University of Potsdam
Am Neuen Palais 10
14469 Potsdam
Germany

1

DELIVERABLE D4.9 – FINAL RELEASE OF EDUC'S NETWORKED IT INFRASTRUCTURE

1

Project Full Name	**European Digital UniverCity**
Grant Agreement No.	612442-EPP-1-2019-1-DE-EPPKA2-EUR-UNIV
Programme	Erasmus +
Instrument	European Universities
Start date of Project	01/10/2019
Duration	36 months
Deliverable No.	D4.9
Document name	Deliverable D4.9 - Final release of EDUC's networked IT infrastructure
Work Package	WP4
Associated Task	4.1, 4.2, 4.3, 4.4 and 4.5
Dissemination Level	Public
Contractual Submission Date	M35 (August 2022)
Actual Submission Date	M39 (December 2022)
Main Author	Giovanni Fonseca
Institution	University of Potsdam
E-mail	giovanni.fonseca@uni-potsdam.de
Abstract	Access to the final realease of the EDUC portal
Keywords	EDUC Portal, final

Table of contents

1 General

For the reasons given in D4.5 and D4.7, the final version of the portal is consistent with the pilot version.

2 System Design

This section gives an overview of the EDUC digital infrastructure.

The development has been done in an agile way. First needs and features are discussed among the Pedagogical Engineers and WP 4. In the next step WP 4 tries to translate these requirements into development tasks. Subsequently the developers do the coding and publish everything to the central repository on GitHub[22]. After development is done the administrators in Potsdam release a new version and deploy the things to the test instance. Next, the Pedagogical Engineers care for testing, they try to investigate bugs, problems or to suggest further improvements. The development and testing are iterated until everything works as desired. Then at last everything is deployed to the production instances.

The main components of the EDUC infrastructure will consist of the Federated Identity & Access Management underlying the Portal, the Webpage, the Social Network, the Course Catalogue and the Learning Management System. The Portal links to the existing services. Besides all the, are the Project Management Tools consisting of collaborative and support tools for the staff.
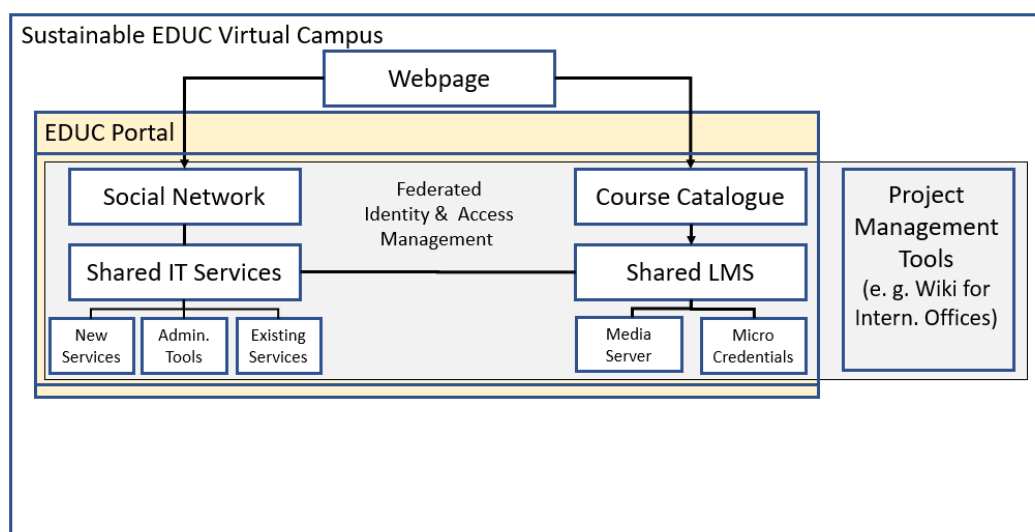

Figure 1- EDUC system design.

2.1 Basic Infrastructure Layout

The main digital infrastructure of EDUC is hosted at the data center on Potsdam (called ZIM). The system is performed in a defined automatic way and supports running multiple instances of each service distributing user requests to all instances running (load balancing). The infrastructure allows adding and removing physical machines as required. Single physical machines must be temporarily removable for maintenance purposes (service redundancy). The data center in Potsdam already provides a monitoring environment for machines hosted. The EDUC virtual machines are added to that environment. This also allows running

monitoring of standard parameters using pre-configured standard monitoring profiles. In order to access to data between services, a distributed file system has been enabled. To minimise the effort in implementing we started working with already existing infrastructure offered by the data center, namely Network File System (NFS) accessible via the network (Storage Back-End). All services of the infrastructure are wrapped into Docker Containers.

