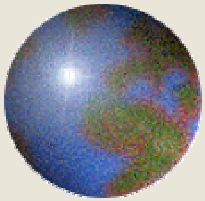


*Using Antelope in an Operational Environment
for Real-Time Seismic Networks*



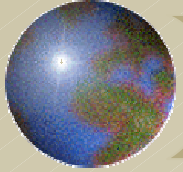
Jennifer Eakins

University of California, San Diego

European Antelope User Group

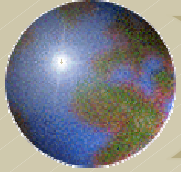
Trieste, Italy

29-30 November 2004



Topics of Discussion

- ⊕ Initial setup of rt data collection
- ⊕ Antelope parameter files
- ⊕ Review of rtextec files
- ⊕ Initial database setup and maintenance
- ⊕ Collecting multiple databases
- ⊕ Merging databases
- ⊕ Day-to-day monitoring
- ⊕ Email from cronjobs - when is a problem truly a problem?



Initial setup of rt data collection

❖ /export/home/rt - home directory

- ❑ Modify .tcshrc (.setup) to include

```
setenv $ANTELOPE /opt/antelope/4.6  
source $ANTELOPE/setup.csh
```



```
setenv PATH $ANTELOPE/data/pf../pf../
```

- ❑ Create directories for system operations and each rtexec

```
mkdir -p seismic/net seismic/status seismic/catalogs
```

Create a status orb
for state of health

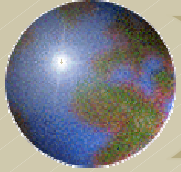
- ❑ Run the rtinit program in each directory

- Creates directories:

```
bin/      dbmaster/ orb/      rtsys/  
db/       logs/     pf/       state/
```

- Copies rtexec.pf and other parameter files

Customize
your rtinit.pf



Auto restart of real-time system at reboot

File is: /etc/init.d/antelope

Allows auto-restart upon reboot

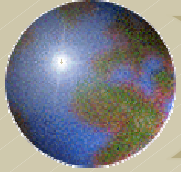
Edit these

```
# To restart systems on reboot
# 1) edit @dirs and $user below to fill in the directories
#    where systems are running and the user who runs them.
#    edit $sleep to cause a delay of $sleep seconds between
#    startups in multiple directories.
#
# 2) install this script as
#    /etc/init.d/antelope
#    and
#    /etc/rc[01].d/K01_antelope
#    and
#    /etc/rc3.d/S99_antelope
#
# 3) test it by executing "/etc/init.d/antelope stop" as root.
#
# 4) test it by executing "/etc/init.d/antelope start" as root.

@dirs = qw(/export/rt/quanterra /export/rt/anza /export/rt/knet /export/rt/catalogs);
$user = "rt" ;
```

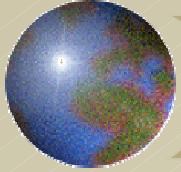
Follow instructions

Copy \$ANTELOPE/data/system/S99_antelope to /etc/init.d/antelope.



Antelope parameter files

- ❖ Default parameter files are found under `/opt/antelope/4.6/data/pf`
Create local copies of pf files under `/export/home/rt/pf` or `/export/home/rt/seismic/net1/pf`
- ❖ `$PFPATH` is key to determining which parameter file(s) the program recognizes.
If program is not using variables you expect make sure `PFPATH` is properly set!
- ❖ Use `pfwhich` to determine which parameter file is being used. `Pfecho` returns values from parameter file.
 - ❑ `pfwhich orbdetect`
 - ❑ `pfecho orbdetect`
 - ❑ `pfdiff orbdetect $ANTELOPE/data/pf/orbdetect`



Antelope parameter files - orbserver.pf

```
valid_ip_addresses    &Tbl{  
# ip-address          mask  
127.0.0.1             255.255.255.255      # local host  
207.174.76.0         255.255.255.0       # brtt.com network  
132.239.4.0          255.255.255.0       # IGPP
```

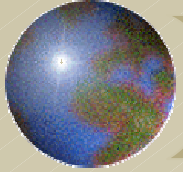
- Change buffer size
- Modify reject message with contact information

```
rinasize              1 8G    # total size of the file which holds the packets
```

- Allow local/remote access.
- Control type of access (readonly)

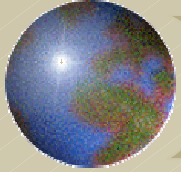
Please contact jeakins@ucsd.edu to gain access.

```
}
```



Antelope parameter files - orbmonrtd

- ❖ Change network code, station, channels, time window, and scale factors as needed.
- ❖ Multiple time scales/filters can be displayed in same orbmonrtd window.
- ❖ Create multiple parameter files for varying displays.
- ❖ On command line:
 - ❑ Add titles for clarity.
 - ❑ Increase ntinc
 - ❑ Unmap option for (non)interactive displays

