Antelope RT usage @ OGS

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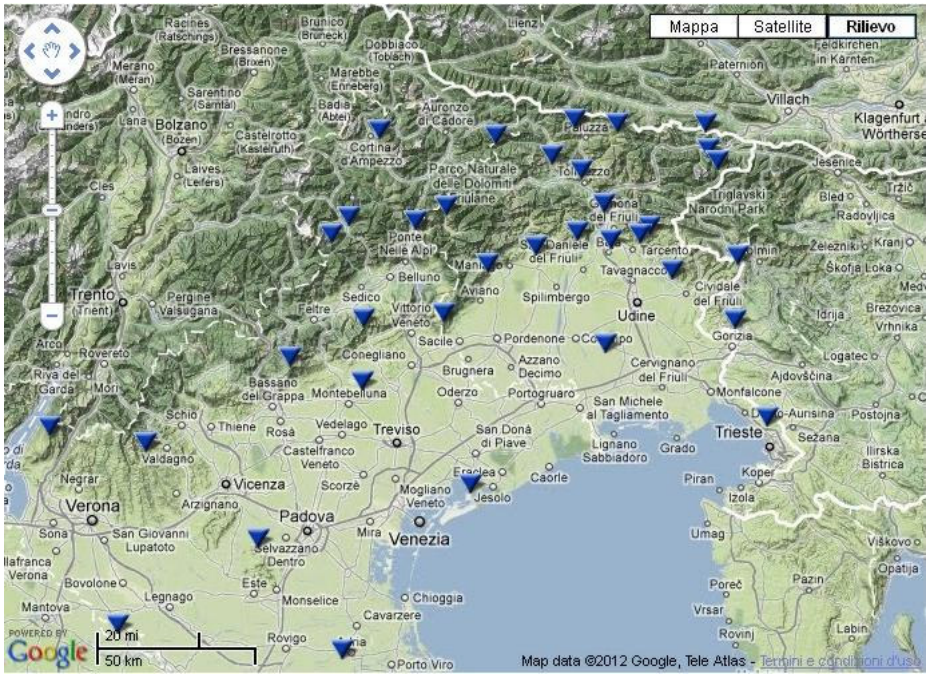
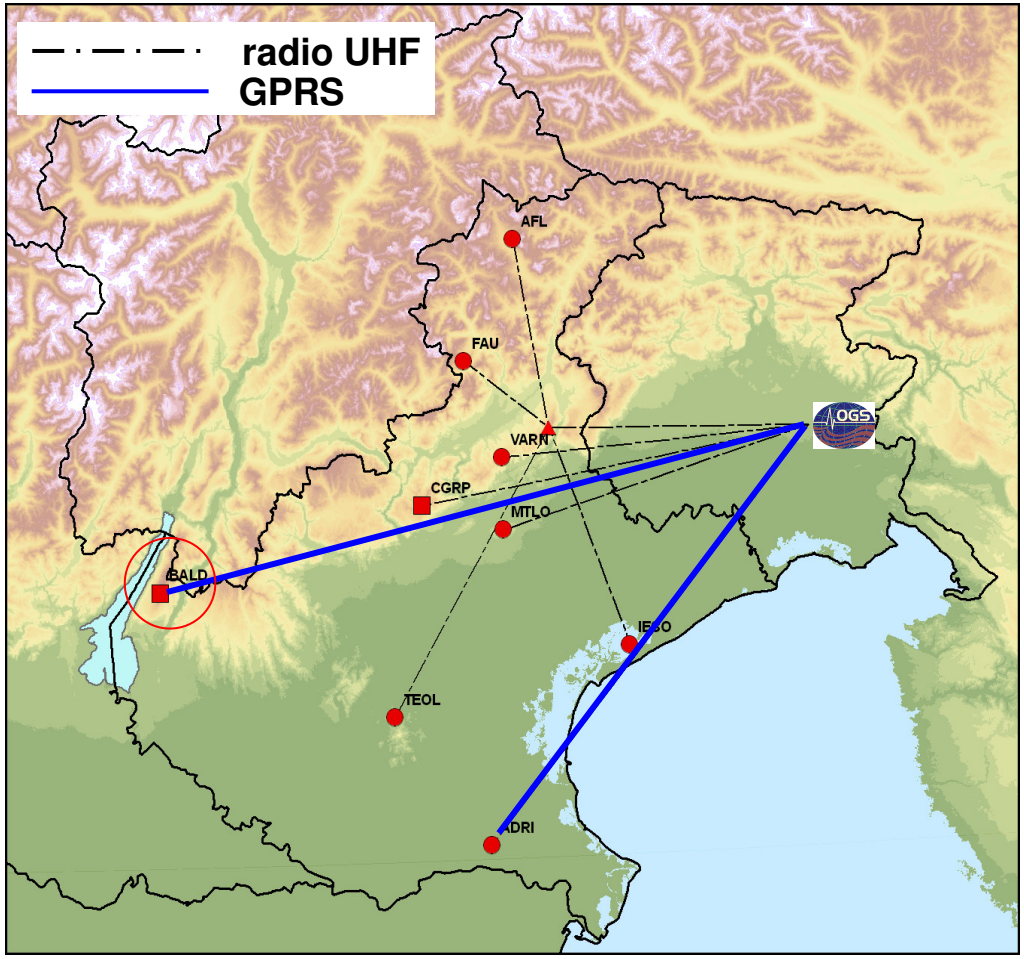
NE Italy Seismic Network - OGS



