



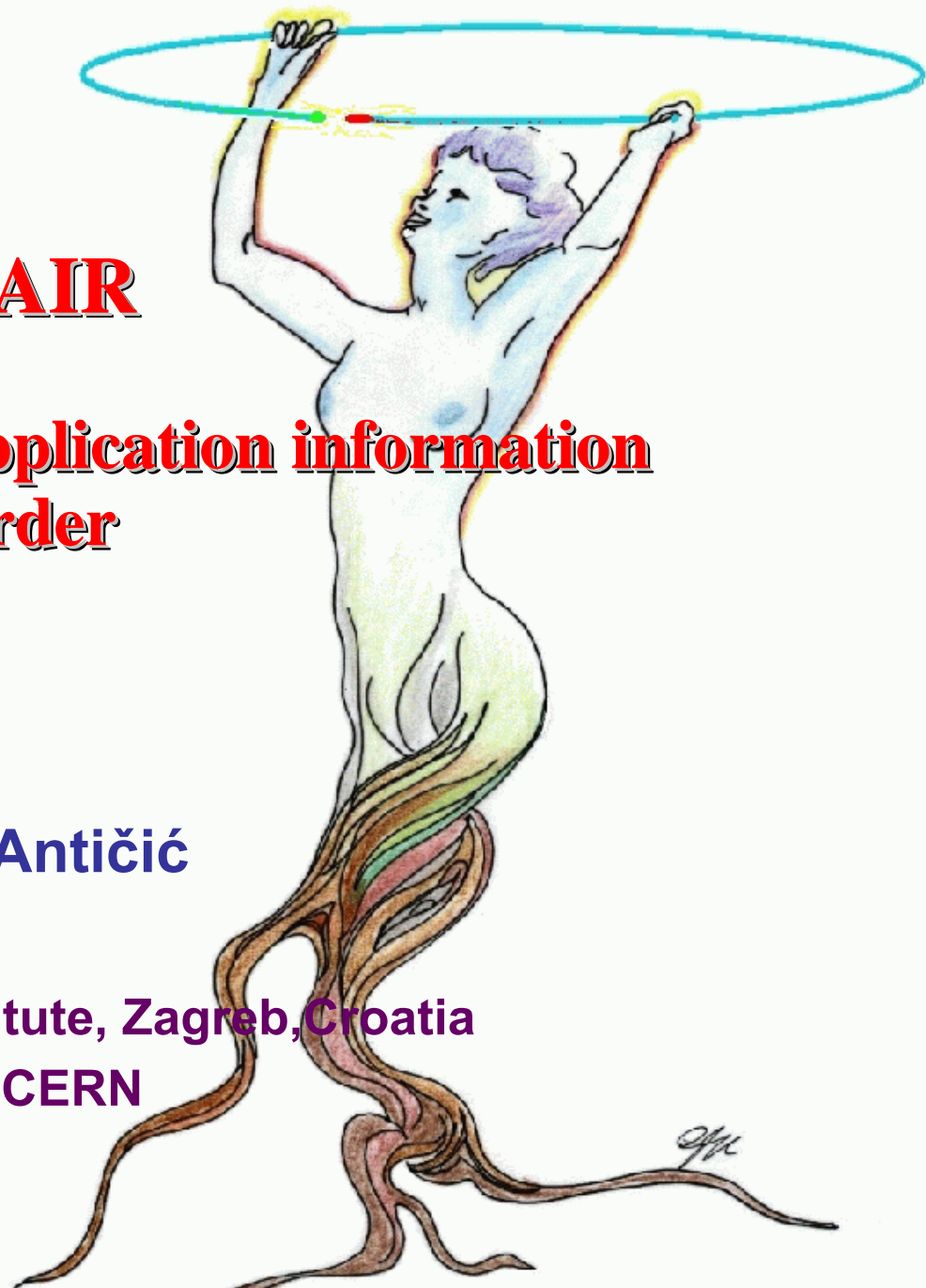
# **AFFAIR**

**a flexible fabric and application information recorder**

**Tome Antičić**

**Ruđer Bošković Institute, Zagreb, Croatia**

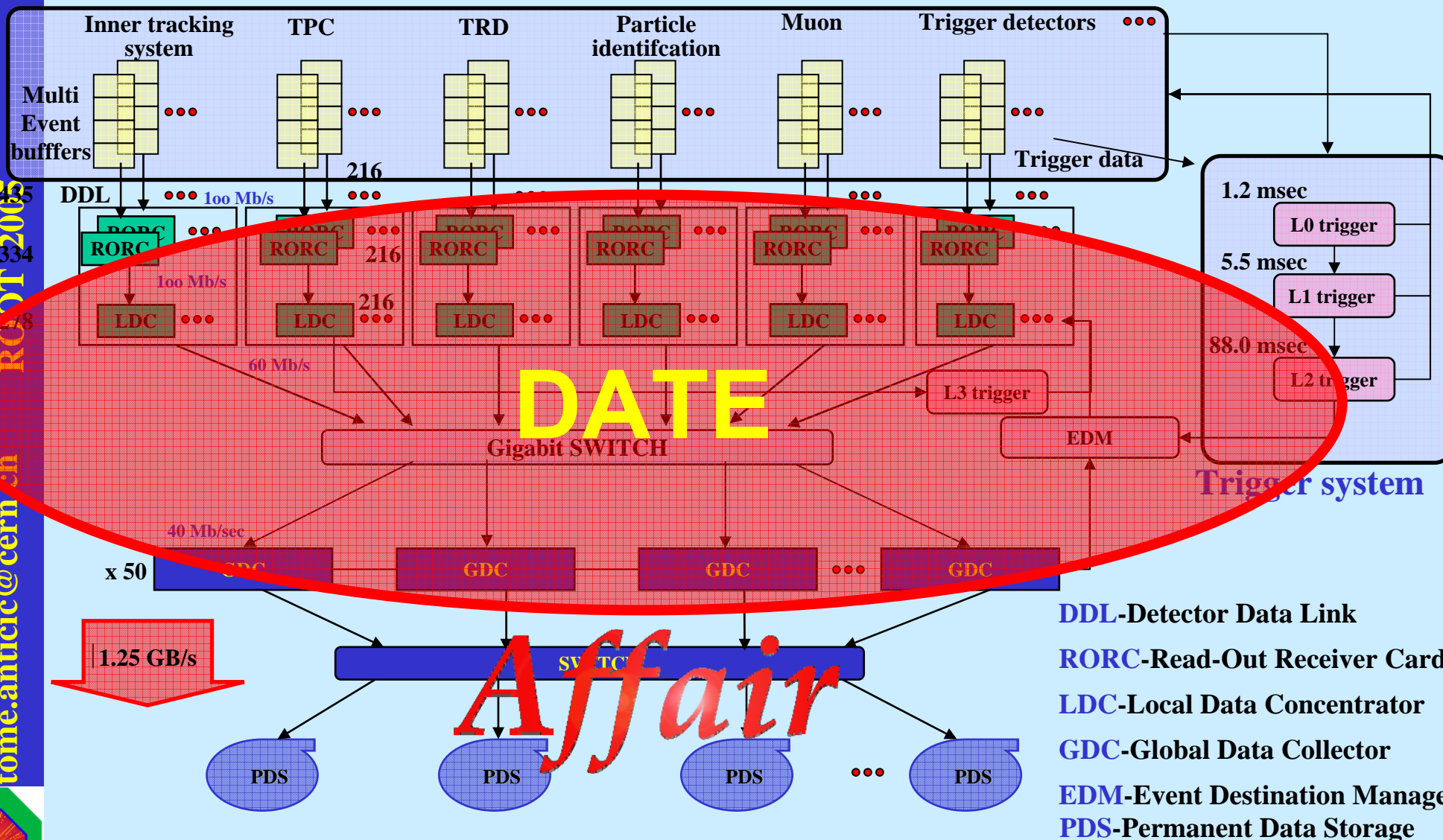
**ALICE, CERN**





# Why/What is AFFAIR?

AFFAIR – fabric monitoring  
x 435  
x 334  
x 178  
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# Affair

But, Affair is also able to run in stand alone mode (no DATE)





# Requirements

- Monitor system performance (bandwidth, CPU, disk usage, ...)
- Monitor DATE performance (LDC/GDC/DDL bandwidth, events recorded,...)
- Need down to 10 (or even less) sec updates
- Should be as “invisible” as possible
