Seventh FRAMEWORK PROGRAMME
FP7-ICT-2009-5 - ICT-2009-1.6
Future Internet experimentally-driven research

SPECIFIC TARGETED RESEARCH OR INNOVATION PROJECT

Deliverable D5.1
"IT and Knowledge management tools"

Project Description
Project acronym: **EULER**
Project full title: **Experimental UpdateLess Evolutive Routing**
Grant Agreement no.: **258307**
Document Properties
Number: FP7-ICT-2009-5-1.6-258307-D5.1
Title: IT and Knowledge management tools
Responsible: David Coudert (INRIA)
Editor(s): David Coudert (INRIA)
Contributor(s): David Coudert (INRIA), Dimitri Papadimitriou (ALB)
Deliverable Reviewer: Jordi Perello (CAT)
Dissemination level: Public (PU)
Date of preparation: *December 2010*
Version: 1.0

D5.1 - IT and Knowledge management tools

Executive Summary

This document details the IT tools for the efficient management of the knowledge production (documents, publications, software, etc.) during the lifetime of the EULER project. These tools include the i) mailing lists, the file repository for all produced documents (deliverables, source-code/ software, project reports, scientific/technical papers, training courses, presentations, and workshop material); ii) private wiki for on-line collaboration, knowledge sharing, and composition project-specific documents (such as deliverables, and reports); iii) public wiki to publicize the project results and technical deliverables, as well as scientific publications and contributions to standards. After briefly introducing each tool, this document details their configuration and operation as well as their usage in the context of the project activities.

List of authors

Affiliation	Author
INRIA	David Coudert
ALB	Dimitri Papadimitriou

List of figures

List of tables

Table of Contents

1. Introduction

Nowadays, IT tools play a crucial role in operating the input, task execution and output of a collaborative project. They enable to cross-fertilize the exchange of information and data. This is particularly interesting in a project like EULER, where partners are located in different countries. The tools that the EULER project has put in place allow to perform this type of distributed production and sharing of information across various locations (including Academic Institutes, Research Centers, etc.). Being remotely and homogeneously accessible, they have been setup to facilitate the daily operations of the researchers and engineers participating in the scientific and technical activities of the project.

The EULER project has concentrated the development and deployment of IT tools on mailing lists (and archiving system), wiki (together with an integrated file management system), SVN (Subversion), and calendar. These tools also take into account the type of information exchanged and the needs to realize the project activities. Twitter would, for instance, be suited for a multimedia project or a project requiring the exchange of short messages on a sustained rate basis. However, this tool is not suited for the exchange of more structured and elaborated information, as required by most EULER project tasks.

Mailing lists constitute thus the primary means of exchange of information. Even if asynchronous their almost immediate delivery is sufficient to sustain the rate of exchange foreseen in the context of the EULER project. Their simplicity of usage and operation (archives, subscription) but also their ease of setup (creation, etc.) provides a commodity tool for the exchange and the diffusion of information. E-mail applications are available today on most computer operating systems but also on devices such as Smart Phones, iPad, etc. In other terms, e-mails exchanges can operate across operating systems and devices. Furthermore, more advanced mailing applications enable the edition of e-mails as electronic documents that can incorporate figures and graphics but also equations. These capabilities are of main importance for the exchange of scientific results.

Wiki's that were initially used for personal note taking to empower community websites, are now also used for the creation of collaborative wiki websites, professional intranets, and in knowledge management systems. A wiki is a website that allows the easy creation and editing of any number of interlinked web pages via a web browser using a simplified markup language or a WYSIWYG text editor. Certain Wiki software incorporate a true file management, others such as PMWiki do not include this functionality. The EULER project has thus integrated a file management application (acting as document repository) as part of its Wiki software and made it accessible via a single interface. This functionality will enable efficient file management during the lifetime of the project.

Subversion (SVN) is an Open Source version control system that manages any collection of files and directories, and the changes made to them, over time. This tool allows recovering older data versions or examining the history of how data changed over time. Subversion can operate across networks, which allows it to be used by people on different computers. Subversion includes a repository that holds all versioned data and a client program, which manages local reflections of portions of that versioned data. Between these components are multiple repository access routes. Some of these routes go across computer networks and through network servers,

which then access the repository. Others bypass the network altogether and access the repository directly.

Certain of these tools have been also made accessible and usable by communities external to the project. For instance, dedicated mailing lists have been setup for exchanges with worldwide research communities interested in the topics investigated by the EULER project. A public wiki site is also going to be made available to enable sharing of knowledge and confront our results to a wider community.

In the course of the project, additional tools could be setup depending on the partner and/or project needs. For instance, the creation of a directory with people involved in the project could be required if the number of participants grows up significantly. Another reason would be the progressive incorporation of young researchers that have a smaller network than senior researchers. The partner in charge of the project IT tools and its collaborators commit also to keep these tools managed and updated when a new version or path is made available by the software publisher. Moreover, the ad-hoc development of such tools is not precluded in particular if their equivalent is not available.

This document is organized as follows. We start in Section 2 with the description of the mailing lists that we have setup for the EULER project. For each of them we detail their configurations, as well as their associated archive and file repository systems. Then, we present in Section 3 the public tools that we have designed for the EULER project. These public tools include a public website, a bi-monthly newsletter, and a list of relevant events. In Section 4, we present all the private tools that have been designed for the EULER project. These tools include: the private mailing lists (described in Section 2), a private wiki, a project working space, a set of templates, a shared file repository, etc. We also describe existing tools provided by ALB and INRIA and that will be used for the EULER project. These tools include a collaborative development tool, a tool for exchanging large data files, a reliable backup system, and an audio conference tool. Moreover, we discuss security aspects and measures that have been taken for limiting risks of intrusion. We finally conclude this document in Section 5.

2. Mailing lists

We describe in this section the mailing lists setup for the EULER project. For each of them, we detail their configurations and associated archive systems.

2.1 Project mailing lists

We have configured the public mailing list (euler-news) and the 11 private mailing lists listed below for the EULER project. Additional mailing lists can be setup on demand for restricted discussion groups (thematic mailing lists).

Table 2-1: List of project mailing lists

List name	Object	Subscribers
euler-project	Diffusion of general information on the project	All persons involved in the EULER project
euler-pmc	Overall project coordination, administration and management	Project Management Committee: Partners representative + partners deputy + Project Coordinator (PC) + Project Administrator (PA) + Technical Assistant (TA)
euler-tmc	Scientific management of the EULER project	Technical Management Committee: Scientific and Technical leaders per partners + partners deputy + PC + TA
euler-admin	Legislative and financial aspects	Partners representatives + financial and administrative department per partners + PC + TA.
euler-wpl	Coordination of the scientific activities of the project	Workpackage leaders + appointed assistants
euler-wp2	Animation and coordination of the scientific activities of WP2	All participants to the scientific activities of WP2
euler-wp3	Animation and coordination of the scientific activities of WP3	All participants to the scientific activities of WP3
euler-wp4	Animation and coordination of the scientific activities of WP4	All participants to the scientific activities of WP4
euler-wp5	Animation and coordination of the scientific activities of WP5	All participants to the scientific activities of WP5
euler-pub	Information and feedback on publications and submissions	euler-project
euler-com	Announcement of scientific and technical events, call for papers, etc.	euler-project
euler-news	Diffusion of the bi-monthly EULER newsletter	External subscriber + euler-project

These lists are all hosted by INRIA, and are accessible as follows:

<list-name>@lists-sop.inria.fr

where <list-name> = euler-project, euler-pmc, euler-tmc, euler-admin, euler-wpl, euler-wp2, euler-wp3, euler-wp4, euler-wp5, euler-pub, euler-com, euler-news.

2.2 Mailing lists management

The Sympa server hosted by INRIA powers the electronic mailing list management. Sympa (http://www.sympa.org) automates list management functions such as subscriptions, moderation, and archive management. Each mailing list is administered using a Web interface: WWSympa. We use version 5.4.3 of Sympa and WWSympa, operating on an Apache server version 2.2.3.

http://lists-sop.inria.fr/sympa/info/<list-name>

where <list-name> = euler-project, euler-pmc, euler-tmc, euler-admin, euler-wpl, euler-wp2, euler-wp3, euler-wp4, euler-wp5, euler-pub, euler-com, euler-news.

The Project Technical Assistant (TA), under the supervision of the Project Coordinator (PC), is the *owner* of all the mailing lists. He is responsible for creation and configuration of the mailing lists. He is also responsible for the day-to-day management of the mailing lists, which mainly concerns:

- Subscriptions and un-subscriptions;
- Moderation of messages on moderated lists.

The responsibility of the project management is also shared as follows:

- Each WP leader is co-responsible for the management of their specific WP mailing list (euler-wp2, euler-wp3, euler-wp4, euler-wp5)
- WP5 leader is also co-responsible for the management of the list euler-news.

2.3 Configuration of the mailing lists

Mailing list (un)subscription:

- The subscription to the mailing lists but euler-news is restricted to EULER project participants;
- The subscription to the euler-news mailing list is open to external subscribers from the project;
- Each subscription request to a mailing list has to be approved by one mailing list owner;
- Un-subscription to a mailing list can be performed either by the subscriber, or by the list owner.

Posting on a mailing list:

- Only confirmed subscribers are allowed to post on the mailing lists;
- Lists euler-pub, euler-com, euler-news are moderated. This is particularly important for the euler-news mailing list, whose subscription is open to everyone. List owners act as moderators.

2.4 Archives

MHonArc (http://www.mhonarc.org/), a Perl mail-to-HTML converter, powers mailing lists archives. This archiving software provides HTML mail archiving with index, mail thread linking, etc; plus other capabilities including support for MIME and powerful user customization features. Using this tool, mails are monthly archived for each list, and searchable per-date or per thread. We use version 2.6.16 of MHonArc.

All mails posted on the EULER mailing lists are stored for **5 years (starting from the first of October 2010)**, and accessible to list subscribers through the following link:

http://lists-sop.inria.fr/sympa/arc/<list-name>

where <list-name> = euler-project, euler-pmc, euler-tmc, euler-admin, euler-wpl, euler-wp2, euler-wp3, euler-wp4, euler-wp5, euler-pub, euler-com, euler-news.

2.5 Associated file storage system

Every mailing list has an associated file storage system for shared documents. This file storage system allows creating directories and sub-directories into a root folder, uploading files into this directory tree, deleting files/directories, adding bookmarks to relevant URLs, etc. The file storage system is powered by WWSympa.

The shared documents are accessible to list subscribers only, through the following link:

http://lists-sop.inria.fr/sympa/d_read/<list-name>

where <list-name> = euler-project, euler-pmc, euler-tmc, euler-admin, euler-wpl, euler-wp2, euler-wp3, euler-wp4, euler-wp5, euler-pub, euler-com, euler-news.

2.6 Really Simple Syndication, RSS

Really Simple Syndication (RSS) is a family of web feed formats used to publish frequently updated works (blog entries, news headlines, audio, and video) in a standardized format. An RSS document (called "feed", "web feed", or "channel") includes full or summarized text, plus metadata such as publishing dates or authorship. Web feeds are of benefit to:

- Publishers: automatic syndication of content;
- Readers: aggregation of feeds from many selected websites into one place, based on individual subscription.

A standardized XML file format allows the information to be published once and viewed by many different programs: web browsers, e-mail readers, etc.

The EULER mailing lists are provided with the following web feeds (RSS version 2.0), powered by WWSympa:

- latest arc: modification on the mailing list archive;
- latest document: modification on the shared file storage system of the mailing list (addition/modification/deletion of documents).

Registration to a feed can be initiated by accessing the following link:

http://lists-sop.inria.fr/sympa/rss/<FEED>/<list-name><OPTIONS>

where

- <FEED> = latest_arc, latest_d_read;
- <list-name> = euler-project, euler-pmc, euler-tmc, euler-admin, euler-wpl, euler-wp2, euler-wp3, euler-wp4, euler-wp5, euler-pub, euler-com, euler-news;

- <OPTION> = ?count=20&for=10, where count limits the number of response (here to 20), and for limits the number of days used for the selection (here 10).

3. Public Tools

This section is devoted to the description of the public tools that have been designed for the EULER project. These public tools include a public website, a bi-monthly newsletter, and a list of relevant events.

3.1 Public website

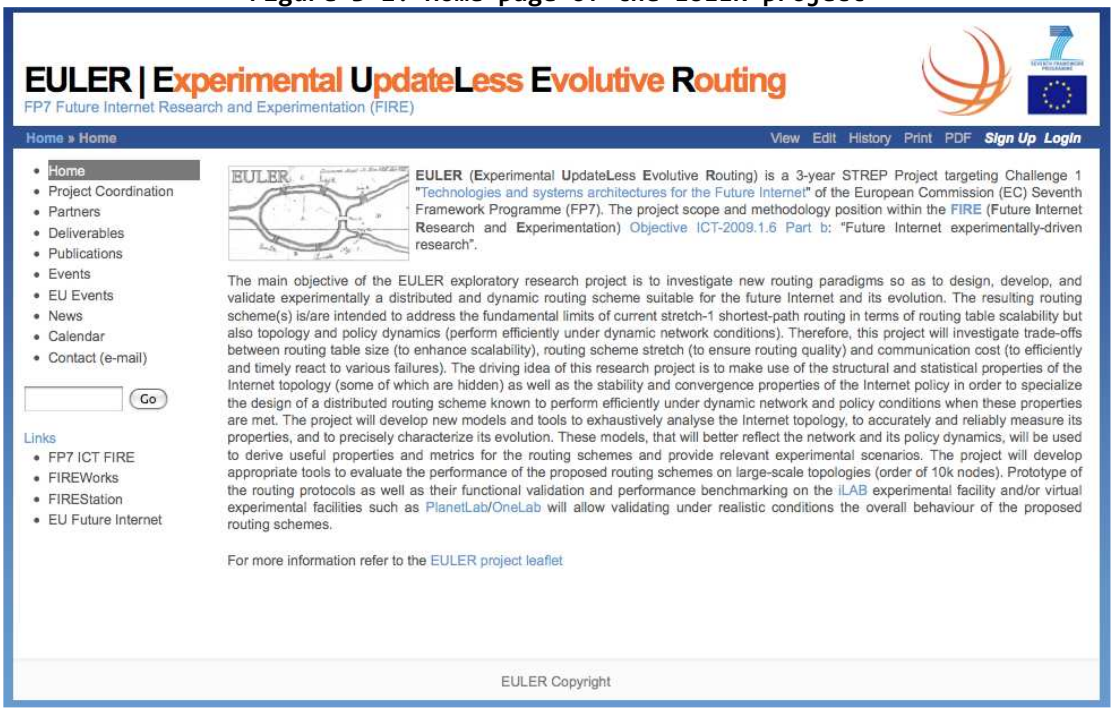
The official EULER project website (http://www.euler-fire-project.eu) is powered by the PMWiki (version 2.2.4) Open Source software (http://www.pmwiki.org) and is hosted by INRIA. The reasons for choosing PMWiki among others wikis and content management systems will be discussed in Section 4.1.

The http://www.euler-fire-project.eu URL has been reserved for 5 years (starting from the first of October 2010) with possible extension. It is a redirection to https://www-sop.inria.fr/mascotte/EULER/wiki/. A contact email address (contact@euler-fire-project.eu) has also been reserved for the same time period, and is currently an alias to David.Coudert@inria.fr, the Technical Assistant (TA) of the project.

3.1.1 Website layout

The EULER website layout (Figure 3-1) is based on a Cascading Style Sheet (CSS) that has been specifically designed for this project (see Section 3.1.2 for the W3C's validation of this style sheet).

Figure 3-1: Home page of the EULER project



The website is best viewed with the following web browsers: Firefox, Google Chrome, Opera, Safari, and Internet Explorer version 8 (IE8) running on most common operating systems (Microsoft Windows 7, Linux, Mac OSX). However, some problems remain using Internet Explorer version 6 and 7 (IE6 and IE7), since these web browsers are not interpreting the CSS standard style-sheets correctly.

More precisely, the website layout has been validated by users running the following operating systems and web browsers:

- Firefox 3.0.15 (under fedora 10) and 3.6.8 (under Mac OSX leopard);
- Safari 5.0.2 (under Mac OSX Leopard);
- Internet Explorer 8 (under Windows 7);
- Opera 10.62 (under Mac OSX Leopard);
- Google Chrome 6.0.472.55 (under Mac OSX Leopard).

Users have indicated layout problems in the following situations:

- Internet Explorer 6 (under rdesktop and Microsoft Windows XP) but this browser is now deprecated;
- Internet Explorer 7 (under Microsoft Windows XP).

