TCExam 5
Open-Source Web-based Assessment Software

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TCExam

TCExam is a free open-source Assessment Software(*) (FLOSS) that enables educators and trainers to author, schedule, deliver, and report on surveys, quizzes, tests and exams.

(*) CBA - Computer Based Assessment, CBT – Computer Based Testing, e-exam.

2

TCExam is freely used all over the world by universities, schools, companies and independent teachers.

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2007

![TCEXAM]

TCExam :: Key Quality Features

- Free and Open Source *(license GNU-GPL v.2)*

- Platform Independent *(PHP, MySQL o PostgreSQL)*

- No expensive hardware requirements

- Web-based

- Accessibility *(W3C-WAI-WCAG)*

- Usability *(quality of the interaction between user and system)*

- Spoken Language Independent *(I18N, TMX, UTF-8, Unicode)*

- Adoption of Open Standards

- Source code and DB documentation

- Large user community

(*) The listed features help to reduce the digital divide.

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4

Open Source Choice

Open Source promotes software reliability and quality by supporting independent peer review and rapid evolution of source code.

Stability

Open Source Advantages (1)

- **Openness**
  All advantages of Open Source are a result of its openness. Having the code makes it easy to resolve problems (by yourself or the next guy) which means that you don't have to rely on only one vendor for fixing potential problems.

- **Stability**
  Since you can rely on anyone and since the license states that any modification shipped elsewhere should be equally open, this means that after a period of time Open Source software is more stable then most commercially distributed software.

- **Adaptability**
  Open Source software means Open Standards, thus it is easy to adapt software to work closely with other Open Source software and even closed protocols and proprietary applications. This solves vendor lock-in situations which ties your hands and knees to one and only one vendor if you choose one's products.

Open Source Advantages (2)

- **Quality**
  Not only does software evolve onto a stable product, a large user base also supplies new possibilities, making it a feature-rich solution. More new features, less bugs and a broader (testing) audience (peer-review) are significant to the quality of a product.

- **Innovation**
  Competition is what drives innovation and Open Source keeps competition alive. As none has any unfair advantages, everybody has the possibility to add value and provide services. Information wants to be free.

- **Security**
  It is widely known that security by obscurity is not a secure practice in the long run. By opening the code and by wide adoption of Open Source software, it grows more secure.

- **Zero-price**
  TCExam software is freely available and doesn't cost any additional licenses per user/year. This is probably why TCExam is more used on developing countries.

TCExam :: Architecture (1)