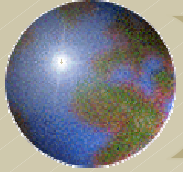


Orbmonrtd - pf example

The screenshot shows the orbmonrtd application window with the title "orbmonrtd: :usarray". The interface includes a menu bar with "File", "View", "Amp", and "Time". On the left, a list of data streams is shown with checkboxes, including TA_109C_BHZ, TA_Y22C_BHZ, TA_HAST_BHZ, TA_V04C_BHZ, TA_A04A_BHZ, TA_D03A_BHZ, TA_Y12C_BHZ, and their counterparts at 14400.000. The main display area shows a spectrogram with yellow and blue horizontal bands. A configuration table is overlaid on the right side of the window.

```
sources &Tbl{
TA_109C_BHZ ORB 3600.000 -1000.000 1000.000 800 30 filter BW 1.0 4.0 0.0 0.0
TA_Y22C_BHZ ORB 3600.000 -1000.000 1000.000 800 30 filter BW 1.0 4.0 0.0 0.0
TA_HAST_BHZ ORB 3600.000 -1000.000 1000.000 800 30 filter BW 1.0 4.0 0.0 0.0
TA_V04C_BHZ ORB 3600.000 -1000.000 1000.000 800 30 filter BW 1.0 4.0 0.0 0.0
TA_A04A_BHZ ORB 3600.000 -1000.000 1000.000 800 30 filter BW 1.0 4.0 0.0 0.0
TA_D03A_BHZ ORB 3600.000 -1000.000 1000.000 800 30 filter BW 1.0 4.0 0.0 0.0
TA_Y12C_BHZ ORB 3600.000 -1000.000 1000.000 800 30 filter BW 1.0 4.0 0.0 0.0
#
TA_109C_BHZ ORB 14400.000 -1000.000 1000.000 800 30 filter BW 0.8 5 3.0 5
TA_Y22C_BHZ ORB 14400.000 -1000.000 1000.000 800 30 filter BW 0.8 5 3.0 5
TA_HAST_BHZ ORB 14400.000 -1000.000 1000.000 800 30 filter BW 0.8 5 3.0 5
TA_V04C_BHZ ORB 14400.000 -1000.000 1000.000 800 30 filter BW 0.8 5 3.0 5
TA_A04A_BHZ ORB 14400.000 -1000.000 1000.000 800 30 filter BW 0.8 5 3.0 5
TA_D03A_BHZ ORB 14400.000 -1000.000 1000.000 800 30 filter BW 0.8 5 3.0 5
TA_Y12C_BHZ ORB 14400.000 -500.000 500.000 800 30 filter BW 0.8 5 3.0 5
}
detections &Arr{
BW_0.8_4_3.0_4 00ff00 0.05
BW_0.5_4_1.2_4 ffa0a0 0.1
BW_3.0_4_0_0 a0a0ff 0.0
}
```

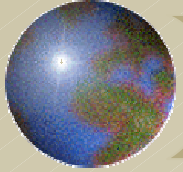
Command: orbmonrtd :usarray -ntinc 4 -pf orbmonrtd_TAcombo -width 2000



Review of rtextec files

- Standard - most seismic data acquisition experiments
 - orbserver, “something”2orb, orb2orb, orbdetect, orbtrigger, orbassoc, etc.

- “Alternative” - no orbserver
 - Collect external bulletins
 - Use to spawn external processes such as vnc or dbrecenteqs



Standard rtextec file - Defines

The definitions from Defines are substituted into the environment variables
and commands below. For example, \$ANTELOPE in an environment definition or
command line below will become the value of ANTELOPE from the array Defines.

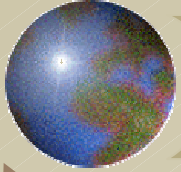
```
Defines &Arr{  
ANTELOPE    PRESERVE || /opt/antelope/4.6  
ORB         :usarray          # orbname:port  
DB          db/usarray        # database name
```

- Choose an appropriate port name/number for your ORB

 - Register new (permanent) names and ports with BRTT

- Select database name

 - Add additional ORB or DB names as needed



Standard rtextec file - Processes

Processes &Tbl{

orbserver orbserver -p \$ORB orbserver

dbidserver dbids -p 2497 idserver/dbids

q3302orb q3302orb -v -calib db \$DB anf usarray q330 dataorb \$ORB

orb2orb_AZ orb2orb -m "AZ_(MONP|PFO)/BBA/(DAS|RTX|BS|LS)" -S
state/orb2orb_AZ bbarry:anza \$ORB

orb2orb_CI orb2orb -m "CI_*_[BLU][HEF].*|.**/orbstat" -S state/orb2orb_CI
andesite.gps.caltech.edu:usarray \$ORB