The website layout has also been tested using Adobe BrowserLab (https://browserlab.adobe.com/), a browser compatibility service that provides designers exact renderings of their pages on leading browsers.

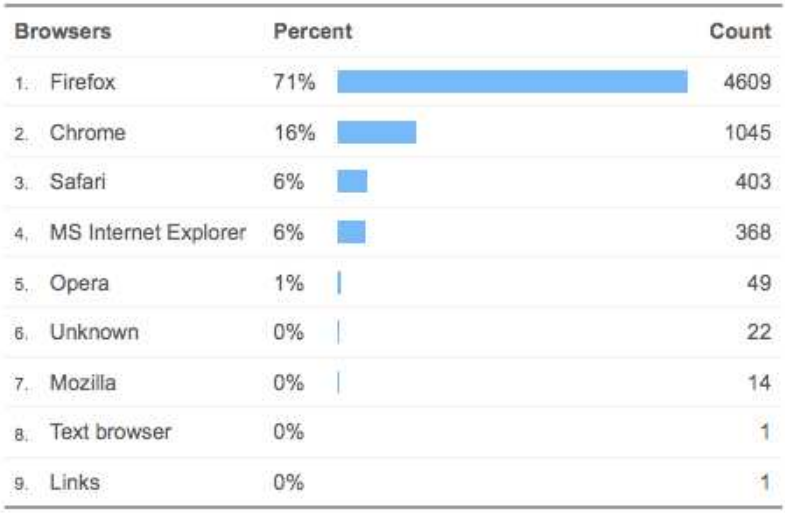
- The layout has been validated for the following web browsers:
  - Google Chrome 7.0 (Windows);
  - Internet Explorer 8 (Windows);
  - Firefox: v2, v3, v3.6 (Windows and Mac OSX), and v4.0beta7 (on Microsoft Windows);
  - Safari 3, 4 and 5 (Mac OSX).
- However, the layout has not been validated for the following browsers:
  - Internet Explorer 6, 7, and 9.0beta (Windows).

The layout problems encountered with Internet Explorer are caused by an inaccurate interpretation of the standard CSS. These interpretation errors vary from one version to another. Also, we have decided to concentrate on Internet Explorer 8 to avoid the development of a specific style sheet per version. Furthermore, the following message is displayed at the bottom of the webpage for Internet Explorer users:

EULER Copyright (Best viewed with Chrome, Firefox, IE8, Opera, Safari…)

Notice that on December 14 2010, Internet Explorer is used by only 6% of the users/visitors of the EULER project website (Figure 3-2). This percentage has been automatically obtained from the hits statistics of the web site.

Figure 3-2: Statistics of web browsers used by EULER website visitors



Browsers	Percent	Count
1. Firefox	71%	4609
2. Chrome	16%	1045
3. Safari	6%	403
4. MS Internet Explorer	6%	368
5. Opera	1%	49
6. Unknown	0%	22
7. Mozilla	0%	14
8. Text browser	0%	1
9. Links	0%	1

3.1.2 W3C validation

The World Wide Web Consortium (W3C, http://www.w3.org) provides a markup validation service (http://validator.w3.org/) that checks the markup validity of Web documents in HTML, XHTML, SMIL, MathML, etc. This validator is part of Unicorn, the W3C's unified validator service (http://validator.w3.org/unicorn). This tool allows to check whether a given webpage satisfies the HTML standard, and if its CSS style sheet is correct (follows the CSS standard and contains no error).

As can be seen in Figure 3-3 and Figure 3-4, the EULER public website has successfully been checked as XHTML 1.0 Transitional when using URLs such as:
http://www-sop.inria.fr/mascotte/EULER/wiki/index.php
or
https://www-sop.inria.fr/mascotte/EULER/wiki/index.php<GROUP>/<PAGE>

where:
- <GROUP> = the wiki group of the page
- <PAGE> = the name of the wiki page

However, as can be seen in Figure 3-5, 7 errors and 3 warnings where found while checking the home page through the http://www.euler-fire-project.eu URL. After careful analysis, we found that these errors are due to the way in which the redirection from such an address to the real URL address (http://www-sop.inria.fr/mascotte/EULER/wiki/index.php) is performed. Indeed, the redirection transmits an intermediate HTML page containing a frameset that hides the real content of the page to the W3C validator. This intermediate page uses valid HTML code and all instructions are correct but it would require additional declaration instructions to pass the test. Unfortunately, we are unable to modify this page since it is automatically generated by the redirection entity. Nonetheless, these errors and warnings are minor and do not affect the navigation on the EULER website.

Figure 3-3: Markup Validation of https://www-sop.inria.fr/mascotte/EULER/wiki/index.php

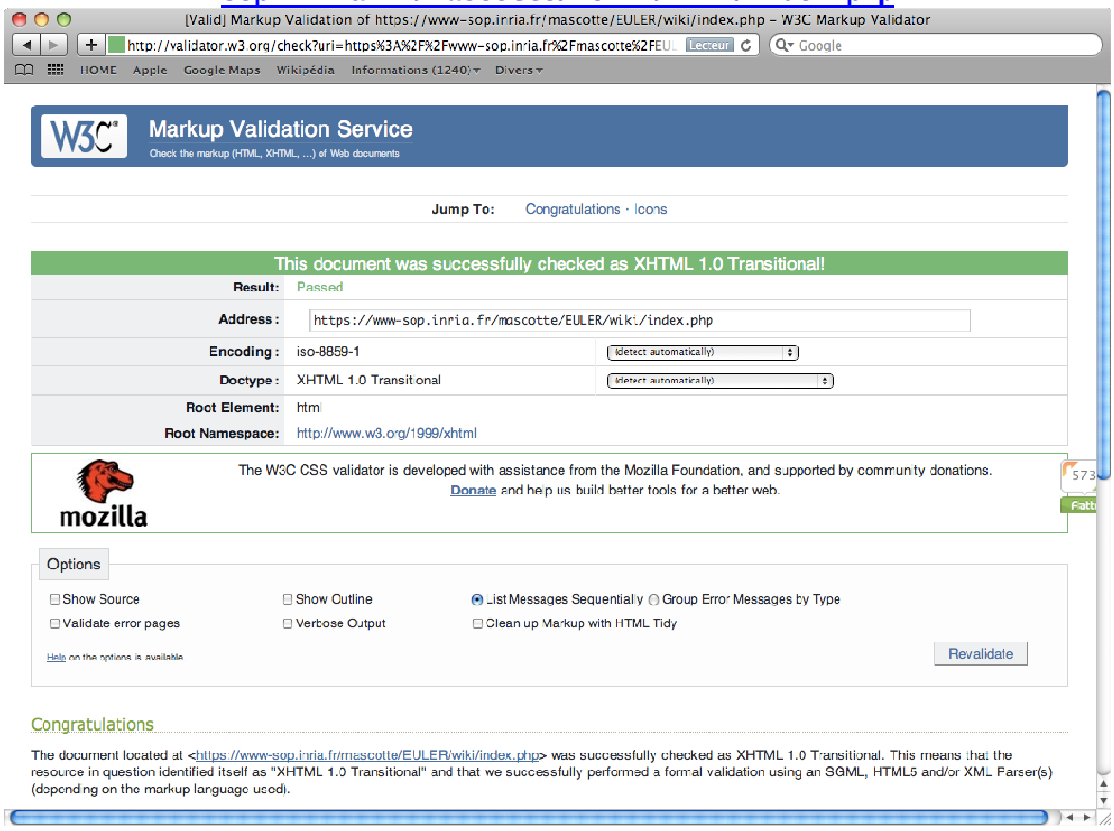
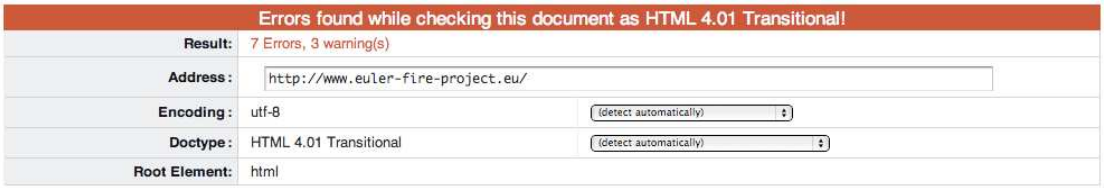


Figure 3-4: Markup validation of the Events page

Figure 3-5: Result of the W3C validation tool on http://www.euler-fire-project.eu url

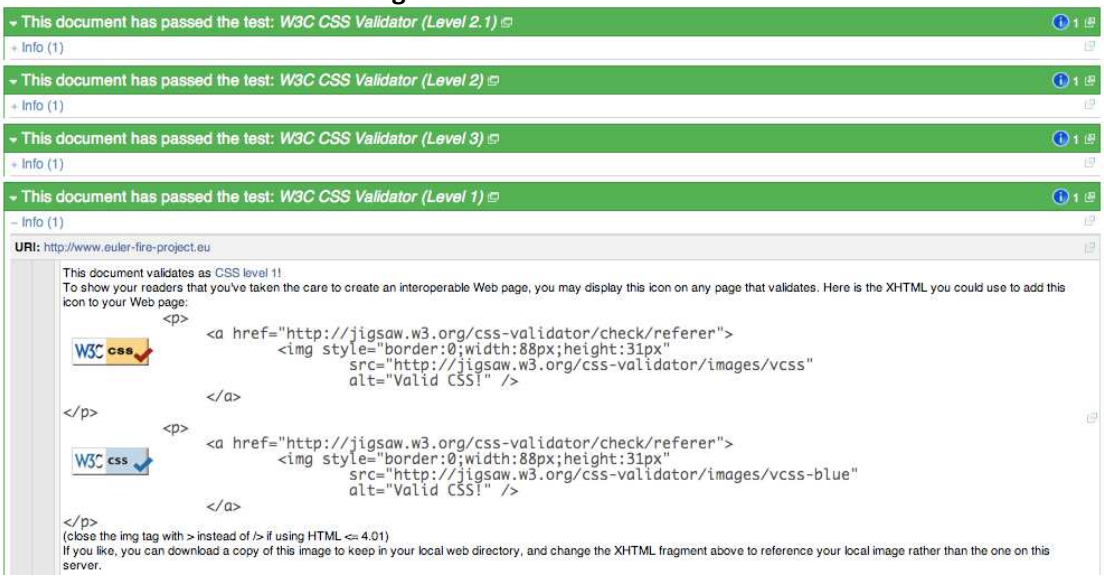


Concerning the CSS style sheet, the EULER website has successfully passed all tests performed by the W3C's unified validator (See Figure 3-6). More precisely, the style sheet satisfies the CSS specifications reported in Table 3-1 (all current versions).

Table 3-1: Satisfied CSS specifications

Level 1	http://www.w3.org/TR/REC-CSS1/
Level 2	http://www.w3.org/TR/CSS2/
Level 2 Revision 1 (CSS2.1)	http://www.w3.org/TR/CSS21/
Level 3	http://www.w3.org/Style/CSS/current-work.html

Figure 3-6: CSS Validation



3.1.3 Information published on the EULER public website

We now describe the information provided on the EULER public website to external bodies.

The information is structured into directories. The following directories have been defined:

Home: provides a project overview including objectives and methodology. The project leaflet is accessible from this page.

Project Coordination: provides contact information on the Project Coordinator, Technical Coordinator, Project Administrator and Technical Assistant.

Partners: links to all partners' websites, and respective leaders' web pages (when available).

Deliverables: the list of all project deliverables including

- Public deliverables (including this one) will be accessible from this page;
- Confidential deliverables will also be accessible from this page to authorized and identified users (protection by login/password, see Section 4.1.1).

Publications: the list of scientific publications produced by project participants in the course of the project. Publications are reported on this page only after their publication.

Events: the list of scientific and technical events, journals, and magazines relevant for project participants and external bodies. We also provide a list of scientific events (conferences, schools, special issues…) sorted by increasing submission/registration deadlines. A list of upcoming and past events is also available from this page (See Section 3.1.4 for more details).

EUEvents: links to events organized by the European Commission (EC) that are related to the activities of the EULER project (e.g., cluster meetings, open workshops/symposia, and Future Internet conference).

News: lists the news related to the EULER project, together with the EULER newsletter. It gives access to the euler-news mailing list registration form. It also provides links to mailing lists form other sources (FIRE, Future Internet Assembly, Future Networks, ICT 2010…).

Calendar: displays the EULER project public calendar. We use this calendar to inform project partners and external bodies about the events attended by project partners. In particular, it contains the dates of FIRE and European Commission events, as well as project physical meetings. It is currently powered by Google Calendar and used as follows:

- Project partners are able to synchronize their own electronic agenda with the EULER one, using dedicated iCal or XML files. In the future, these files might also be distributed to external bodies;
- So far, adding entries to the agenda can be done only through the calendar web interface proposed by Google (http://www.google.com/calendar) using appropriate login/password. Current experiments for adding entries from external sources have not been successful yet.

Google Calendar has been selected among other possible alternatives because i) it can easily be synchronized with various external electronic agendas, ii) it is commonly used around the world, iii) its web interface is easy to use and convenient, and iv) it was simple to embed it into the wiki using the existing PMWiki plug-in. However, the usage of the calendar is still under improvements (in particular to allow the addition of new entries from external sources), and we may switch to another tool whenever a better solution is found.

Contact: link to the generic contact email of the EULER project: contact@euler-fire-project.eu. Currently, this email is an alias to David.Coudert@inria.fr, the Technical Assistant (TA) of the project.
The processing of the messages send to the contact email depends on the kind of query:

- Queries concerning the IT tools are handled directly by the TA;
- Queries concerning scientific and technical activities of the EULER project are forwarded to the Project Coordinator.

So far, the workload induced by the contact email is low, and so the current solution is sufficient. However, if the workload increases too much, we will have to find a more suitable solution such as a shared mailbox allowing a larger set of project participants to process them.

The public website also provides links to several related web sites: FIRE (http://cordis.europa.eu/fp7/ict/fire/), FIRE Works (http://www.ict-fireworks.eu/), FIRE Station (http://www.ict-fire.eu/), Future Internet (http://www.future-internet.eu/).

3.1.4 List of relevant events

A specific PMWiki plug-in has been developed to handle the list of events in a convenient way. It allows extracting the list of relevant events from a larger scientific and technical events (conferences, schools, special issues…) database: the “Mascotte conference database”, operated by INRIA (Mascotte project-team):

http://www-sop.inria.fr/mascotte/conferences

Events are stored on a MySQL (http://www.mysql.com/) database, and extracted on purpose. We use MySQL server version 5.0.18.

The following operations can be performed:

i) Adding an event: Addition of new interesting event to the database is open to every one using a dedicated web form:
https://www-sop.inria.fr/mascotte/conferences/submit/
However, as clearly indicated on this web page, the list is moderated. Acceptation/rejection of events is based on the scientific quality of the event, and on the relevance of the topic for the Mascotte project-team. All events of interest for the EULER project are thus relevant for this list.

