GERDA Slow Control Status

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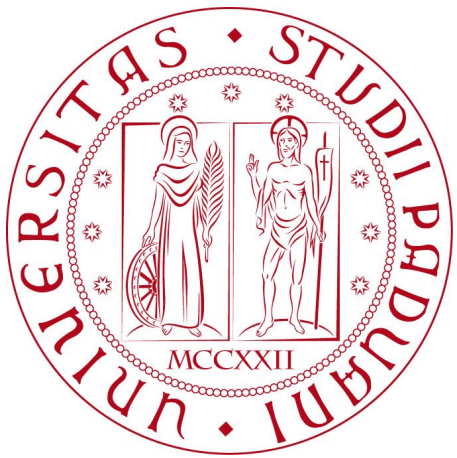
June 9, 2008



Talk Outline

The Alarm Manager

The VME Crate Interface

Windows/Linux Interface

Future Plans

Conclusions

Alarm Manager Specifications

A new Alarm Manager has been designed and developed for the OPERA spectrometer slow control. (Now in testing phase)

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- Alarm Messages delivery to all on-call users and sub-component experts
- Communicate via SMS and EMAIL
- Agile system configuration and alarm management (WEB interface).
- Security: only authorized users can interact with the system

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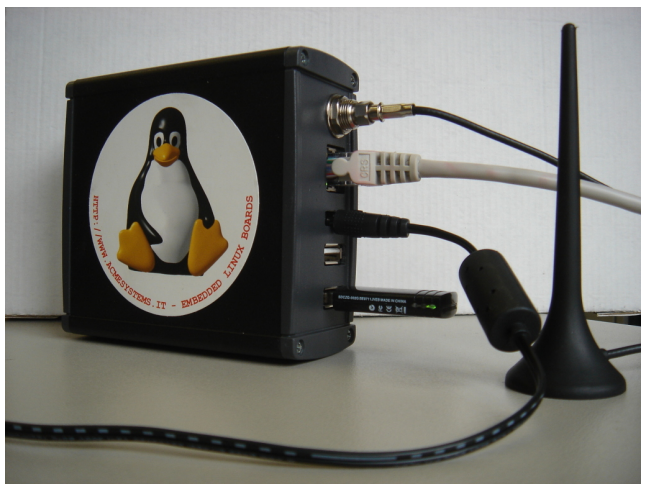
- Security: only authorized users can interact with the system

Hardware

- Axis ETRAX LX100 CPU (32 bit, RISC)
- 32 MB RAM, 8 MB FLASH ROM
- Linux Kernel 2.6.19
- I/O : Ethernet 10/100 Mb, 2 1.1. USB port
  48 I/O lines, I2C BUS, SPI,
  serial and parallel port
  Telit GM862-QUAD GSM Modem



Alarm System Workflow

- Alarm Generation in the Underground Labs (Hall A)
- Alarm Delivery in the External Labs