- 14 BB stations
  - Q330 + STS-2/Trillium 40/120s
  - real time, continuous

- 21 SP stations
Mars88 + Lennartz 1sec
real time, on trigger

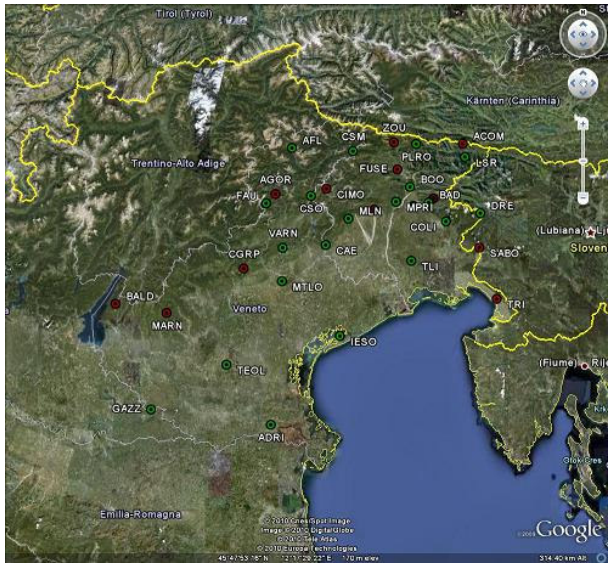
How is data transmitted?



- Digital UHF radio system
  - bandwidth 19.2kb/s
  - shared frequencies
- GPRS modem
- Satellite (2 sites: BALD, CLUD)

OGS-CRS: monitoring NE Italy seismicity

- 2 people on call duty H24 for 1 week
  - 1 seismologist + 1 technician
- Intervention in office for events with M>3.5
- OGS staff intervention at Civil Protection headquarters for events with M>4.5



CRS headquarters in Udine (Italy)

Intervention at CRS headquarters for:

- operations checking
- review / confirmation of the location with magnitude (picking of S waves)
- control over any replicas of earthquake
- maintain the link with the structures of the regional Civil Protections

OGS Virtual Seismic Network (~100 real-time stations)