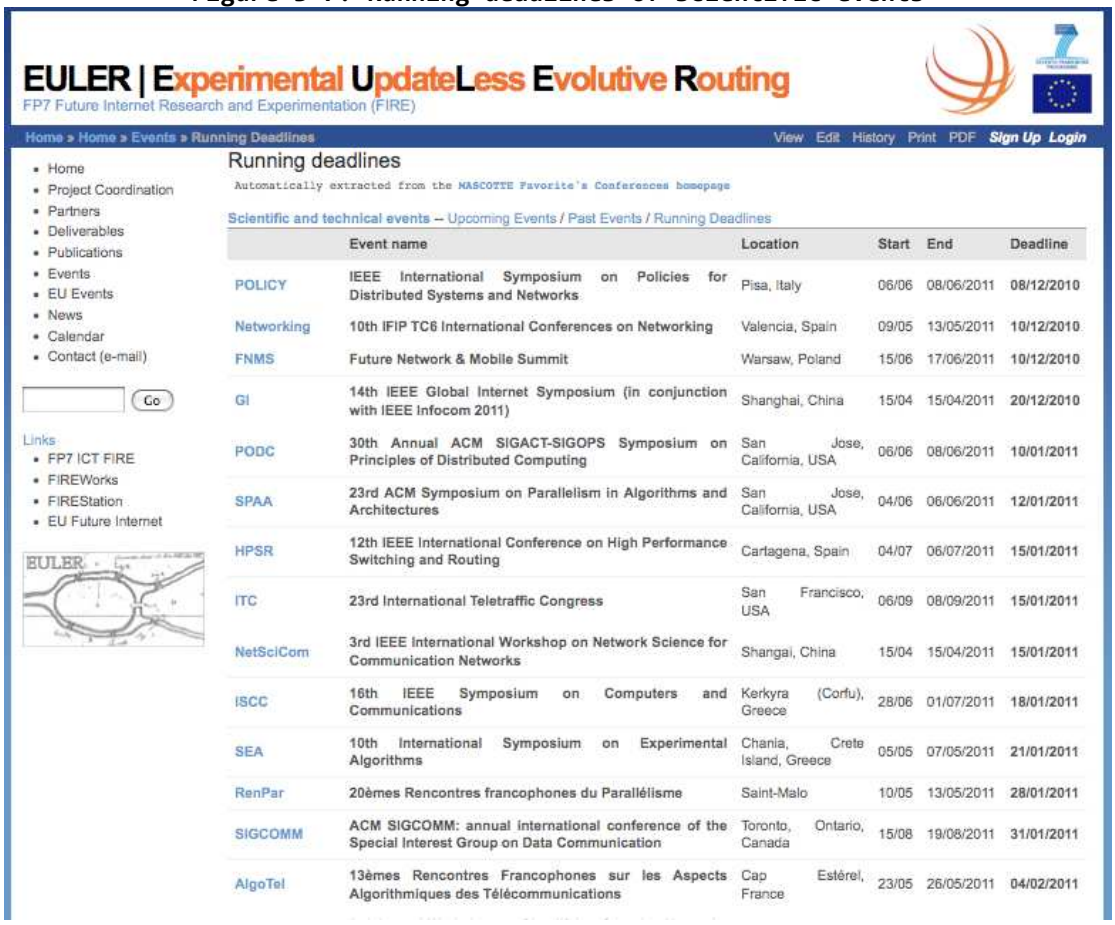
In order to simplify extraction from the database, a list of tags is associated to each event. For the EULER project, we have added the 3 following tags:

- EULER: indicates a scientific or technical event;
- FIRE: indicates specific FIRE events;
- EUEVENT: indicates event organized by the European Commission in relationship with the activities of the EULER project.

ii) Extracting events: For given tag (EULER, FIRE, or EUEVENT) events are extracted from the database according to the target usage:

- **Running Deadlines:** list of events sorted by increasing submission/registration deadlines (e.g., see Figure 3-7). All listed events have a deadline later or equal to one week before the current date (to cope with extended deadlines);
- **Upcoming Events:** list of events that will be held in the future, taking the current date minus one week as a reference (to display ongoing events). Such events are sorted by increasing dates;
- **Past Events:** list of events that have already been held, listed by decreasing dates.

Figure 3-7: Running deadlines of scientific events



Usage: To use this specific plug-in on a wiki page, users (allowed to modify pages) have to use the following command:

(:myconferences <TAG>|tag=<TAG> [order=<ORDER>] [since=<YEAR>] [look=<LOOK>] :)

where:
- <TAG> = EULER, FIRE, EUEVENT;
- <ORDER> =
  - past: past events;
  - future: future events;
  - dead: events with submission/registration deadlines in the future. Default value;
  - all: all events;
- <YEAR> = some year, e.g., 2009;
- <LOOK> =
  - listing: standard HTML list (see e.g. the EUEvent page). Default value;
  - table: standard PMWiki table (see e.g. the Event page).

Argument tag=<TAG> is mandatory, but arguments order=<ORDER>, since=<YEAR>, and look=<LOOK> are optional.

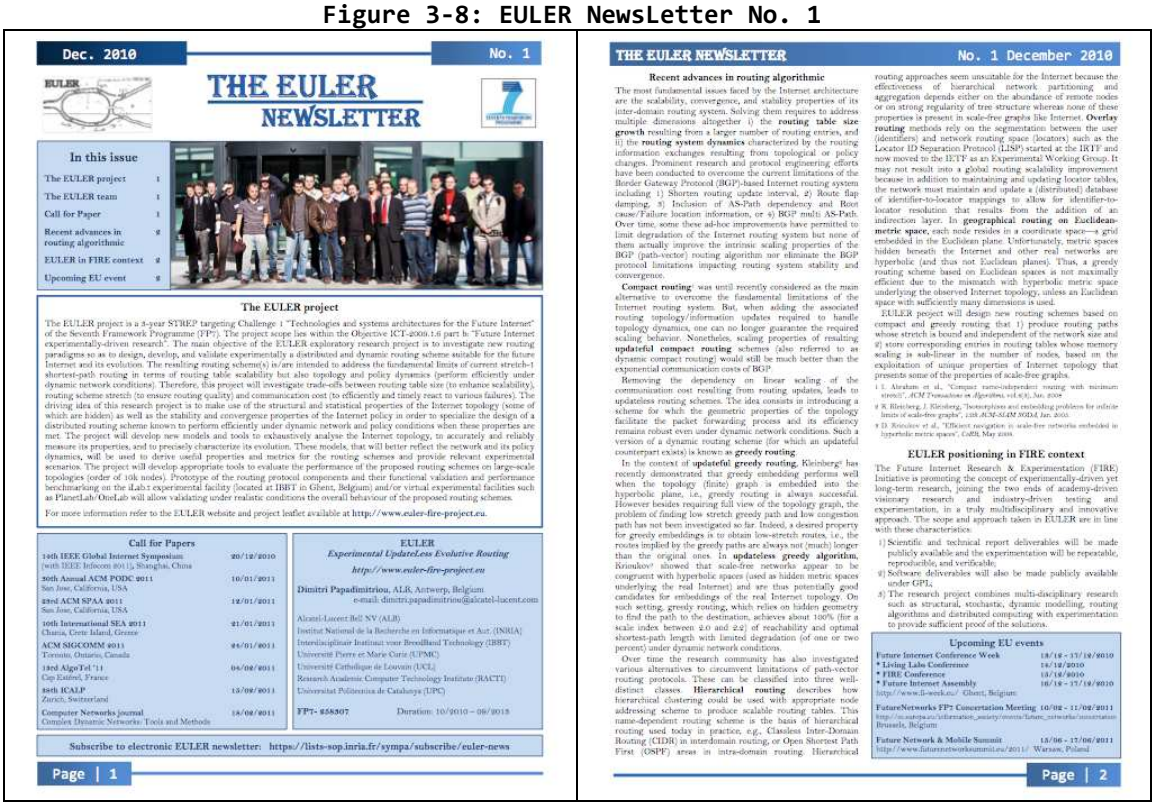
Notice that this plug-in has already been re-used for other websites, such as http://www-sop.inria.fr/teams/mascotte/projets/DIMAGREEN/wiki/

3.2 Public newsletter

The bi-monthly newsletter of the EULER project is accessible from the "News" page of the public project website, and is announced via the euler-news mailing list to registered users. The printed version of the newsletter is distributed in events such as Fire Week, FIA, etc. The layout of the newsletter is shown in Figure 3-8. The leader of WP5 (CAT) is responsible for the edition of the newsletter.

All issues of the newsletter remain available on the "News" page of the public project website.

Figure 3-8: EULER NewsLetter No. 1



Dec. 2010 — No. 1

THE EULER NEWSLETTER

In this issue

The EULER project

The EULER project is a 3-year STREP targeting Challenge 1 "Technologies and systems architectures for the Future Internet" of the Seventh Framework Programme (FP7). The project scope lies within the Objective ICT-2009.1.6 part b "Future Internet experimentally-driven research". The main objective of the EULER exploratory research project is to investigate new routing paradigms so as to design, develop, and validate experimentally a distributed and dynamic routing scheme suitable for the future Internet and its evolution. The resulting routing scheme(s) is/are intended to address the fundamental limits of current stretch-1 shortest-path routing in terms of routing table scalability but also topology and policy dynamics (perform efficiently under dynamic network conditions). Therefore, this project will investigate trade-offs between routing table size (to enhance scalability), routing scheme stretch (to ensure routing quality) and communication cost (to efficiently and timely react to various failures). The driving idea of this research project is to make use of the structural and statistical properties of the Internet topology (some of which are hidden) as well as the stability and convergence properties of the Internet policy in order to specialize the design of a distributed routing scheme known to perform efficiently under dynamic network and policy conditions when these properties are met. The project will develop new models and tools to exhaustively analyse the Internet topology, to accurately and reliably measure its properties, and to precisely characterize its evolution. These models, that will better reflect the network and its policy dynamics, will be used to derive useful properties and metrics for the routing schemes and provide relevant experimental scenarios. The project will develop appropriate tools to evaluate the performance of the proposed routing schemes on large-scale topologies (order of 10k nodes). Prototype of the routing protocol components and their functional validation and performance benchmarking on the iLab.t experimental facility (located at IBBT in Ghent, Belgium) and/or virtual experimental facilities such as PlanetLab/OneLab will allow validating under realistic conditions the overall behaviour of the proposed routing schemes.

For more information refer to the EULER website and project leaflet available at http://www.euler-fire-project.eu.

Call for Papers

10th IEEE Global Internet Symposium (with IEEE Infocom 2011), Shanghai, China	20/12/2010
20th Annual ACM PODC 2011, San Jose, California, USA	10/01/2011
23rd ACM SPAA 2011, San Jose, California, USA	12/01/2011
10th International SEA 2011, Chania, Crete Island, Greece	21/01/2011
ACM SIGCOMM 2011, Toronto, Ontario, Canada	26/01/2011
23rd AlgoTel'11, Cap Estérel, France	04/02/2011
38th ICALP, Zurich, Switzerland	13/02/2011
Computer Networks journal, Complex Dynamic Networks: Tools and Methods	18/02/2011

EULER
Experimental UpdateLess Evolutive Routing
http://www.euler-fire-project.eu

Dimitri Papadimitriou, ALB, Antwerp, Belgium
e-mail: dimitri.papadimitriou@alcatel-lucent.com

Alcatel-Lucent Bell NV (ALB)
Institut National de la Recherche en Informatique et Aut. (INRIA)
Interdisciplinair Instituut voor Breedband Technology (IBBT)
Université Pierre et Marie Curie (UPMC)
Université Catholique de Louvain (UCL)
Research Academic Computer Technology Institute (RACTI)
Universitat Politecnica de Catalunya (UPC)

FP7- 258307 Duration: 10/2010 – 09/2013

Subscribe to electronic EULER newsletter: https://lists-sop.inria.fr/sympa/subscribe/euler-news

Page | 1

THE EULER NEWSLETTER — No. 1 December 2010

Recent advances in routing algorithmic

The most fundamental issues faced by the Internet architecture are the scalability, convergence, and stability properties of its inter-domain routing system. Solving them requires to address multiple dimensions altogether i) the **routing table size growth** resulting from a larger number of routing entries, and ii) the **routing system dynamics** characterized by the routing information exchanges resulting from topological or policy changes. Prominent research and protocol engineering efforts have been conducted to overcome the current limitations of the Border Gateway Protocol (BGP)-based Internet routing system including 1) Shorten routing update interval, 2) Route flap damping, 3) Inclusion of AS-Path dependency and Root cause/Failure location information, or 4) BGP multi AS-Path. Over time, some these ad-hoc improvements have permitted to limit degradation of the Internet routing system but none of them actually improve the intrinsic scaling properties of the BGP (path-vector) routing algorithm nor eliminate the BGP protocol limitations impacting routing system stability and convergence.

Compact routing was until recently considered as the main alternative to overcome the fundamental limitations of the Internet routing system. But, when adding the associated routing topology/information updates required to handle topology dynamics, one can no longer guarantee the required scaling behavior. Nonetheless, scaling properties of resulting **updateful compact routing** schemes (also referred to as dynamic compact routing) would still be much better than the exponential communication costs of BGP.

Removing the dependency on linear scaling of the communication cost resulting from routing updates, leads to updateless routing schemes. The idea consists in introducing a scheme for which the geometric properties of the topology facilitate the packet forwarding process and its efficiency remains robust even under dynamic network conditions. Such a version of a dynamic routing scheme (for which an updateful counterpart exists) is known as **greedy routing**.

In the context of **updateful greedy routing**, Kleinberg[8] has recently demonstrated that greedy embedding performs well when the topology (finite) graph is embedded into the hyperbolic plane, i.e., greedy routing is always successful. However besides requiring full view of the topology graph, the problem of finding low stretch greedy path and low congestion path has not been investigated so far. Indeed, a desired property for greedy embeddings is to obtain low-stretch routes, i.e., the routes implied by the greedy paths are always not (much) longer than the original ones. In **updateless greedy algorithm**, Krioukov[9] showed that scale-free networks appear to be congruent with hyperbolic spaces (used as hidden metric spaces underlying the real Internet) and are thus potentially good candidates for embeddings of the real Internet topology. On such setting, greedy routing, which relies on hidden geometry to find the path to the destination, achieves about 100% (for a scale index between 2.0 and 2.2) of reachability and optimal shortest-path length with limited degradation (of one or two percent) under dynamic network conditions.

Over time the research community has also investigated various alternatives to circumvent limitations of path-vector routing protocols. These can be classified into three well-distinct classes. **Hierarchical routing** describes how hierarchical clustering could be used with appropriate node addressing scheme to produce scalable routing tables. This name-dependent routing scheme is the basis of hierarchical routing used today in practice, e.g., Classless Inter-Domain Routing (CIDR) in interdomain routing, or Open Shortest Path First (OSPF) areas in intra-domain routing. Hierarchical routing approaches seem unsuitable for the Internet because the effectiveness of hierarchical network partitioning and aggregation depends either on the abundance of remote nodes or on strong regularity of tree structure whereas none of these properties is present in scale-free graphs like Internet. **Overlay routing** methods rely on the segmentation between the user (identifiers) and network routing space (locators) such as the Locator ID Separation Protocol (LISP) started at the IRTF and now moved to the IETF as an Experimental Working Group. It may not result into a global routing scalability improvement because in addition to maintaining and updating locator tables, the network must maintain and update a (distributed) database of identifier-to-locator mappings to allow for identifier-to-locator resolution that results from the addition of an indirection layer. In **geographical routing on Euclidean-metric space**, each node resides in a coordinate space—a grid embedded in the Euclidean plane. Unfortunately, metric spaces hidden beneath the Internet and other real networks are hyperbolic (and thus not Euclidean planes). Thus, a greedy routing scheme based on Euclidean spaces is not maximally efficient due to the mismatch with hyperbolic metric space underlying the observed Internet topology, unless an Euclidean space with sufficiently many dimensions is used.

EULER project will design new routing schemes based on compact and greedy routing that 1) produce routing paths whose stretch is bound and independent of the network size and 2) store corresponding entries in routing tables whose memory scaling is sub-linear in the number of nodes, based on the exploitation of unique properties of Internet topology that presents some of the properties of scale-free graphs.

[8] R. Kleinberg, J. Kleinberg, "Isometries and embedding problems for infinite limits of scale-free graphs", *ACM-SIAM SODA Jan. 2010*.

[9] D. Krioukov et al., "Efficient navigation in scale-free networks embedded in hyperbolic metric spaces", *CoRR, May 2009*.

EULER positioning in FIRE context

The Future Internet Research & Experimentation (FIRE) Initiative is promoting the concept of experimentally-driven yet long-term research, joining the two ends of academy-driven visionary research and industry-driven testing and experimentation, in a truly multidisciplinary and innovative approach. The scope and approach taken in EULER are in line with these characteristics:

1) Scientific and technical report deliverables will be made publicly available and the experimentation will be repeatable, reproducible, and verifiable;
2) Software deliverables will also be made publicly available under GPL;
3) The research project combines multi-disciplinary research such as structural, stochastic, dynamic modelling, routing algorithms and distributed computing with experimentation to provide sufficient proof of the solutions.

Upcoming EU events

Future Internet Conference Week, http://www.ict-fireweek.eu/ Ghent, Belgium	18/10 – 17/10/2010
* Living Labs Conference	18/10/2010
* FIRE Conference	18/10/2010
* Future Internet Assembly	18/10 – 17/10/2010
FutureNetworks FP7 Concertation Meeting, http://ec.europa.eu/information_society/events/future_networks/concertation Brussels, Belgium	10/02 – 11/02/2011
Future Network & Mobile Summit, http://www.futurenetworksummit.eu/2011/ Warsaw, Poland	15/06 – 17/06/2011

Page | 2

4. Private tools

This section is devoted to the description of the private tools that have been designed for the EULER project. These tools include: the private mailing lists (described in Section 2); a private wiki; a project working space; a set of templates; a shared files repository; etc.