TCExam is developed on the popular **LAMP** platform (GNU-Linux, Apache, MySQL and PHP). Part of TCExam attraction is it can run on almost any server that can run PHP. In addition, PostgreSQL can be used instead of MySQL.
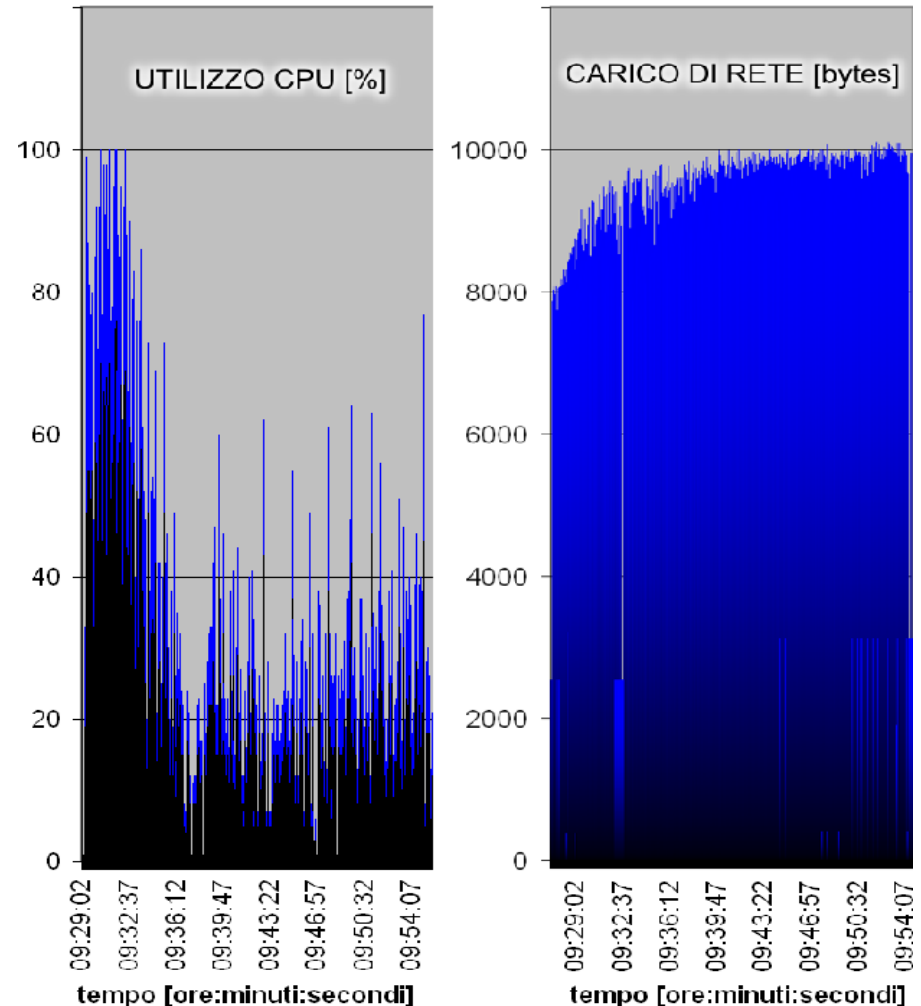
For users, all TCExam requires is a Web browser and an Internet or Intranet connection to the TCExam Web server.
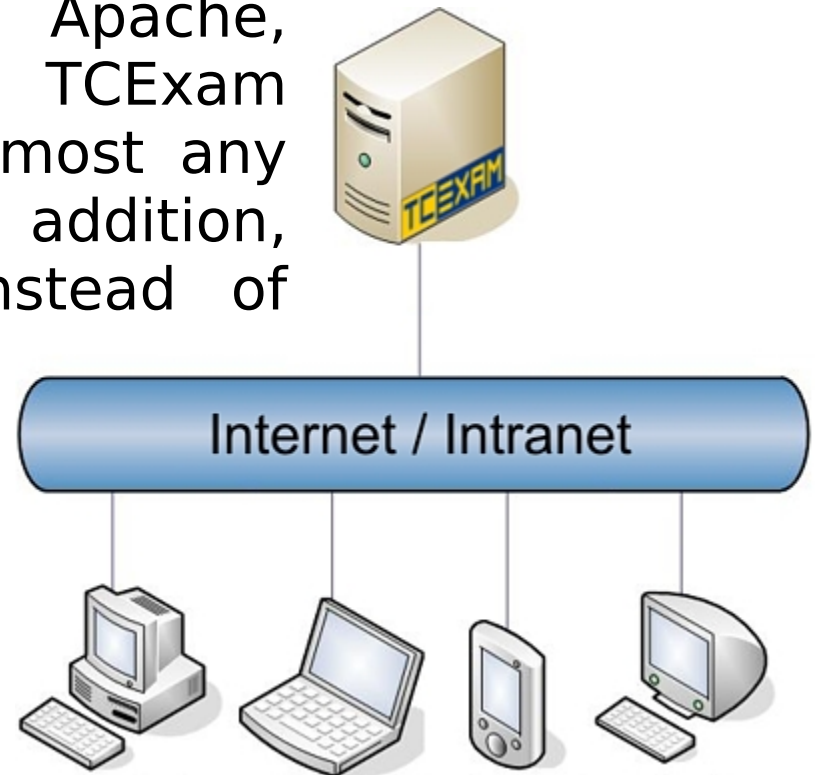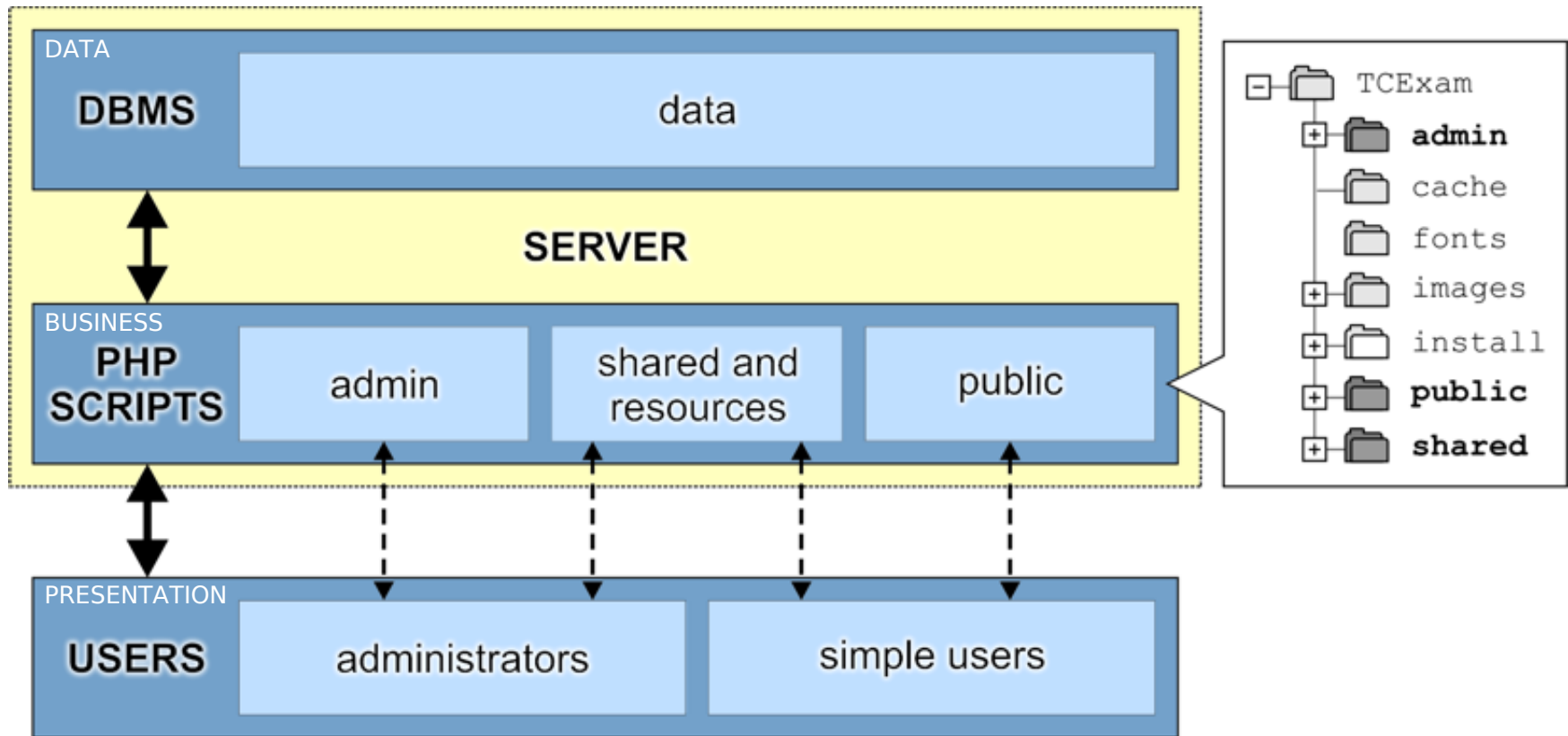
TCExam :: Architecture (2)

