

ENDEAVOUR: Towards a flexible software-defined network ecosystem



ENDEAVOUR

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12/14/2015	0.4	Revised version including early web analytics	Medjiah, LAAS-CNRS, Bruyere, LAAS-CNRS

Executive Summary

This deliverable provides an overview of the ENDEAVOUR public portal available at :

<https://www.h2020-endeavour.eu/>

The report describes the basic functionalities of the project website. The public portal offers a compilation of relevant information for project members, partners, reviewers (European Commission) and anybody else interested in the ongoing research carried out in the ENDEAVOUR project.

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1 Introduction

This website is a public page describing the main goals of the ENDEAVOUR project as well as a collaborative tool for the consortium members. The associated URL is:

`https://www.h2020-endeavour.eu/`

The portal is based on Drupal v.7, an open source CMS tool. The web design contains an internal view and an external or public view. The internal view is dedicated to the ENDEAVOUR consortium and project reviewers and is implemented in an uncomplicated way so that the addition of new and updated information can be done in a simple and efficient way. For this purpose, several user accounts have been created in order to allow uploading new content as well as updating the existing information in the portal. On one hand, special registered users are allowed to create and edit news and include new entries for deliverables. Administrators, on the other hand, have the same permissions as the registered users, but are able to edit the website layout and add new menus. The external or public view shows the whole ENDEAVOUR project information, social media feed (a.k.a twitter feed) and related news. The web page consists basically of a Main Menu, a horizontal menu and an information display area. A more detailed description of the information layout can be found in annex A. When the portal is accessed, users will first find a homepage with recent news/events and the Main Menu. This menu is structured in basic sections or categories which are, (see Fig. 1): 1. Home 2. Objectives 3. Consortium 4. Deliverables 5. Dissemination 6. Events 7. Resources 8. Contacts 9. Reviewer Area

Reserved access



Figure 1: Main menu

This model optimizes content location and enhances user experience.

2 Menu options

The main menu of the ENDEAVOUR portal is organized as follows :

2.1 Home

This section shows the latest news about papers, events, and other dissemination activities. This section is automatically generated as new content items are put on the web site. An overview of this section is shown in Fig. 2



Home	Objectives	Consortium	Deliverables	Dissemination	Events	Resources	Contacts
------	------------	------------	--------------	---------------	--------	-----------	----------

- > Home
- > Objectives
- > Consortium
- > Deliverables
- > Dissemination
- > Events
- > Resources
- > Contacts

Twitter Feed

Published Paper: "NetPaxos: Consensus at Network Speed"

Abstract: This paper explores the possibility of implementing the widely deployed Paxos consensus protocol in network devices. We present two different approaches: (i) a detailed design description for implementing the full Paxos logic in SDN switches, which identifies a sufficient set of required OpenFlow extensions; and (ii) an alternative, optimistic protocol which can be implemented without changes to the OpenFlow API, but relies on assumptions about how the network orders messages.

[Read more](#)

Published Paper: "A Distributed and Robust SDN Control Plane for Transactional Network Updates"

Abstract: Software-defined networking (SDN) is a novel paradigm that outsources the control of programmable network switches to a set of software controllers. The most fundamental task of these controllers is the correct implementation of the *network policy*, i.e., the intended network behavior.

[Read more](#)

ENDEAVOUR Quarterly Meeting in London, UK





Figure 2: Home section

Consequently, this section is very useful for everyone interested in the project progress and updates as it is the first content the visitor can access on the portal.

2.2 Objectives

The ENDEAVOUR portal has a full section dedicated to the project objectives. In this section, a visitor can read about the context and the problem being tackled in ENDEAVOUR, and finally the detailed list of ENDEAVOUR goals. An overview of this section is shown in Fig. 3.