Provincia di Trento

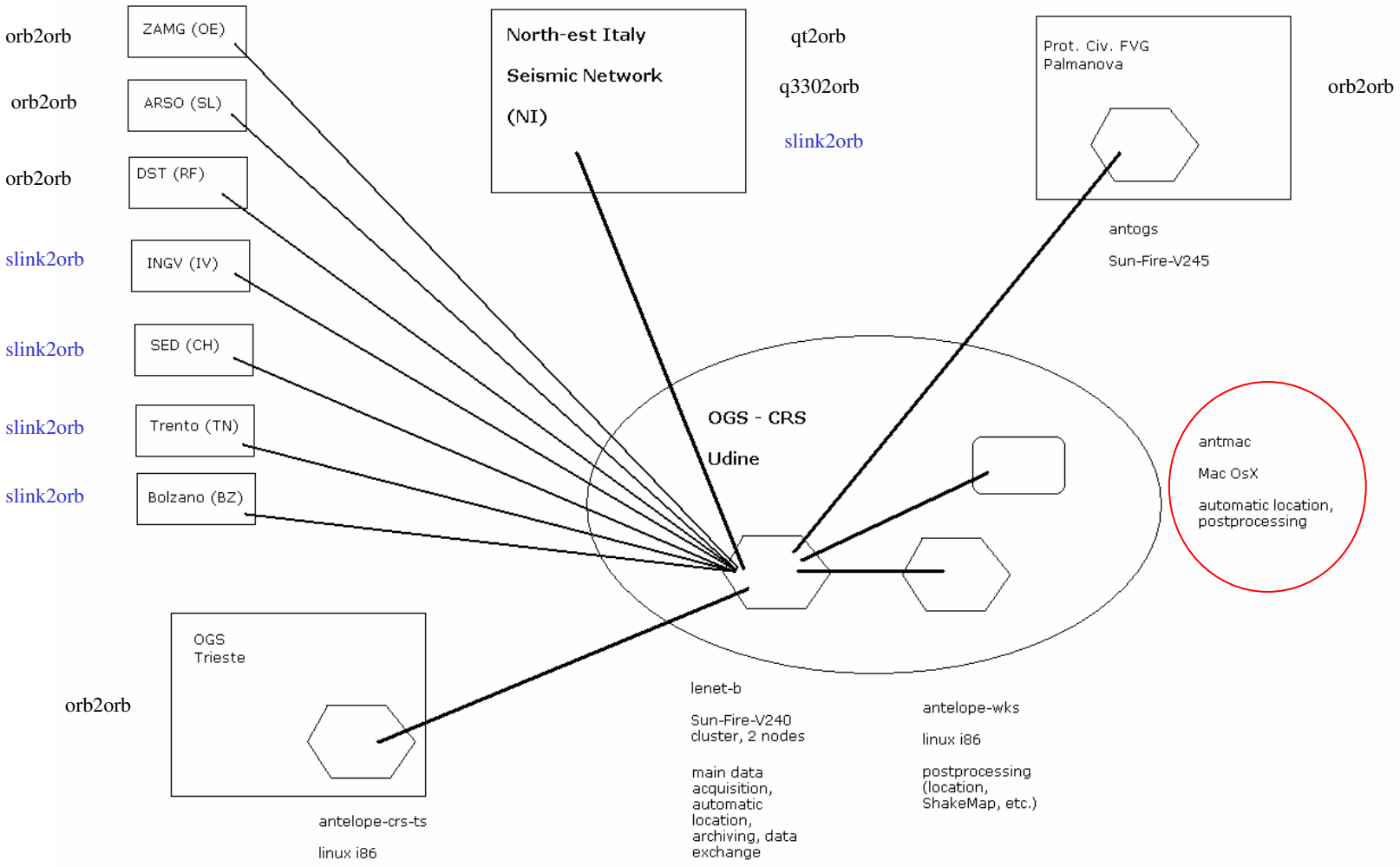
Provincia di Bolzano

INGV

ZAMG

Dipartimento di Geoscienze

OGS Antelope configuration



main rtexec processes table

Processes &Tbl{

orbserver orbserver -p $ORB orbserver

orbexport orbserver -p $ORBEXPORT
orbexport

orbinIV orbserver -p $ORBINIV orbinIV

qt2orb qt2orb -dataorb $ORB -cmdorb
$ORB -calib_db $DB -v

q3302orb q3302orb -calib_db $DB -S

main OGS Antelope load averages

load averages: 1.36, 1.44, 1.38; up 79+03:26:20 15:32:25
108 processes: 104 sleeping, 2 running, 2 on cpu
CPU states: 76.1% idle, 18.5% user, 5.4% kernel, 0.0% iowait, 0.0% swap
Memory: 4096M phys mem, 81M free mem, 20G total swap, 18G free swap