The flexible technical requirements make it possible to install and evaluate TCExam on almost any computer and even run it on shared Web servers managed by Web hosting providers.

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TCExam :: Architecture (3)

TCExam uses a Three-Tier structure.

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TCExam :: DBMS

The TCExam database has been designed and normalized to be compatible with both *MySQL* e *PostgreSQL*. It's also possible to add drivers for other DBMSs.

The database is fully documented to be easily extended or accessed by external applications.

TCExam :: Data Import/Export

TCExam supports various import/export data formats (**CSV** – *Comma Separated Values*, **XML** – *eXtensible Markup Language*, **PDF** – *Portable Document Format*).

TCExam :: Accessibility (1)

TCExam generates Web interfaces that conforms to the **XHTML 1.0 Strict** standard and **W3C-WAI-WCAG 1.0** Accessibility guidelines.

TCExam has been successfully used by blind users and users with various disabilities.
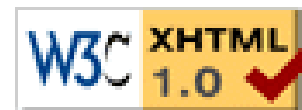
TCExam :: Accessibility (2)

The graphic aspect of the user's interfaces is handled by a **CSS2** style sheet.

TCExam :: Spoken Language

TCExam is language independent by adopting the **TMX** (*Translation Memory eXchange*) standard. A single **XML** file contains all TCExam translations.

TCExam has been already translated in 9 languages.