4.1 Private wiki

Recall that a wiki is a website allowing to create and edit web pages via a web browser using a simple markup language or a WYSIWYG text editor. Wikis are commonly used to create collaborative websites. Hence, a wiki is an accurate tool for supporting collaborative work among EULER project partners.

According to WikiMatrix (http://www.wikimatrix.org), a website gathering all information on the development of wiki systems, the most commonly used ones are:

- DokuWiki (http://www.dokuwiki.org);
- MediaWiki (http://www.mediawiki.org);
- TWiki (http://twiki.org);
- PMWiki (http://www.pmwiki.org).

They all have similar functionalities and an active users community. Therefore, we had no clear technical argument to choose between one or another. However, several EULER project partners are familiar with PMWiki and satisfied with its functionalities. We believe that this was the best argument for choosing PMWiki.

Now, before describing the content of the private parts of the EULER wiki, we start by explaining the procedure for obtaining a valid login/password to access the private parts, and the user groups controlling the read/edit rights for each page.

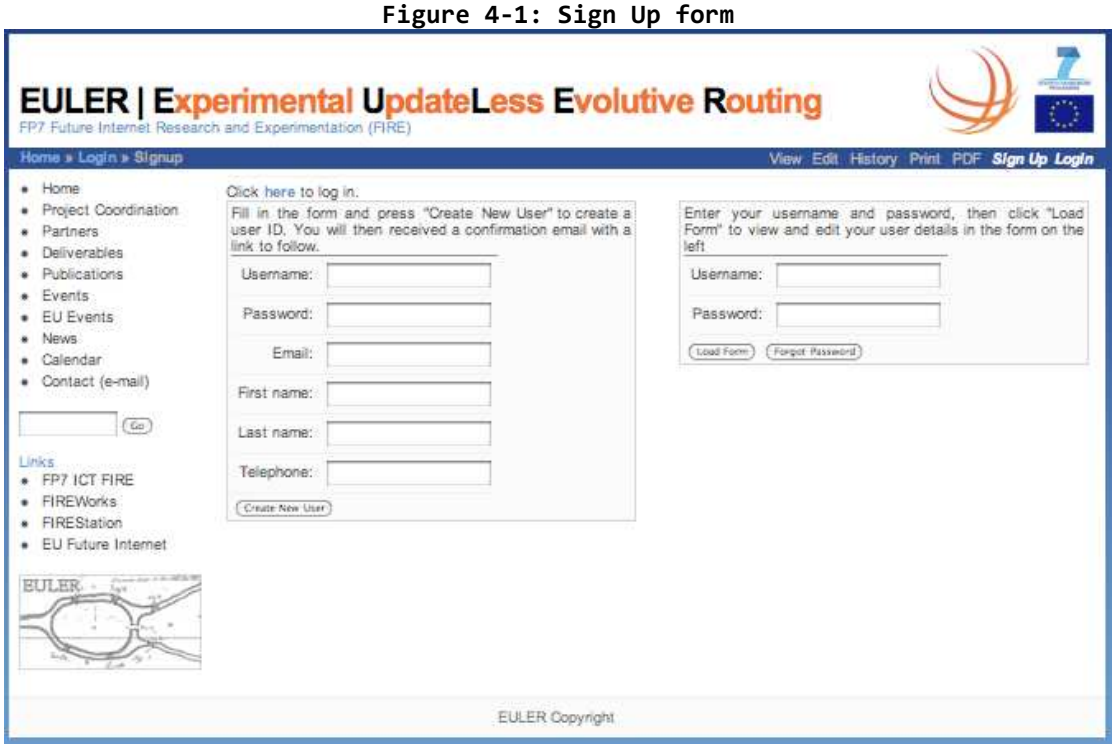
4.1.1 Users authentication

The EULER private wiki is accessible from the EULER website (http://www.euler-fire-project.eu) to registered project collaborators with valid group membership only. A valid login/password is thus required.

The registration procedure is the following:

1. Each project collaborator has to fill the registration form: the “SignUp” form (see Figure 4-1);
2. The collaborator will then receive a confirmation email containing a link. By opening this link in a web browser, the collaborator will confirm his/her registration to the wiki.

Figure 4-1: Sign Up form



Simultaneously to the confirmation email send to the collaborator, the system informs the wiki administrator of the new registration. Once the registration has been confirmed, the wiki administrator has to assign adequate group(s) membership to this collaborator.

4.1.2 Users Groups

We have set up the following authorization groups:

- **"admins"**: Project wiki administrators (PC+TA);
- **"EulerLeaders"**: Partners representative + partners assistants + work-packages leaders;
- **"EulerPrivate"**: Project collaborators involved in the scientific and technical activities of the project;
- **"EulerAdmin"**: Legislative and financial representatives of each partners;
- **"OtherRegisteredUsers"**: Registered users that are not members of the EULER project.

Other authorization groups might later be set up for specific purpose.

Group memberships allow us to control Read (R), Edit (E), and Upload (U) rights of each page of the wiki by groups of collaborators. More precisely, we can decide for each page who is allowed to read it, to edit it, or to upload an attachment (file) to it. Only the EULER wiki administrators can fix these rights, also called page attributes. Table 4-1 describes the page attributes of each group in each wiki part.

Table 4-1: Access rights per parts of the wiki and per users groups

	admins	EulerLeaders	EulerPrivate	EulerAdmin	Other
Public web site	R+E+U	R+E+U	R	R	R
Private Part	R+E+U	R+E+U	R+E+U	R	--
Administration	R+E+U	R+E+U	R	R+E+U	--
Contacts Info	R+E+U	R+E	R+E	R+E	--
FAQ & How To	R+E+U	R+E+U	R+E+U	R+E+U	--
Wiki Admin	R+E+U	--	--	--	--

Remark: so far, registered users that are not partners of the EULER project have the same access rights as non-registered users. We have set up the group "OtherRegisteredUsers" to keep track of them. This group shall be used later on to control read and edit access of registered users to the public wiki, once launched.

EC access: It might be suitable to create an authorization group for the Project Officer and the Project Evaluators to ease the communication and exchange of documents (reports, deliverables, presentations, etc.).

4.1.3 Private wiki spaces

The private parts of the wiki are divided in different spaces, each with different read/edit rights, as described above. In this section, we give a brief overview of these spaces. Then, in the next sections, we will describe further the spaces, sub-spaces, or functionalities requiring additional details.

"Private Part": this part includes

- *Working Space*: this space is devoted to the sharing of information and joint work regarding the scientific and technical activities of every work-package and task. Several pages have been open, one per work-package and per task. The activities conducted on every task are regularly documented on these pages. Furthermore, these pages act as a discussion forum for ongoing joint work, thus allowing more collaborators to contribute;

- *Meetings*: this page concerns all project meetings (technical, plenary, or review meetings). For each meeting, we provide here all information regarding the practical organization (venue, accommodation) of the meeting, the list of participants, the agenda, the material of the presentations, and the minutes of the meeting. Minutes of the technical management committee conference calls are also documented here;

- *Milestones*: this page reports the current status of all the milestones of the EULER project: achieved on due time, required further improvements, etc. It is thus updated according to the progress of the activities;

- *Deliverables*: this page extends the public deliverables page, allowing to access all deliverables, including the private ones;

- *Experimental Tools*: this page maintains links to all experimental tools that will be developed in the project, and links to all existing tools that are relevant for the project. For example, we list existing routing protocol simulators, and routing protocol emulators;

- *Publications*: this page is an extension of the public publication page. It displays the publication list of all scientific articles produced by project collaborators in the course of the project. The page has three sub-pages, each one consisting of a list of bibliography entries (in BibTex format, see Section 4.1.4): submitted papers, accepted but not published papers, and accepted and published papers. The system takes these bibtex files as an input, and turns them into a comprehensive list of papers. Only

"accepted and published papers" are displayed and accessible in the public version of this page but they are technically on the same page of the wiki;

- *FIRE Space*: we report and gather on this page all the information and documents related to FIRE activities/events that are relevant to the project. This page allows all participants to be fully aware of FIRE initiatives;

- *Files Repository*: link to the shared files repository tool (Section 4.2).

- *History*: relates the agenda, action points, and milestones of the preparation of the EULER project since the first meeting in September 2009;

- *Album*: we place here photos taken during EULER project meetings, and various events that EULER project partners have attended (e.g. ICT 2010).

"Administration": concerns all administrative aspects of the project.

- *Admin Space*: this page is devoted to the activity of work-package 1 on the "project administration and management";

- *Quarterly Reports*: we gather on this page the partner and work-package quarterly reports;

- *Annual Reports*: lists all annual reports of the project;

- *Templates*: this page gathers all EULER templates, including presentations, deliverables, partner/work-package/financial reports, and logos. These templates are provided in different formats:
  - .dot for Microsoft Word documents and Powerpoint presentation templates;
  - .xls for Microsoft Excel sheet;
  - .sty for LaTeX reports and presentations;

- *Contract & Finance*: comprises all Legislative and financial documents (grant agreement, contract agreement, etc.), forms (financial statement, budget and payments calculation, etc.).

"Contacts Info": all contact information.

- *Contact Persons*: lists of individual participants of the project with name, email or URL address, phone number(s), and role in the project;

- *Mailing Lists*: table of all public/private mailing lists of the EULER project, with scope/audience and links to the Sympa server (see Section 2);

- *Audio Coordinates*: provides the phone numbers and codes required for audio conferences, as further explained in Section 4.7.

"FAQ & How To":

- *FAQ & How To*: in this page, we explain some basic PMWiki commands that might be useful for all users (e.g. how to open a link in a new

window, how to write using different colors, etc.), and some tricks. More importantly, we explain how to use the functionalities that have been design (or adapted) specifically for this wiki, such as the file management tool (see Section 4.2), the bibliography engine (see Section 4.1.4), and the events tool (see Section 3.1.4);

- *SandBox*: page on which users can test editing commands and functionalities. It is useful for people not used to edit PMWiki pages;

- *Sitemap*: displays the tree of the pages of the wiki, and is thus a short-cut page. Wiki administrators update this page each time a new page is added to the wiki. It allows maintaining a virtual tree structure of pages. This virtual structure allows to simplify navigation on the wiki;

"Wiki Admin": This part is devoted to the administration of the wiki, and is visible only by members of the "admins" group.

- *To Do & How To*: notes on the functionalities added to this wiki, list of tasks to be done (e.g. functionalities to be added);

- *Pages attributes*: automatic listing of the attributes (read and edit rights) of all pages of the wiki;

- *AuthUser*: page allowing to manage groups membership for each registered user;

- *Changes*: listing of all pages that have been recently edited. Only the last modification date is stored along with the login of the editor. This is an internal functionality of PMWiki.
  Each wiki page stores the list of modifications along with the contributors' login. This list can be access through the "History" button (see e.g. Figure 4-2) of the page, allowing to restore any previous version when required;

- *Statistics*: displays statistics on visited pages of the wiki, origin of visitors, number of downloads per file, etc. See Section 4.1.8 for more details;

- *WikiSandbox*: page devoted to test editing commands and new functionalities. It is similar to the "SandBox" page of the "FAQ & How To" part of the wiki, but reserved to wiki administrators.

4.1.4 Bibliography engine

We use the "BibtexRef" PMWiki plug-in to handle bibliography references on the wiki. It allows for a simple management of BibTex entries, and inclusion of bibliography references everywhere in the wiki. Recall that the word "BibTeX" stands for a tool and a file format that are used to describe and process lists of references, mostly in conjunction with LaTeX documents. The reader is referred to http://en.wikipedia.org/wiki/BibTeX for more details about BibTex. It is worth mentioning that i) BibTex entries can be easily converted to various formats, including EndNotes (for use with MicroSoft Word), Html, XML, RTF, etc., and ii) LaTex and BibTex are commonly used for scientific publications and so BibTex is a convenient file format for most EULER project partners.

Figure 4-2 shows how to edit a page to store BibTex entries. Then, Figure 4-3 shows how to add a citation in a wiki page. Figure 4-4 shows how to display a given reference in a wiki page. Finally, Figure 4-5 shows how to display a references list in a wiki page.

Figure 4-2: Edition of a BibTex entries page

Figure 4-3: Cite a bibliography reference in a wiki page

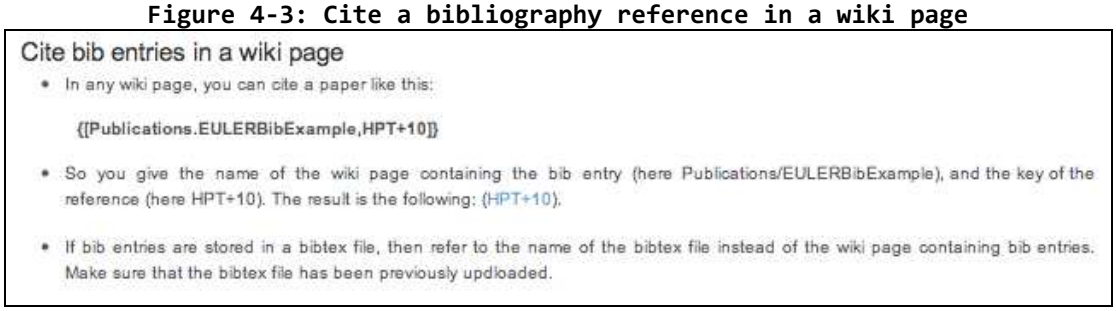
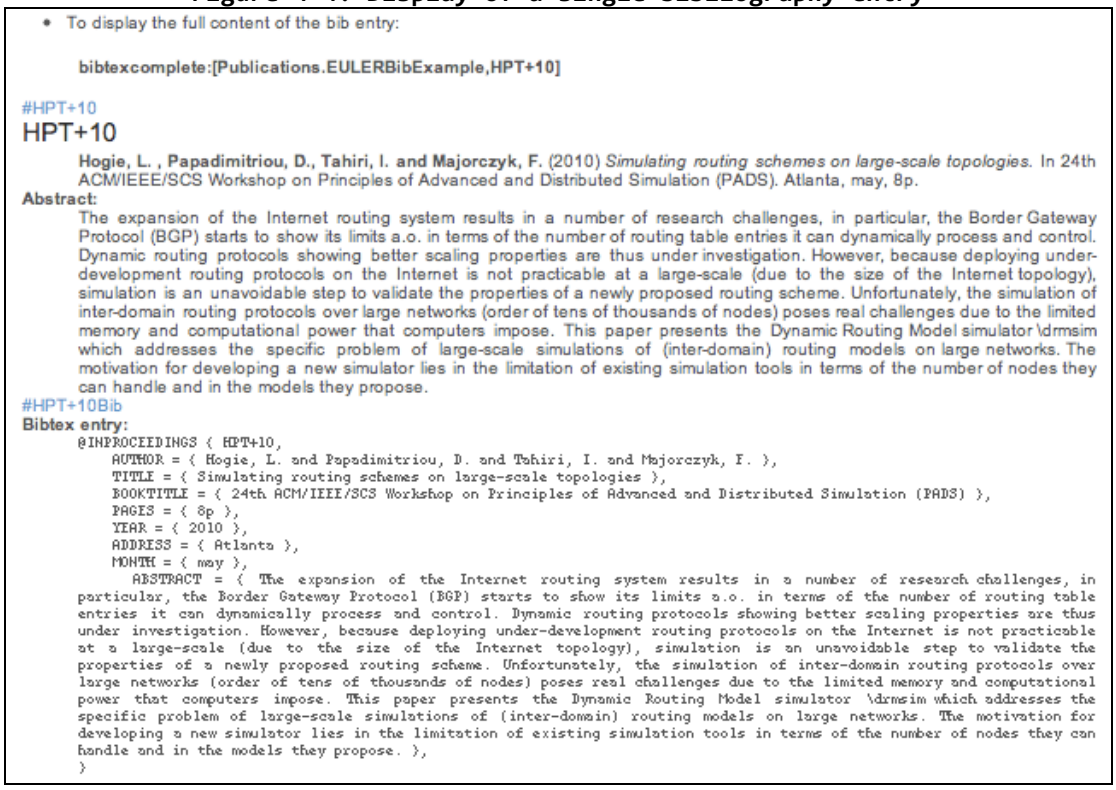


Figure 4-4: Display of a single bibliography entry



- To display the full content of the bib entry:

bibtexcomplete:[Publications.EULERBibExample,HPT+10]

#HPT+10

HPT+10

Hogie, L. , Papadimitriou, D., Tahiri, I. and Majorczyk, F. (2010) *Simulating routing schemes on large-scale topologies.* In 24th ACM/IEEE/SCS Workshop on Principles of Advanced and Distributed Simulation (PADS). Atlanta, may, 8p.

