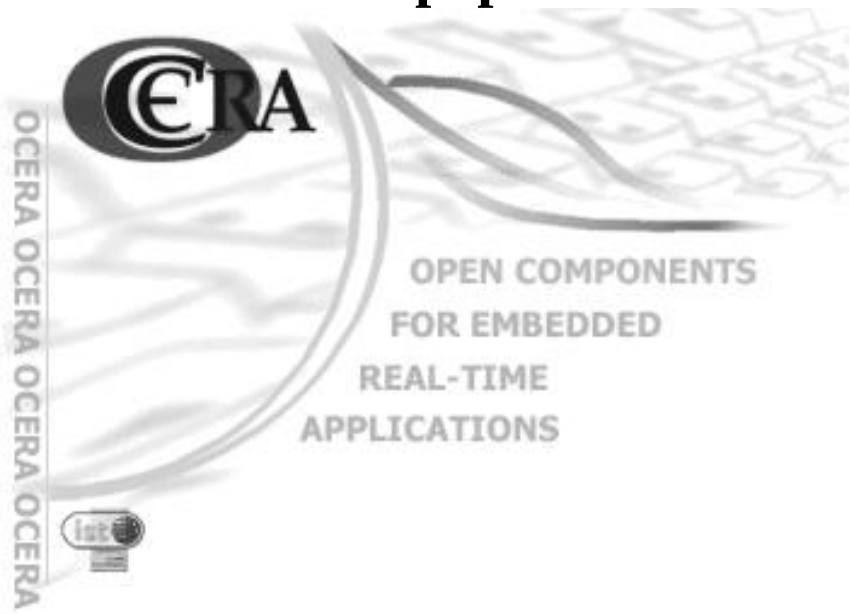
White paper



Dissemination activities

2nd Year Report

Dissemination activities. 2nd Year Report
by A. Crespo

Published March 2004
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Document Presentation

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CR	4	CEA/DRT/LIST/DTSI	CEA	FR
CR	5	Unicontrols	UC	CZ
CR	6	MNIS	MNIS	FR
CR	7	Visual Tools S.A.	VT	E

Document version

Release	Date	Reason of change
1_0	07/20/03	First release
2	04/03/04	Second release

Chapter 1. Introduction

In this document we try to show the set of activities carried to disseminate the results of the OCERA project.

The dissemination activities are listed considering the target audience of the project results. The information is provided attending the following aspects:

- Project deliverables
- Technical Publications
- OCERA in the Linux Community
- Dissemination indicators

Chapter 2. Technical Publications

List of the publications:

- IRIS: A new reclaiming algorithm for server-based real-time systems
  Luca Marzario, Giuseppe Lipari, Patricia Balbastre and Alfons Crespo
  Real Time Application Symposium, to be held in Toronto (Canada) in May 2004.
- Adaptive reservations in a Linux environment
  L. Abeni, T. Cucinotta, G. Lipari, L. Marzario, L. Palopoli
  Real Time Application Symposium, to be held in Toronto (Canada) in May 2004.
- Scheduling of Iterative Algorithms on FPGA with Pipelined Arithmetic Unit
  P. Sucha, Z. Pohl, Z. Hanzalek
  Real Time Application Symposium, to be held in Toronto (Canada) in May 2004.
- Scheduling with Start Time Related Deadlines
  P. Sucha, Z. Hanzalek
  IEEE Conference on Computer Aided Control Systems Design, Taipei, September 2-4, 2004.
- TLSF: a new dynamic memory allocator for real-time systems
  M. Masmano, I. Ripoll, A. Crespo
  Euromicro 2004, to be held in Catania (Italy) July 2004.
- Extending the capabilities of Real-Time Applications by combining MaRTE-OS and Linux
  M. Masmano, J. Real, I. Ripoll and A. Crespo
  9th International Conference on Reliable Software Technologies - Ada-Europe 2004
- Verifying Real-Time Properties of CAN Bus by Timed Automata
  J. Krakora, Z. Hanzalek
  World Automotive Congress, Barcelona, May 2004
- Analysis of OSEK/VDX Based Automotive Applications
  L. Waszniowski, Z. Hanzalek
  IFAC Symposium on Advance in Automotive Control, Salerno, Elsevier, April 2004.
- Timed Automata Approach for CAN Verification
  J. Krakora, Z. Hanzalek
  11th IFAC Symposium on Information Control Problems in Manufacturing, INCOM, Salvador, Elsevier, April 2004.
- Application Defined Scheduler Implementation in RTLinux
  J. Vidal, A. Crespo, I. Ripoll, P. Balbastre
  Fifth Real-Time Linux Workshop. Nov. 9-11, 2003,
  in Valencia, Spain
- Stand-Alone RTLinux
  V. Esteve, I. Ripoll, A. Crespo
  Fifth Real-Time Linux Workshop. Nov. 9-11, 2003,
  in Valencia, Spain
- Open Source Components for CAN Bus
  Pavel Pisa, Frantisek Vacek
  Fifth Real-Time Linux Workshop. Nov. 9-11, 2003,
  in Valencia, Spain
- Building Ethernet Drivers on RTLinux-GPL
  Sergio Pérez, Joan Vila, Ismael Ripoll
  Fifth Real-Time Linux Workshop. Nov. 9-11, 2003,