You may change the language at any time by using the selector at the end of each page.
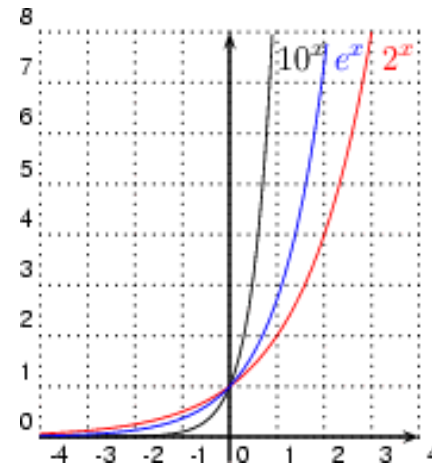
BR **EN** ES HU IT MR RU TR VN

TCExam :: Rich Content

TCExam supports a custom mark-up language to add text formatting, images, multimedia objects (audio and video) and mathematical formulas (supports *LaTeX*).

$$\text{corr}(X,Y) = \frac{\sum_{i=1}^{n}(x_i - \overline{x})(y_i - \overline{y})}{\left[\sum_{i=1}^{n}(x_i - \overline{x})^2 \sum_{i=1}^{n}(y_i - \overline{y})^2\right]^{1/2}}$$

TCExam :: Question Types

TCExam supports various question types:

MCSA
Multiple Choice Single Answer

MCMA
Multiple Choice Multiple Answer

ORDER
Ordering Answers

TEXT
free-answer questions, essay questions, subjective questions, short-answer questions (short-answers questions are automatically graded).

TCExam :: Unique Test

TCExam may generate unique test for each user by randomly selecting and ordering questions and alternative answers.

This drastically reduces or eliminate the risk of copying between users.

TCExam :: Automatic Grading

TCExam automatically grades the users' answers in real-time, considering the question difficulty and the test base score.

TCExam :: Public Area - Login

https://<tcexam-host>/public/code/

The public area contains the forms and the interfaces that will be used by the users to execute the tests.

In order to access this area, the users must login[*] inserting their username and password in the specific form.

(*) Radius and LDAP support will be available soon.

TCExam :: Public Area – Test List

Once logged in, the users will see a page with the list of the tests to do and possibly the tests already done. The list of the tests visualized depends on the relative time frames, the user IP address and the condition if they have already been performed or not.

The list of active tests shows, other than the test name, a list of links different case by case: [info], [execute], [continue], [results].

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TCExam :: Test Execution (1)

The Test Execution form contains two sections. On the first section you may answer to the selected question.

TCExam :: Test Execution (2)

The second section contains a menu to select the questions and show their status (selected, displayed, answered, difficulty).

The user is allowed to change the answers with no limitation throughout the whole duration of the test. It is not necessary to confirm the end of the test since it will be considered concluded when the expiration time is reached.

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TCExam :: Administration Area

The administration area contains the forms and the interfaces to manage the whole system, included the user and database management, the generation of the tests and the results.

https://<tcexam-host>/admin/code/

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TCExam :: First Use

The main steps to create your first test are:

- create a group for test-takers;
- create or import users' accounts;
- create test topics;
- create or import possible questions and answers for each topic;
- create the test.

TCExam :: Test Creation (1)

The Test form contains two sections.

On the first section you may specify the general test information.

test [1. 2007-10-27 Test di prova ▼]

┌─ test ───
│
│   name [Example   ]
│   description [This is an example test.   ]
│   [   ]
│   [   ]
│   [   ]
│
│   start time [yyyy-mm-dd hh:mm:ss] [2007-11-29 09:00:00]
│   end time [yyyy-mm-dd hh:mm:ss] [2007-11-30 13:00:00]
│   test time [min] [30   ]
│   random questions ☑
│   results to users ☐
│   basic points [1.000   ]
│   authorized IP's [192.168.1.*   ]
│   groups [administrators ▲]
│   [default   ]
│   [test   ]
│   [   ]
│   [▼]
│
│   [update] [delete] [add] [clear]
│

TCExam :: Test Creation (2)

On the second section you may specify the quantity and the type of questions.

You may group several topics from which extract the specified questions.

You may also generate tests in PDF format to be printed and used in a traditional Pen and Paper Testing (PPT).

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TCExam :: Test Monitor and Results

The test-takers activity could be monitored in real time by administrators.
An administrator has the privileges to stop, restart or increase the remaining time of each test.

Once a test is completed, an administrator may:

- manually grade the TEXT answers;
- display, export (CSV, PDF) and print the general and detailed results;
- send the results to each user by email;
- display the test statistics.

Thank you for your attention.

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