orb2orb_BK orb2orb -S state/orb2orb_BK **\$BKORB** \$ORB

orb2db orb2db -S state/orb2db \$ORB \$DB

orb2db2 orb2db -S state/orb2db2 \$ORB **\$DB2**

orb2dbt orb2dbt -state state/orb2dbt -overwrite \$ORB \$DB

orb2dbt_testing orb2dbt -state state/orb2dbt_testing -overwrite \$ORB **\$DB2**

orbdetect orbdetect -out \$ORB \$ORB \$DB

orbtrigger orbtrigger -v -out \$ORB \$ORB

orbassoc orbassoc -v \$ORB \$ORB ttgrid

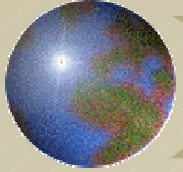
orbmag orbmag -v -state state/orbm

dbassoc_SCEC dbassoc_rt /hf/hifreq/cit

dbassoc_NCEDC dbassoc_rt /hf/hifreq/nc

dbassoc dbassoc_rt /hf/hifreq/qe

**Multiple orb2orb processes
to collect waveforms from
various data centers.**

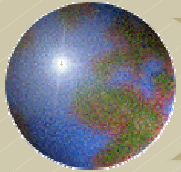


Standard rtxec file - email

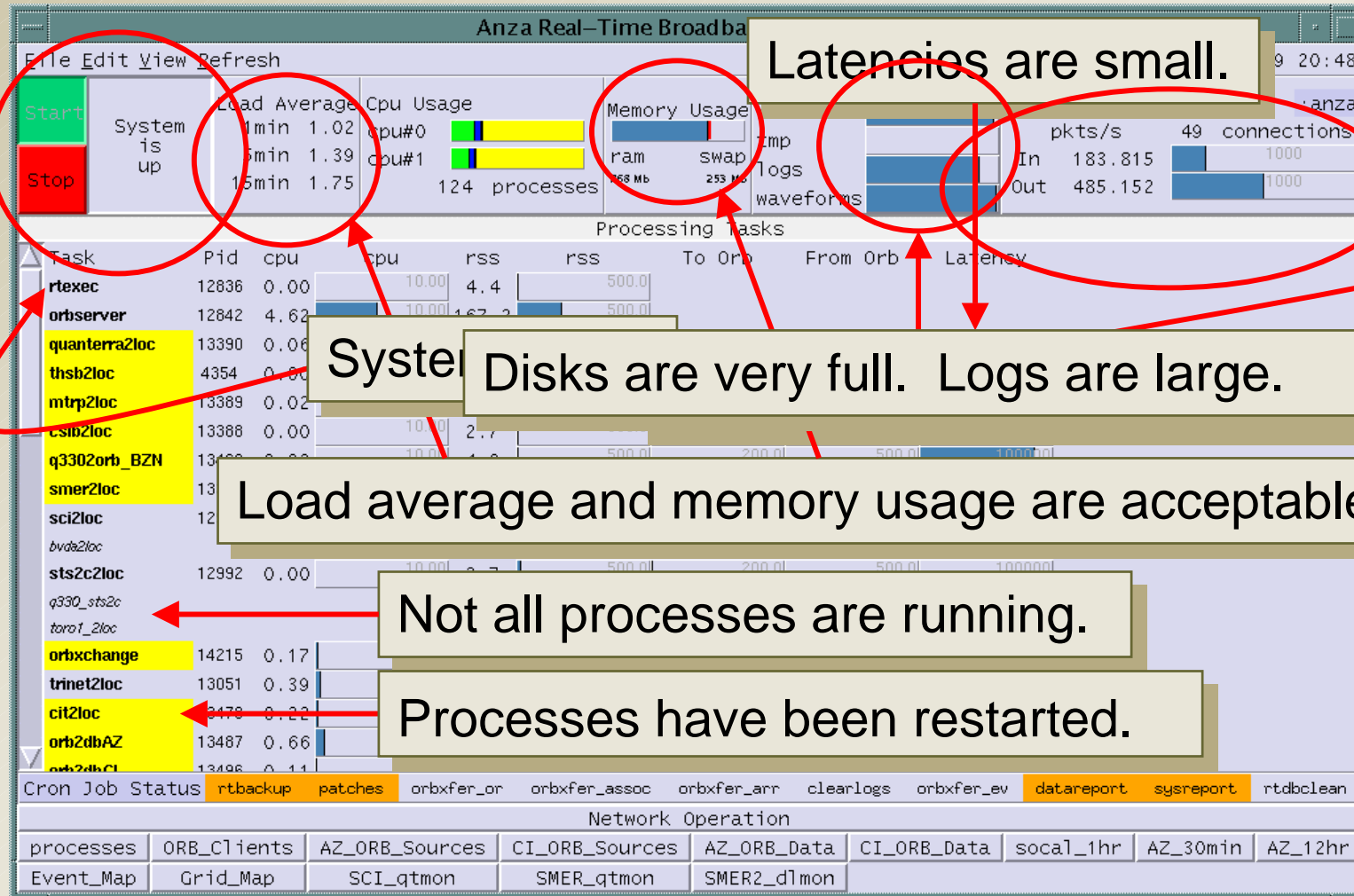
```
# set this parameter to a list of email addresses which will receive  
# email automatically when the system is started or stopped.  
startup_shutdown_email  eakins@epicenter.ucsd.edu,  
vernon@epicenter.ucsd.edu, chad@iris.washington.edu
```

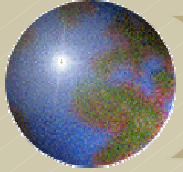
```
# resource problems  
status_email            eakins@epicenter.ucsd.edu
```

- Add appropriate email addresses to the `startup_shutdown_email` and `status_email`
 - Use different lists



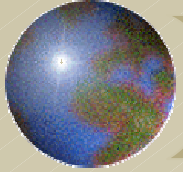
Standard rtextec file - is the system healthy?





Why an alternative rtextec?

- ❖ “Alternative” because there is no orbserver
- ❖ Gathers variety of diverse programs into one easy to monitor system.
- ❖ Takes advantage of cronjob monitoring structure built into rtextec.
- ❖ What do I put into this “alternate” rtextec?
 - ❑ External bulletin collection
 - ❑ External bulletin generation
 - ❑ Database or dataless SEED transfer
 - ❑ Dbrecenteqs



“Alternative” rtextec file

Processes &Tbl{

transfer database tables

orbxfer_AZ orbxfer -d db igpprt.ucsd.edu:anza

orbxfer_TA orbxfer -d db vsn.ucsd.edu:usarray

orbxfer_VE orbxfer -d db igpprt.ucsd.edu:bba1

collect bulletins

new_qedd NEIC_qed2 -v "http://neic.usgs.gov/neis/bulletin/"
/hf/hifreq/qed/qed_2004

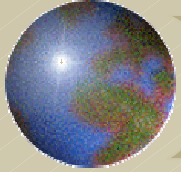
UNR_bulletin bin/get_unr_bulletin /hf/hifreq/unr/unr_2004

PNSN_bulletin bin/get_pnsn /hf/hifreq/pnsn/pnsn_2004

generate bulletins

finger_quakeAZ bin/finger_quake -p mk_finger_anza -e 75 -a /home/quake
/hf/igpprt1/anza/db/anza

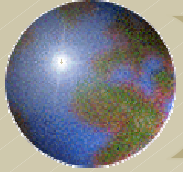
- Port name/number and db name are not important (no orbserver).
- Edit Run and Processes



“Alternative” *rtexec* file

```
crontab &Arr{
# task UTC/LOCAL Min Hr Day Month DayOfWeek Command
# generate web maps
dbrecenteqs_anza      UTC 1,11,21,31,41,51 * * * * dbrecenteqs -v -p
pf/dbrecenteqs_AZ.pf -c db/anza db/quakes
dbrecenteqs_vz       UTC 7,17,27,37,47,57 * * * * dbrecenteqs -v -p
pf/dbrecenteqs_VZ.pf -c db/venezuela db/venezuelaQuakes
dbrecenteqs_usarray  UTC 4,14,24,34,44,54 * * * * dbrecenteqs -v -p
pf/dbrecenteqs_USARRAY.pf -c db/usarray db/usarrayQuakes
make_anza_bulletin  UTC 0,30 * * * * bin/create_custom_bulletin -n 31 -a "UCSD.*"
/hf/igpprt1/anza/db/anza /hf/hifreq/ucsd/anza
}
```

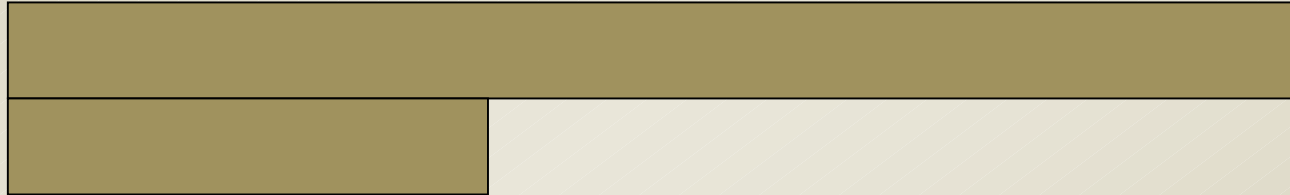
- Edit crontab
- Add any startup_tasks or shutdown_tasks