in Valencia, Spain

- Energy Saving Scheduling for Embedded Real-Time Linux Applications
  Claudio Scordino e Giuseppe Lipari
  Fifth Real-Time Linux Workshop. Nov. 9-11, 2003,
  in Valencia, Spain
- Preemption Patch Integration in the RTLinux Environment
  Carlo Andrea Orrico and Giuseppe Lipari
  Fifth Real-Time Linux Workshop. Nov. 9-11, 2003,
  in Valencia, Spain
- Doing Real-Time with a Simple Linux Kernel
  David Servat, Agnès Lanusse, Sébastien Gérard and François Terrier
  Fifth Real-Time Linux Workshop. Nov. 9-11, 2003,
  in Valencia, Spain
- Dynamic storage allocation for real-time embedded systems
  M. Masmano, I Ripoll, A. Crespo
  WIP of the Real-Time Systems Symposium. December 3-5 2003. Cancun. Mexico
- A new reclaiming algorithm for server-based real-time systems.
  L. Marzario, G. Lipari, P. Balbastre, P. Mendoza and A. Crespo
  WIP of the Real-Time Systems Symposium. December 3-5 2003. Cancun. Mexico
- OCERA: An Architecture based on Components for the Development of Real-time Embedded Applications.
  I. Ripoll, A. Crespo, G. Lipari, A. Matellanes
  International Workshop on Advanced Real-Time Operating System Services, July 2003, Porto (Portugal)
- V. Lorente, A. Espinosa, A. Terrasa, A. Garcia and A. Crespo
  Evaluating Reasons for Unexpected Results When Measuring Execution Time of Code
  3rd International Workshop on Worst Case Execution Time Analysis July 2003, Porto (Portugal)
- Resource Partitioning among Real-Time Applications
  Giuseppe Lipari and Enrico Bini,
  15th Euromicro Conference on Real-Time Systems. June 2003. Porto (Portugal)
- ORTE - open source implementation of Real-Time Publish-Subscribe protocol
  Petr Smolik, Zdenek Sebek, Zdenek Hanzalek
  2nd Intl. Workshop on Real-Time LANs in the Internet Age. July 2003, Porto (Portugal)
- Running Ada on Real-Time Linux
  M. Masmano, J. Real, I. Ripoll, A. Crespo.
  8th International Conference on Reliable Technologies Ada-Europe 2003. June 2003. Toulouse (France)
  This paper received the two prizes of the conference: *the best paper* and *the best presentation paper.*
- Measuring execution time of code by means of POSIX Tracing
  V. Lorente, A. Espinosa, A. Garcia-Fornes, A. Crespo
  Workshop on Real-time Programming. May 2003. Lakov (Poland)
- Embedded Real time application to control of an unstable system.
  P. García, A Crespo, P. Albertos
  Workshop on Real-time Programming. May 2003. Lakov (Poland)
- On the applications of hybrid control to CPU Reservations
  Luigi Palopoli, Luca Abeni, Giuseppe Lipari