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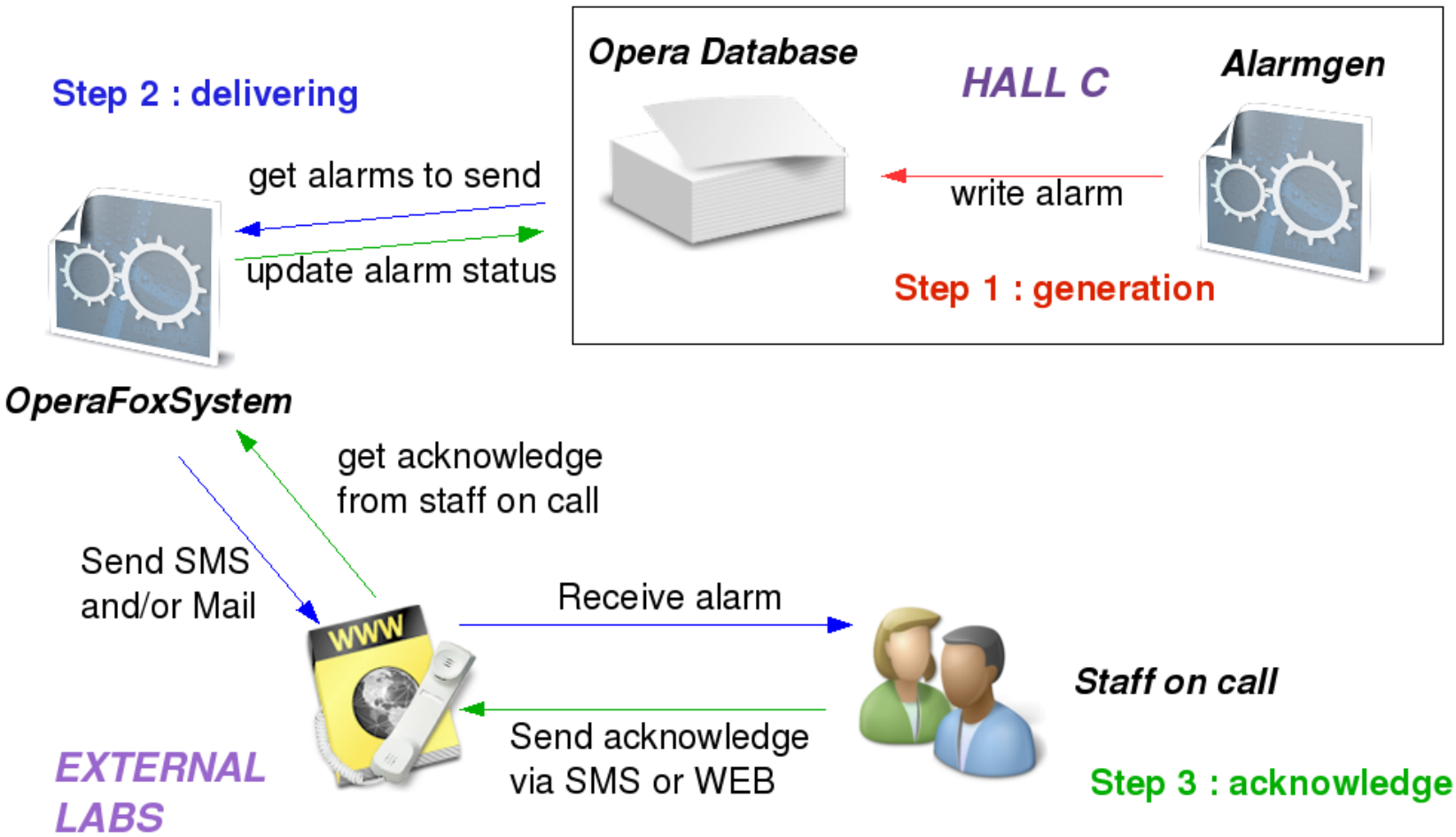

Alarm Administration

Web Interface for

- view/acknowledge slow control alarms

27	Started	retry	2008-05-23 11:46:45	2008-06-06 14:34:46.097987	Info	1000	ACK THIS!
28	Stopped	retry	2008-05-23 11:46:55	2008-06-06 14:35:42.937009	Info	1000	ACK THIS!
372	Started	alive	2008-06-06 14:48:22	2008-06-06 14:48:22	Info	1000	TO MANAGE!
373	nodeid = 32 AND tid = 2 did not get data from DataBase last 5min	alive	2008-06-06 14:47:42	2008-06-06 14:47:42	Warning	4001	TO MANAGE!
374	nodeid = 33 AND tid = 1 did not get data from DataBase last 5min	alive	2008-06-06 14:47:42	2008-06-06 14:47:42	Warning	4160	TO MANAGE!
375	nodeid = 33 AND tid = 2 did not get data from DataBase last 5min	alive	2008-06-06 14:47:42	2008-06-06 14:47:42	Warning	4161	TO MANAGE!
376	nodeid = 34 AND tid = 1 did not get data from DataBase last 5min	alive	2008-06-06 14:47:42	2008-06-06 14:47:42	Warning	4320	TO MANAGE!
377	nodeid = 34 AND tid = 2 did not get data from DataBase last 5min	alive	2008-06-06 14:47:42	2008-06-06 14:47:42	Warning	4321	TO MANAGE!
378	nodeid = 32 AND tid = 2 did not get data from DataBase last 5min	alive	2008-06-06 14:48:22	2008-06-06 14:48:22	Warning	4001	TO MANAGE!
379	nodeid = 33 AND tid = 1 did not get data from DataBase last 5min	alive	2008-06-06 14:48:22	2008-06-06 14:48:22	Warning	4160	TO MANAGE!
380	nodeid = 33 AND tid = 2 did not get data from DataBase last 5min	alive	2008-06-06 14:48:22	2008-06-06 14:48:22	Warning	4161	TO MANAGE!
381	nodeid = 34 AND tid = 1 did not get data from DataBase last 5min	alive	2008-06-06 14:48:22	2008-06-06 14:48:22	Warning	4320	TO MANAGE!
382	nodeid = 34 AND tid = 2 did not get data from DataBase last 5min	alive	2008-06-06 14:48:22	2008-06-06 14:48:22	Warning	4321	TO MANAGE!
383	Stopped	alive	2008-06-06 14:48:35	2008-06-06 14:48:35	Info	1000	TO MANAGE!
384	Started	OK	2008-06-06 14:55:47	2008-06-06 14:55:47	Info	1000	See ack history
385	nodeid = 32 AND tid = 2 did not get data from DataBase last 5min	OK	2008-06-06 14:55:07	2008-06-06 14:55:07	Warning	4001	See ack history
386	nodeid = 33 AND tid = 1 did not get data from DataBase last 5min	OK	2008-06-06 14:55:07	2008-06-06 14:55:07	Warning	4160	See ack history