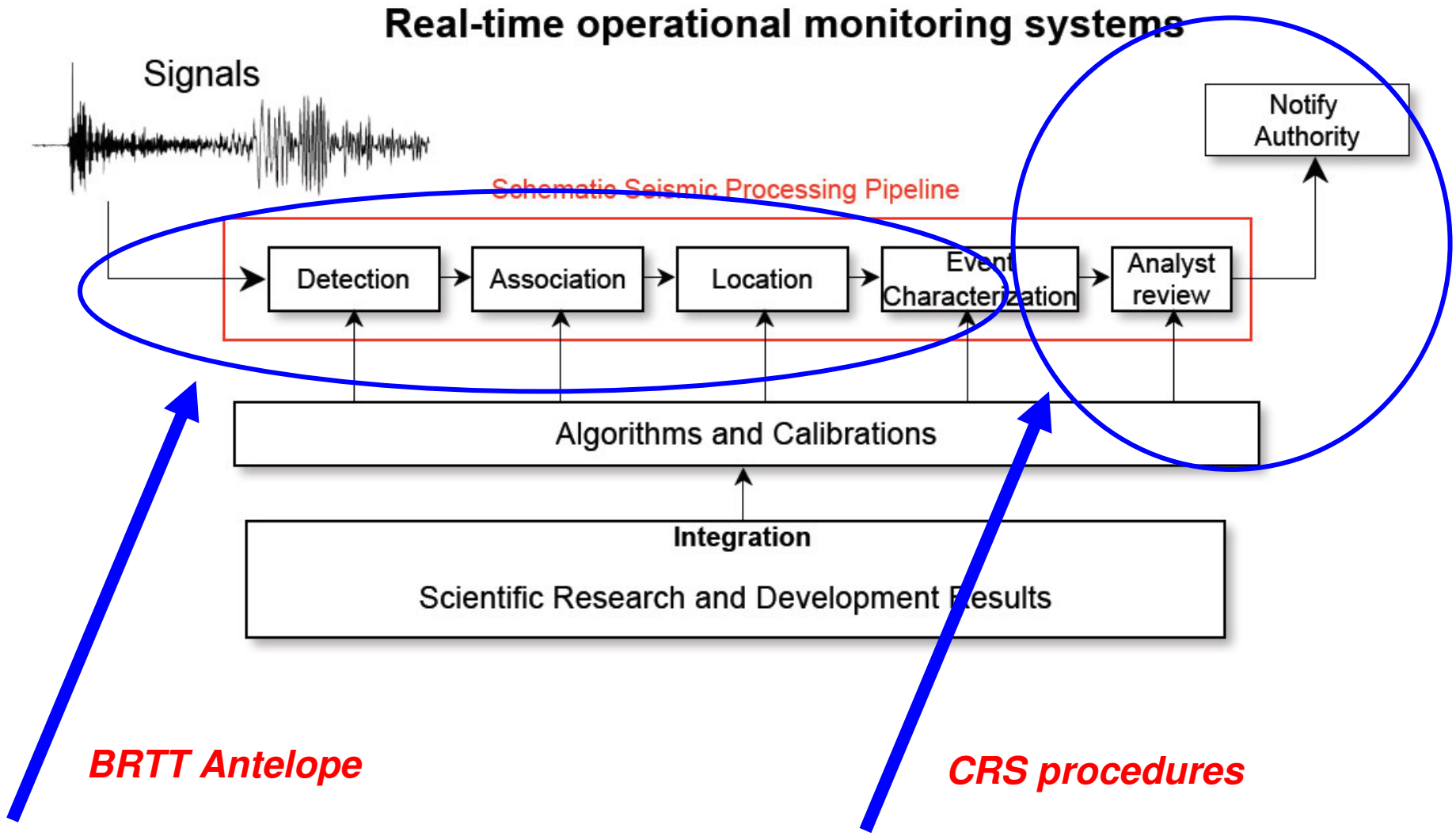
PID	USERNAME	LWP	PRI	NICE	SIZE	RES	STATE	TIME	CPU	COMMAND
15952	rt	87	19	0	1043M	562M	cpu/1	30.5H	18.07%	orbserver
16174	rt	1	59	0	93M	22M	sleep	317:42	1.50%	orbdetect
8933	rt	55	59	0	41M	18M	run	136:44	0.83%	q3302orb
16170	rt	1	58	0	39M	18M	sleep	188:07	0.74%	cdorb2db
15998	rt	8	59	0	109M	69M	sleep	46:35	0.24%	orbserver
16168	rt	1	59	0	59M	13M	sleep	3:05	0.16%	orb2db
24172	rt	1	59	0	3056K	1976K	cpu/0	0:00	0.15%	top
16189	rt	1	59	0	6216K	2688K	sleep	25:07	0.13%	orb2orb
16098	rt	13	59	0	24M	4504K	sleep	18:11	0.11%	qt2orb
16150	rt	1	59	0	6232K	2640K	sleep	16:29	0.08%	orb2orb
16134	rt	1	59	0	21M	3136K	sleep	15:58	0.08%	slink2orb
16148	rt	1	59	0	6304K	2832K	sleep	14:21	0.07%	orb2orb
15940	rt	1	59	0	31M	11M	sleep	14:17	0.06%	perl
16152	rt	1	59	0	6216K	2632K	sleep	14:20	0.06%	orb2orb
16155	rt	1	59	0	6232K	2736K	sleep	13:48	0.06%	orb2orb

main OGS orb sources & clients

```
orbserver  2/22/2012 (053) 14:34:50.704
        Version 'Release 5.1-64 SunOS 5.10 2011-04-28 '
        Pid 15952 @ crs-v240-b:/database (158.110.30.133), port #7000
        Started Wed 2012-046 Feb 15  9:40:49 by rt, running  7 days 4.9
     hours
        ring buffer last initialized Tue 2011-263 Sep 20  9:34:13
        Maximum    1000.0 Mbytes packet data
        Maximum  2500010 packets
        Maximum     1000 sources
         52 clients
        421 sources
        156994 opens 156942 closes 0 errors 0 rejections
 Total Output rate = 2271.513 kbps
        Total Input  rate =  214.773 kbps

        Total Output packet rate = 1124.570 pkts/s
        Total Input  packet rate =  184.106 pkts/s
```