Workshop on Hybrid system computation and control, Prague, April 2003

- Implementing Resource Reservations in Linux
  Luca Abeni and Giuseppe Lipari
  Fourth Real-Time Linux Workshop, December 2002. Boston (USA)
- Analysis of a Reservation-Based Feedback Scheduler
  Luca Abeni, Luigi Palopoli, Giuseppe Lipari
  Real-Time System Symposium, Austin (TX), December 2002
- Improving the Responsiveness of Linux Applications in RTAI
  Luca Marzario, Luca Abeni and Giuseppe Lipari
  Fourth Real-Time Linux Workshop, December 2002. Boston (USA)
- Task Decomposition Implementation in RT-Linux
  J. Vidal, A. Crespo, P. Balbastre
  15th IFAC World Congress on Automatic Control. July 2002. Barcelona (Spain)
- A Minimal RT-Linux embedded system for control applications
  J. Vidal, P. Mendoza, J. Vila, A. Crespo, S. Sáez
  15th IFAC World Congress on Automatic Control. July 2002. Barcelona (Spain)
- Schedulability analysis of window-constrained execution time tasks for real-time control
  P. Balbastre, I. Ripoll, A. Crespo14th Euromicro Conference on Real-Time Systems. June 2002. Vienna (Austria)
- Enhancing the Flexibility and the Quality of Service of Autonomous Mobile Robotic Applications
  H. Hassan, A. Crespo, J. Simó
  14th Euromicro Conference on Real-Time Systems. June 2002. Vienna (Austria)
- An Ada Binding to the IEEE 10031q (POSIX Tracing) Standard
  A. Espinosa, A. García Fornes, A. Crespo
  7th International Conference on Reliable Technologies Ada-Europe 2002. June 18-20. Vienna (Austria)

Events organised or supported by the Consortium

In order to promote the OCERA development in the **Real-time Linux Community**, OCERA Consortium organised the Fifth Edition of the Real-time Linux Workshop that was held in Valencia in November 2003.

2.1. Actions in the Real time Linux Community

Several activities has been carried out to increase the visibility of the OCERA project in the Real-Time Linux community. These activities are summarised in the following points:

- UPVLC servers host the main GPL RT-Linux distributions.
- A new domain www.rtlinux-gpl.org has been purchased and it will be used as reference in the RTLinux distributions. This domain is hosted in the UPVLC server being OCERA Consortium the supporter.
- Real-Time Linux-GPL is the major receptor of the OCERA components. Several OCERA POSIX components Signals, Timers, Message Queues, Barriers, TLSF (Dynamic memory allocator) have been included in the RTLinux-GPL distribution rtlinux-3.2pre1.
- MARTE OS has adopted TLSF as dynamic memory allocator and has also included in the last version some components as: RT_UDP. Additionally, the posting of MARTE OS as Linux module is being used by several MARTE OS users.
  - SHaRK operating system has included some OCERA components as the dynamic memory allocator.
  - RTAI is being porting some OCERA components. They have shown a high interest in the adaptation of more components.
  - Communications components are being ported to different Linux versions and are distributed as independent components.

    - LinCAN (CAN driver) is fully utilizable in Linux kernels from 2.2.x, 2.4.x and 2.6.x series and RT-Linux version 3.2 or OCERA RT-Linux enabled system is required for hard real-time use. A high number of cards are supported.

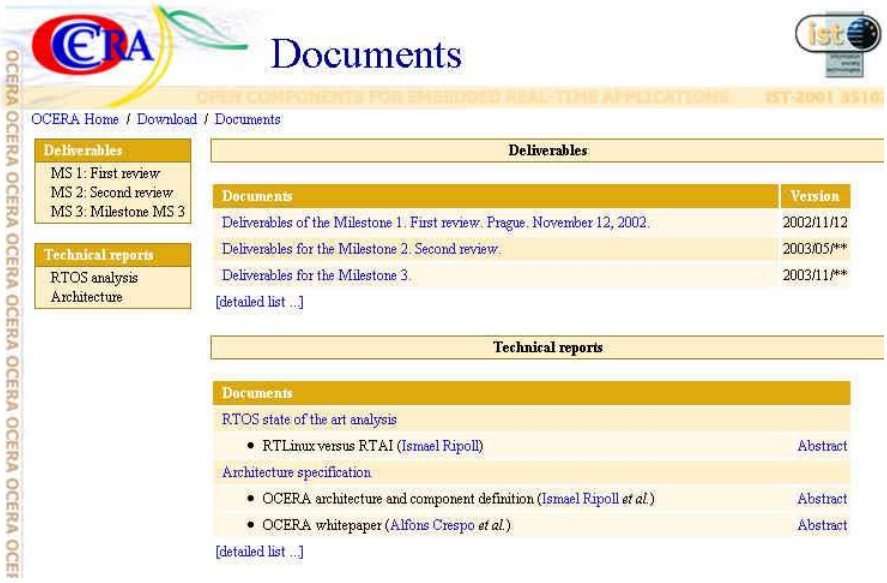
    - ORTE has been ported and tested on multiple platforms: Linux, RTLinux, Windows platforms (MinGW and MSCV), RTAI (RT-NET TCP/IP) and compatible with RTI NDDS. (RTLinux version requires RTL_UDP and RW-locks components)