Home Objectives Consortium Deliverables Dissemination Events Resources Contacts

> Home > Objectives

Objectives

ENDEAVOUR: Towards a flexible software-defined network ecosystem

"Bringing SDN to the Inter-domain settings"

The focus of the project is to enable added-value services to be provided thanks to Software-Defined Networking (SDN), on top of Internet Exchange Points and other network interconnection fabrics. The services would relate not only to the flexibility of the interconnection fabric, but most importantly to enable the content and data center ecosystem that is present at the interconnection fabric to collaborate. The ultimate goal is to create a service marketplace on top of the ecosystem composed of Cloud/data centers, networked applications, and the interconnection fabric.

The objective of ENDEAVOUR is to address current limitations of the Internet interconnection model, as well as to open the opportunity for novel services, creating the possibility for new economic models around the created ecosystems

Context & Problem

The rise of the IXP

Internet eXchange Points (IXPs) originate at the time the Internet transitioned from an academic/research network into today's commercial infrastructure. Indeed, the basic role of IXPs dates back to the establishment of Network Access Points (NAPs). Over the past 20 years, as the Internet grew by leaps and bounds by any imaginable metric, the original four NAPs were replaced by a steadily increasing number of modern IXPs. The critical role they have played in the Internet ecosystem has until recently gone largely unnoticed by the Internet community at large.

Twitter Feed

Figure 3: Project objectives section

2.3 Consortium

This section is dedicated to the presentation of all the partners collaborating in the ENDEAVOUR project. The list of partners is first summarized on a geographic map highlighting the country of each partner. Then, the list of partners is given with a link to each partner detailed presentation as shown in Fig. 4. Finally, in each partner description, a link is given to the web page of the involved teams on the project.

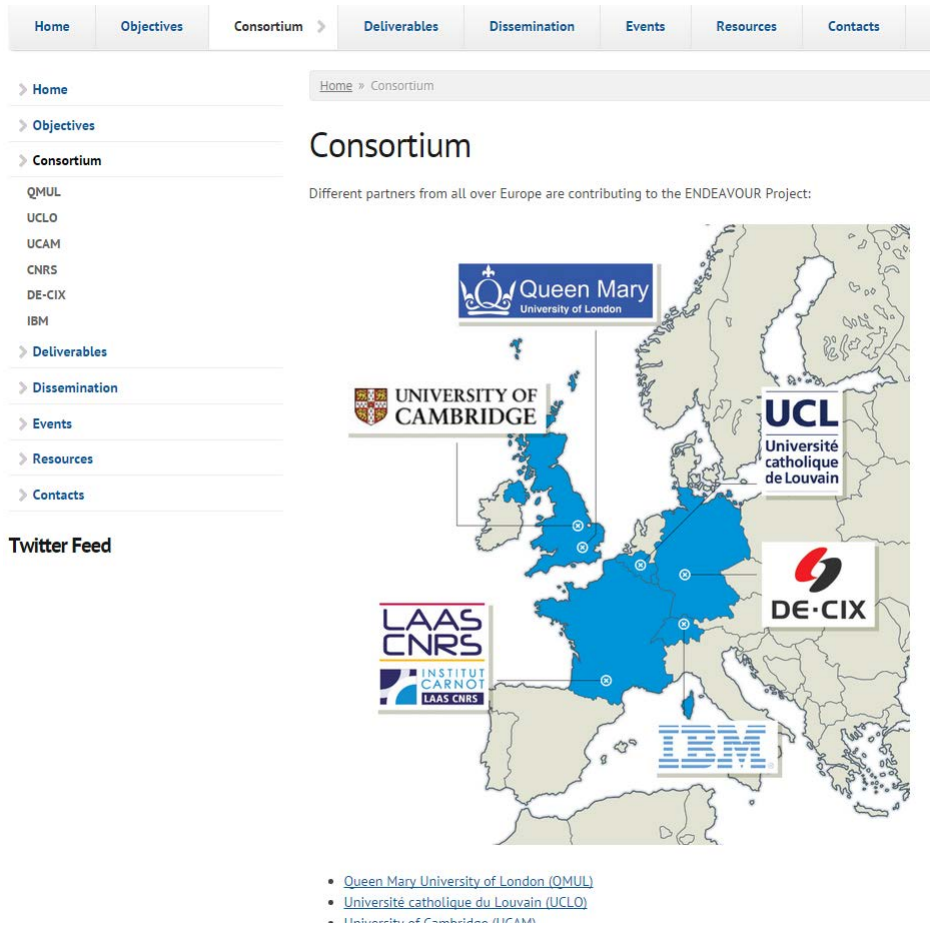



Figure 4: Project members section

2.4 Deliverables

This section displays the list of deliverables issued so far with an indication about the workpackage, the delivery date and the status of each one (under review or published with a download link when it applies (i.e. public deliverable)). An overview of this section is shown in Fig. 5.