Abstract:

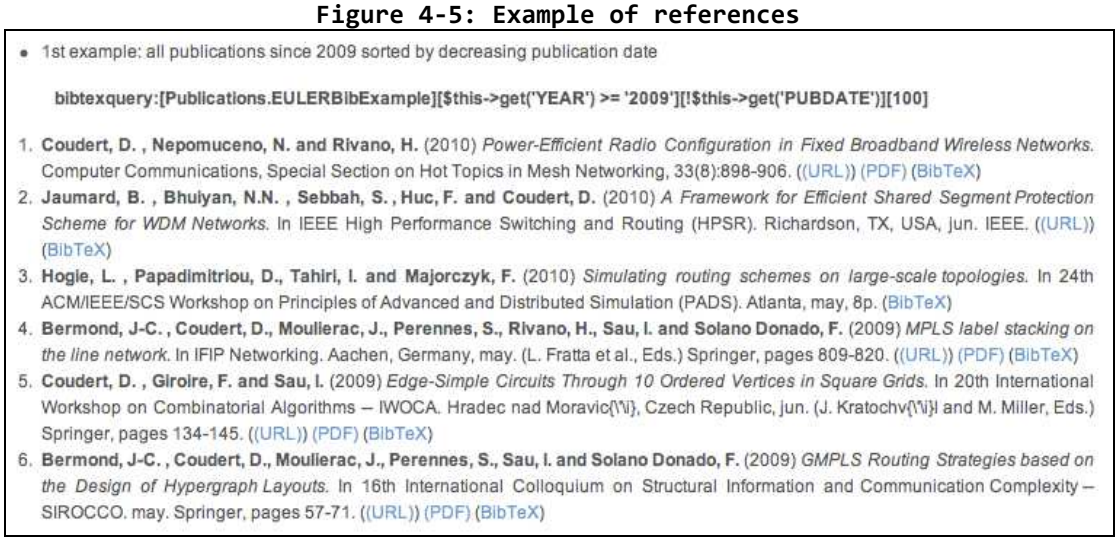
The expansion of the Internet routing system results in a number of research challenges, in particular, the Border Gateway Protocol (BGP) starts to show its limits a.o. in terms of the number of routing table entries it can dynamically process and control. Dynamic routing protocols showing better scaling properties are thus under investigation. However, because deploying under-development routing protocols on the Internet is not practicable at a large-scale (due to the size of the Internet topology), simulation is an unavoidable step to validate the properties of a newly proposed routing scheme. Unfortunately, the simulation of inter-domain routing protocols over large networks (order of tens of thousands of nodes) poses real challenges due to the limited memory and computational power that computers impose. This paper presents the Dynamic Routing Model simulator \drmsim which addresses the specific problem of large-scale simulations of (inter-domain) routing models on large networks. The motivation for developing a new simulator lies in the limitation of existing simulation tools in terms of the number of nodes they can handle and in the models they propose.

#HPT+10Bib

Bibtex entry:

```
@INPROCEEDINGS { HPT+10,
    AUTHOR = { Hogie, L. and Papadimitriou, D. and Tahiri, I. and Majorczyk, F. },
    TITLE = { Simulating routing schemes on large-scale topologies },
    BOOKTITLE = { 24th ACM/IEEE/SCS Workshop on Principles of Advanced and Distributed Simulation (PADS) },
    PAGES = { 8p },
    YEAR = { 2010 },
    ADDRESS = { Atlanta },
    MONTH = { may },
      ABSTRACT = { The expansion of the Internet routing system results in a number of research challenges, in
particular, the Border Gateway Protocol (BGP) starts to show its limits a.o. in terms of the number of routing table
entries it can dynamically process and control. Dynamic routing protocols showing better scaling properties are thus
under investigation. However, because deploying under-development routing protocols on the Internet is not practicable
at a large-scale (due to the size of the Internet topology), simulation is an unavoidable step to validate the
properties of a newly proposed routing scheme. Unfortunately, the simulation of inter-domain routing protocols over
large networks (order of tens of thousands of nodes) poses real challenges due to the limited memory and computational
power that computers impose. This paper presents the Dynamic Routing Model simulator \drmsim which addresses the
specific problem of large-scale simulations of (inter-domain) routing models on large networks. The motivation for
developing a new simulator lies in the limitation of existing simulation tools in terms of the number of nodes they can
handle and in the models they propose. },
}
```

Figure 4-5: Example of references



- 1st example: all publications since 2009 sorted by decreasing publication date

bibtexquery:[Publications.EULERBibExample][$this->get('YEAR') >= '2009'][!$this->get('PUBDATE')][100]

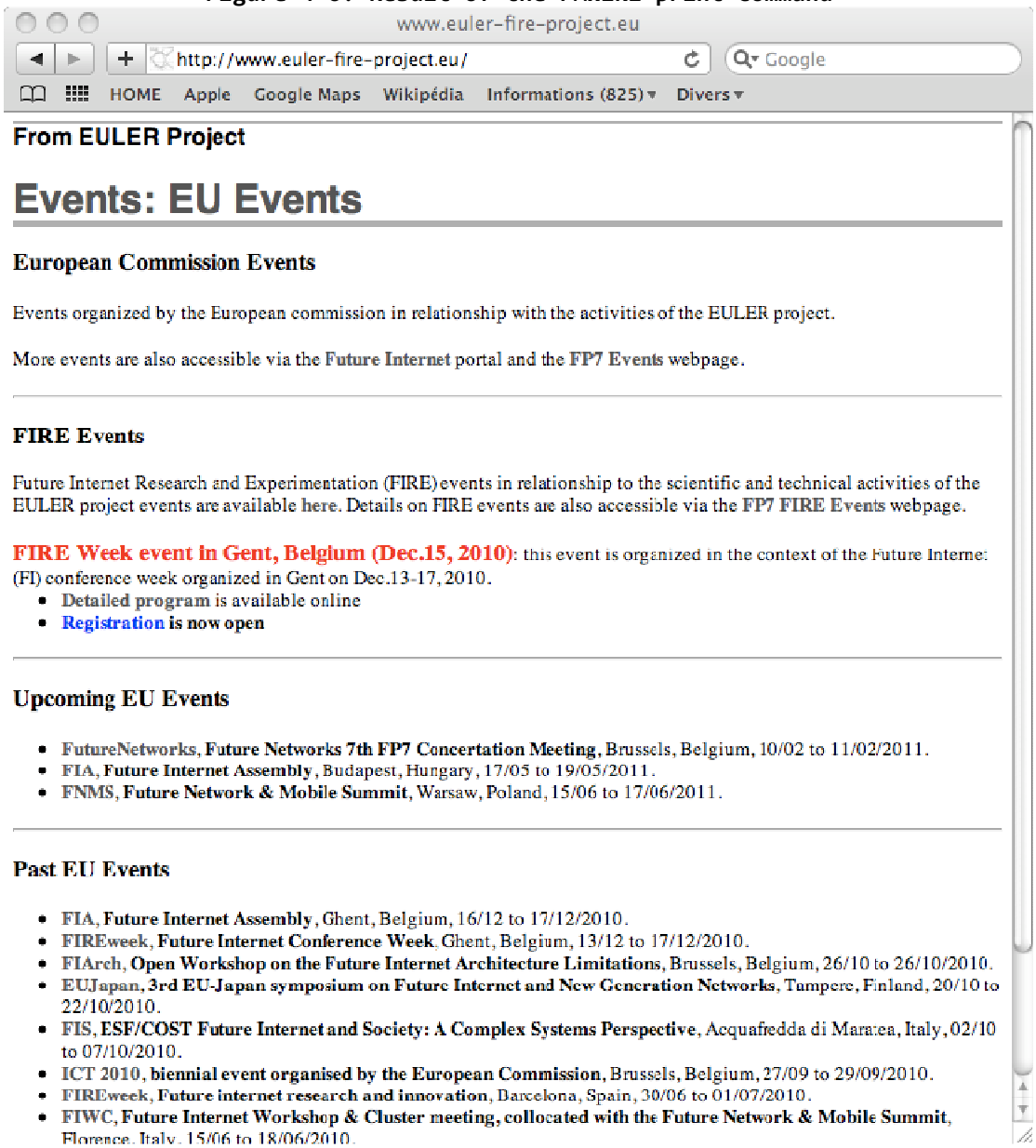
1. **Coudert, D. , Nepomuceno, N. and Rivano, H.** (2010) *Power-Efficient Radio Configuration in Fixed Broadband Wireless Networks.* Computer Communications, Special Section on Hot Topics in Mesh Networking, 33(8):898-906. ((URL)) (PDF) (BibTeX)
2. **Jaumard, B. , Bhuiyan, N.N. , Sebbah, S. , Huc, F. and Coudert, D.** (2010) *A Framework for Efficient Shared Segment Protection Scheme for WDM Networks.* In IEEE High Performance Switching and Routing (HPSR). Richardson, TX, USA, jun. IEEE. ((URL)) (BibTeX)
3. **Hogie, L. , Papadimitriou, D., Tahiri, I. and Majorczyk, F.** (2010) *Simulating routing schemes on large-scale topologies.* In 24th ACM/IEEE/SCS Workshop on Principles of Advanced and Distributed Simulation (PADS). Atlanta, may, 8p. (BibTeX)
4. **Bermond, J-C. , Coudert, D., Moulierac, J., Perennes, S., Rivano, H., Sau, I. and Solano Donado, F.** (2009) *MPLS label stacking on the line network.* In IFIP Networking. Aachen, Germany, may. (L. Fratta et al., Eds.) Springer, pages 809-820. ((URL)) (PDF) (BibTeX)
5. **Coudert, D. , Giroire, F. and Sau, I.** (2009) *Edge-Simple Circuits Through 10 Ordered Vertices in Square Grids.* In 20th International Workshop on Combinatorial Algorithms – IWOCA. Hradec nad Moravic{\'\i}, Czech Republic, jun. (J. Kratochv{\'\i}l and M. Miller, Eds.) Springer, pages 134-145. ((URL)) (PDF) (BibTeX)
6. **Bermond, J-C. , Coudert, D., Moulierac, J., Perennes, S., Sau, I. and Solano Donado, F.** (2009) *GMPLS Routing Strategies based on the Design of Hypergraph Layouts.* In 16th International Colloquium on Structural Information and Communication Complexity – SIROCCO. may. Springer, pages 57-71. ((URL)) (PDF) (BibTeX)

4.1.5 Print and export to pdf

It is sometimes useful to print webpages but in general, printing a page using the web browser printing functionality is not satisfactory. Indeed, we do not want to print the menu of a webpage or the web page decoration.

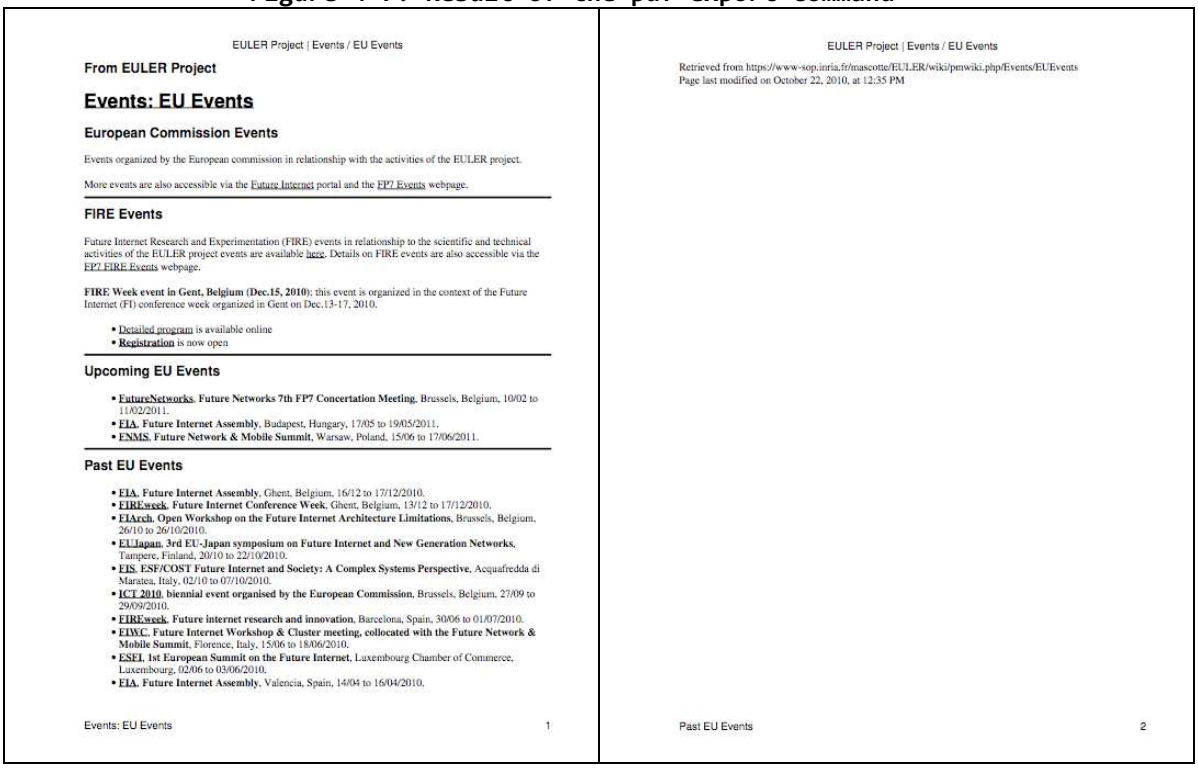
PMWiki offers a printing functionality that allows printing only the content of a page. For example, Figure 4-6 depicts the result of the print command for the EUevents page. As can be seen, the output of the command is a single HTML page. However, wiki pages requiring more than one paper sheet to be printed are not properly handled and some lines might be cut (depending on the printer). This command is therefore not sufficient and thus requires the selection of an alternative to properly print webpages.

Figure 4-6: Result of the PMWiki print command



In order to propose a proper printing of wiki pages, we use the GeneratePDF plug-in of PMWiki combined with the htmldoc software (http://www.htmldoc.org/, version 1.8.27). It allows generating a pdf version of a wiki page. As can be observed in Figure 4-7, the resulting pdf file (here a 2 pages file) is clean. This functionality is typically used to print meetings agenda and minutes.

Figure 4-7: Result of the pdf export command



EULER Project | Events / EU Events

From EULER Project

Events: EU Events

European Commission Events

Events organized by the European commission in relationship with the activities of the EULER project.

More events are also accessible via the Future Internet portal and the FP7 Events webpage.

FIRE Events

Future Internet Research and Experimentation (FIRE) events in relationship to the scientific and technical activities of the EULER project events are available here. Details on FIRE events are also accessible via the FP7 FIRE Events webpage.

FIRE Week event in Gent, Belgium (Dec.15, 2010); this event is organized in the context of the Future Internet (FI) conference week organized in Gent on Dec.13-17, 2010.

- Detailed program is available online
- **Registration** is now open

Upcoming EU Events

- **FutureNetworks**, **Future Networks 7th FP7 Concertation Meeting**, Brussels, Belgium, 10/02 to 11/02/2011.
- **FIA**, **Future Internet Assembly**, Budapest, Hungary, 17/05 to 19/05/2011.
- **ENMS**, **Future Network & Mobile Summit**, Warsaw, Poland, 15/06 to 17/06/2011.

Past EU Events

- **FIA**, **Future Internet Assembly**, Ghent, Belgium, 16/12 to 17/12/2010.
- **FIREweek**, **Future Internet Conference Week**, Ghent, Belgium, 13/12 to 17/12/2010.
- **FIArch**, **Open Workshop on the Future Internet Architecture Limitations**, Brussels, Belgium, 26/10 to 26/10/2010.
- **EUJapan**, **3rd EU-Japan symposium on Future Internet and New Generation Networks**, Tampere, Finland, 20/10 to 22/10/2010.
- **FIS**, **ESF/COST Future Internet and Society: A Complex Systems Perspective**, Acquafredda di Maratea, Italy, 02/10 to 07/10/2010.
- **ICT 2010**, **biennial event organised by the European Commission**, Brussels, Belgium, 27/09 to 29/09/2010.
- **FIREweek**, **Future internet research and innovation**, Barcelona, Spain, 30/06 to 01/07/2010.
- **FIWC**, **Future Internet Workshop & Cluster meeting, collocated with the Future Network & Mobile Summit**, Florence, Italy, 15/06 to 18/06/2010.
- **ESFI**, **1st European Summit on the Future Internet**, Luxembourg Chamber of Commerce, Luxembourg, 02/06 to 03/06/2010.
- **FIA**, **Future Internet Assembly**, Valencia, Spain, 14/04 to 16/04/2010.