2.2. OCERA web site dissemination

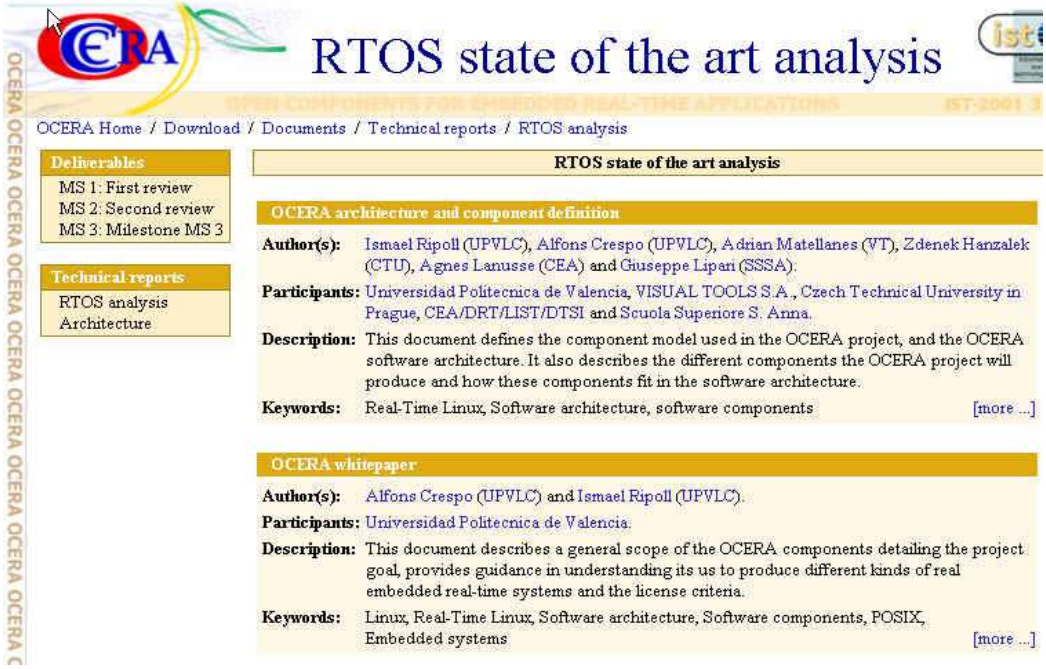
The OCERA web site aims at disseminating the goals, partners, deliverables and components of the project. From the beginning of the project, the web site was built to provide the project information. One of the first actions was to purchased the www.ocera.org domain.

From the main page can be accessed to the project and partners information and download the project deliverables and components.

The Document page contains the specific documents produced in the project and allows to access to the deliverables delivered since the project beginning.



Associated to each document a detailed information about the authors, participants, description and keywords can be found.



The developed components are available in the download area of the web. In this area a list and description of each component can be seen. All the developed components are available with the status of the component and examples of use.

Components

OCERA Home / Download / Components

Training
- POSIX Streams

Resource management
- Generic Scheduler patch
- Preemption+RTLinux patch
- RTLinux API on Linux
- QoS Manager
- Linux/CBS Scheduler

Scheduling
- Application Scheduler
- DID Memory Allocator
- POSIX CPU Clocks
- POSIX Barriers
- POSIX Message Queues
- POSIX Signals
- POSIX Timers
- POSIX Trace
- RTLinux/CBS Scheduler
- GNAT for RTLinux
- RTLinux Terminal
- RTLinux UDP/IP
- Stand-Alone RTLinux

Sample components

Components	Status	Version
POSIX Streams	Design	0.1

[detailed list ...]