The EDUC infrastructure consists out of five virtual machines running in the data center. The first machine is the test instance. The second virtual machine is for the EDUC webpage. The third, fourth and fifth virtual machines are currently for running the Portal, the Course Catalogue and the EDUC LMS behind the Load Balancer in the production environment (Service Schema). For more technical details, see D4.1, section 4.

2.2 Identity & Access Management

All partner universities operate a central Identity Provider (IdP) and Identity Management system to handle authentication, access, rights and roles for the IT-services offered to their academic staff and students. SAML is the most common protocol currently used by the IdPs. A Single-Sign-On (SSO) is in place at all partner universities.

The SSO allows users to login and authenticate themselves only once at one of the university's web-based IT services or a central website and then use all connected web-based IT-services for the rest of the day. All universities are registered within the global authentication service "eduGAIN" and are ready for connecting their local IdPs to EDUC IT-Services offered via eduGAIN. This was a precondition for implementing a SSO for EDUC IT-services.

For Identity & Access Management the SAML 2.0 protocol is used. All universities in the EDUC alliance offer an Identity Provider providing SAML 2.0 bindings and all are member of a national authentication & authorization federation, who are part of the eduGAIN network.

For the Course Catalogue and the EDUC Portal are using SimpleSAML as a SAML Service Provider to handle incoming authentication and authorization requests. For the EDUC LMS the Shibboleth Service Provider is used. Currently the identity providers of all EDUC alliance members are part of the metadata files.

2.3 Webpage

The Webpage is an in-house development based on a proprietary solution. Currently no state-of-the-art Content Management System is in place. The webpage should be relaunched in the next funding phase. The current webpage is implemented by using Vue.js[33]. The webpage is built as a Single-Page-Web-Application using the Model-View-Viewmodel-Model-Concept and NPM[34]. The webpage is a standalone application, which does not require any APIs or dependencies.

The webpage runs currently on a dedicated virtual machine.

2.4 Portal

The EDUC Portal is just like the EDUC Shared Course Catalogue a self-developed application. The Portal and the Course Catalogue are both documented in a private GitHub repository of the EDUC alliance.

2.4.1 Navigation Bar

The navigation bar is the only visible component of the portal at this moment. It offers access to the current services connected to the Portal.

2.4.2 Service List

The services available (e. g. Learning Management System or Course Catalogue) will be configured over an external database. Alteration of the database's content should be done with the roll-out of single services so that there is no need for an administration interface.

2.4.3 User Button

The user button offers login and logout functionality to the portal which counts as login to the EDUC services (LMS and Course Catalogue)

2.5 Course Catalogue

The EDUC course catalogue was implemented by using PHP and the same technology as the Portal. The data is stored in a dedicated MySQL database. At the landing page a possibility is offered for searching, filtering and to browse for courses offered by the EDUC alliance. Furthermore, Pedagogical Engineers, and Project Managers have the possibility to log in and to add new courses via a backend site. A course offers detailed information according to the requirements. The following figure shows detailed information (cp. fig. 2)

Figure 2-Course offered within the EDUC alliance with multiple information.

2.5.1 Course Catalogue Browser

The course catalogue browser presents the user an interface to search all curated courses within the EDUC consortium by the partner universities. It is possible to browse by discipline, mobility format, the leader university, min. academic level, language, duration and the starting semester.

The detailed view offers more information about the course itself e. g. like a description, pre-requisites, the mode or the platform (cp. fig. 2).

2.5.2 Retrieval of Course Catalogue Data

The automatic retrieval of the Course Catalogue Data is currently not implemented. The data for the course catalogue is entered via a backend of the EDUC course catalogue by the Pedagogical Engineers or Project Managers.

2.6 Learning Management System (EDUC Moodle)

As most of the alliance's universities are already hosting their own Moodle installation and therefore most of the teaching personnel are already familiar with Moodle. Therefore, we use Moodle as EDUC's learning management system.