  - No growing (or better yet none) logfiles on monitored nodes
  - Not cpu intensive
  - Not network intensive
- Web access to processed, real time data in the form of graphs, histograms,..
- Scalable – should work equally well for 10 as for 1000 computers
- All monitored data should be permanently stored for offline analysis

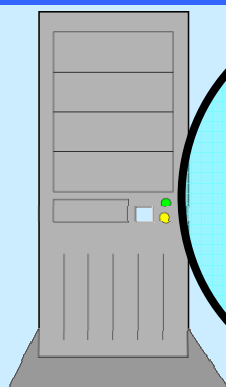
**Has to work, with no lost data, crashes, etc, no maintenance  
So some choices made, wich may not be optimal, but gets the job done**



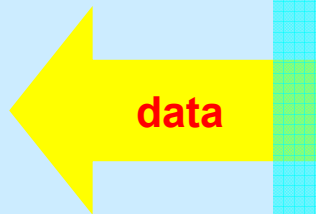


# AFFAIR structure

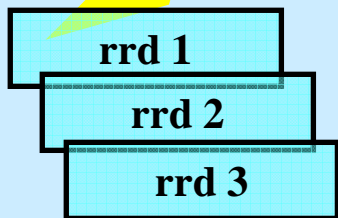
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**AFFAIR Monitor**