Events: EU Events 1

EULER Project | Events / EU Events

Retrieved from https://www-sop.inria.fr/mascotte/EULER/wiki/pmwiki.php/Events/EUEvents
Page last modified on October 22, 2010, at 12:35 PM

Past EU Events 2

4.1.6 Web Feeds

Web feeds are a convenient mechanism to let visitors be notified of changes operated on a web site. Typically, users can use a news aggregator to quickly see what pages of interest have changed. Web feeds are commonly recognized by terms such as RSS, Atom (Atom Syndication Format), and web syndication.

Similarly to the Sympa mailing server (see Section 2.6), PMWiki has internal functionalities allowing the creation of web feeds. Also, we plan to create web feeds allowing users and visitors to be informed of updates performed on the project wiki. These web feeds should allow for selecting specific groups of wiki pages, such as: News, Publications, FIRE space, given work-package, etc.

These web feeds have not been launched yet for technical reasons:

- We would like to tune the transmitted information in order to transmit only those significant modifications. Typically, correcting typos should not be notified;
- We would like to control registrations to these web feeds in order to prevent external bodies to be informed of private activities. Currently, the knowledge of the web feed address is sufficient to subscribe to it, even if the subscriber is not allowed to access corresponding wiki pages.

Therefore, web feeds will be proposed on the project wiki as soon as suitable solutions are found.

4.1.7 Wiki Administration

The administration of both the EULER wiki public and private parts consists of several tasks, including:

- Setting up appropriate tools (mailing lists, wiki, etc.);

- Developing and maintaining the dedicated tools documented in this document;
- Designing and maintaining the wiki pages architecture, as well as the directory tree of the file repository;
- Setting appropriate read/edit rights to new wiki pages. Notice that wiki pages inherits group attributes by default, thus simplifying this task;
- Validating new registered users;
- Answering questions concerning the usage of functionalities, and report frequently asked questions and solutions in the "FAQ & How To" page;
- Addressing technical difficulties encountered by users while using the wiki.

Some of these tasks require punctual intervention (development and set up of tools), and others require continuous attention (maintenance of wiki pages and directory architectures, update of page attributes, validation of new registered users, answer user inquiries). As of today, the wiki administrators are the Project Coordinator (PC), Dimitri Papadimitriou of ALB, and the Technical Assistant (TA), David Coudert of INRIA. The PC is mainly responsible for continuous tasks, and the TA for the development and maintenance of the dedicated tools and for setting up all appropriate tools described in this document. Additional wiki administrators might be appointed for any task requiring regular intervention on the wiki. However, the maintenance of the tools can only be performed by the TA and his colleagues from INRIA, since these tasks require direct access to the internal INRIA network.

Tools for maintenance of the wiki architecture:

- **Recent changes**: as explained in Section 4.1.3, the list of recent changes provides the last edition page of every page along with the login of the last editor. From that list, it is possible to track all modifications as well as the creation of new pages;
- **Sitemap**: As explained above, the wiki page architecture consists of a virtual tree structure of pages. This tree is formed using a wiki page, the sitemap, in which pages are organized using lists, sub-lists, sub-sub-lists, etc. Figure 4-8 shows how to edit the sitemap (left) and how the sitemap is seen by users (right);
- **Shared files repository tool**: This tool will be described in Section 4.2. Note however that wiki administrators have no restrictions when using this tool, as explained in Section 4.2.2. In particular, they are allowed to create/delete directories at the root of the file repository;
- **Page attributes:** as explained in Section 4.1.3, the "page attributes" of the "Wiki Admin" part of the wiki lists the attributes of all pages. To modify the attributes of a particular page (e.g., the Experimental tools page), wiki administrators have to use the following url:

  `http://euler-fire-project.eu/index.php/<GROUP>/<PAGE>?action=attr`

  where:
  - <GROUP> = the wiki group of the page
  - <PAGE> = the name of the wiki page

  Figure 4-9 shows an example of form to modify page attributes.

Figure 4-8: Edition of the sitemap (left) and output (right)

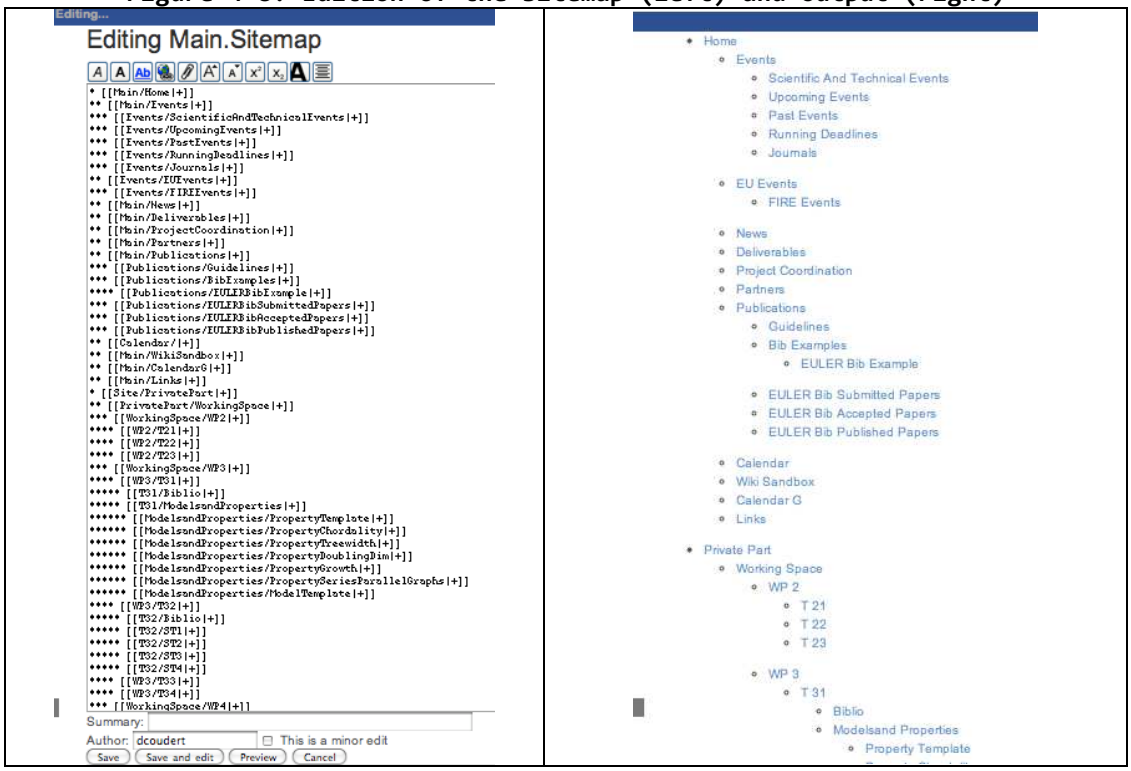
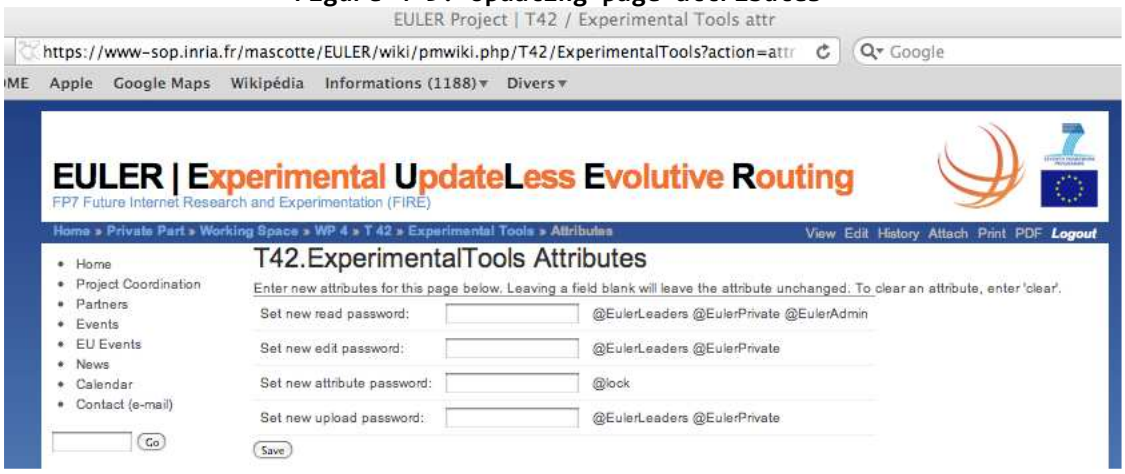


Figure 4-9: Updating page attributes



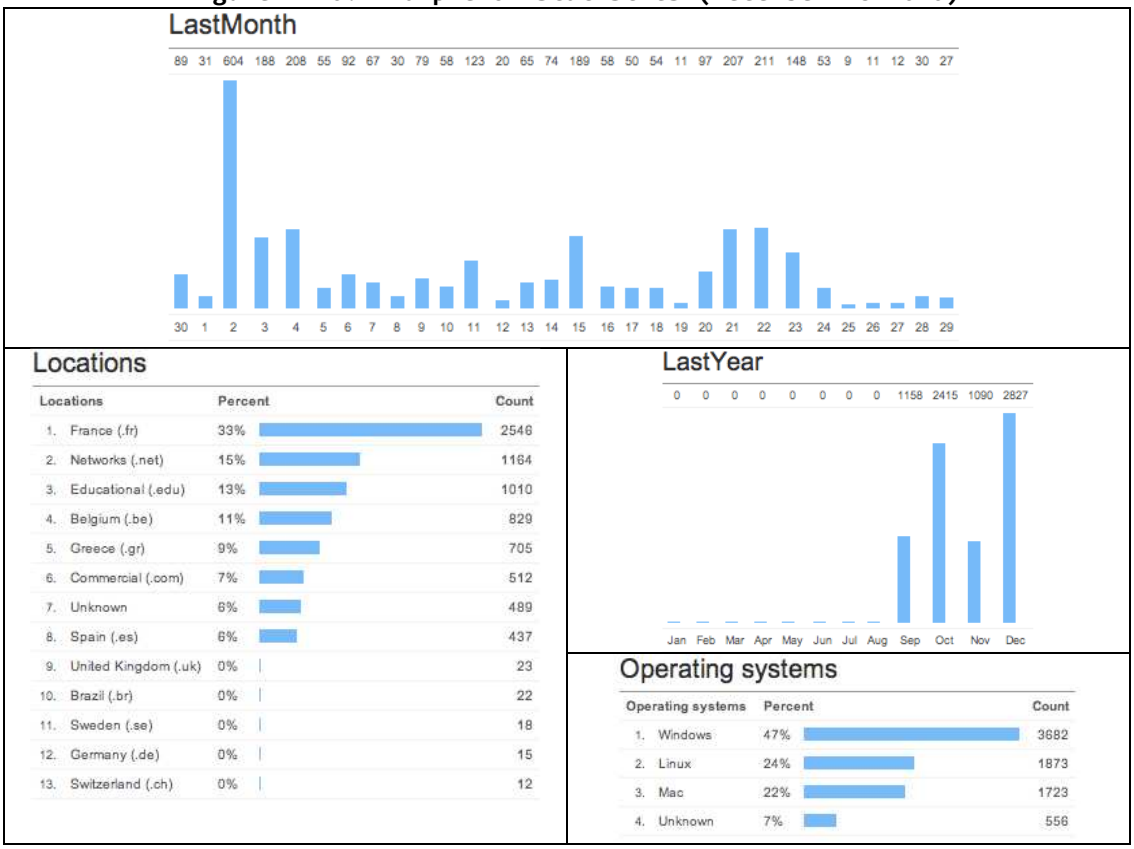
As explained in Section 3.1.3, all questions concerning the usage of functionalities, or regarding technical difficulties encountered while using the wiki have to be reported to the contact email (contact@euler-fire-project.eu) who will help solving the problem. He will also report frequently asked questions and solutions in the "FAQ & How To" page.

4.1.8 Statistics

We use the TotalCounter (version 1.9.2) PMWiki plug-in to perform simple statistics of users/visitors activity. It allows counting page views and time of visits (but not the duration), files downloads, used web browsers, operating systems, referrers, locations, etc. Some examples of statistics automatically obtained from the tool are reported in Figure 3-2, Figure 4-10, and Figure 4-17.

Notice that some of the statistics require further analysis. In particular, “locations” are biased since, for instance, all traffic originated from ALB is recognized as originated from France. Indeed, before entering the Internet, the traffic coming from Alcatel-Lucent Bell site is first routed throughout the private network of Alcatel-Lucent to reach a gateway located in France. When the Alcatel-Lucent intranet is accessed remotely (by means of an IPSEC connection) the traffic follows the same path to enter the Internet. Consequently, the interpretation of the plots and statistics has to be done with caution.

Figure 4-10: Example of statistics (December 28 2010)



Remark: To perform more precise statistics, and so analysis, of the users/visitors activity on the EULER web site, it is required to access the log files of the Apache server of INRIA. This would allow extracting more precise data such as visit duration or the exact activity of a given visitor. However, for security reasons these log files can only be accessed by the web administrators of INRIA. Furthermore, for clear confidentiality reasons it is forbidden to analyze these files, even for web administrators. Therefore, some statistics will not be available in the website (outside of exceptional circumstances).

4.2 Project shared files repository

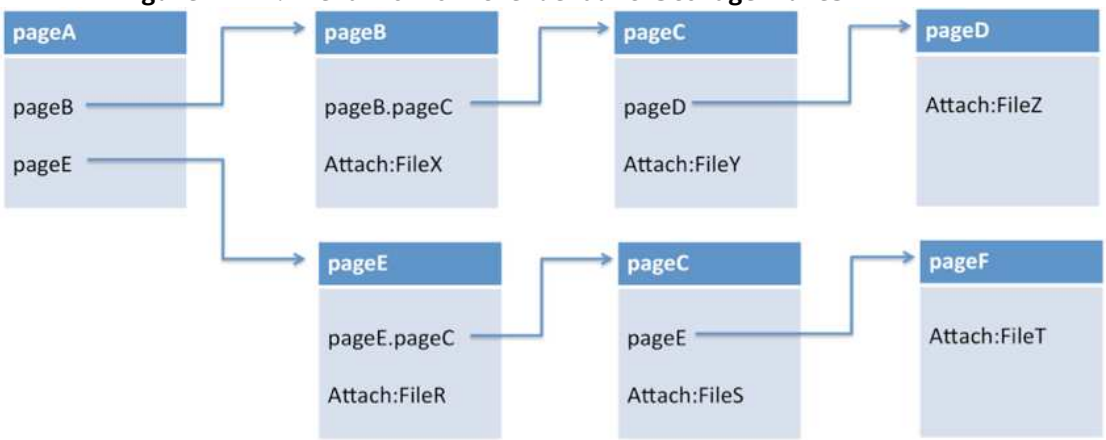
One of the weaknesses of PMWiki, as well as most of the wiki engine, is the absence of a clear directory tree structure for pages. More precisely, PMWiki uses the notion of groups of pages to maintain some sort of structure. For example, if page pageB is created (and first edited) from pageA, the wiki engine will assign it the group pageA. We thus understand

that page pageB is a sub-page of page pageA. Similarly, if page pageC is created from pageB, it will be interpreted as a sub-page of pageB. We are thus able to maintain a kind of tree structure for pages, which is further consolidated by the sitemap. Indeed, web pages form a graph, and the structure proposed by PMWiki is sufficient.

More embarrassing, PMWiki does not structure or index directories and thus files. This absence of an effective directory tree is very embarrassing for storing files. Indeed, using the default PMWiki configuration, if fileX is attached to pageB, and so uploaded on the wiki from pageB, it will be stored in the directory of the group to which pageB belongs, so pageA. In addition, if fileY is attached to pageC, and so uploaded on the wiki from pageC, it will be stored in the directory of the group to which pageC belongs, so pageB. But pageB directory will not be a sub-directory of pageA directory, resulting in a flat directory structure (see Figure 4-11). Notice that the name of a group and the name of its associated directory is exactly the name given to the wiki page. Therefore, the same directory is used to store files belonging to different sub-groups of pages in the wiki, as depicted in Figure 4-11.

The above explanation is true for the default configuration of PMWiki in which attached files are stored by groups. Moreover, this is also true when PMWiki is configured to store attached files per pages. In such case, the target directory has the same name as the page, and again two independent pages may store files into the same directory.