Resource management components

Components	Status	Version
Generic Scheduler patch for Linux kernel	Beta	1.0-1
Preemption Compatibility patch for Linux and RTLinux	Alpha	1.0-1
RTLinux compatibility library for Linux	Alpha	1.0-1
Quality of Service Manager for Linux	Alpha	1.0-1
Constant Bandwith Server (CBS) for Linux	Beta	1.0-1

[detailed list ...]

Scheduling components

Components	Status	Version
Application-defined Scheduler	Stable	0.2-1

Communication components

OCERA Home / Download / Components / Communication

Training
- POSIX Streams

Resource management
- Generic Scheduler patch
- Preemption+RTLinux patch
- RTLinux API on Linux
- QoS Manager
- Linux/CBS Scheduler

Scheduling
- Application Scheduler
- DID Memory Allocator
- POSIX CPU Clocks
- POSIX Barriers
- POSIX Message Queues
- POSIX Signals
- POSIX Timers
- POSIX Trace
- RTLinux/CBS Scheduler
- GNAT for RTLinux
- RTLinux Terminal

Communication components

CANopen device

Description: CANopen device is the library based on VCA (Virtual CAN Api) and also CANopen master and CANopen slave application based on this library. Device functionality is configured by loading CANopen device specific EDS (Electronic Data Sheet). CANopen slave is linked with hardware module to cooperade with real device hardware.

Keywords: CANopen, master, slave, PDO, SDO, EDS, Object dictionary

Version: 0.91 **Status:** Beta [more ...]

CAN/CANopen monitor

Description: CAN monitor is a component used to monitor a CAN bus. It can log messages and send ones. If CANopen device EDS (Electronic Data Sheet) is available CanMonitor offers also SDO functionality using device object dictionary tree view. Package consists of three parts: canmond (canmaste/IP proxy), testclient (command line monitoring tool) and CanMonitor (Java GUI monitoring tool).

Keywords: CAN, CANopen, monitoring, GUI, Java

Version: 0.99 **Status:** Testing [more ...]

Chapter 3. Dissemination indicators

The OCERA web site was designed for dissemination purposes, so the success of this goal can be, at this moment, evaluated in terms of number of accesses to the different parts of the web. Of course, this is not a criteria for the evaluation of the project, it is only a indicator of the success or not of the dissemination process using the web. We concentrate the analysis in the period January-July of 2003 because ii is the period when the information was more mature.

Several indicators can be used to analyze the results:

- General statistics
- Number of visitors
- Geographical location for the visitors
- Hits par week
- Number of downloads and Most requested files
- OCERA in Goggle

3.1. General statistics

Several indicators can be used to analyze the results:

- General statistics
- Number of visitors
- Geographical location for the visitors
- Hits par week
- Number of downloads and Most requested files
- OCERA in Sourceforge
- OCERA in Goggle

3.2. General statistics

This is a summary of the web reporting.

Item	Value
Hits	321653
Total Data Transferred	6.64 gigabytes
Total Visiting Users	49813
Time Period	March 30, 2003, 01:31 AM to April 05, 2004, 07:03 AM
Average Hits per User	6.46

Average Users per Day	133.55
Average Data Transferred per Day	18.22 megabytes
Hits cached by Client	32092 (9.98%)
Report generated on	April 05, 2004 at 12:05 PM
Incomplete downloads/file requests	10793 (3.36%)
Log spans a period of	373 days
Total failed requests	13955 (4.34%)
Unique IP Addresses	12604
Average Data Transferred per User	139.68 kilobytes
Average Hits per Day	862.34
Average Data Transferred per Hit	21.63 kilobytes
Each user has visited approximately	3.95 times
Hits on Pages	109255
Hits on Files	179711
Hits on Images	18732

3.3. Number of visitors

The most relevant information is the number of visiting users (49.813 users) and the average hits par day (133.55). The number of unique IP addresses is lower (12.604 IP addresses) can be consequence of the use of a proxy.

With respect to the people who has revisited the web after the first visit, it is significant that the number of times that each user has visited the web is approximately 2.33.

3.4. Geographical location for the visitors

The following table shows the domain distribution of the users. Only domains with a number of hist greater than 100 has been listed.