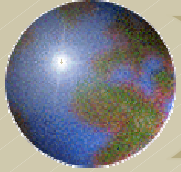


Initial setup of a database

• Dbmaster/

- Get dataless seed if possible (psd2db)
- Build your own with dbbuild

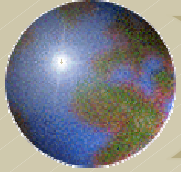




Dataless SEED generation

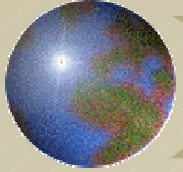
❖ Multi-step process

- ❑ Build your dbmaster tables (using dbbuild)
- ❑ Modify db2sd.pf (additional units_descriptions(?), originating_organization, etc.)
 - originating_organization # This must be filled in with up to 80 characters
- ❑ Build your dataless SEED using mk_dataless_seed
 - % mk_dataless_seed
 - Usage: /opt/antelope/4.6p/bin/mk_dataless_seed [-kv] [-p parameter file] input_database
- ❑ Rename dataless volume (I have requested mk_dataless_seed add option for alternate dataless name)
- ❑ Check for any errors using PASSCAL program verseed
- ❑ Distribute (via orbxfer, mail, ftp, etc.)



Database maintenance

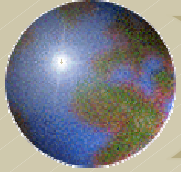
- Dbmaster ([site](#), [sitechan](#), [network](#), [sensor](#), [stage](#), [instrument](#)) tables are static until field work necessitates update.
 - Wftar table grows with daily backups
 - Update tables on a functioning real-time system with caution. Adding new records shouldn't cause problems.
- Db tables ([arrival](#), [assoc](#), [origin](#), [event](#), [detection](#), [wfdisc](#), etc.) are constantly modified and growing.
 - Save continuous data with daily rtbackup, or second orb2db
 - A 'backup' or automatic solutions with second orb2dbt
 - Save event segmented data with event_archive
 - Clean/truncate tables with rtdbclean



Collecting multiple databases

❁ Mechanisms to share databases

- ❁ orb2orb with -m “db./.*/” option
 - unreviewed automatic solutions
- ❁ orbxfer
 - sends raw data packets
 - databases transferred can be analyst reviewed
 - can transfer dataless seed (recover with seed2db)
- ❁ db2orb
 - sends waveforms too
- ❁ orbpftrigger
 - waveform segments with automatic solutions
- ❁ dbt2orb
 - just found out about this one... sends table rows to orb



Example of orbxfer

❁ Two instances of orbxfer need to run.

❁ orbxfer on the 'server' side

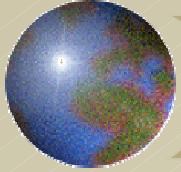
```
% orbxfer -v TA.DATALESS.2004.11.18 vsn:usarray
```

- Pushes the file into the orb as a /raw/*.*** packet

❁ orbxfer on the 'receiver' side

```
% orbxfer -v -d dataless vsn.ucsd.edu:usarray
```

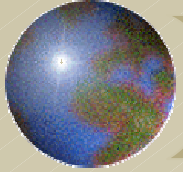
- Collects /raw/*.*** packets from remote orb and places them in the local dataless/ directory.



Example of orbxfer

Srcname	#pkts	kbytes	pktid	Oldest		Latest		latency
				time	time			
/raw/DATALESS.2004.11.18	141	175	4255434	327 17:59:20	4255589	327 17:59:20	1:46 minutes	
/raw/usarray.arrival	478608	598185	2386776	327 10:04:00	4247396	327 17:54:12	6:54 minutes	
/raw/usarray.assoc	696714	870816	2387902	327 10:04:01	4248238	327 17:54:13	6:54 minutes	
/raw/usarray.event	5546	6850	2424381	327 10:14:00	4222498	327 17:54:00	7:07 minutes	
/raw/usarray.origin	44424	55448	2386034	327 10:04:00	4224328	327 17:54:00	7:06 minutes	

- /raw/DATALESS.* is sent 'manually' upon update.
- /raw/usarray.* are sent via a cronjob every 10 minutes.



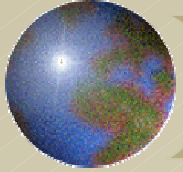
Merging multiple databases

In real-time:

- ✚ Gather triggers from all networks and associate against a complete grid
 - ▣ assumes you have a complete and correct dbmaster
- ✚ Collect bulletins from all institutions and use multiple instances of dbassoc_rt

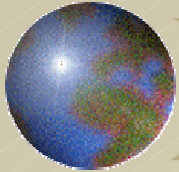
Delayed analysis:

- ✚ Re-run detection/triggers/associators
- ✚ Analyst reviews all available picks with dbloc2



Day-to-Day monitoring

- ❖ Monitoring tools:
 - ❖ orbstat
 - ❖ dbevents and dbrecenteqs
 - ❖ orbmonrtd (desktop vs. gif dumps for web)
 - ❖ orblookup
 - ❖ dlmon (qt4120, q330, k2 dataloggers)
 - ❖ Nagios
 - ❖ cronjobs



Orbmonrtd - gifdump

Earthscope USArray ANF Website :: Online Tools :: Real-time USArray Data Monitor - 24 hour display

http://anf.ucsd.edu/tools/orbmon/orbmonrtd24.php

Apple .Mac Amazon News USE Credit Union HPWREN Cameras RT Image ANF Tools

earthscope USArray

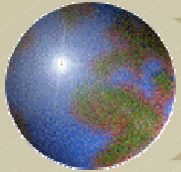
Earthscope USArray ANF Website

Online Tools > Real-time USArray Data Monitor - 24 hour display

Image created: 2004-11-25 20:47:34

The image below is a snapshot of the last 24 hours of data the ANF is currently receiving from USArray stations. The page is auto-refreshed every 150 seconds to reflect the latest data recorded. You can keep the focus on a particular station by clicking the station name hyperlink at the left-side of the page:

Station	File	View	Amplitude	Time
TA_109C_BHZ	<input type="checkbox"/> TA_109C_LHZ			
TA_Y22C_BHZ	<input type="checkbox"/> TA_Y22C_LHZ			
TA_HAST_BHZ	<input type="checkbox"/> TA_HAST_LHZ			
TA_V04C_BHZ	<input type="checkbox"/> TA_V04C_LHZ			
TA_D03A_BHZ	<input type="checkbox"/> TA_D03A_LHZ			
TA_A04A_BHZ	<input type="checkbox"/> TA_A04A_LHZ			
AZ_MONP_BHZ	<input type="checkbox"/> AZ_MONP_LHZ			
AZ_PFO_BHZ	<input type="checkbox"/> AZ_PFO_LHZ			
BK_CMB_BHZ	<input type="checkbox"/> BK_CMB_LHZ			
BK_CVS_BHZ	<input type="checkbox"/> BK_CVS_LHZ			
BK_FARB_BHZ	<input type="checkbox"/> BK_FARB_LHZ			
BK_HOPS_BHZ	<input type="checkbox"/> BK_HOPS_LHZ			
BK_HUMO_BHZ	<input type="checkbox"/> BK_HUMO_LHZ			
BK_JCC_BHZ	<input type="checkbox"/> BK_JCC_LHZ			
BK_JRSC_BHZ	<input type="checkbox"/> BK_JRSC_LHZ			
BK_KCC_BHZ	<input type="checkbox"/> BK_KCC_LHZ			
BK_MNRC_BHZ	<input type="checkbox"/> BK_MNRC_LHZ			
BK_MOD_BHZ	<input type="checkbox"/> BK_MOD_LHZ			
BK_ORV_BHZ	<input type="checkbox"/> BK_ORV_LHZ			
BK_PACP_BHZ	<input type="checkbox"/> BK_PACP_LHZ			
BK_PKD_BHZ	<input type="checkbox"/> BK_PKD_LHZ			
BK_POTR_BHZ	<input type="checkbox"/> BK_POTR_LHZ			
BK_WDC_BHZ	<input type="checkbox"/> BK_WDC_LHZ			
BK_WENL_BHZ	<input type="checkbox"/> BK_WENL_LHZ			
BK_YBH_BHZ	<input type="checkbox"/> BK_YBH_LHZ			
CI_ARV_BHZ	<input type="checkbox"/> CI_ARV_LHZ			
CI_BBR_BHZ	<input type="checkbox"/> CI_BBR_LHZ			
CI_BC3_BHZ	<input type="checkbox"/> CI_BC3_LHZ			
CI_BCC_BHZ	<input type="checkbox"/> CI_BCC_LHZ			
CI_BEL_BHZ	<input type="checkbox"/> CI_BEL_LHZ			
CI_BFS_BHZ	<input type="checkbox"/> CI_BFS_LHZ			
CI_CIA_BHZ	<input type="checkbox"/> CI_CIA_LHZ			
CI_CWC_BHZ	<input type="checkbox"/> CI_CWC_LHZ			



Orblookup

Netscape: igpprt:anza real-time status

File Edit View Go Communicator Help

igpprt:anza real-time status

last update: June 04 2002 17:58 UTC [[Update Now](#)]

ORB LIST

[igpprtanza](#)
[rtquakeanza](#)

NETWORKS

[AZ](#)
[CI](#)

LEGEND

Station is operating normally.
Station is reporting alert conditions.
Station has not reported.
Station has not been added to the database.

Network	# of stations	# expected	# of channels	min latency	median latency	max latency
Anza Real-Time Broadband Array	22	17	180	4 secs	5 secs	1 mins

Anza Real-Time Broadband Array

242	243	BZN	CRY	DHL	FRD	GLA	IREF
KNW	LVA2	MONP	PFO	RDM	SMTC	SND	SOL
STS2	THSB	TRIL	TRO	WMC	YAQ		

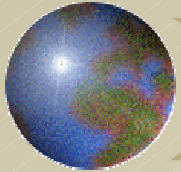
Anza Real-Time Broadband Array

station	latency	numchans	skew	voltage	AC failure	hazard	clock lock
242	32 secs	0			off	off	off
243	35 secs	0			off	off	off

Fields to display:

AC failure
 clock lock
 hazard
 latency
 numchans
 skew
 temp(C)
 temp(F)
 voltage

Show alerts only



Orblookup

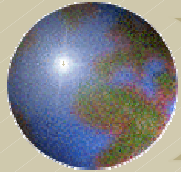
Netscape: igpprt:anza real-time status

File Edit View Go Communicator Help

Anza Real-Time Broadband Array

station	latency	numchans	skew	temp(F)	temp(C)	voltage	AC failure	hazard	clock lock
242	30 secs	0					off	off	off
243	33 secs	0					off	off	off
BZN	4 secs	12		71.0 °F	21.7 °C	13.30 V			
CRY	5 secs	12		71.0 °F	21.7 °C	13.60 V			
DHL	15 secs	3		71.0 °F	21.7 °C	11.80 V			
FRD	5 secs	12		71.0 °F	21.7 °C	13.21 V			
GLA									
IREF	28 secs	6		86.0 °F	30.0 °C	14.01 V			
KNW	4 secs	12		66.0 °F	18.9 °C	12.68 V			
LVA2	4 secs	12		73.3 °F	22.9 °C	13.30 V			
MONP	5 secs	9		75.0 °F	23.9 °C	13.31 V			
PFO	4 secs	12		78.0 °F	25.6 °C	13.81 V			
RDM	4 secs	12		71.0 °F	21.7 °C	12.39 V			
SMTC									
SND	4 secs	12		78.0 °F	25.6 °C	13.70 V			
SOL									
STS2	14 secs	9		71.0 °F	21.7 °C	11.50 V			
THSB	13 secs	12							
TRIL	13 secs	9		69.0 °F	20.6 °C	11.85 V			
TRO	1 mins	12		62.0 °F	16.7 °C	12.30 V			
WMC	4 secs	12		69.0 °F	20.6 °C	13.22 V			
YAQ	4 secs	12		88.7 °F	31.5 °C	14.14 V			