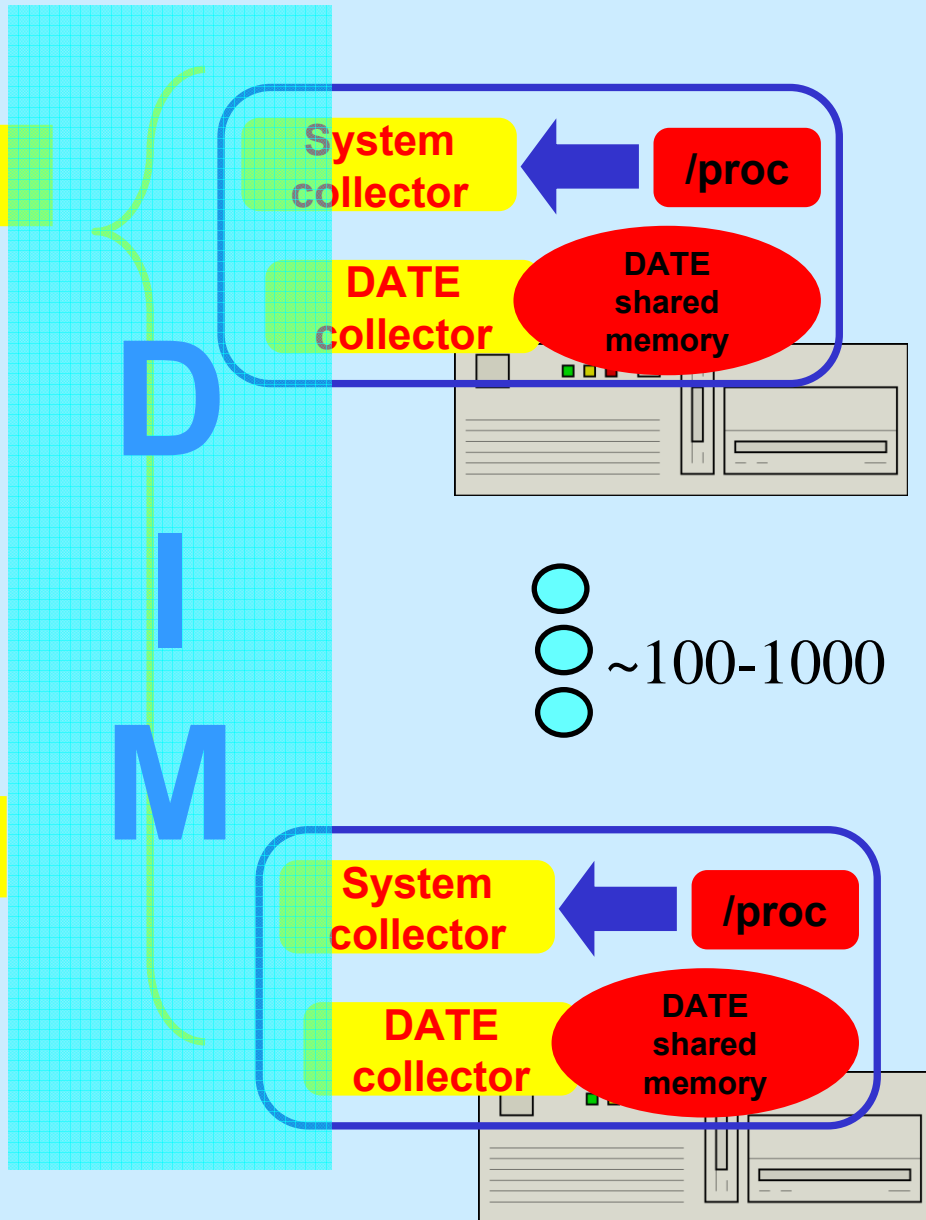
- Round robin excellent way to write/read file fast and easy, with no performance loss
- Works with fixed amount of data (fixed time depth), so unchanging size



Root program that reads files and creates plots



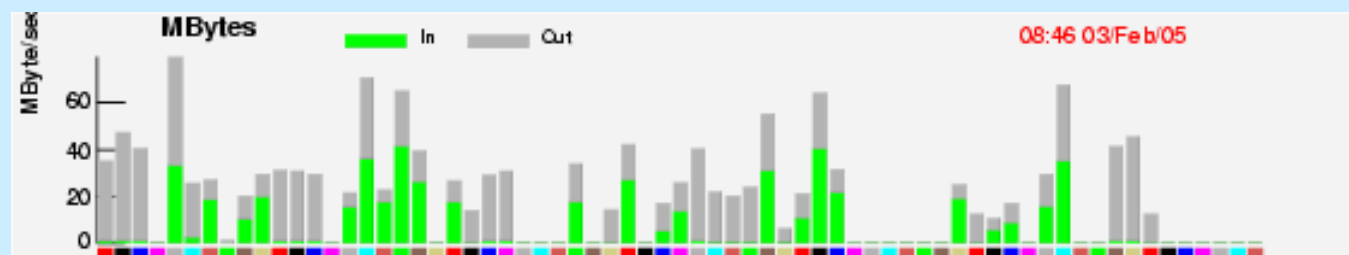
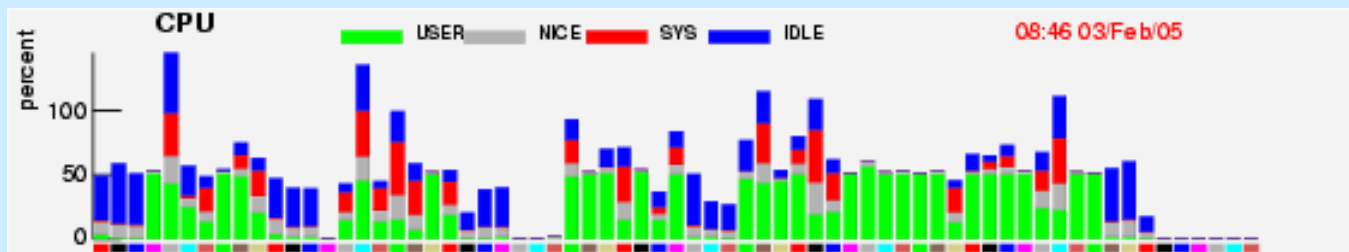
Web/apache/php





