



DL NGL
NEXT
GENERATION
LABS



DL NGL-ECOM
Module for the study of e-commerce

The 'e-Commerce' module deals with the problems of electronic commerce at an educational level, i.e., the activities of selling and buying products via the Internet.

The phenomenon of electronic commerce is now pivotal in daily life and allows easier access to goods sold globally.

This innovative way of commerce is powered by hardware and software components 'distributed' within the Internet network: Web servers, e-commerce sites, payment system management servers. Reproposing distributed systems of this type at an educational level where the student, in order to learn, must see inside the system how the information passes from one component to another is impossible using directly Servers available online on the Internet with their services of hosting.

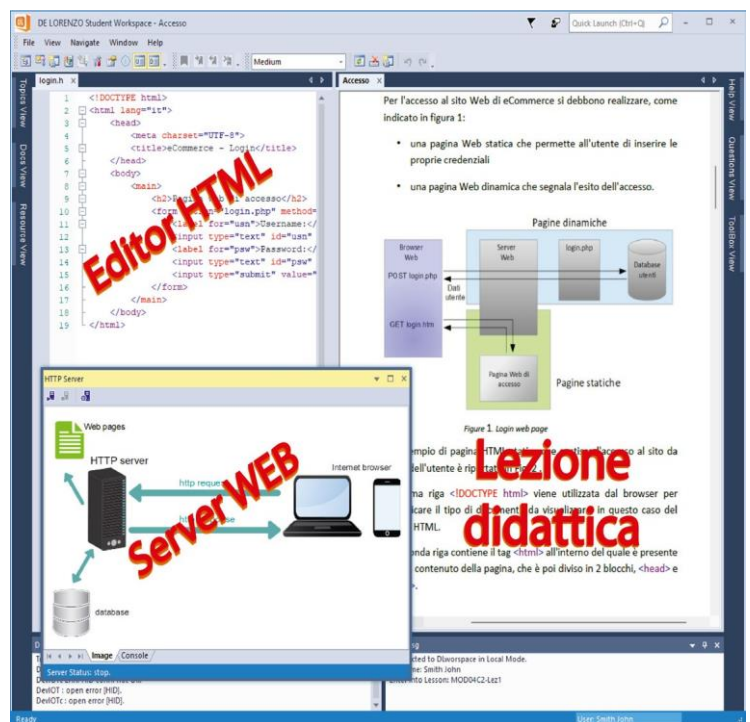
The 'e-Commerce' module addresses the study of all these issues with a two-level approach, particularly aimed at teaching.

In a first level, we exploit the potential of the DL Workspace application, which internally contains tools for the creation of web pages, HTTP servers, database management tools, all aimed at studying the basic problems of an electronic commerce system:

- access to the site,
- product display,
- shopping cart management,
- payment systems,
- etc.

With these resources, the student, guided by the didactic lessons:

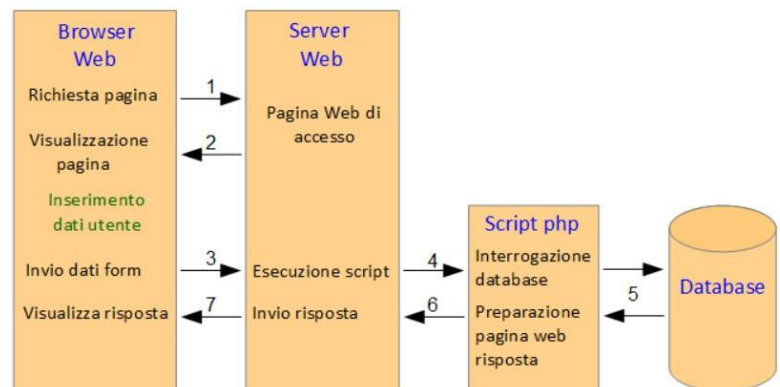
- creates his own web pages,
- creates PHP scripts to make dynamic web pages with access to the database,
- checks on his computer the functioning of the system he has created.



An example is shown in the following figure where the tools involved in the site login operation by a user are represented (Web Browser, Web Server, PHP script and Database) and the various operations that are performed:

- login page request,
- sending the data entered by the user,
- database access,
- sending of the answer.

The student is able to create the login web page and the database query PHP script and, in the operation verification phase, he can observe and control everything that happens because the different tools are within the DL Workspace.



All this allows each student to learn the various problems that underlie the creation of an e-Commerce site, working independently on their workstation and proceeding at their own learning speed.

In a second level, the Module provides a Server equipped with all the necessary hardware and software components of a real system:

- Preconfigured physical server
- Ubuntu Operating System
- Docker and Docker Compose
- Traefik proxy server in reverse proxy mode
- Apache Web server
- MySQL database
- Local e-mail server for receiving e-mails generated by the e-commerce site
- DNS server
- Proprietary payment system that allows you to simulate payment transactions with credit/debit cards
- Complete e-commerce application with access management, product selection, shopping cart management, electronic payment, etc.

After having learned the basic concepts with the tools of the first level, the students can now access the e-commerce website and perform the normal operations necessary to conclude an electronic purchase: view the catalogue of products offered by the site, add these products to the cart, checkout in guest mode or by registering an account on the site and finally pay by credit/debit card using the proprietary payment system that simulates the transaction (no transaction performed within this payment gateway is valid and, therefore, there is no money handling).

Educational experience

- Introduction to e-Commerce
- Structure of an e-Commerce system: server, database, etc.
- Creation of static and dynamic web pages
- Database and SQL language
- Creation of web pages and scripts for:
 - Access to the e-Commerce site
 - Product catalog management
 - Shopping cart management
 - Electronic payments management
- Structure and software tools of an e-Commerce Server
- Content Management Systems (CMS) for the creation of websites
- Creation of websites oriented to the electronic commerce
- Product pages, product listings, price lists, digital showcases
- Plug-in for electronic payments

NEXT GENERATION LABS

The DL NGL-ECOM module can be integrated in the NEXT GENERATION LAB - DL NGL laboratory through the minimum purchase of the following modules:

- **Teacher Station - DL NGL-BASE**
Necessary for the proper functioning of the laboratory. Quantity: 1.
- **Student Station - DL NGL-STUDENT**
To be multiplied by the number of "student stations" to be created.