Show alerts only
Update



Dlmon

- Check state of health of digitizers (k2, q330, q4120).

dlmon: :usarray :usarray

File	sta	SLT	runtm	dr	cme	pkp	buf	m0	m1	m2	temp	volt	amp	lat	lon	elev	gps	gps	clk	cldrf	vco	cltncy	dgp	dltny
	TA_D03A	0m		0	0.0%	0																	0s	
	TA_109C	0m	15h	3.8k	100%	58502	0.0%	20	20	20	23C	13.3V	64mA	32.889	-117.105	163m	offp	lf	H	3us	2021	1h	0s	1s
	TA_A04A	0m	11h	1.3k	100%	38630	0.0%	-8	1	-8	12C	12.9V	54mA	48.720	-122.707	29m	offp	lf	H	4us	1924	1h	0s	14s
	TA_HAST	0m	28m	2.7k	100%	1906	0.0%	21	20	20	18C	12.8V	64mA	36.389	-121.552	553m	offp	lf	H	3us	1965	4m	0s	9s
	TA_Y12C	0m	5m	3.0k	85%	461	100%	20	20	20	19C	12.8V	65mA					lf	H	4us	2045	3h	0s	2h
target: anf_usarray_q330						69	0.0%	-4	7	-23	14C	13.2V	56mA	34.074	-106.921	1430m	offp	lf	H	3us	1913	43m	0s	9s

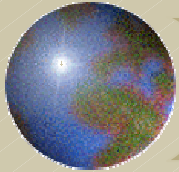
host: vsn.ucsd.edu 132.239.4.3[17769]
 cmdorb: -
 model: Q330
 dlcon: udp:204.102.84.241:5332:L1
 sn: 0100000A27A69463
 ptag: 1006
 nchan: 6
 thr: 25600
 status interval: 20s
 nrb: 35
 trb: 11/19/2004 0:15:19.000
 nrs: 42
 trs: 11/19/2004 0:15:41.000

display log
 command

```

q330: TA_Y12C: q3302orb: q330_cfg_channels_pvt: LOG window_size ok...
q330: TA_Y12C: q3302orb: q330_cfg_channels_pvt: LOG acknowledge_count ok...
q330: TA_Y12C: q3302orb: q330_cfg_channels_pvt: LOG acknowledge_timeout ok...
q330: TA_Y12C: q3302orb: q330_cfg_channels_pvt: configuration ok...
q330: TA_Y12C: q3302orb: q330_get_status_pvt: timeout - retrying
q330: TA_Y12C: q3302orb: q330_open_data: data stream open - starting with 47042.
q330: TA_Y12C: q3302orb: q330_run_data_thread: reading data.
q330: TA_Y12C: q3302orb: q330_get_status_pvt: timeout - retrying
q330: TA_Y12C: q3302orb: q330_get_status_pvt: timeout - retrying
q330: TA_Y12C: LOG: ip = 204.102.84.242 ?, msg = Baler readback, 644 recs, seq end: 420901
q330: TA_Y12C: q3302orb: q330_get_status_pvt: timeout - retrying
  
```

ALL STATIONS



Nagios - general status

Nagios

http://mercali.ucsd.edu/nagios/

Google

Nagios

General

- Home
- Documentation

Monitoring

- Tactical Overview
- Service Detail
- Host Detail
- Hostgroup Overview
- Hostgroup Summary
- Hostgroup Grid
- Servicegroup Overview
- Servicegroup Summary
- Servicegroup Grid
- Status Map
- 3-D Status Map
- PerfData Graphs

Service Problems

- Host Problems
- Network Outages

Show Host:

- Comments
- Downtime
- Process Info
- Performance Info
- Scheduling Queue

Current Network Status

Last Updated: Wed Nov 24 13:17:53 PST 2004
 Updated every 90 seconds
 Nagios® - www.nagios.org
 Logged in as eakins

[View History For This Host](#)
[View Notifications For This Host](#)
[View Service Status Detail For All Hosts](#)

Host Status Totals

Up	Down	Unreachable	Pending
1	0	0	0

[All Problems](#) [All Types](#)

0	1
---	---

Service Status Totals

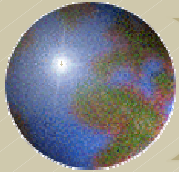
Ok	Warning	Unknown	Critical	Pending
7	0	0	1	0

[All Problems](#) [All Types](#)

1	8
---	---

Service Status Details For Host 'vsn'

Host	Service	Status	Last Check	Duration	Attempt	Status Information
vsn	PING stats	OK	11-24-2004 13:12:54	34d 11h 14m 36s	1/6	PING OK - Packet loss = 0%, RTA = 0.95 ms
	TA_109C/MGENC/M40	OK	11-24-2004 13:16:12	1d 3h 38m 14s	1/3	ORBSTAT OK: last packet age = 3.345 seconds
	TA_A04A/MGENC/M40	OK	11-24-2004 13:12:51	1d 2h 31m 22s	1/3	ORBSTAT OK: last packet age = 11.419 seconds
	TA_D03A_BHZ/MGENC/M40	CRITICAL	11-24-2004 13:12:53	5d 21h 0m 10s	3/3	CRITICAL: No orbstat packet found, age = 0
	TA_HAST/MGENC/M40	OK	11-24-2004 13:16:15	1d 3h 38m 14s	1/3	ORBSTAT OK: last packet age = 11.837 seconds
	TA_V04C_BHZ/GENC	OK	11-24-2004 13:16:12	1d 14h 48m 25s	1/3	ORBSTAT OK: last packet age = 16.287 seconds
	TA_Y22C/MGENC/M40	OK	11-24-2004 13:12:52	1d 14h 33m 20s	1/3	ORBSTAT OK: last packet age = 12.916 seconds
	orbpf2db :usarray	OK	11-24-2004 13:16:11	1d 14h 48m 25s	1/3	ORBSTAT OK: latency = 6:26 minutes



Nagios - problem status

Nagios

http://mercali.ucsd.edu/nagios/

Google

Nagios

General

- Home
- Documentation

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- Tactical Overview
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- Servicegroup Summary
- Servicegroup Grid
- Status Map
- 3-D Status Map
- PerfData Graphs