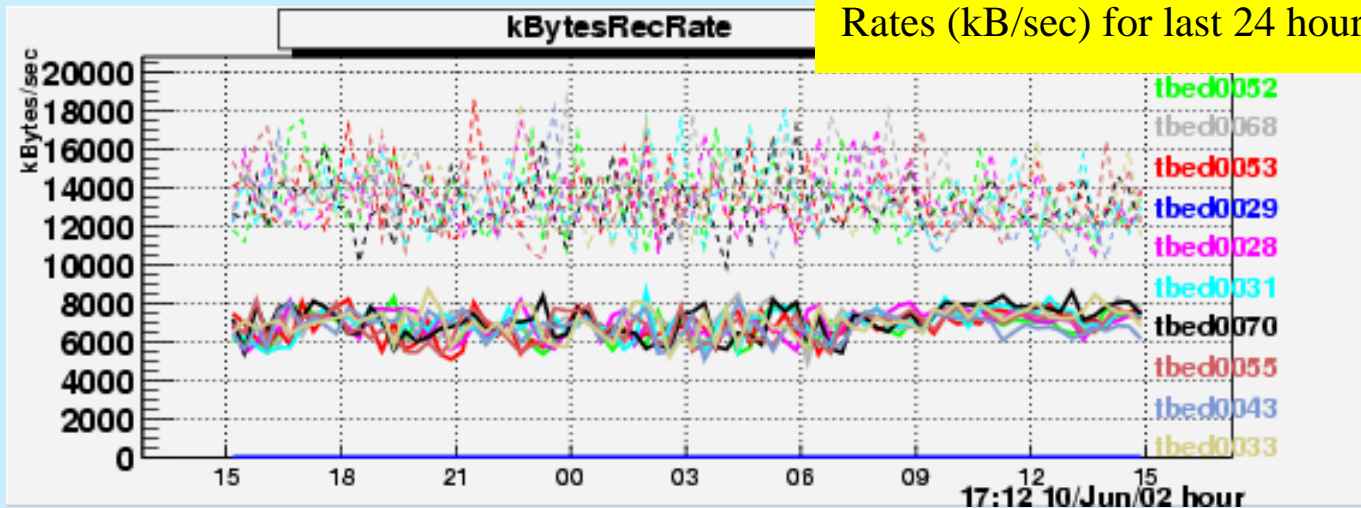
# Snapshot plots

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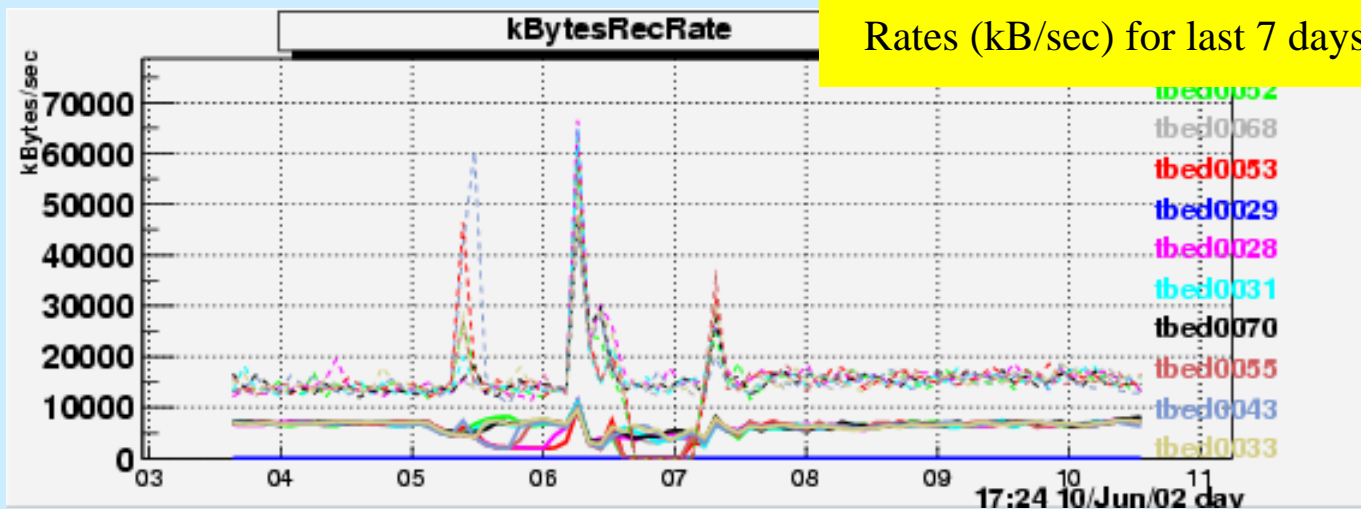
# Time dependent plots