Domain Name	Hits	Percentage
Commercial (.com)	91997	36.98%
Network (.net)	43698	17.57%
Spain (.es)	27959	11.24%
Educational (.edu)	16537	6.65%
France (.fr)	11871	4.77%
Italy (.it)	7081	2.85%
Germany (.de)	5188	2.09%
Poland (.pl)	4838	1.94%
Venezuela (.ve)	3874	1.56%
Czech Republic (.cz)	3031	1.22%

3.5. Number of downloads and Most requested files

OCERA deliverables and components can be downloaded from several different sources: OCERA web site (www.ocera.org), Sourceforge web site (www.sourceforge.org/ocera) and RTPortal (rtportal.disca.upv.es) where the UPVLC offers the unstable developments.

To detect which are the most interested documents downloaded, next table shows the list of the **Deliverables** sorted by the number of hits.

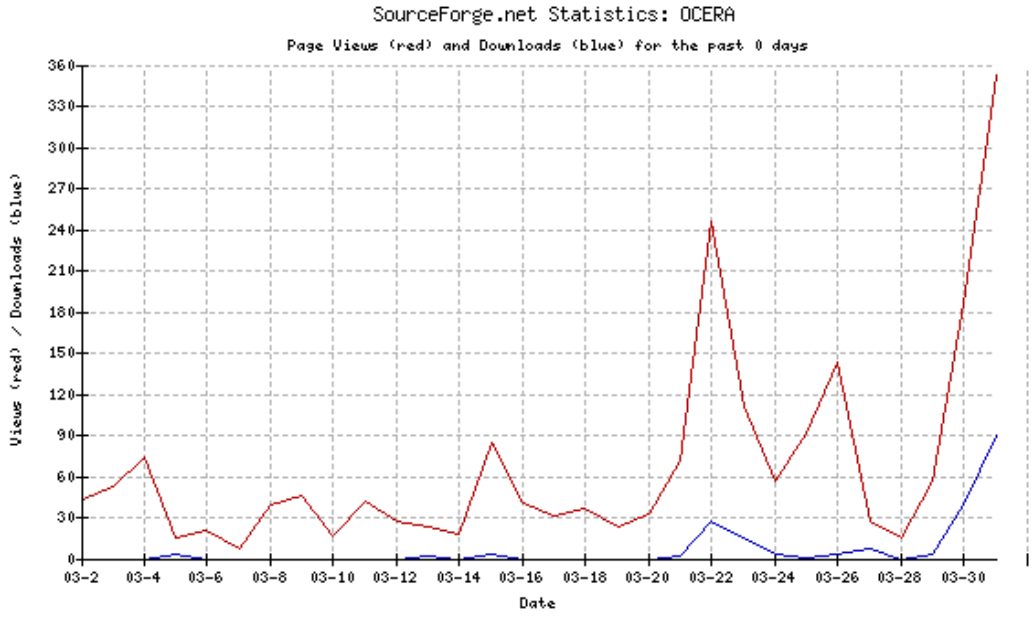
File Name	Hits
/archive/deliverables/ms1-month6/WP1/D1.1.pdf	455
/archive/deliverables/ms1-month6/WP2/D2.1.pdf	411
/archive/upvlc/public/reports/architecture/Arch_db.pdf	332
/archive/deliverables/ms1-month6/WP3/D3.2_Not_in_Open_RTOS/D3.2.pdf	325
/archive/deliverables/ms2-month12/WP5/D5.1.pdf	299
/archive/deliverables/ms2-month12/WP9/D9pc1.pdf	203
/archive/deliverables/ms1-month6/WP3/D3.1_Feedback/D3.1.pdf	201
/archive/deliverables/ms2-month12/WP7/D7.1.pdf	195
/archive/deliverables/ms1-month6/WP3/D3.3_New_Approaches/D3.3.pdf	192
/archive/deliverables/ms1-month6/WP11/D11.1/D11.1.pdf	161
/archive/deliverables/ms2-month12/WP9/D9rb1.pdf	155
/archive/deliverables/ms2-month12/WP4/D4.1.pdf	153
/archive/deliverables/ms2-month12/WP9/D9mm1.pdf	134
/archive/deliverables/ms2-month12/WP5/D5.2_rep.pdf	134
/archive/deliverables/ms1-month6/WP13/D13.1_1/D13.1_1.pdf	134
/archive/upvlc/public/reports/whitepaper/whitepaper.pdf	108
/archive/deliverables/ms1-month6/WP12/D12.1_Assesment/D12.1.pdf	105
/archive/deliverables/ms2-month12/WP10/D10.2.pdf	99
/archive/deliverables/ms2-month12/WP4/D4.2_rep.pdf	88
/archive/deliverables/ms2-month12/WP7/D7.2_rep.pdf	86
/archive/deliverables/ms2-month12/WP10/D10.1.pdf	71
/archive/deliverables/ms1-month6/WP11/D11.5/D11.5.pdf	67
/archive/upvlc/public/components/ptrace/ptrace-1.0/doc/rtl-pt1.0.pdf	66
/archive/deliverables/ms1-month6/WP11/D11.2/D11.2.pdf	56
/archive/deliverables/ms2-month12/WP6/D6.1.pdf	54
/archive/upvlc/public/components/ptrace/ptrace-1.0/doc/posixtrace.pdf	53
/archive/deliverables/ms2-month12/WP6/D6.2_rep.pdf	52
/archive/deliverables/ms2-month12/WP8/D8.1.pdf	50