Figure 4-11: Behavior of the default storage rules in PMWiki



Listing of directory tree:

```
Root/PageA/FileX
Root/PageA/FileR
Root/PageB/FileY
Root/PageC/FileZ
Root/PageC/FileT
Root/PageE/FileS
```

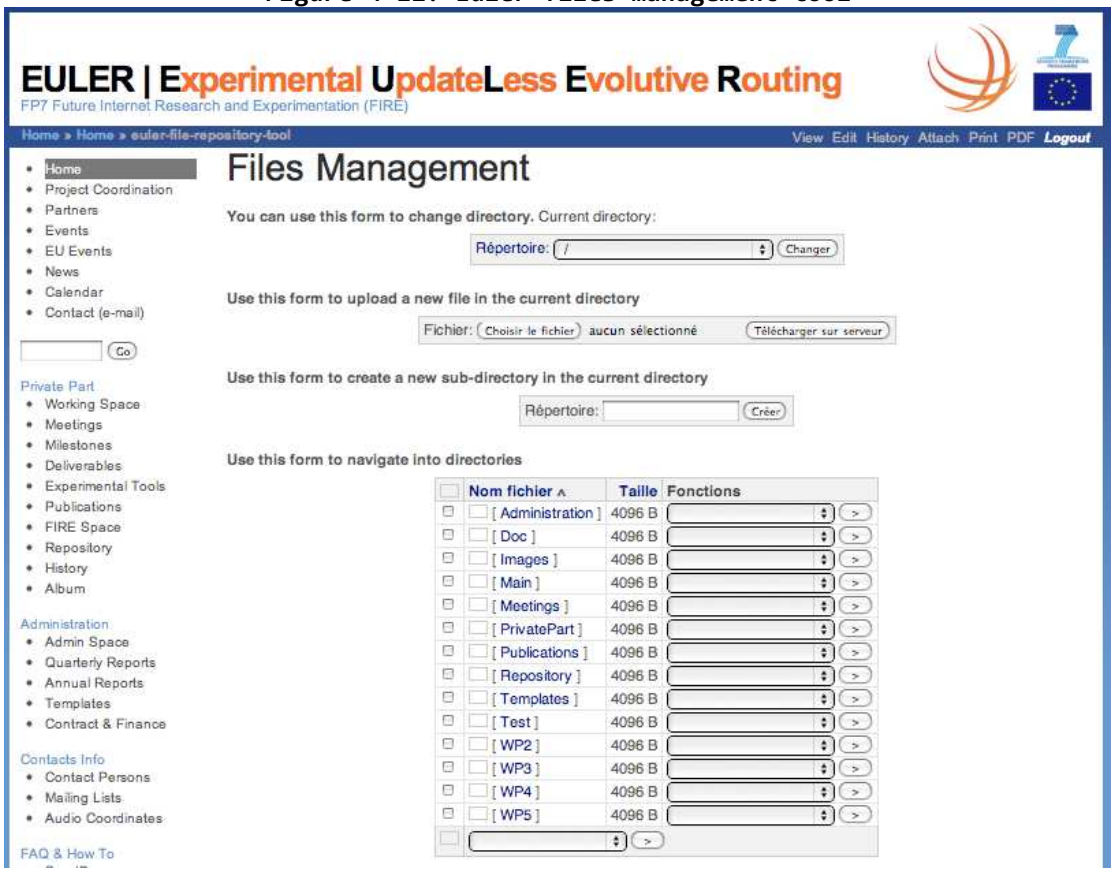
Different pages but same storage directory

To overcome this difficulty, we have designed and developed a specific tool to handle the file repository. Such a new tool allows maintaining a directory tree structure. In addition, we have added a new functionality to our PMWiki engine in order to allow linking files in the directory tree.

4.2.1 The EULER files repository tool

The files repository tool designed to maintain a directory tree has been developed as a PMWiki plug-in. It has been fully integrated to the EULER website, as can be seen Figure 4-12.

Figure 4-12: Euler files management tool



This tool allows to:

- **Navigate into the directory tree by selecting a path** (Figure 4-13). The select form proposes all known paths;

Figure 4-13: Navigation by selecting a path

- **Navigate into the directory tree by clicking on the name of a directory** (Figure 4-14);

Figure 4-14: Navigation per directory

- **Download files** stored into the directory tree;

- **Create a new directory** into the current directory (Figure 4-15);

Figure 4-15: Directory creation form

- Upload a file into the current directory (Figure 4-16);

Figure 4-16: File upload form

In addition, the tool also allows to:
- **Rename** a file/directory;
- **Move** a file/directory to another directory. When moving a directory, the entire sub-tree directory and files are also moved;
- **Create** a symbolic link to one file/directory;
- **Copy** a file into another directory;
- **Delete** a file/directory. When deleting a directory, a warning message is displayed and confirmation is required, since deletion is inclusive: the directory and its entire sub-tree (including files) of that directory will be deleted simultaneously.

The Move, Copy, and Delete actions can also be performed on sets of files/directories.

4.2.2 Usage restrictions

Since the files repository tool is very powerful, we have set up some usage restrictions:

- ***Root directory***: users (but the wiki administrators) are only allowed to navigate into directories, or to create a symbolic link stored in a sub-directory. Thus, the creation of a new directory at the root requires the agreement of the wiki administrators;

- ***EulerAdmin***: users that are not allowed to edit the public and the "Private Part" of the wiki, as documented in Section 4.1.2, they are also not allowed to upload files in the corresponding directories. Also, we maintain a list of forbidden directories for these users, and the corresponding directory trees are not accessible for them (they are simply hidden);

- ***EulerPrivate*** **and** ***EulerLeaders*****:** as for the EulerAdmin users, and following the restrictions documented in Section 4.1.2, we maintain for each of these groups a list of forbidden directories;

- ***OtherRegisteredUsers*****:** although these users should normally not be able to access the files repository tool, we prefer to be on the safe side, and so, we maintain a list of forbidden directories for them: all directories.

4.2.3 Linking files in the directory tree

The standard pmwiki command for attaching a file to a wiki page is:

Attach:<GROUP_NAME>/<PAGE_NAME>/<FILE_NAME>

where:
- <GROUP_NAME> is the name of the group to which the file belongs (using the default configuration). If no group name is given, then the group name of the current wiki page is selected;
- <PAGE_NAME> is the name of the page to which the file belongs (and so the directory name when files are stored by pages). If no page name is given, then the name of the current page is selected;
- <FILE_NAME> is the name of the file (including its extension) stored on the wiki.

If the requested file is already stored on the wiki, then the Attach command produces a link allowing its download. Otherwise, the Attach command produces a link to the PMWiki file upload tool.

We have introduced a new command, named File, to attach files stored in the directory tree of the files repository. It can be used as follows:

File:<PATH>/<FILE_NAME>

where:
- <PATH> is the path to the file in the directory tree of the files repository. Paths are relative to the root of the directory tree;
- <FILE_NAME> is the name of the file (including its extension) stored on the wiki.

If the requested file is already stored on the files repository, then the File command produces a link allowing its download. Otherwise, the File command produces a link to the EULER files repository tool with the path to the target directory as an argument. Then, if the target directory exists, it remains to upload the file using the dedicated tool. Otherwise, it is requested to create the required directories first.

For convenience, the link to the EULER files repository tool forces to open it in a new window/tab.

The File command also allows to automatically count the number of downloads for each file (see Figure 4-17). For fairness of accounting, downloads performed by wiki administrators (and all collaborators of the “admins” group) are not taken into account.

Figure 4-17: Download statistics of files stored on the wiki

Downloads	Count
1. uploads/PrivatePart/FIRE_Participation_to_Events.pdf	63
2. uploads/Main/EULER_Leaflet_2010.pdf	55
3. uploads/Meetings/EULER-kickoff-Topics-on-Complex-Networks.pdf	32
4. uploads/Meetings/EULER-kickoff-WP3T31.zip	27
5. uploads/PrivatePart/EULER-258307-PartB-Technical-Annex-23-06-2010.pdf	24
6. uploads/Meetings/EULER-kickoff-T32.pdf	22
7. uploads/Meetings/EULER-kickoff--AurelienLancin.pdf	21
8. uploads/Meetings/EULER-kickoff-Training-Dimitri-Papadimitriou.zip	20
9. uploads/Main/EULERnewsletter_No1.pdf	16
10. uploads/PrivatePart/FIREWorks_Portfolio_Analysis.pdf	13
11. uploads/PrivatePart/Lemke_Keynote_TridentCom_2010.zip	11
12. uploads/PrivatePart/EULER-Synoptic--10-08-2009.ppt	10
13. uploads/Meetings/EULER-kickoff-WP5T51.zip	10

4.2.4 On possible extensions

The current version of the files repository tool will be extensively tested in the course of the EULER project. Also, future improvements will mainly be driven by users' feedback.

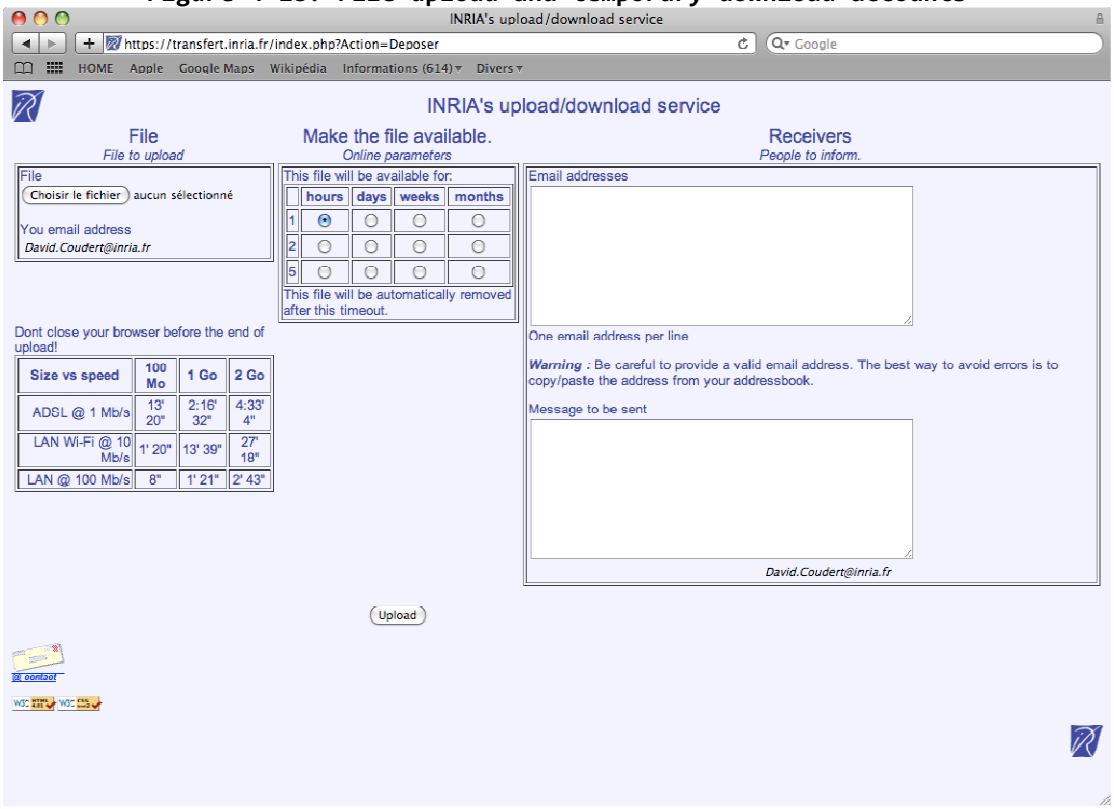
We intend to distribute a stabilized version of this tool as a PMWiki plug-in, since it might be useful for other wiki administrators.

4.3 Exchange of very large files

The IT services of INRIA have designed a secured tool for exchanging files of up to 2 Go: https://transfert.inria.fr. We describe it below. This tool might be useful in the course of the project, e.g., to exchange large data sets of topologies on which to perform experiments.

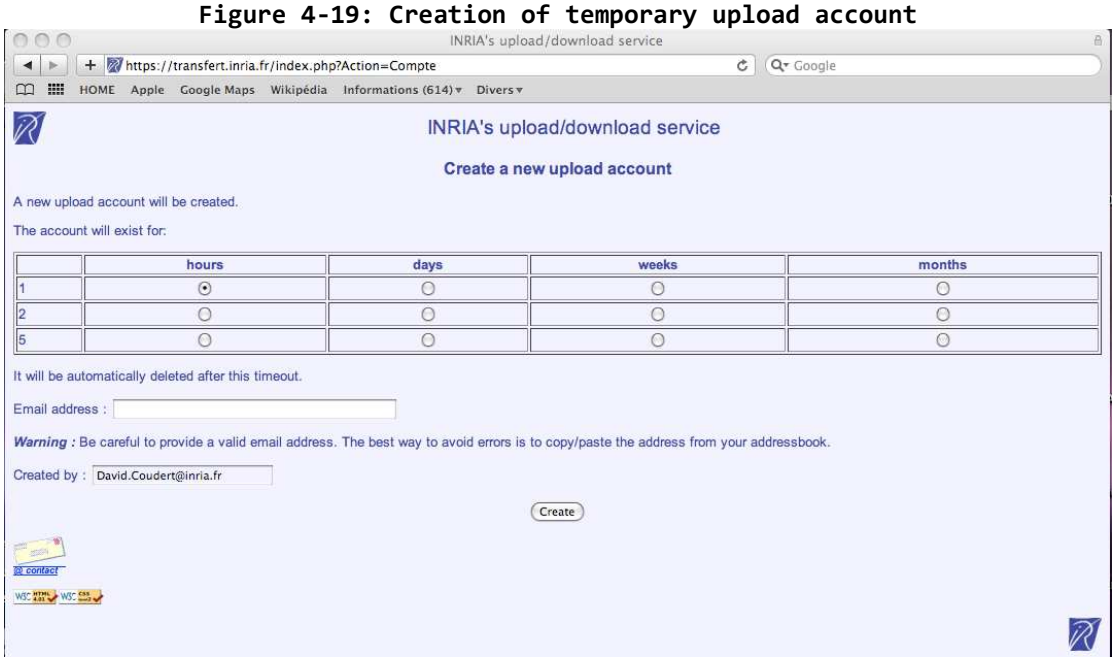
Using the transfert.inria.fr tool, every person registered in the INRIA LDAP directory can upload a file onto the server and create temporary download accounts for external collaborators (unknown to the INRIA LDAP directory), allowing them to download the file during a specified and limited period of time. As can been seen in Figure 4-18, the period of time during which the file will be available can go from 1 hour to 5 months. At the end of the period, the file is automatically suppressed from the server.

Figure 4-18: File upload and temporary download accounts



Reciprocally, every person registered in the INRIA LDAP directory can create a temporary upload account for an external collaborator. The collaborator will then receive by email the address of a web page to upload the file. This temporary download account has also a limited validity, from 1 hour to 5 months (see Figure 4-19), and the uploaded file is suppressed from the server at the end of the validity period.

Figure 4-19: Creation of temporary upload account



Using both functionalities, it is thus possible to exchange large files among collaborators of the EULER project.

If the size of the file(s) to exchange is larger than the 2 Go size limit, two solutions can be envisioned:

- If the file(s) can be split into a small number of files of less than 2 Go each, each file can be exchanged using this tool;
- If the size of the total amount of data is prohibitive (e.g. 1 To), though, one would prefer to exchange the data directly from hard-drive to hard-drive during one of the project meetings.

The security of the system relies on the limited validity of the upload/download URLs and of the files exchanged through the system (from 1 hour to 5 months). These links are randomly generated and are distributed only to specified users. Therefore, a file is kept secret as long as none of the specified users distribute the download link to external bodies.

4.4 Collaborative development tool

In this section, we describe the INRIA GForge collaborative development environment that allows for collaborative software development by a group of users located in different places. This tool is currently used for a large number of collaborative projects (more than 2500 projects) and has a large community of users (more than 9400 registered users). Furthermore, several members of the EULER project have already used it, and they all acknowledge that it is very convenient. In these conditions, the INRIA GForge tool seems the most appropriate for the collaborative software developments of the project.