Rates (kB/sec) for last 24 hours for some GDC nodes



- Full lines average
- Dashed lines max values

Rates (kB/sec) for last 7 days for some GDC nodes

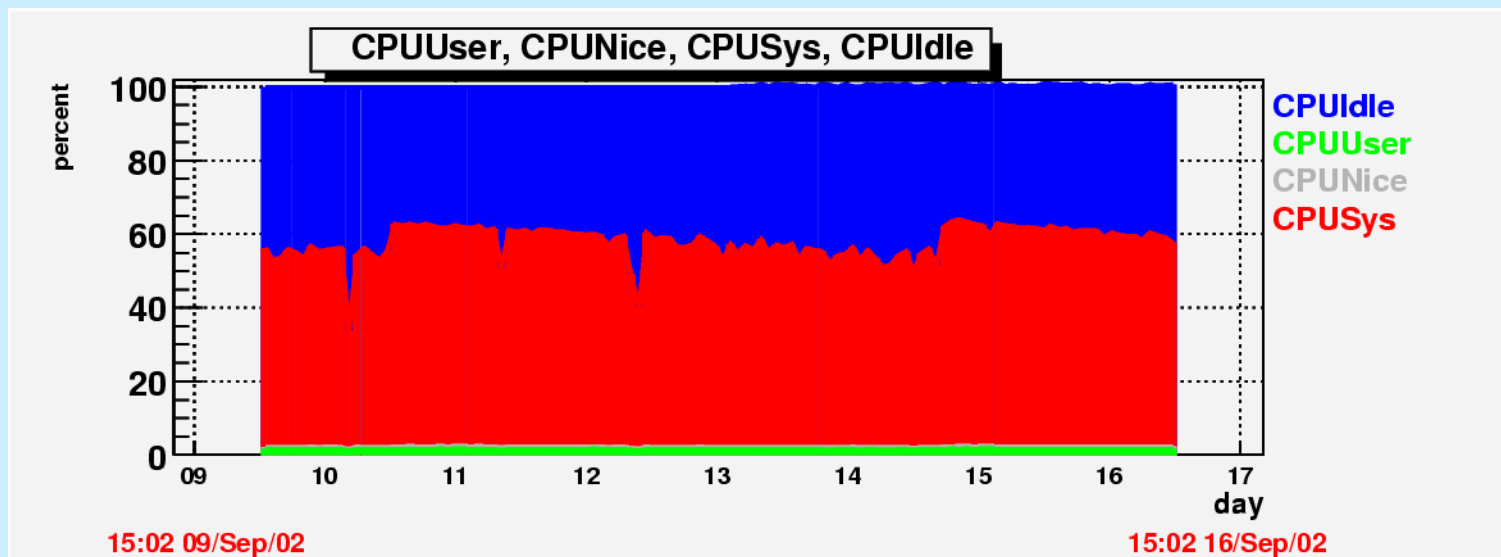
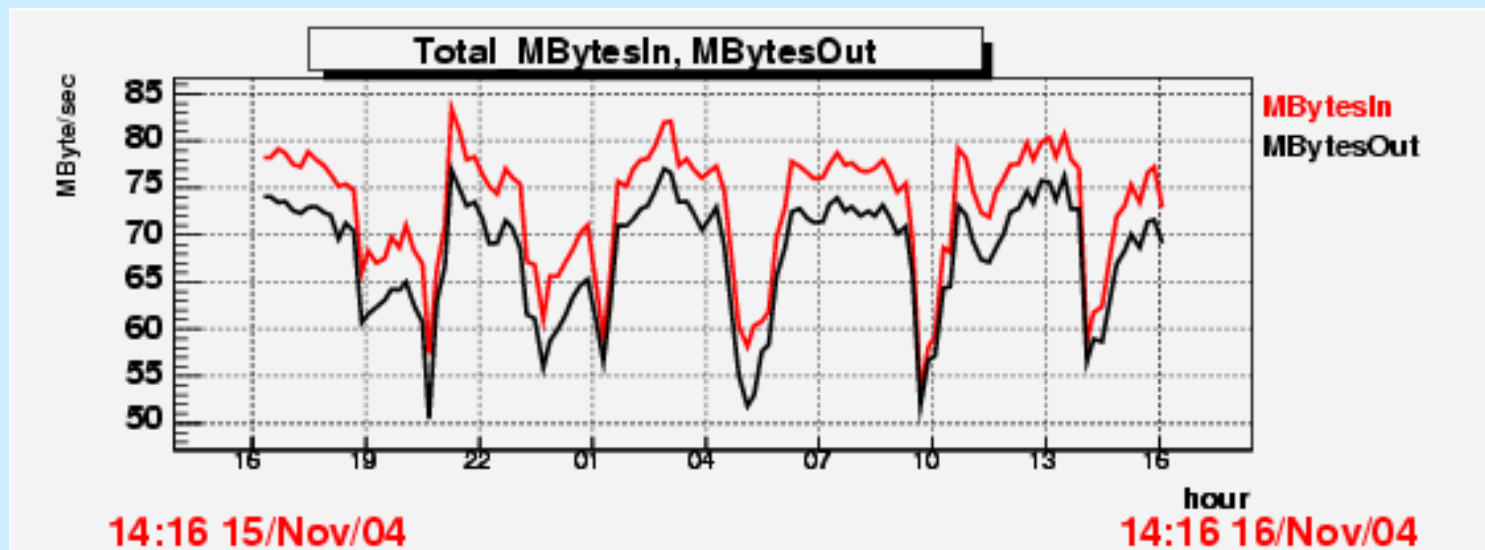