To include Moodle in the EDUC infrastructure the Moodle is wrapped into a Docker container. A peculiarity of Moodle is that it requires a cron job running once a minute which requires us to find a way of running this job in the container. Login to the Moodle instance is performed via the SAML single sign-on mechanism of the Shibboleth Service Provider running in front of the Moodle instance as a separated container. Moodle further requires access to a database which is a MySQL hosted in the data center of the University of Potsdam. Same applies for the shared network-based storage which is an NFS mount on the machine. Moodle uses the mail relay service of the data center in Potsdam to send messages.
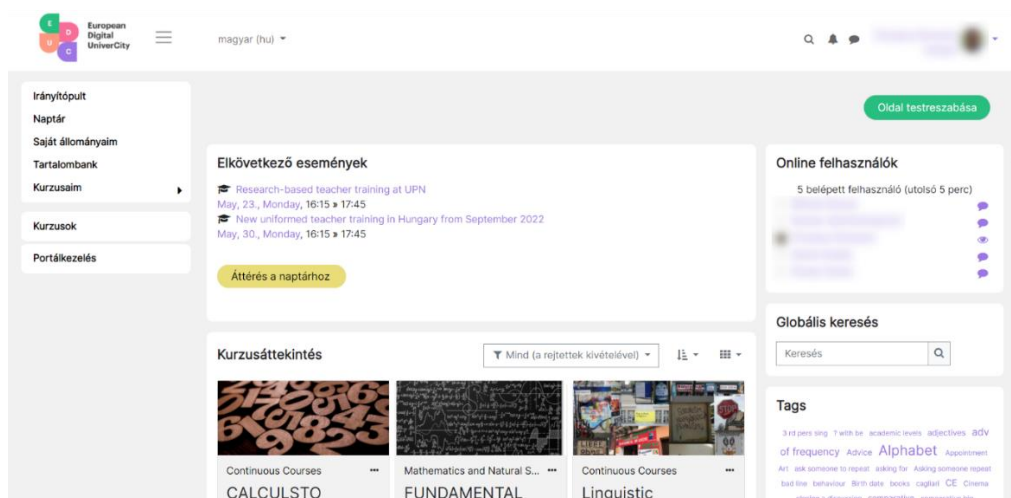

Figure 3- EDUC LMS Dashboard, students view.

The service has been adapted to the design to match the EDUC visual identity, implement a set of course templates and a course overview that can also be used for promoting courses.

As it is hard to anticipate the required plugins for the system, we started with a minimum set of standard plugins and will install new plugins on request by teachers or students. Nevertheless, the plugins currently installed let create a very diverse and flexible learning scenarios.

2.7 Collaboration Tools

The portfolio of collaboration tools currently depends on the specific Work Packages. Nearly every Work Package defines its own collaboration tools used. Therefore, several tools like Google Drive, Microsoft Teams, Onedrive or cloud-storages hosted by different EDUC alliance partners are used. At the moment for video collaboration especially Zoom or Microsoft Teams are used. The licenses are provided by the EDUC alliance universities. For creating collaborative mindmaps Miro or Klaxoon are normally used.

2.8 Support Tools

The 1st and 2nd level support are handled by the teachers and the responsible Pedagogical Engineers. For the 3rd level support the central support e-mail address is used. The e-mail address support@educalliance.eu directs to a support queue. All requests open new requests in the ticket system OTRS, which is operated by the data center in Potsdam. For the EDUC Course Catalogue on top a FAQ for students and teachers is in place.

2 Request Access

Access to the portal for EDUC community: https://portal.educalliance.eu

We are not able to offer general access credentials. EDUC portal works under the standards of EduGAIN and is constrainted to the institution's members of EDUC. In order to request access to the EDUC portal, we need to apply for a guess account in one of our partner universities. Therefore, in case of need it, please send an email to our WP4 coordinator: Giovanni Fonseca, giovanni.fonseca@uni-potsdam.de with the following information:

Email's subject: Portal guess account request

- first name:
- Surname:
- Gender:
- Date of birth: [dd.mm.yyyy]
- Birth name:
- City of birth:
- Private email: [for feedback and to reset password].

Important information:

The UP account will be sent to the user by ZIM (University of Potsdam Data Center) via e-mail (private e-mail). Afterwards the UP account has to be activated via the service website https://accountup.uni-potsdam.de/

After activation, please test your login at https://portal.educalliance.eu by following the next steps:

1. Choose one of the EDUC languages (optionl, English is the defautl)
2. Click on the login button (right-upper-corner)

3. Choose University of Potsdam (you can check, to remember this option in the future)

4. Enter the username, only the second part of your email address at UP, eg. If your account is john.smith@uni-potsdam.de, your username is only: smith

5. Enter your password

6. **Voila, enjoy how your [digital] world just got bigger!**

Do not share your password with anyone. The account is set up for a limited period of one year. The WP4 Coordinator must be informed in good time of the need to extend the account, stating the reason, and the account will be extended for a further year.

In line with international practice, you should use the email address firstname.surname@uni-potsdam.de (a number will be added to duplicate names). Messages sent to this address will be forwarded to your mailbox on the ZIM communication server and can be retrieved from there.