4.4.1 Forge and INRIA GForge

A Forge is a collaborative development environment aimed at the software development community. It provides a fully configured development system:

- With versioning, bug tracking, task manager;
- A project web site;
- Tools for communication between members of a development team;
- Tools for communication with the users and for software distribution.
-

Technically, a forge is a glue of scripts combining several services (Apache, CVS, mailing-list, access with SSH and OpenSSL…). Various Forge implementations are available, such as:

- Sourceforge: http://sourceforge.net
- GForge : http://gforge.org
- Savannah : http://savannah.gnu.org
- INRIAGForge https://gforge.inria.fr/

INRIAGForge (https://gforge.inria.fr/) is a service offered to facilitate the scientific collaborations of people working at INRIA. It offers easy access to the best in CVS (as well as subversion), mailing lists, bug tracking, message boards/forums, task management, site hosting, permanent file archival, full backups, and total web-based administration. INRIAGForge currently hosts more than 2.500 projects (including more than 550 public projects), and has more than 9.400 registered users from all over the world. Among others, it hosts:

- CGAL, the Computational Geometry Algorithms Library, an Open Source C++ library of geometric algorithms and data structures https://gforge.inria.fr/projects/cgal/
- The BonFIRE Cloud Broker API https://gforge.inria.fr/projects/bonfire-api/

For basic description of functionalities offered and usage, we refer to the "gentle introduction to INRIA GForge" (a.k.a. INRIAGForge for dummies), available at: http://siteadmin.gforge.inria.fr/gforge.html. A more detailed tutorial is available at the following URL: http://siteadmin.gforge.inria.fr/Tutorial.html

Site maintenance: site updates happen on Tuesday mornings, around 9am. Service may be interrupted a few minutes on these occasions. Moreover, the web server is restarted every night.

4.4.2 Subversion, SVN

INRIA GForge uses Subversion (SVN) in order to provide an efficient mean to manage content (documents, software code, experimental results, etc.) produced during the project lifecycle.

Subversion (SVN) is an Open Source version control system that manages any collection of files and directories, and the changes made to them, over time. This allows recovering older data versions or examining the history of how data changed over time. Subversion can operate across networks, which allows it to be used by people on different computers.

Subversion is a centralized system for sharing information. It is a repository that stores data in the form of a file system tree, a typical hierarchy of files and directories. Any number of clients connects to the repository and then reads or writes to these files. By writing data, a client makes the information available to others; by reading data, the client receives information from others (or from itself). The repository acts as a file server that tracks changes to data over time; it remembers every change to every file and every change to the directory tree itself, such as the addition, deletion, and rearrangement of files and directories. So, when clients read data from the repository, they normally see only the latest version of the file system tree, but clients also have the ability to view previous states of the file system.

As an alternative to file lock-modify-unlock, the Subversion version control systems use a copy-modify-merge model: each user's client contacts the project repository and creates a personal working copy (a local reflection of the repository's files and directories). Users then work simultaneously and independently, modifying their private copies. Finally, the private copies are merged together into a new, final version. The version control system often assists with the merging, but ultimately, a human being is responsible for making it happen correctly. Using this model, users can work concurrently and make changes to the same file within their copies. It is important to notice that the copy-modify-merge model can not be applied to binary files like .zip files or .doc documents.

i) Repository Access

Subversion repositories can be accessed through many different methods, on local disk or through various network protocols, depending on the administrator configuration. Threes methods are supported:

- SVN protocol: Client connects to the server by the SVN protocol. It is fast but at the cost of some features as well.

  svn://userLogin@server/project

- Over SSH: allows using its own secure connection. URL to access repositories follows the form:

svn+ssh://userLogin@scm.gforge.inria.fr/svn/project

- Over HTTPS: allows to use secure connection through HTTP, and so to avoid firewall restriction. URL to access repositories follows the form:

  https://userLogin@scm.gforge.inria.fr/svn/project

ii) Available clients

Subversion has its own command-line client (SVN). Other clients are available, which are easier and intuitive to use in different scenarios. Note that several clients are installed and each can be used for different tasks.

- SVN client or svn: CollabNet Subversion Client v1.5.4 (for MicroSoft Windows) is a typical example of native SVN client that provides means to modify and work with a SVN repository on a number of platforms in particular MicroSoft Windows XP.

  http://www.collab.net/

- Windows shell extension: TortoiseSVN is a Windows shell extension, which gives feedback on the state of versioned items by adding overlays to the icons in the Windows Explorer. Repository commands can be executed from the enhanced context menu provided by Tortoise.

  http://tortoisesvn.tigris.org/

- Integrated client: client integrated within development environment are also possible and practical for programmers. Visual feedback of the state of versioned items is provided, and repository commands are added to the menus of the development environment. Examples of this approach are AnkhSVN, Unified SCC and VisualSVN for use with Microsoft Visual Studio, and Subclipse for use with Eclipse.

  http://subclipse.tigris.org/

4.5 Security

Preventing our tools from malicious usage and intrusion has always been taken into account in the deployment of the public and private wikis. In this section, we present some specific configurations of the EULER wiki that allows for limiting access to authorized users only, and limit the risk of intrusion.

Notice first that the mailing list server and its associated tools (see Section 2), the public and private project websites, and all tools provided by INRIA inherits from the security measures of INRIA. This rule reduces the risk for malicious usage of our tools. Typically, web requests are analyzed in real time for tracking possible attacks; robots analyze regularly the source code of web pages for tracking known security holes or automatic code injection (of known code); etc.

The most important means to prevent intrusion on the wiki and its malicious usage are the following:

- **Users authentication:** as explained in Section 4.1.1 how users can register to the EULER wiki, and how users are assigned specific rights;

- **Control read and edit rights:** as explained in Section 4.1.2, we are able to set appropriate read/edit access right for each page of the wiki. We have also explained in Section 4.1.7 how the wiki administrators can update the attributes of a particular page. By regularly checking and updating page attributes we are able to avoid intrusion of external bodies;

- **Protection of wiki source code:** by default PMWiki allows external bodies to access the wiki source (language used to edit a wiki page) of a wiki page by using the following command:

  `http://euler-fire-project.eu/index.php/<GROUP>/<PAGE>?action=source`

  where:
  - <GROUP> = the wiki group of the page
  - <PAGE> = the name of the wiki page

  To prevent malicious usage of such information, we have decided to disable this option. Combined with the read/edit right control, we ensure that only authorized users (those with edit right) can access the source code of a given page;

- **Avoid direct downloads:** to prevent external bodies accessing files stored on the wiki, and in particular in the private part, the directory in which files are stored cannot be accessed via HTML requests. This is done simply by adding a file named ".htaccess" and containing the following two lines in the root directory of the files repository:

  ```
  Order Deny,Allow
  Deny from all
  ```

  The Apache server is thus informed that this directory and all its sub-directories cannot be accessed via Html requests. All such requests are thus blocked and an error message is returned.

- **Approval of external links:** To prevent and discourage "link spamming" (including hidden links), we use a functionality of PMWiki that:
  - Forces to approve links to Internet sites before the creation of links to them on the wiki;
  - Allows limiting the number of unapproved links that may be added to a page (this value as been set to 10).

  All registered users with "edit" rights are allowed to approve an external link.

- A project web site;

- Tools for communication between members of a development team;

With these configurations we expect to limit drastically the risk of intrusions on the wiki and the risk of malicious usage of our tools. However, since expert users are always able to find security holes, we will continuously track possible holes and propose appropriate solutions.

4.6 Backups

INRIA hosts the project website (public and private parts), the project mailing lists and associated storage systems, and the project shared files repository. Also, the EULER public and private IT tools benefit from the INRIA backup policy explained below:

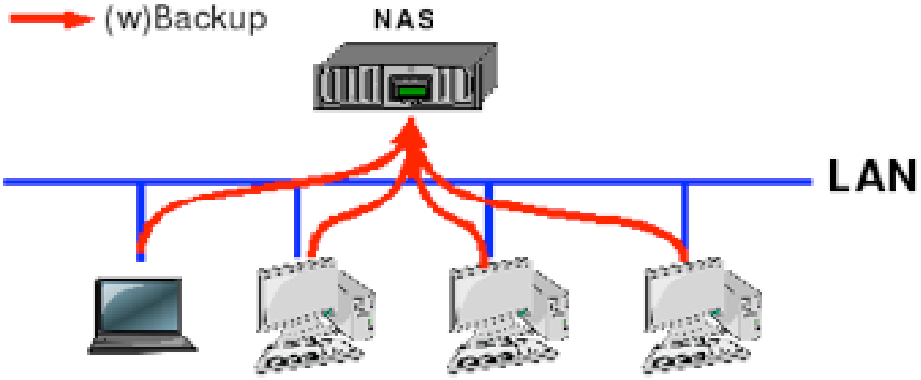
This section presents the user data backup service for workstations. It also explains how to ask for recovery of lost data. Notice that the Sympa server powering the EULER mailing lists, the EULER public/private web sites, and all tools provided by INRIA (GForge, transfert, etc.) are also backed up similarly, thus ensuring the reliability of the IT tools.

4.6.1 Description of the backup service

Only servers are automatically backed up (services like mail, ftp, http... data project team servers, and some experimental servers). User data on workstations are backed up in the following way:

- User's data must be copied on a backed up storage area (named SES space). This copy (or synchronization) is made via a synchronization tool named (w)Backup;
- Backup area (SES) is located on a Network Storage System named NAS server (Network Attached Storage) that provides its online backup system, named snapshot (Figure 4-20).

Figure 4-20: Principle of the backup system



4.6.2 Synchronization frequency

File synchronizations are scheduled by default on a daily basis (every night) by the operating system scheduling daemon of the workstations. According to the snapshot mechanism on the NAS server, it is not necessary to opt for the incremental option of (w)Backup command (-b option) because NAS gives access to all previous version through snapshots. It is better to increase the frequency of the synchronizations in coordination with the snapshots scheduled on the NAS.

4.6.3 Data storage period

SES space is backed up directly by the NAS (snapshot). The schedule of snapshots is the following:

- hourly snapshots occur at 8, 9, 10, 11, 12 am and 1, 2, 3, 4, 6, 8 pm;
- daily snapshot occurs at midnight;
- monthly snapshot on the first day of every month.

Retention policy (number of scheduled snapshots to keep) is as follow:

- The last 10 hourly snapshots;
- The last 30 daily snapshots;
- The last 3 monthly snapshots.

4.6.4 Data recovery

Users can restore lost files or directory. Snapshots are stored on the NAS server and available in read-only mode according to the file and directories permissions.

- Directories hourly.X contain files of hourly snapshots, from the most recent to oldest;
- Directories nightly.X contain files of daily snapshots, from the most recent to oldest;
- Directories monthly.X containfiles of monthly snapshots, from the most recent to oldest.

Example: On December 10 2010 at 10:42am, and according to snapshot policy described above:

- The directory hourly.0 contains snapshot of Dec 10 2010 at 10h00;
- The directory hourly.7 contains snapshot of Dec 9 2010 at 14h00;
- The directory nightly.0 contains snapshot of Dec 10 2010 at 00h00;
- The directory nightly.5 contains snapshot of Dec 5 2010 at 00h00;
- The directory monthly.1 contains snapshot of Oct 1 2010.

4.7 Audio conference tool

The EULER project uses audio conferences between physical plenary or interim meetings for decision-making and collaborative work.

The platform used for audio conferences, namely, the Alcatel-Lucent Bell Audio Conferencing system, is an essential communication service for the project. Using this tool, audio conferences can be flexibly set up on short notice. The lists of toll free numbers, toll numbers, and the international toll number for conference calls are available on the wiki.

By means of dedicated agenda and invitation sent on the appropriate mailing list e.g. euler-tmc for technical decisions, euler-wpl for workpackage related tasks, etc. audio conferences can be tailored to the targeted audience with the appropriate level of participation. For example, technical management committee conference calls are scheduled every 3 weeks (with some flexibility).

Audio conferences are systematically followed by thorough minutes posted on the project private wiki and announced on corresponding mailing list(s).

5. Conclusion

This document provides the description of the public and private tools that have been setup or designed for the EULER project. These tools include public and private mailing lists, a public website, a bi-monthly newsletter, a list of relevant events, a private wiki; a project working space, a set of templates, a shared files repository, etc. We also describe existing tools provided by ALB and INRIA that will be used for this project, such as the INRIA GForge collaborative development tool, a tool for exchanging large data files, a reliable backup system, and an audio conference tool.

Confronted to a plethora of possible and available tools together with their variants, the project has followed the approach of selecting these tools using the following criteria: simplicity, ease-of-use (and update) as well as the possibility left to tailor and customize these tools to better fit the needs of the project information production and exchanges. This is particularly the case for what concerns the interactive creation of content/input but also the security aspects, such as authentication, authorization, and accounting. Moreover, as the modification of the configuration of these tools can be easily performed, they can be (relatively) easily adapted to the new needs that the project will have to face during its lifetime.

Throughout this document, we have provided the base arguments for their selection. We also outlined the reasoning of why we consider (based on our experience and understanding of the project needs) that these tools are suitable and effective to interactively produce and share content, to process the various outcomes of the project (files, documents, etc), as well as to help in the dissemination of the project results. The statistics obtained by means of page hits and file downloads enables us to keep track of their actual usage both internally and externally. In particular, for what concerns the mailing lists and the Wiki, keeping track of such information enables us to determine if the proposed segmentation is the most suited one. These statistics will thus provide clear indication on whether our approach is adapted to the project needs, acknowledging also that both the frequency and rate of access depends on the content these tools enable to remotely access.

Hence, we recognize the need for keeping this document updated and commit to perform the required revisions when a change in configuration is performed on the usage of these IT tools. In this regard, Table 5-1 and Table 5-2 disclose the list of software tools used, as well as the contact person per tool. Reporting of these changes will also be recorded in the project periodic reports.

Table 5-1: List of software used

Software	Version	License	Comments
Sympa	5.4.3	GPLv2	http://www.sympa.org
WWSympa	5.4.3	GPLv2	Sympa's web interface
RSS	2.0	GPLv2	Powered by WWSympa See http://en.wikipedia.org/wiki/RSS
d_read	5.4.3	GPLv2	Powered by WWSympa
MHonArc	2.6.16	GPLv2	http://www.mhonarc.org
Htmldoc	1.8.27	GPLv2	http://www.htmldoc.org
Apache	2.2.3	Apache2.0	http://httpd.apache.org
PMWiki	2.2.4	GPLv3	http://www.pmwiki.org
MySQL	5.0.18	GPLv2	http://www.mysql.org

Table 5-2: Contact persons per tool

Tool	Contact person	Affiliation
Mailing lists (Sympa, MHonArc, RSS, d_read)	David Coudert	INRIA
Public Wiki	David Coudert	INRIA
Private Wiki	David Coudert	INRIA
Audio Conference Tool	Dimitri Papadimitriou	ALB
Newsletter	Davide Careglio	CAT
GForge	At least two persons from partners appointed for each project.	One of the contact person must be from INRIA

6. Acronyms

ALB: Alcatel-Lucent Bell, Antwerpen, Belgium

Apache2.0: Apache License, Version 2.0.
http://www.apache.org/licenses/LICENSE-2.0.txt

API: Application Programming Interface

CAT: Catalan Consortium

CSS: Cascading Style Sheet
http://www.w3.org/Style/CSS/

CVS: Concurrent Versions System
http://savannah.nongnu.org/projects/cvs

FAQ: Frequently Asked Questions

GPLv2: GNU General Public License Version 2.
http://www.gnu.org/licenses/old-licenses/gpl-2.0.txt

GPLv3: GNU General Public License Version 3.
http://www.gnu.org/licenses/gpl-3.0.txt

HTML: HyperText Markup Language
http://www.w3.org/TR/html401/

HTTP:	Hypertext Transfer Protocol
HTTPS:	Hypertext Transfer Protocol Secure
IE6, IE7, IE8:	Microsoft Internet Explorer version 6, 7, and 8
INRIA:	Institut National de Recherche en Informatique et en Automatique http://www.inria.fr
LAN:	Local Area Network
MathML:	Mathematical Markup Language http://www.w3.org/Math/
NAS:	Network Attached Storage
OpenSSL:	Open Source toolkit implementing the Secure Sockets Layer protocol http://www.openssl.org/
PC:	Project Coordinator (Dimitri Papadimitriou, ALB)
RSS:	Really Simple Syndication http://www.rssboard.org/
SMIL:	Synchronized Multimedia Integration Language http://www.w3.org/AudioVideo/
SSH:	Secure Shell
SVN:	Subversion http://svnbook.red-bean.com/
TA:	Technical Assistant (David Coudert, INRIA)
URL:	Uniform Resource Locator
W3C:	World Wide Web Consortium http://www.w3.org
WWSympa:	Sympa's Web Interface http://www.sympa.org/manual/web-interface
XHTML:	eXtensible HyperText Markup Language http://xhtml.com/en/xhtml/reference/
XML:	Extensible Markup Language http://www.w3.org/XML/