17:24 10/Jun/02 day



# Time dependent plots II

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# Web interface

- Web interface written using php/java script
  - Completely automatically generated
  - New variables, monitored sets automatically reflected in plots

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# Web interface II

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Performance Monitoring::GDC - Mozilla

File Edit View Go Bookmarks Tools Window Help

Back Forward Reload Stop http://pcald19/affair/types.php?type=GDC Search Print

Home Bookmarks Red Hat, Inc. Red Hat Network Support Shop Products Training

## GDC

**Refresh page**  
[Access/customize plots](#)  
**Description**

**DATE monitoring:**  
[LDC summary](#)  
[LDC nodes](#)  
[GDC summary](#)  
[GDC nodes](#)

**System monitoring of nodes running DATE:**  
[System summary](#)  
[System nodes](#)

**System monitoring of nodes with no DATE:**  
[System summary](#)  
[System nodes](#)

**Monitoring home**  
[Affair homepage](#)

Plot time period: **20min** hour 6hour day 7days month  
Refresh time: 30sec min 2min 5min 10min no refresh

**Total MBytesRecRate**

14:27 11/May/05 15:27 11/May/05

Last 20min Last hour (checked) Last 6 hours Last day  
Last 7 days Last 30 days download eps

**eventsRec**

14:27 11/May/05 15:27 11/May/05

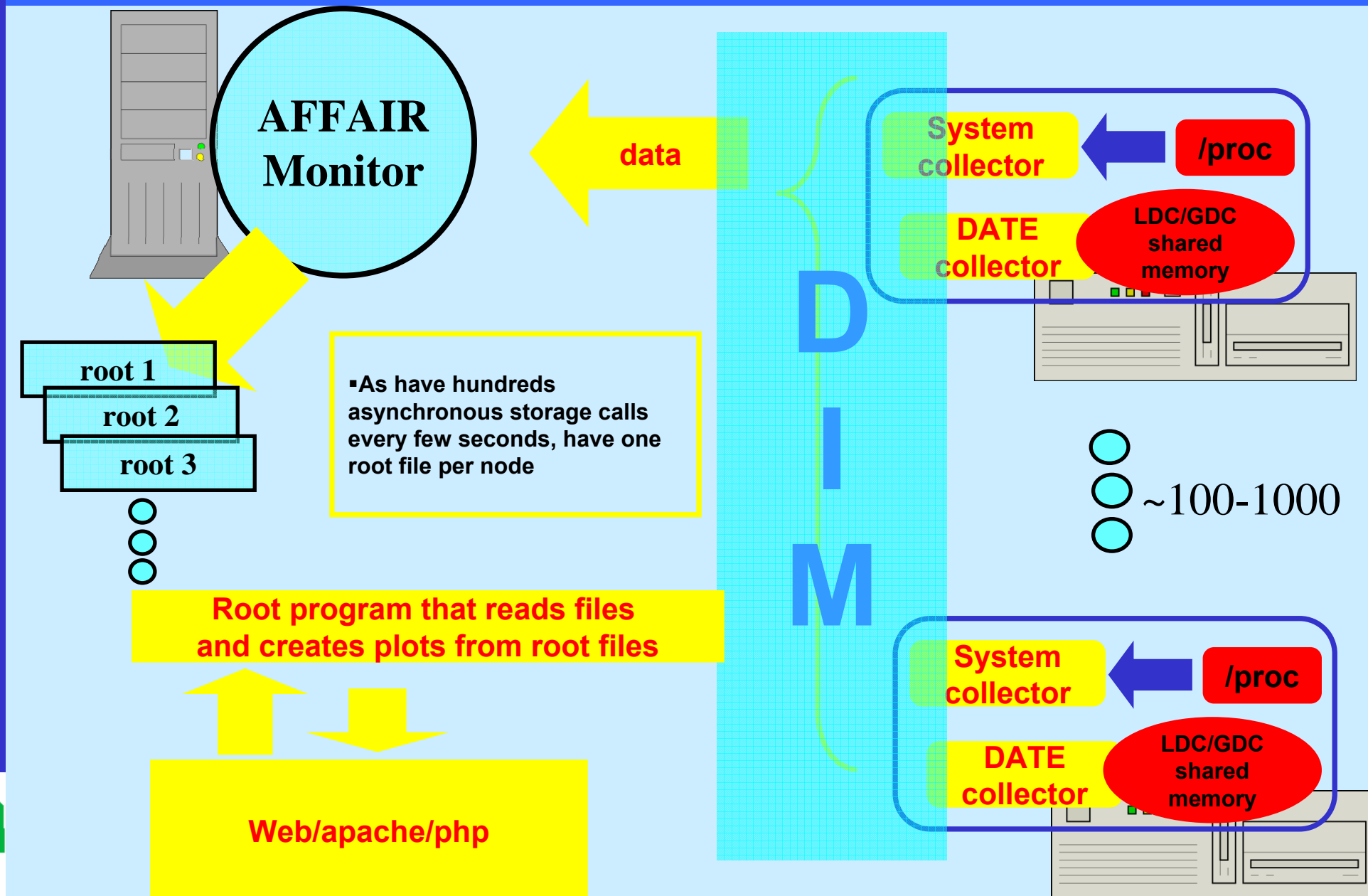
Last 20min Last hour (checked) Last 6 hours Last day  
Last 7 days Last 30 days download eps

