

- Teachers may have editing privileges removed so that they can’t modify the course (eg for part-time tutors)
- Security - teachers can add an “enrolment key” to their courses to keep out non-students
- Teachers can unenrol students manually if desired, otherwise they are automatically unenrolled after a certain period of inactivity (set by the admin)
- Students are encouraged to build an online profile including photos, description. Email addresses can be protected from display if required
- Every user can specify their own timezone, or choose the language used for the Moodle interface

Managing Moodle courses

- A full teacher has full control over all settings for a course, including restricting other teachers
- Choice of course formats such as by week, by topic or a discussion-focussed social format
- Flexible array of course activities - Forums, Journals, Quizzes, Resources, Choices, Surveys, Assignments, Chats, Workshops
- Recent changes to the course since the last login can be displayed on the course home page - helps give sense of community
- Most text entry areas (resources, forum postings, journal entries etc) can be edited using an embedded WYSIWYG HTML editor
Managing Moodle courses

- All grades for Forums, Journals, Quizzes and Assignments can be viewed on one page
- Full user logging and tracking - activity reports for each student are available with graphs and details about each module
- Mail integration - copies of forum posts, teacher feedback etc can be mailed in HTML or plain text
- Custom scales - teachers can define their own scales to be used for grading forums, assignments and journals
- Courses can be packaged as a single zip file using the Backup function

Managing assignments

- For every assignment, deadlines and max grades can be given
- Students can save solutions of their assignments - coded with date of saving - onto server
- Saving assignments that aren’t solved on time is also allowed, but the teacher is informed about the time of delay
- For every assignment, whole ‘class’ can be evaluated (along with comments of assignments) in one form on one page
- Teacher’s comment is linked with the page on which solution of assignment is, so it can be sent to student by e-mail
- Teacher can allow re-delivering of the solution of assignment after evaluation, for reevaluation
- Teacher can create quizzes with various types of questions and various types of answers
Additional features

- ‘Chat module’ - which enables easy and simple textual communication between students
- ‘Choice module’ - enables polls about issues important for the teacher or course
- ‘Forum module’ - which enables various types of discussions: ‘teacher-only’, ‘news’, ‘free-for-all’ or ‘one-discussion-thread-per-user’
- ‘Journal module’ - enables communication between teacher and single student
- ‘Resource module’ - which presents electronic content in optional format (doc, ppt, flash, video, audio ...)
- ‘Survey module’ - enables work analysis of whole ‘class’, and results are visible on web-site as tables or graphs
- ‘Workshop module’ - enables teacher to review and evaluate documents

Moodle coding rules

- In order to keep consistency and stability of project involving large group of people, there is a list of rules ‘inside’ Moodle that must be followed by anyone who works on the project. Here is some of them:
  - All files containing code must have .php extension
  - All files containing explanations and patterns must have .html extension
  - All text files must use Unix formatting
  - Database access is performed using functions from lib/datalib.php (whenever it’s possible)
  - All variables must be initialized, or tested for existence
  - All strings must be easy for translation
  - All texts inside Moodle, especially user’s, must be printed in the same way, using standard Moodle functions
- Similar rules exist for creating tables in databases
Coding style rules

- Variable name must be readable, English word that make sense
- Constant name must be written in uppercase, starting with module name
- Function name must be English word in lowercase, starting with module name
- Strings are defined using quotation marks
- Comments are marked with three slashes in front of actual comment

Managing Moodle project

- For successful work on the project, Moodle uses CVS (Concurrent Versioning System).
- This system is frequently used for managing source code of large software projects
- CVS saves all versions of all files, so nothing can be lost
- CVS enables linking and merging of code simultaneously developed by two or more persons
- Entire code and all of its versions are stored on central server
Some in-work possibilities

- Working with text - built-in text filters which enables following features when working on your lessons:
  - Automatic link insertion
  - Using math notation
  - Multimedial plug-ins

- Working with assignments and their solutions:
  - Upload file - assignment type
  - Offline - assignment type

- ‘Chat’ possibilities:
  - ‘chat’ repeating always at the same time, with public access
  - open ‘chat’ which can be started at any given time

Assignments examples
Choices

- with anonymous results

- With non-anonymous results

Which allows you to update anytime
Forums

- Standard forum
- Each participant starts one discussion
- Single discussion

Glossaries, journals and labels

- Glossaries created by:
  - student
  - teacher
- Evaluated journals
- Labels allow insertion of HTML files in course
Lessons

- Most important module
- Screen shows lesson in a way student can see it. Teacher’s view is different, showing complete path through lesson, as well as lesson ‘behavior’
- Teacher can also use Check Navigation option
- Screen on next slide is showing a Branch Table

Lessons

- This screen shows some branching possibilities
- There is also a recommendation for students
- Each branch can contain some textual content, questions or quizzes
Lessons

- Lesson module is used to give student some information regarding learning subject. Subject can be divided into parts (pages).
- After each subject, teacher can ask a question to check student’s knowledge. Student can advance only if he gives correct answer.
- If student doesn’t answer correctly, he can be ‘punished’ by returning to selected page.
- Page shouldn’t be bigger than one screen.

Question page

- It’s possible to have page with question only, without any other information.
End of lesson

- When all pages are learned and all questions are answered correctly, student is brought to the last page, that shows total results for the student.

Quizzes in Moodle

- Quiz module gives teacher the possibility to create tests in form of quizzes. Some of the quiz characteristics are:
  - Order of questions, as well as order of answers can be shuffled on each quiz attempt
  - Questions can contain HTML pages and pictures
  - Questions can be choose randomly from given question categories
  - Teacher can define database of questions with questions that appears in several quizzes
  - Questions can be grouped by categories, that can be accessed by any of the courses that exist on web site
  - Quizzes are graded automatically, and can be ‘re-checked’ and graded after answers being changed
Quizzes in Moodle

- Period of time, in which quiz can be attempted, can be given
- Teacher can control number of attempts to solve quiz. Every future attempt can be built on the last one
- Grading method can be defined as one of the following: highest grade, last grade, lowest grade or average grade
- Feedback can be shown to the student after answering, along with correct answers
- Students can be allowed to review their previous quiz attempts
- Quiz questions can be entered manually, by using Moodle interface, or by using upload option

There is a numerous types of questions that can be used in quizzes:

- Multiple choice
- TRUE/FALSE
- Short answer
- Numerical
- Calculated
- Matching
- Random
- Description
- Random short-answer matching
Some examples of quizzes

- Example of test that includes text which provides some helpful information, multiple choice question, as well as option of saving student’s answer.

- Example of quiz which has limited time for answering (2 minutes), as well as period of time in which it is available (24 May 2010, 04:55 PM).

- At each quiz attempt, Moodle gives you information about conditions.
Some examples of quizzes

- Representation of a quiz with timer

![Image of a quiz with timer]

Some examples of quizzes

- Example of a quiz which includes an audio element
- Student must have an installed audio player, as well as speakers

![Image of a quiz with an audio element]
Some examples of quizzes

- Example of a listening quiz

- There is a possibility of creating a quiz that requires a password
Some examples of quizzes

- Example of a quiz with a password

What hasn’t been told ...

- Persons which are defined as course creators (by administrator) are the only people that can create or change course
- During course creating, creators work in ‘editing on’ regime, adding resources, lessons, quizzes ...
- During course controlling and reviewing, creators work in ‘editing off’ regime, and they can see course in a way that students can see it
- One of the function of a course creator is defining of a lecturer