Home Objectives Consortium **Deliverables** > Dissemination Events Resources Contacts

> Home > Objectives > Consortium > **Deliverables** Workplan > Dissemination > Events > Resources > Contacts

Twitter Feed

Home > Deliverables

Deliverables

Number	Title	Workpackage	date	status
D2.1	Requirements and Initial Design	WP2: Software-defined Networking	July 2015	Under review
D3.1	Monitoring Requirements	WP3: Measurements & Monitoring	June 2015	under review
D4.1	Use Cases from Related Work	WP4: Use cases	June 2015	under review
D5.3	Report from IXP member workshops	WP5: Dissemination & Exploitation	May 2015	under review

Figure 5: Project deliverables section

2.5 Dissemination

This section is dedicated to all ENDEAVOUR dissemination activities. This section features a sub menu organizing the dissemination material into four categories:

- Research papers.
- Standardization efforts.
- Software.
- Press releases.

Each dissemination category links to a specific sub-section with a list of published materials. Fig. 6 shows an overview of the published papers sub-section. The project poster, flyer and fact sheet are published under the press desk sub-section.

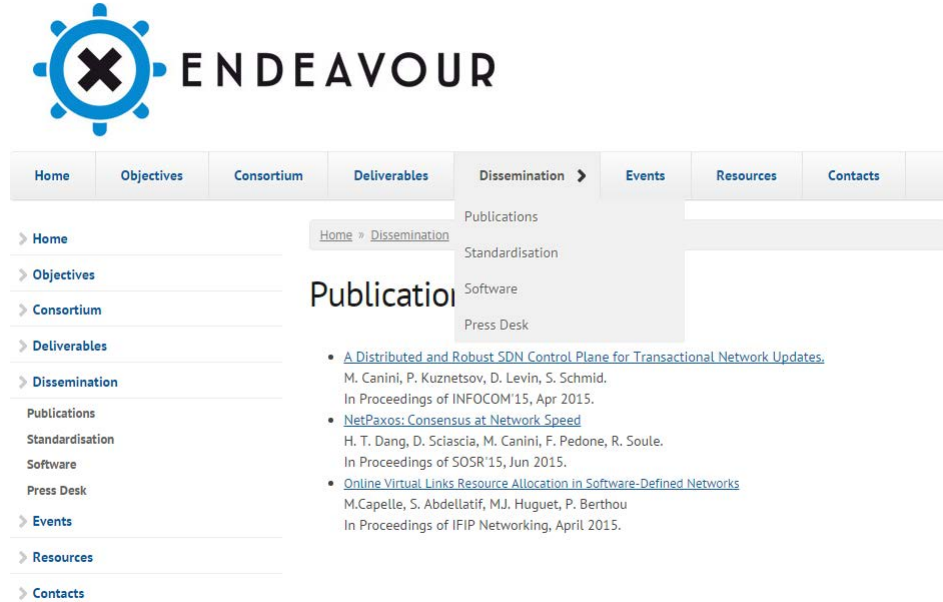


Figure 6: Dissemination section

2.6 Events

The events' section of the ENDEAVOUR portal advertises all kind of events related to the project with participation of at least one ENDEAVOUR partner. As shown in Fig. 7, this section is organized into three sub-sections:

- Upcoming events, where one can find the list of already known and planned events.
- Project meetings, where one can find information of the previously held face-to-face meetings.
- workshops, where one can find the list of workshops organized by ENDEAVOUR or attended by the project members.