LDC nodes	GDC nodes	DATE system nodes
tbed0001	tbed0001	tbed0001
tbed0002	tbed0002	tbed0002
tbed0003	tbed0003	tbed0003
tbed0004	tbed0004	tbed0004
tbed0005	tbed0005	tbed0005
tbed0006	tbed0006	tbed0006
tbed0007	tbed0007	tbed0007
tbed0008	tbed0008	tbed0008
tbed0009	tbed0009	tbed0009
tbed0010	tbed0010	tbed0010
tbed0011	tbed0011	tbed0011
tbed0012	tbed0012	tbed0012
tbed0013	tbed0013	tbed0013
tbed0014	tbed0014	tbed0014
tbed0015	tbed0015	tbed0015
tbed0016	tbed0016	tbed0016
tbed0017	tbed0017	tbed0017
tbed0018	tbed0018	tbed0018
tbed0019	tbed0019	tbed0019
tbed0020	tbed0020	tbed0020
tbed0021	tbed0021	tbed0021
tbed0022	tbed0022	tbed0022
tbed0023	tbed0023	tbed0023
tbed0024	tbed0024	tbed0024
tbed0025	tbed0025	tbed0025
tbed0026	tbed0026	tbed0026
tbed0027	tbed0027	tbed0027
tbed0028	tbed0028	tbed0028



# AFFAIR structure

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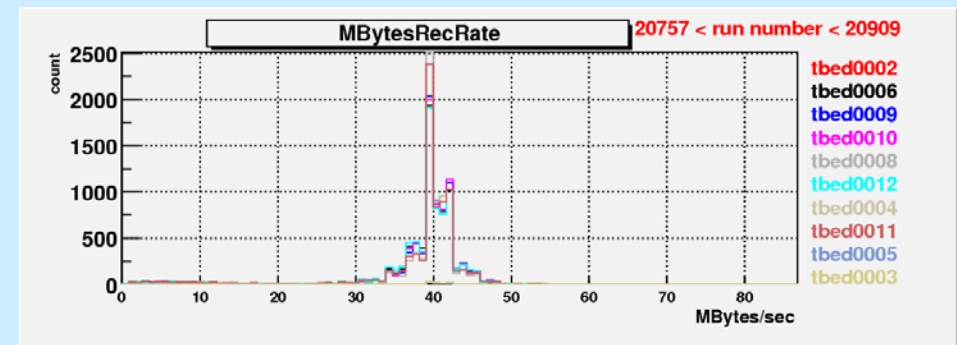
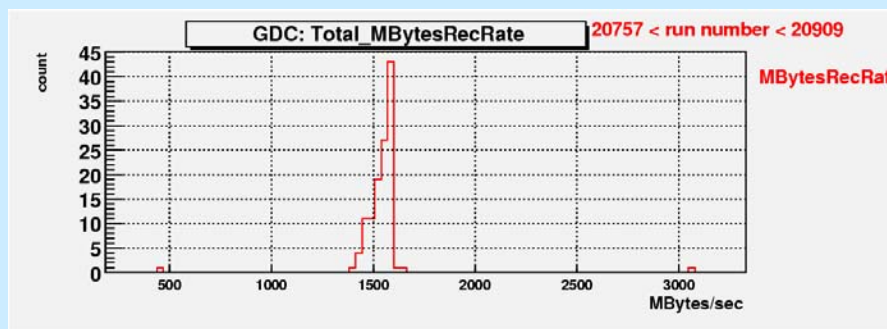


# Offline analysis

- Detailed histograms (aggregate and individual) can now also be created

The screenshot shows the 'Affair Performance Monitoring' web interface. The title is 'Offline analysis for tome'. It features a form for selecting time ranges and monitoring sets. The 'Start time' is set to 48 hours ago, and the 'End time' is 24 hours ago. The monitoring set is 'SYSMON'. A 'Create plots and root file for chosen period' button is visible. The interface also includes a search bar and navigation links.

The screenshot shows the ROOT Object Browser displaying a directory tree of histograms. The tree structure includes folders for 'computers', 'histograms', and 'LDC'. The 'histograms' folder is expanded, showing a list of histograms such as 'GDC\_MBytesIni0\_Each\_user;1', 'GDC\_MBytesIni1\_Each\_user;1', 'GDC\_MBytesIni2\_Each\_user;1', etc., up to 'GDC\_eventsRec8\_Each\_user;1'. The interface also shows the number of objects (46) and the canvas type (The Ntuple canvas).