User Administration

Web Interface for

- administer the on-call users and settings

OPERA Fox Alarm System

Please, wait...

Loading Staff on call list...

List loaded

ID	Name	Phone	Email	Sms enable	Mail enable	Able to ack	Alarm type managed	Minimum alarm level	Web access level	Delete this profile	Update this profile
1	OPERA Alarm Administrator	3381032818	dario.zinato@pd.infn.it	YES	YES	YES	255	FATAL	admin	Delete this!	Modify this!
2	Staff on call	-	dario.zinato@gmail.com	NO	YES	YES	255	ERROR	staff	Delete this!	Modify this!
3	Simple user	-	zinatoda@dei.unipd.it	NO	YES	NO	255	INFO	user	Delete this!	Modify this!
4	Alberto Garfagnini	3406177876	alberto.garfagnini@pd.infn.it	YES	YES	YES	255	INFO	staff	Delete this!	Modify this!

Clean

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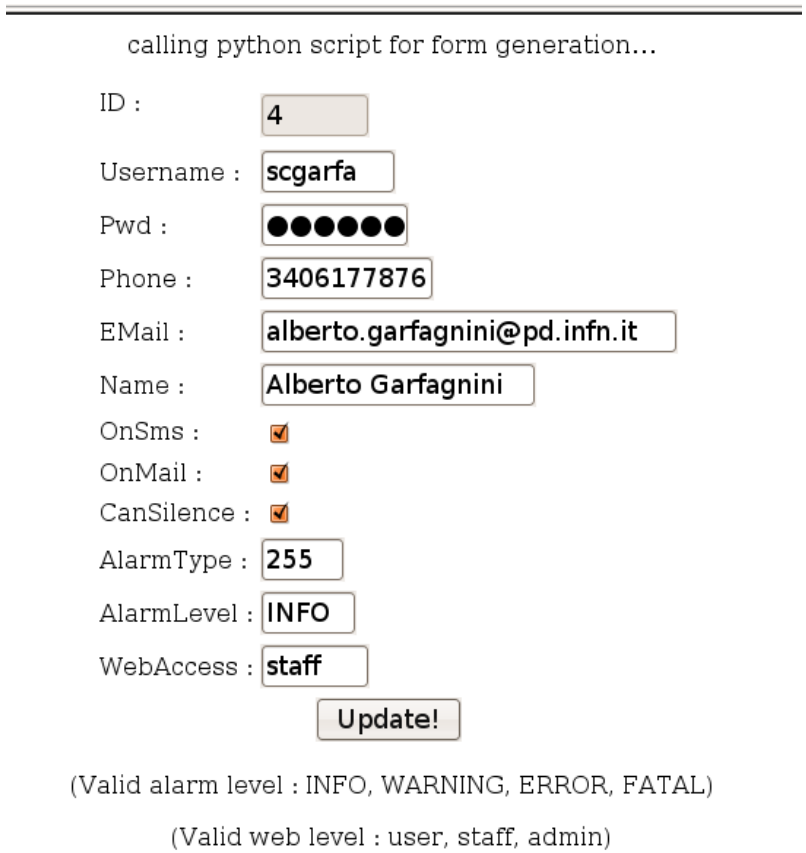