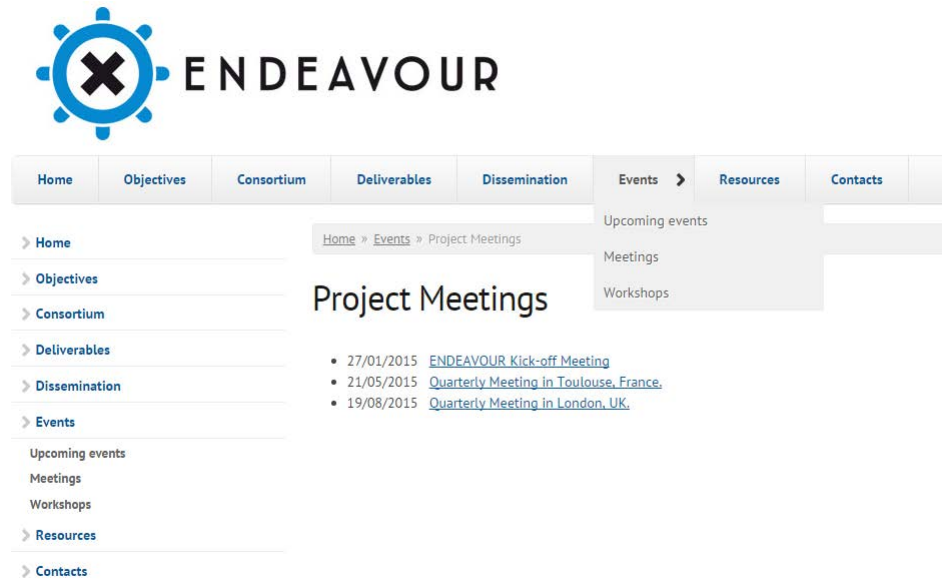


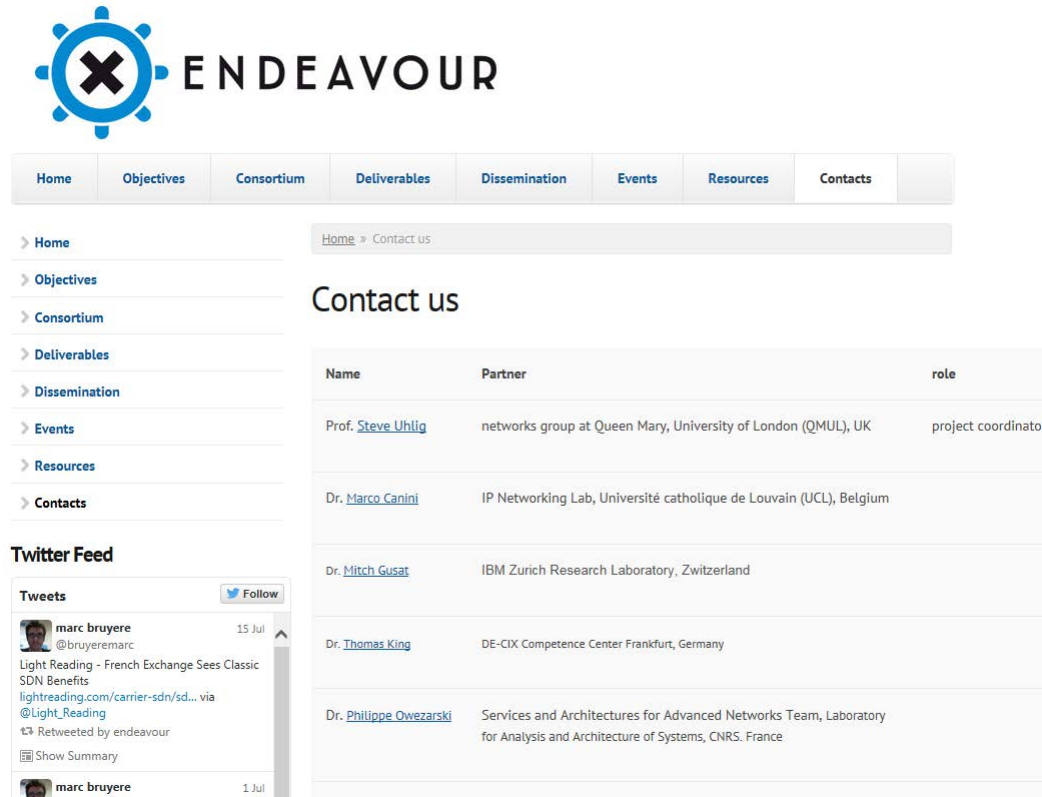
Figure 7: Events section

2.7 Resources

This section of the ENDEAVOUR portal shall contain various resources that are available for partners' members such as links to code source repositories, internal wiki, shared documents. During the first year of the project, this section contains a link to a private bitbucket repository.

2.8 Contacts

The Contacts' section of the ENDEAVOUR portal contains information about the person to contact from each project partner. The project coordinator is also identified. An overview of this section is shown in Fig. 8.



ENDEAVOUR

Home Objectives Consortium Deliverables Dissemination Events Resources **Contacts**

Home » Contact us

Contact us

Name	Partner	role
Prof. Steve Uhlig	networks group at Queen Mary, University of London (QMUL), UK	project coordinator
Dr. Marco Canini	IP Networking Lab, Université catholique de Louvain (UCL), Belgium	
Dr. Mitch Gusat	IBM Zurich Research Laboratory, Zwitterland	
Dr. Thomas King	DE-CIX Competence Center Frankfurt, Germany	
Dr. Philippe Owezarski	Services and Architectures for Advanced Networks Team, Laboratory for Analysis and Architecture of Systems, CNRS. France	

Twitter Feed

Tweets [Follow](#)

marc bruyere @bruyere marc 15 Jul
 Light Reading - French Exchange Sees Classic SDN Benefits
[lightreading.com/carrier-sdn/sd...](#) via @Light_Reading
 Retweeted by endeavour
 Show Summary

marc bruyere 1 Jul

Figure 8: Contacts section

2.9 Reviewer Area

The corresponding menu entry to this section is hidden in the public view. Once logged in with the corresponding credentials, reviewers can see a new entry to the main menu. In this section, private information and documents are displayed for the sake of the reviewers. Displayed documents include project proposal and submitted deliverables for review.

3 Widgets

The ENDEAVOUR portal features a social media feed. In order to ensure a large and efficient visibility, the ENDEAVOUR project has a twitter account @h2020-endeavour. This twitter account is already following related H2020 projects, related European commission accounts, and many other official

accounts. An overview of the twitter widget is shown in Fig. 9.



Figure 9: Twitter Feed

4 Web analytics

Since its launch, the ENDEAVOUR portal has attracted many visitors from all the world. Fig 10 shows web portal statistics from 15 November 2015 (date when web analytics ahve been activated) to 14 December 2015. The first statistics show that a lot of visitors are located in the USA, followed by visitors from Europe.