Earthquake detection and notification

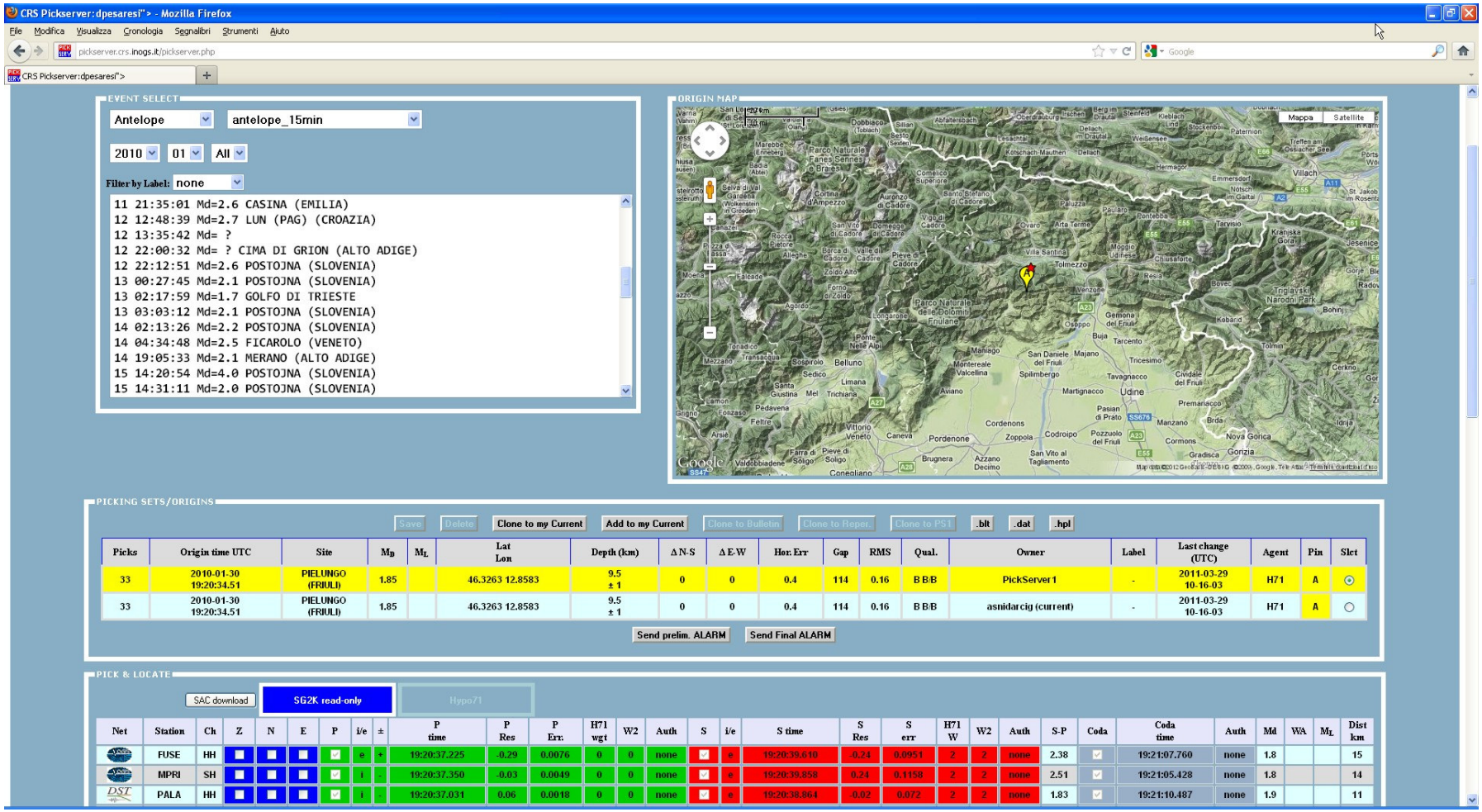


OGS adds-on for Antelope

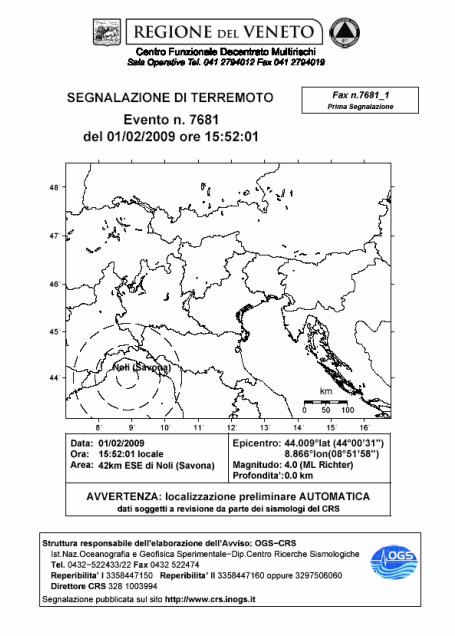
- PickServer (using Lomax viewer)
- Comprehensive Alarm routines with re-location control
  - Output: email, fax, SMS, web
- M882orb and ORION2orb plugins
- Data archive (OASIS)
- Drumplot