GERDA Crates Slow Control Integration

- GERDA subcomponents will use several Crates (VME/CAMAC/NIM).
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System requirements

- Web Interface for manual Crate Monitoring/Control
- CAN Client for automatic Crate Monitoring

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System requirements

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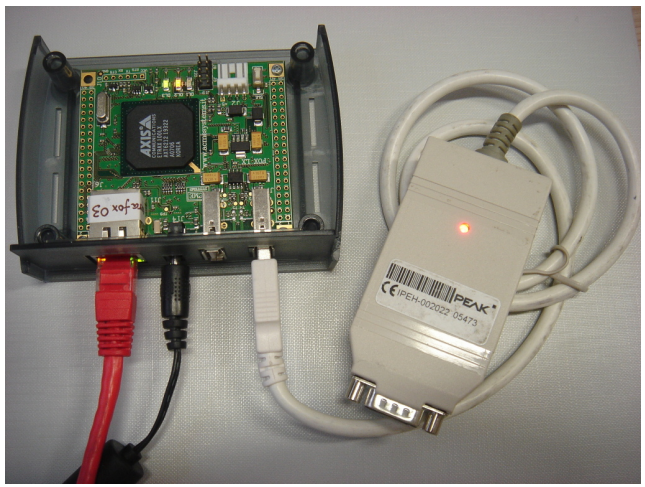
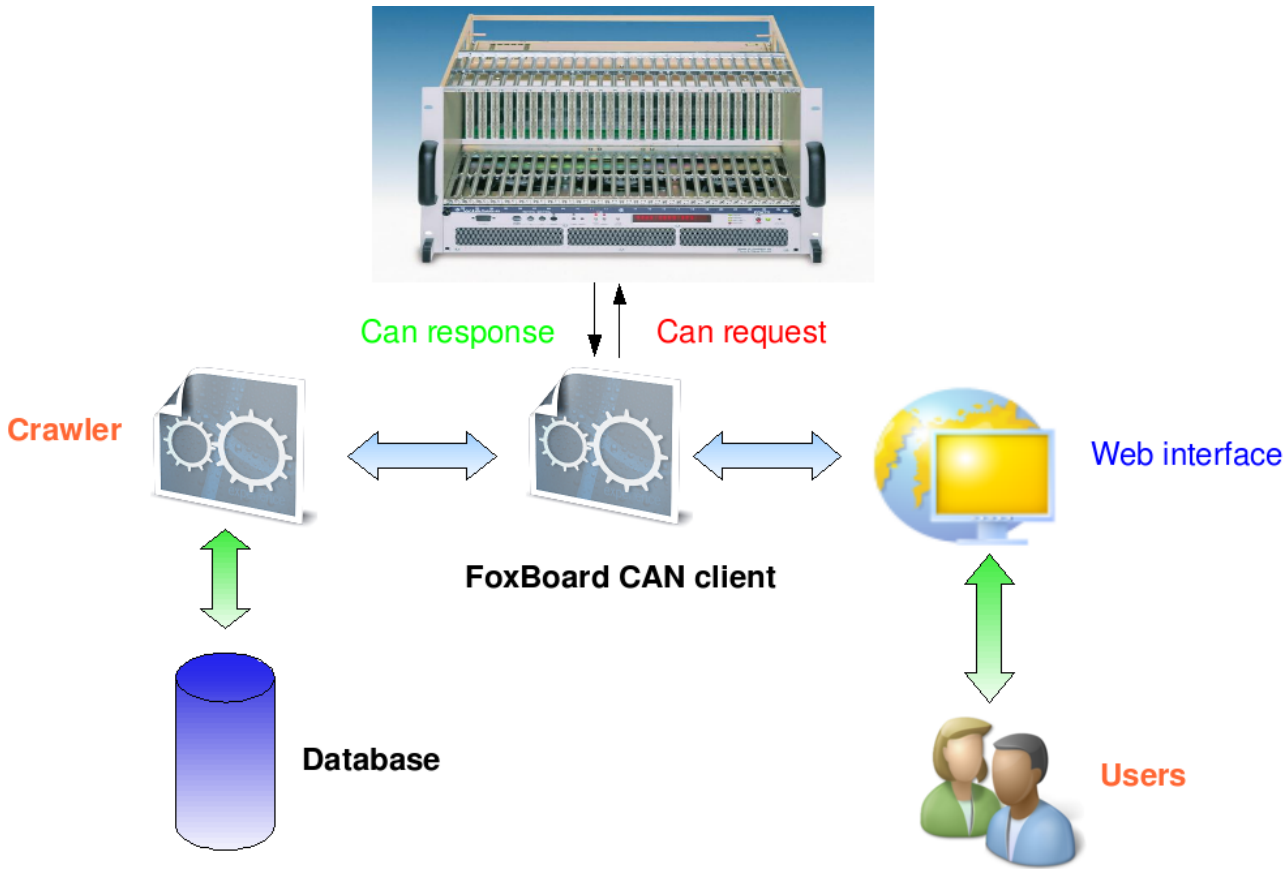
Test Hardware