Service Problems

- Host Problems
- Network Outages

Show Host:

- Comments
- Downtime
- Process Info
- Performance Info

Current Network Status
 Last Updated: Wed Nov 24 13:24:04 PST 2004
 Updated every 90 seconds
 Nagios® - www.nagios.org
 Logged in as *eakins*

Host Status Totals

Up	Down	Unreachable	Pending
9	1	0	0

All Problems: 1 | All Types: 10

Service Status Totals

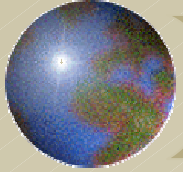
Ok	Warning	Unknown	Critical	Pending
15	1	0	2	0

All Problems: 3 | All Types: 18

Display Filters:
 Host Status Types: All
 Host Properties: Any
 Service Status Types: All Problems
 Service Properties: Any

Service Status Details For Host Group 'usarray'

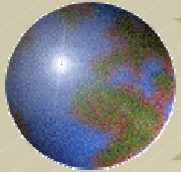
Host	Service	Status	Last Check	Duration	Attempt	Status Information
d03a-g330	PING stats	CRITICAL	11-24-2004 13:21:26	10d 12h 45m 22s	1/6	PING CRITICAL - Host Unreachable (169.204.137.15)
vsn	TA_D03A_BHZ/MGENC/M40	CRITICAL	11-24-2004 13:22:53	5d 21h 6m 22s	3/3	CRITICAL: last packet age = 7:49 hours
y12c-g330	PING stats	WARNING	11-24-2004 13:22:29	0d 0h 4m 35s	2/6	PING WARNING - Packet loss = 30%, RTA = 64.46 ms



Day-to-Day system operations with cronjobs

☀ Cronjobs

- ☒ rtreport - % data return and some network statistics
- ☒ rtsys - summary of log files
- ☒ rtbackup - backup of previous day's waveforms
- ☒ antelope_update - check for patches
- ☒ rtdbclean - removal of excess data and table rows
- ☒ event_archive - extract and archive segmented events
- ☒ truncate_logs - remove excess(old) lines from log files



Crontab editing tool

- Graphical User Interface found under the “Edit” menu of rtm.
- Cronrun command - test cronjob from command line

```
Cron Table for rt@igpprt
# These cron jobs are actually run by rtexec.
# Their environment is the same as the rtexec environment.
# stdout and stderr are redirected to logs/name.
#
# task-name UTC/LOCAL Min Hour Day Month DayOfWeek Command
clearlogs\tUTC 0 3 * * 5 truncate_log -v -r -d 14 logs/* | mailx -v -s "ANZA truncate logs" jeakins@ucsd.edu
rtdbclean UTC 5 3 * * * rtdbclean -v -m flvernon@ucsd.edu,jeakins@ucsd.edu $ORB $DB
sysreport \tUTC 15 3 * * * rtsys -v -m flvernon@ucsd.edu,jeakins@ucsd.edu,dkilb@epicenter.ucsd.edu,jbc
datareport\tUTC 20 3 * * * rtreport -z -v -s "sta!~/PFEN|PREF|PFL1|PFL4|GLA|SMTC|YAQ|I.*/" -m flvernon@ucsd
rtbackup \tUTC 45 3 * * * rtbackup -v -m flvernon@ucsd.edu,jeakins@ucsd.edu,dkilb@epicenter.ucsd.edu,jbc
```

Comments Enable all Disable all

Task Name
rtdbclean

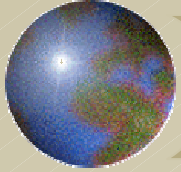
Cron command line
rtdbclean -v -m flvernon@ucsd.edu,jeakins@ucsd.edu \$ORB \$DB

When to run try command Ok

<input checked="" type="checkbox"/> UTC	5	3	*	*	*	run now	New
	Minute	Hour	Day of Month	Month	Day of Week		Revert

soon Disable Delete

Quit without saving Save Save and Quit



Is it a problem? - rtreport

```

/var/mail/eakins
Mailbox Message Compose View Options Move Help

Sender      Subject      Date and Time  Size
548 Real Time System PROBLEMS - db/anza igpprt rtbackup Thu May 30 20:46 1K
549 rt@iris.washington KN System: 2 Problems Fri May 31 5:10 2K
550 rt@iris.washington KN Data: 0.00% of 0 z channels (1/1 Fri May 31 5:15 2K

Message 550 of 564, 7 new, 24 deleted

From: rt@iris.washington.edu
Date: Fri, 31 May 2002 05:15:04 -0700 (PDT)
Subject: KN Data: 0.00% of 0 z channels (1/11 stations) 0 events
Mime-Version: 1.0

Kyrgyz Seismic Telemetry Network
gore:/export/home/rt/knet database=db/knet orb=localhost:knet (6520)

Current time:
5/31/2002 (151) 12:15:01.000 UTC
5/31/2002 (151) 5:15:01.000 US/Pacific Daylight Savings Time

/opt/antelope/4.4/bin/rtreport : $Revision: 1.13 $Date: 2001/01/04 16:34:55
Data report for 1 days beginning Thursday May 30 2002-150

Showing z channels only

Collected 0.1 mbytes of data
filesystem has 9694.8 mbytes left: about 70562.7 similar days

Problem #1
Log files are rather large: 1.96 mbytes

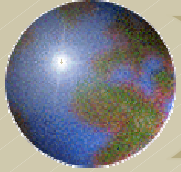
0.00% data recovered from 33 z channels (11 stations)
0.00% data recovered from 0 up z channels (1 stations reporting)
average gap = 1 days
average up gap = 0 microseconds
maximum gap = 1 days

Channels down:
AAK: BHZ
AAK: HHZ
AAK: LHZ
AML: BHZ
AML: HHZ
AML: LHZ
CHM: BHZ
CHM: HHZ
CHM: LHZ
EKS2: BHZ
EKS2: HHZ
EKS2: LHZ
ERPT: BHZ

```

Subject line suggests that you look at this email closely (0% data return).

Text of message confirms you have a problem.