- *ShakeMap*
- *SeisComP (data exchange)*

OGS PickServer (v. 2)



Alarms



REGIONE DEL VENETO
Centro Funzionale Decentrato Multirischi
Sala Operativa Tel. 041 2794012 Fax 041 2794019

SEGNALAZIONE DI TERREMOTO

Fax n.7681_1
Prima Segnalazione

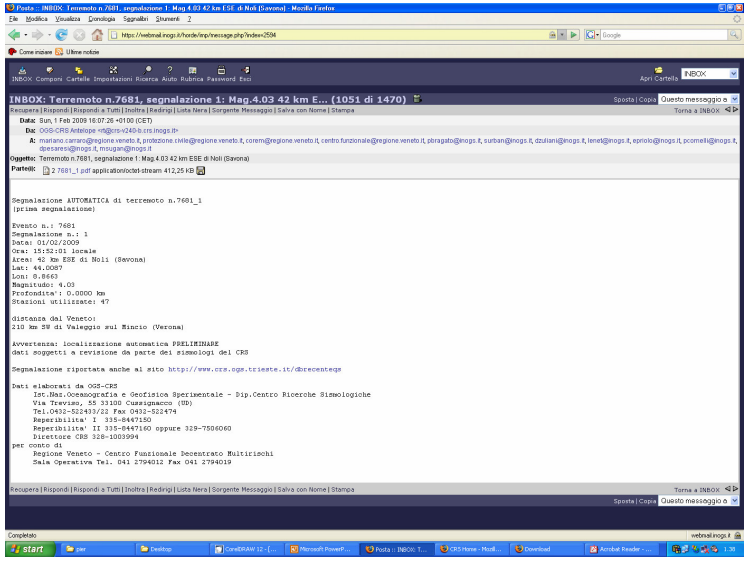
Evento n. 7681
del 01/02/2009 ore 15:52:01

Data: 01/02/2009 Ora: 15:52:01 locale Area: 42km ESE di Noli (Savona)	Epicentro: 44.009°lat (44°00'31") 8.866°lon(08°51'58") Magnitudo: 4.0 (ML Richter) Profondita':0.0 km

AVVERTENZA: localizzazione preliminare AUTOMATICA
dati soggetti a revisione da parte dei sismologi del CRS

Struttura responsabile dell'elaborazione dell'Avviso: OGS-CRS
Ist.Naz.Oceanografia e Geofisica Sperimentale-Dip.Centro Ricerche Sismologiche
Tel. 0432-522433/22 Fax 0432 522474
Reperibilita' I 3358447150 Reperibilita' II 335844716O oppure 3297506060
Direttore CRS 328 1003994
Segnalazione pubblicata sul sito http://www.crs.inogs.it

fax



INBOX: Terremoto n.7681, segnalazione 1: Mag.4.03 42 km E... (1051 di 1470)

Segnalazione AUTOMATICA di terremoto n.7681_1
(prima segnalazione)

Evento n.: 7681
Segnalazione n.: 1
Data: 01/02/2009
Ora: 15:52:01 locale
Area: 42 km ESE di Noli (Savona)
Lat: 44.0087
Lon: 8.8663
Magnitudo: 4.03
Profondita': 0.0000 km
Stazioni utilizzate: 47

distanza dal Veneto:
210 km SW di Valeggio sul Mincio (Verona)

Avvertenza: localizzazione automatica PRELIMINARE
dati soggetti a revisione da parte dei sismologi del CRS

Segnalazione riportata anche al sito http://www.crs.ogs.trieste.it/dbrecenteqs

Dati elaborati da OGS-CRS
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per conto di
Regione Veneto - Centro Funzionale Decentrato Multirischi
Sala Operativa Tel. 041 2794012 Fax 041 2794019