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# ROOT GUI for configuration/operation

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AFFAIR control

Exit Affair Run Control

SYSMON | DATE | Monitor | messages

joshua1.irb.hr  
tbed001  
tbed002  
tbed003  
tbed004  
tbed005  
tbed006  
tbed021  
tbed022  
lxplus021  
lxplus022  
lxplus023  
lxplus024  
lxplus025  
lxplus026  
lxplus027  
lxplus028

Add entry: tbed001

Delete entry/ies

Edit file

Set AFFAIR env. variat

Copy this file and untar using

Install via ssh

Start via ssh

Stop via ssh

AFFAIR control

Exit Affair Control

performance plots | Monitor control | setup nodes: with DATE installed | setup nodes: no DATE installed | log

Change DIM\_DNS\_NODE: joshua1.irb.hr

Start monitoring for nodes with no DATE

Start monitoring for nodes with DATE installed

Stop monitoring

monitor with web interface processes  
 monitor with no web interface processes

monitor with offline storage  
 monitor with no offline storage

# ROOT GUI for monitoring



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AFFAIR control

performance plots | Monitor | DATE | SYSMON | messages

Change time period: hour

Change monitored set: SYSMON

Select plot: SYSMON\_memFree0\_Each

Select node: aggregate plots

Show performance Stop

11:26 25/Nov/04

AFFAIR control

performance plots | Monitor | DATE | SYSMON | messages

Change time period: 6hour

Change monitored set: SYSMON

Select plot: SYSMON\_CPU\_Each

Select node: igrane.irb.hr

Show performance Stop Print

09:22 25/Nov/04 15:22 25/Nov/04



# Graph configuration

- All graphs created using one configuration file
  - Completely defines units/ labels/ if graphs aggregate / if graphs superimposed
  - Thus no code intervention needed to create the plots
    - New monitored variables can be added and configured easily

emac@pcaldz02.cern.ch

Buffers Files Tools Edit Search Mule Help

Ulaz  
Izlaz

Pocetni datum: 01.01.2005  
Završni datum: 27.09.2005

za dobavljača: [dropdown]  
Izabrani dokument: 1  
za ducan: jedinica

sortiraj

	GlavnaKnjigaTe	Vrsta	Broj dokume	Datum	Dobavljac	Dob.uplatnic	opis	Uplatnic	DucanBroj
▶	preneseno	Utrzak blagajne	103	06.05.2004				206	3
	preneseno	Utrzak blagajne	95	25.04.2004				190	3
	preneseno	Utrzak blagajne	96	26.04.2004				192	3
	preneseno	Utrzak blagajne	97	27.04.2004				193	3
	preneseno	Utrzak blagajne	98	29.04.2004				196	3
	preneseno	Utrzak blagajne	99	30.04.2004				198	3
	preneseno	Utrzak blagajne	100	02.05.2004				200	3

	sifra	naziv	Kolicin	Nabavna	Rabat	Jedinic	Prodajna	Total	PDV	PDV Ra	Na
▶	13360	Z.MAJICA UTEX K.R.I D	1		0,00%	KOM	69,00	69,00	12,44	0,22	
	13484	Ž.MAJICA SLAVICA	1		0,00%	KOM	109,00	109,00	19,66	0,22	
	13688	z.top smec	1		0,00%	kom	95,00	95,00	17,13	0,22	
	13710	HLACE LANA I LAN MARIN	2		0,00%	KOM	155,00	310,00	55,90	0,22	
	13716	DJ.MAJA SNIZENJE	4		0,00%	KOM	19,00	76,00	13,70	0,22	
	13727	Z.MAJA DORA ZVONCOM	2		0,00%	KOM	34,00	68,00	12,26	0,22	
	22331	M.MAJICA DOMINIK KR.R.	2		0,00%	KOM	85,00	170,00	30,66	0,22	

--:-- GDC.conf

GUI in

But no

Ubaci nove podatke    Printaj izabrani dokument    prebaci u glavnu knjigu    Printaj uplatnicu    Printaj isplaticu

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# Conclusion

- **AFFAIR successfully monitors hundreds of nodes**
  - Field tested in **ALICE Data Challenges**
- **ROOT huge part of it**
- **It is a work in progress:**
  - Much more detailed offline analysis
  - Add feature to see performance data/plots on mobiles/palm pilots
  - A lot more work on the GUI
  - Add high/low warnings
  - ...

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<http://www.cern.ch/affair>

## Affair

A flexible fabric and application information recorder

- [ChangeLog](#)
- [Roadmap to do list](#)
- [Screenshots](#)
- [Manual in pdf](#)
- [The Team](#)
- [Architecture](#)
- [Download](#)

Affair is a package which monitors the ALICE DAQ system and software (DATE) performance. It is also used as a general performance gathering and analysis tool of computer clusters.

The latest stable version of AFFAIR is 2.4.1

Currently Affair is being used tested at:

- [Cluster](#) of the experimental particle physics group at the Rudjer Boskovic Institute
- [Alice Data Challenge reference system](#) (only available from CERN sites)

**ALICE experiment**

- [DATE site](#)
- [Group home](#)

**CPU** (Legend: LIB, CR, INDC, SYS, IDLE) 08:46:03 Feb 05

Maintained by [Tome Anticic](#), Last update 30/03/2005