- Axis ETRAX LX100 CPU (32 bit, RISC)
- 32 MB RAM, 8 MB FLASH ROM
- Linux Kernel 2.6.19
- I/O : Ethernet 10/100 Mb, 2 1.1. USB port
- Peak System CANbus/USB Interface



VME Crate - System Workflow

- Web Interface for human interaction
- CAN Crawler for automatic monitoring and storage of parameters



VME Crate WEB Interface Example

Web Interface for

- READ parameters, Switch ON/OFF and RESET crate

READ ALL FAN STATUS

READ CRATE STATUS

READ TEMPERATURE STATUS

READ CHANNEL CURRENT/VOLTAGE

RESET CRATE

START CRATE

STOP CRATE

Wed Jun 4 18:31:28 CEST 2008 - Decoding response....

Byte	Bit n.	Bit value	Label	Information
0	0	0	Status byte 0	power is off
0	1	0	Status byte 0	external power inhibit
0	2	0	Status byte 0	power fail
0	3	1	Status byte 0	no error
0	4	1	Status byte 0	fans are ok
0	5	0	Status byte 0	trip off
0	6	1	Status byte 0	trip on
0	7	1	Status byte 0	vme bus signal sysfail inactive (high)
1	0	0	Status byte 1	reserved
1	1	0	Status byte 1	reserved
1	2	1	Status byte 1	not valid value
1	3	1	Status byte 1	not valid value
1	4	0	Status byte 1	reserved
1	5	0	Status byte 1	flash/eeprom data not changed since last can access
1	6	0	Status byte 1	no flash/eeprom data checksum error
1	7	0	Status byte 1	no write protection

Local Slow Controls Integration

The GERDA environment

- Several Local Slow Control Systems exist:
  Front-End Electronics, Rn Monitor, Lock and Clean Room, Cryostat.
- The majority (3/4) use LabView on Windows OS.

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A proposed Solution

- Markus Kaestle proposed to use OPen Connectivity (OPC) client/server architecture.
- OPC is commonly used in industrial automation and the enterprise systems that support industry. It's a standard.
- The solution is well established and used in the Windows World.
- Several Open Clients exist in the LINUX framework.

- We have the expertiese (D. Zinato) and are currently able to implement a solution.

Future Plans

Hot topics for the next months

- Slow Control Computing Infrastructure :
  Some ideas are available (Bernhard), a solution will be proposed in the next months.
- The Network Infrastructure in Hall A is being investigated :
  a mail has been recently distributed with the aim of knowing the computing hardware/network connectivity required by the different groups.
  the result will be essential for proper network architecture design.

- As discussed at the Krakow meeting, a global Run Control has to be implemented for subsomponent syncronization.
- A proposal will be prepared for the next GERDA meeting.

Conclusions

- The experience with the OPERA Slow Control proves to be helpful for the design of the GERDA Slow Control.
- A new Alarm Manager has been developed and after the testing phase in OPERA (next few months) it will be available, and hopefully fully debugged, for GERDA.
- The next months are crucial since several hot topics have to be defined and their developement has to start :
  Local Slow Control Integrations
  Computing and Network Infrastructure
  Run Control

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  Computing and Network Infrastructure
  Run Control

- We are lacking manpower: D. Zinato is going to graduate on the 24^{th} of June and may disappear afterwards if we do not find a way to keep him for the next six months.
- We are lacking money: INFN Commissione II is not supporting our effort, and we are facing severe limitations (no money $\rightarrow$ no party).