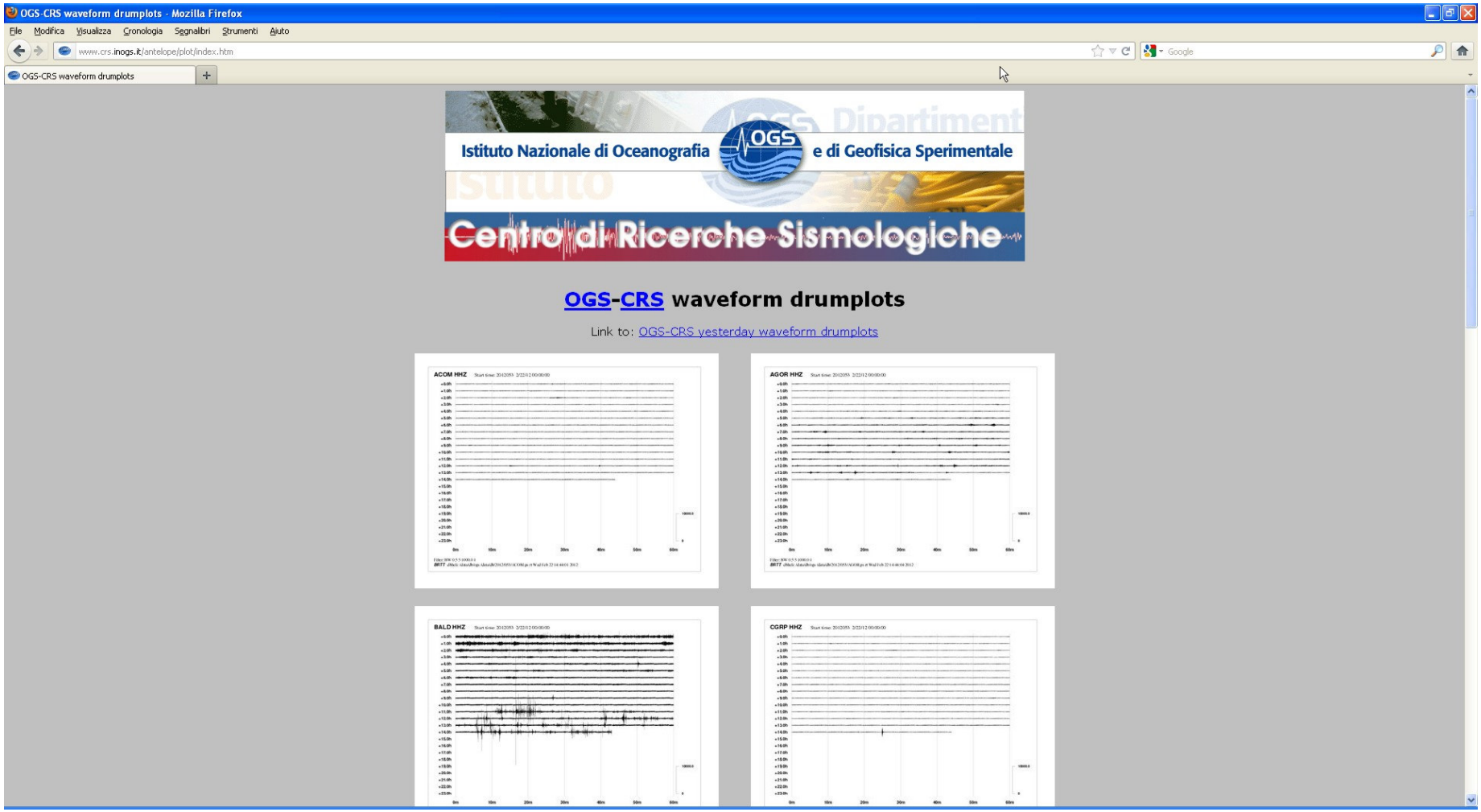
e-mail

sms

OGS-CRS Terremoto n.7681
segnalazione n.1
Mag4.03 H15:52:01
del 01/02/2009
42km ESE di Noli(Savona)
lat44.0087 lon8.8663
rep 3358447150