Is it a problem? - rtsys

```

/var/mail/eakins
Mailbox Message Compose View Options Move Help
Sender Subject Date and Time Size
734 Real Time System AZ System: 11 Problems Mon Jun 3 16:00 13K

Message 577 of 577, 0 new, 157 deleted
Date: Mon, 3 Jun 2002 15:59:40 -0700 (PDT)
From: Real Time System <rt@igpprt.ucsd.edu>
Subject: AZ System: 11 Problems
To: undisclosed-recipients;
X-Mailer: scanner: Clean
Mime-Version: 1.0

System report for Sunday June 02 2002-153
/opt/antelope/dev/bin/rtsys : $Revision: 1.14 $Date: 2001/02/12 21:22:37

Anza Real-Time Broadband Array
igpprt:/export/home/rt/anza database=db/anza orb=:anza (6510)

Current time:
6/03/2002 (154) 22:59:01.000 UTC
6/03/2002 (154) 15:59:01.000 US/Pacific Daylight Savings Time

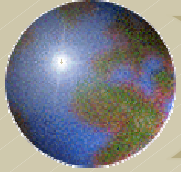
No System shutdowns since midnight 6/02/2002 UTC
Last shutdown was 5/03/2002 23:30:09.000 : fix libstock for Danq

Problem #1
Restarts since midnight 6/02/2002 UTC:
datareport
6/02/2002 3:20:00.000 rtreport -z -v -m
flvernon@ucsd.edu,goffield@ucsd.edu,jeakins@ucsd.edu,cgeddes@ucsd.edu
6/03/2002 3:20:00.000 rtreport -z -v -m
flvernon@ucsd.edu,goffield@ucsd.edu,jeakins@ucsd.edu,cgeddes@ucsd.edu
orb2dbacc
6/03/2002 2:42:23.000 orb2db -m '(CI.*QCDA|IAZ.*CPSCLHS|IAZ_KSW[12].*)'
-r '(./DAS|./RTX|./[BLJS])' -S state/orb2dba
6/03/2002 2:42:45.000 orb2db -m '(CI.*QCDA|IAZ.*CPSCLHS|IAZ_KSW[12].*)'
-r '(./DAS|./RTX|./[BLJS])' -S state/orb2dba
6/03/2002 2:43:31.000 orb2db -m '(CI.*QCDA|IAZ.*CPSCLHS|IAZ_KSW[12].*)'
-r '(./DAS|./RTX|./[BLJS])' -S state/orb2dba
6/03/2002 2:44:54.000 orb2db -m '(CI.*QCDA|IAZ.*CPSCLHS|IAZ_KSW[12].*)'
-r '(./DAS|./RTX|./[BLJS])' -S state/orb2dba
6/03/2002 2:47:34.000 orb2db -m '(CI.*QCDA|IAZ.*CPSCLHS|IAZ_KSW[12].*)'
-r '(./DAS|./RTX|./[BLJS])' -S state/orb2dba
6/03/2002 6:47:34.000 orb2db -m '(CI.*QCDA|IAZ.*CPSCLHS|IAZ_KSW[12].*)'
-r '(./DAS|./RTX|./[BLJS])' -S state/orb2dba
orb2dbcit_bh
6/03/2002 2:42:25.000 orb2db -m '(CI.*BH.)' -S state/orb2dbcit_bh :anza
db/anza 2001304:07:45:00
6/03/2002 2:43:32.000 orb2db -m '(CI.*BH.)' -S state/orb2dbcit_bh :anza
db/anza 2001304:07:45:00
6/03/2002 2:45:15.000 orb2db -m '(CI.*BH.)' -S state/orb2dbcit_bh :anza
db/anza 2001304:07:45:00
6/03/2002 2:46:35.000 orb2db -m '(CI.*BH.)' -S state/orb2dbcit_bh :anza

```

Subject line suggests that there may be problems - rtsys.pf allows customization to ignore some typical or expected problems

Text of message suggests you have a problem - and what logs to check.



Is it a problem? - rtbackup

```

/var/mail/eakins
Mailbox Message Compose View Options Move Help

Sender      Subject      Date and Time  Size
548 Real Time System PROBLEMS - db/anza igpprt rtbackup Thu May 30 20:46 1K
549 rt@iris.washington KN System: 2 Problems Fri May 31 5:10 2K
550 rt@iris.washington KN Data: 0.00% of 0 z channels (1/1 Fri May 31 5:15 2K

Message 548 of 557, 0 new, 24 deleted

Date: Thu, 30 May 2002 20:45:28 -0700 (PDT)
From: Real Time System <rt@igpprt.ucsd.edu>
To: dkilb@epicenter.ucsd.edu, flvernon@ucsd.edu, jbowen@epicenter.ucsd.edu,
jsekins@ucsd.edu
Subject: PROBLEMS - db/anza igpprt rtbackup
X-MailScanner: Clean
MIME-Version: 1.0

Anza Real-Time Broadband Array
igpprt:/export/home/rt/anza database=db/anza

command line: /opt/antelope/dev/bin/rtbackup db/anza /dev/rmt/2n
: 1.24 : 2000/12/28 21:23:29 n
Current time:
5/31/2002 (151) 3:45:01.000 UTC
5/30/2002 (150) 20:45:01.000 US/Pacific Daylight Savings Time

/dev/rmt/2n: no tape loaded or drive offline

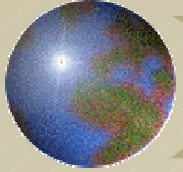
Check errors in logs/rtbackup
rtbackup - died 5/31/2002 (151) 3:45:28.000 UTC

```

Subject line suggests that you look at this email closely.

`/dev/rmt/2n: no tape loaded or drive offline`
`Check errors in logs/rtbackup`
`rtbackup - died 5/31/2002 (151) 3:45:28.000 UTC`

Text of message suggests you have a problem - and what logs to check.



Where to find answers and documentation

- ❁ Manpages
- ❁ User's guide
 - ❁ /opt/antelope/doc (ARTS, datascope, scripting/programming, Matlab)
- ❁ Webpages (FAQ's)
 - ❁ <http://www.brvt.com/faq/>
 - ❁ <http://eqinfo.ucsd.edu/faq/>
- ❁ Antelope User's Discussion Group
 - ❁ <http://www.indiana.edu/~aug/>