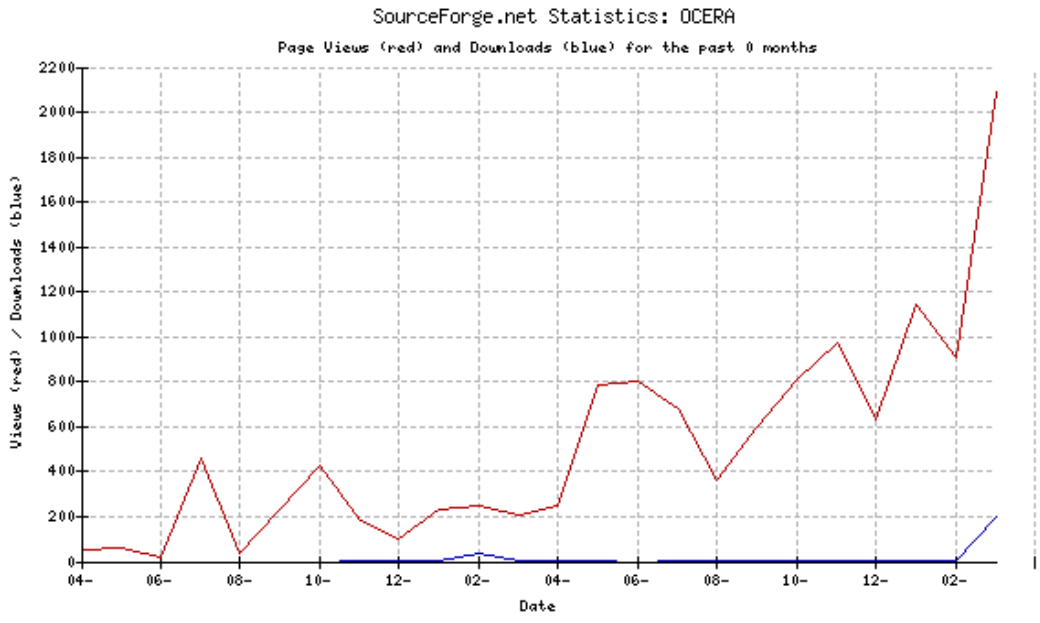
With respect to the components, next table shows the number of downloads of some components that are distributed in a independent way. Other components (as POSIX Timers, POSIX Signals, etc) are included in the new release of the GPL RT Linux.

File Name	Downloads
RTLGNAT 3.14	936
RTLGNAT 3.15	868
Stand-alone	626
POSIX Timers	612
POSIX Signals	611
Dynamic Allocator	245
Application scheduler	124

Sourceforge statistics

The page views and downloads for the last month are shown in the next graphic.





The same information from the beginning of the project is shown in the next figure.

3.6. OCERA in Google

One important indicator is the visibility of the project through the Google motor. Several search strings have been searched in Google in order to look the position to any OCERA reference. Next table shows some of the results of the search using general or specific string.

Search Pattern	Position	Number of references
Scheduling components real-time	1	268000
"Resource management" components real-time	1	105000
Fault tolerance components	1	262000
Communication components real-time	2	887000
POSIX Timers	1	24500
POSIX Signals	3	64200
Real-Time Components	20	3800000
Real-Time Components Embedded systems	14	494000
Memory allocator real-time	1	19200
RT-Ethernet	1	232
CanOpen real-time	18	4700
CBS scheduler	1	3500
Fault tolerance components	1	226000
Scheduling components real-time	1	268000

Date of this information: 05/04/2004