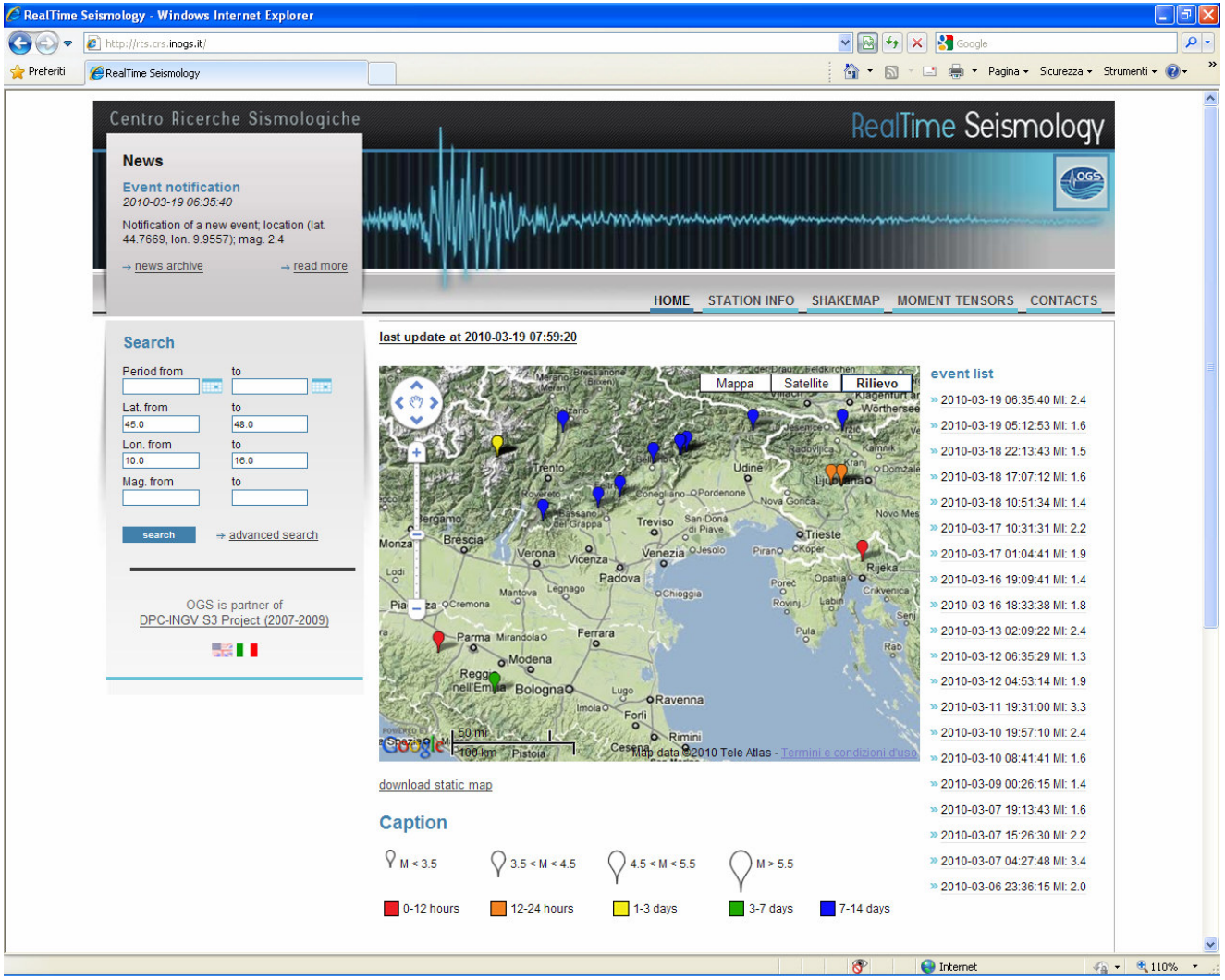
web

OGS dbheli


OGS-CRS waveform drumplots - Mozilla Firefox
File Modifica Visualizza Cronologia Segnalibri Strumenti Aiuto
www.crs.inogs.it/antelope/plot/index.htm
OGS-CRS waveform drumplots
Istituto Nazionale di Oceanografia e di Geofisica Sperimentale
Centro di Ricerche Sismologiche
OGS-CRS waveform drumplots
Link to: OGS-CRS yesterday waveform drumplots
ACOM HHZ
AGOR HHZ
BALD HHZ
CGRP HHZ

OGS Real Time Seismology:

http://rts.crs.inogs.it/



Done (☺):

- Migration core Antelope (SUN cluster) from 4.10 to 5.1-64
- Split event determination and graphics on PowerMAC from main acquisition on SUN cluster
  - Reliability (2 machines)
- Migration from orbampmag to orbevproc
- Migration from orb2db to cdorb2db + db2msd

Work in progress (😐):

- orbdetect tuning
  - BB continuous
  - SP trigger
  - Local/teleseismic bandwidth
  - S phases
- orbassoc tuning (grid, windows, station weighting and grouping, etc.)

The OGS Antelope Real-Time Team

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EGU2012 SM1.3/GI1.7

Improving seismic networks performances: from site selection to data integration

ESC2012 DAP-2

Improving seismic networks performances: from site selection to data integration

DAP-2 Improving seismic networks performances: from site selection to data integration

Conveners:
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Ph.D. Frank L. Vernon, USArray Transportable Array Data Acquisition Manager, University of California San Diego (UCSD), e-mail flvernon@ucsd.edu

Symposium scope:

The number and quality of seismic stations and networks in Europe continually improves, nevertheless there is always scope to optimize their performance. In this session we welcome contributions from all aspects of seismic network installation, operation and management. This includes site selection; equipment testing and installation; planning and implementing communication paths; policies for redundancy in data acquisition, processing and archiving; and integration of different datasets including GPS and OBS. We also welcome contributions on virtual seismic networks on small or large scale, discussing ideas about neighbouring national networks sharing stations near the borders in order to enhance the performance of the networks.

Comments: no

Sign in and submit an abstract

THANKS!

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Damiano Pesaresi, Pier Luigi Bragato, Paolo Comelli, Dario Slejko, Angela Saraò, Paolo Di Bartolomeo, Giorgio Durì, Paolo Bernardi, Michele Bertoni, Elvio Del Negro, Denis Sandron, Luca Moratto
and all the **OGS-CRS** team!