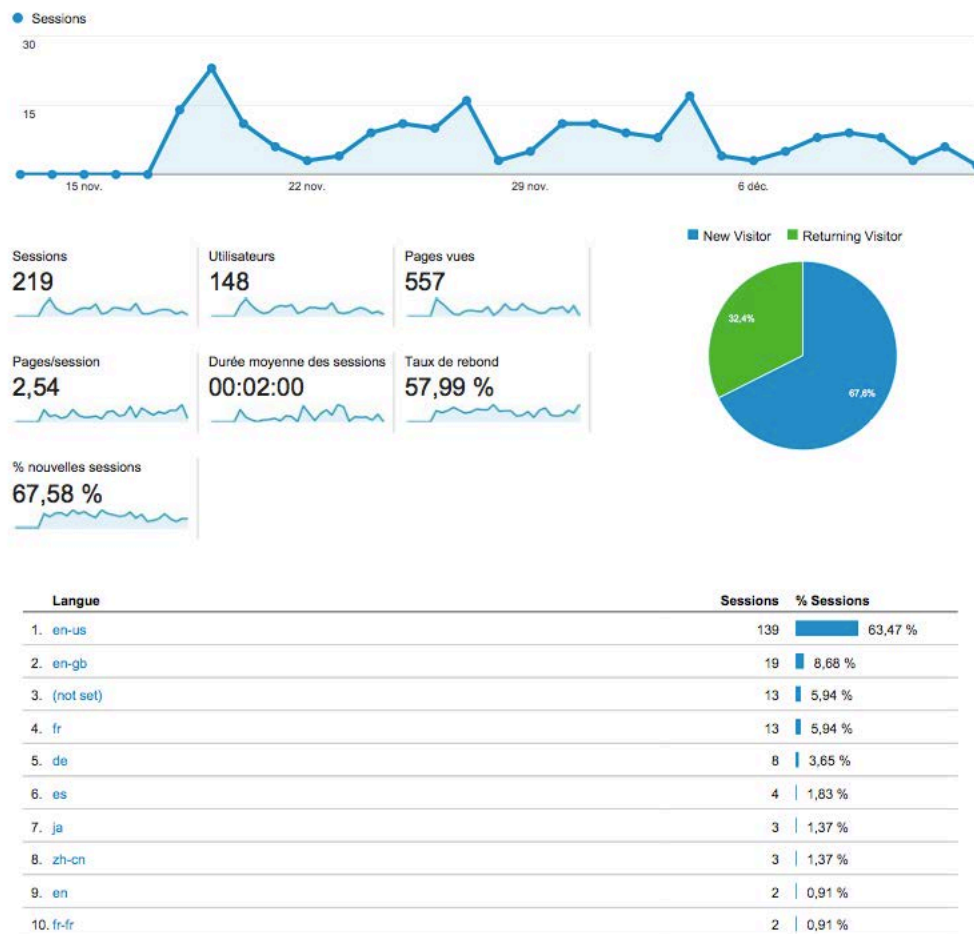


Figure 10: Google Web Analytics at 14 December 2015

5 Future Plans

During the ENDEAVOUR project duration, the portal will be enriched with new content items related to results and findings. The related portal sections are already part of the web site. Published articles, software, standardization drafts, and presentations will be advertised and put on the portal as they will be available.

Annex A

The portal information is organized as follows (see Fig. 11):

- 1 A link to ENDEAVOUR portal administration, content editing, and reviewer access.
- 2 The main menu of the portal.
- 3 A recall of the main menu with a focus on the selected section and its sub-sections.
- 4 The information display area.
- 5 The social media feed (a.k.a. Twitter).
- 6 Footer, project information, and project partners.

The screenshot displays the ENDEAVOUR portal interface. At the top right, a 'Reserved access' button is marked with a red circle '1'. The main header features the ENDEAVOUR logo (a blue gear with an 'X') and the project name 'ENDEAVOUR', with a red circle '2' next to it. Below the header is a navigation menu with items: Home, Objectives, Consortium, Deliverables, Dissemination (highlighted with a red circle '3'), Events, Resources, and Contacts. The main content area is titled 'Dissemination' (marked with a red circle '4') and lists links for 'Research papers', 'Standardization efforts', 'Published software', and 'Press desk'. On the left side, there is a sidebar menu with categories like Home, Objectives, Consortium, Deliverables, Dissemination (with sub-items: Publications, Standardisation, Software, Press Desk), Events, Resources, and Contacts. Below the sidebar is a 'Twitter Feed' section (marked with a red circle '5') showing tweets from @AMS_IX, @h2020_endeavour, and @h2020_endeavour. At the bottom of the page, a footer area (marked with a red circle '6') contains logos for UCL, Queen Mary, Université catholique de Louvain, UNIVERSITY OF CAMBRIDGE, LAAS-CNRS, DE-CIX, and IBM. Below the logos is a disclaimer: 'The information available on this website is property of the contributing authors from the ENDEAVOUR Consortium and does not necessarily reflect the view of the European Commission. The information in this website is provided 'as is', and no guarantee or warranty is given that the information is fit for any particular purpose. The user uses the information at its sole risk and liability.' Below the disclaimer are logos for the European Commission and the Horizon 2020 Programme, with text: 'This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 644960'.

Figure 11: Portal organization