

SC2SEI

Automatic transfer of phase readings and waveforms from a SeisComp3 data base to a SEISAN data base

Version 1.14

Terje Utheim and Jens Havskov

Department of Earth Science
University of Bergen
Allegaten 41, 5007 Bergen
Norway

Ph. +47 55583408

Email: Terje.Utheim@uib.no, terjeu@hotmail.com

December 2016

1	INTRODUCTION	5
2	MODIFICATIONS IN VERSION 1.14	6
3	INSTALLATION	7
3.1	STEP-BY-STEP installation of SC2SEI.....	7
4	HOW SC2SEI WORKS	9
4.1	Which mode to use and testing.	12
4.2	Starting sc2sei as a cron job.....	12
5	PARAMETER FILES	14
5.1	Overview of parameter files.	14
5.2	sc2sei.par.....	14
5.3	sc2sei.cfg.....	15
6	UTILITIES STATIONHYP AND CRT_RESP	17
6.1	stationhyp	17
6.2	crt_resp	17
7	FILES IN DISTRIBUTION.....	18
8	REFERENCES	19
9	CONSOLE OUTPUT EXAMPLES.....	20

Copyright:

The SC2SEI executables and all SC2SEI source files are copyrighted to Department of Earth Science (DES), University of Bergen. However, DES grants permissions to use and modify the SC2SEI source files for non-commercial purposes. DES shall not be held responsible for any loss or damage caused by the use of this software, financially or otherwise. Commercial use of this software requires a written agreement with DES. Use of the software implies agreement with the terms above.

Questions and suggestions

Any questions or suggestions concerning the software can be sent to the email addresses on the front page.

1 INTRODUCTION

Within the seismological community one of the most popular data acquisition and automatic processing system is the SeisComp3(SC3) system (seiscomp3.org). The system is maintained by Gempa (gempa.de). The system has limited facilities for manual processing of events, so many people choose to transfer the data to the SEISAN analysis software for further processing (Havskov and Ottemöller (1999), www.seisan.info). However this is a slightly cumbersome task since the data manually has to be extracted out of the SC3 relational data base (based on date and time and component) and then manually inserted into the SEISAN data base.

The SC2SEI utility is an attempt to make a simple interface to automatically extract triggered and located events recorded by SC3 and store them in the SEISAN database complete with phase readings, locations and magnitudes as well as a corresponding extracted waveform file. Utilities are also included to extract station coordinates and response files, readable by SEISAN, from SC2SEI. The data in the SEISAN data base will then be ready for the operator for further processing.

SEISAN can also read the continuous data from the SC3 archive so manual extraction of events with SEISAN can be done as well as offline event detection, both using the SC3 archive. The combination SC3-SEISAN will then provide the user with a good system for both automatic and manual processing.

This version of SC2SEI must run on the same computer as the SC3 and SEISAN as utilities in both systems are used.

Any feedback will be appreciated.

2 Modifications in version 1.14

Earthmodel is now extracted from SC3. The Seisan s-files will now include the indicator D for distant (iasp91) or L for local.

New input parameter -hid text: host-id. User can extract data from other host where SC3 is running. Assuming that user has access to this host. Default is localhost.

New parameter -sdbnam text: Name of SC3 database. Default is seiscomp3.

Modifications version 1.13

The manual/automatic indicator is extracted from the SC3 bulletin and inserted in the s-file.

The magnitudes, and corresponding amplitudes and periods, are extracted from the SC3 bulletin. In the SC3 bulletin 3 magnitudes are recognized and inserted in line type 1 in the s-file, if present. The corresponding amplitudes and period are stored on the phase lines

MLv	L
mb	b
mB	B

Weight from SC3 bulletin: 1.0 and 0.0 are set to "space" and "4" respectively in the s-file.

First motion from SC3 bulletin is set to C, D or blank in the s-file.

Agency is set to SC3 as default in the s-file

In line 1 in the s-file all events are set to "R", regional.

Three new command line options have been implemented:

- wav 1 (default: record both s-file and waveform)
- wav 0 record s-file only

- allcmp 1 (default: record all components specified in parameter file sc2sei.cfg)
- allcmp 0 record all components that have a phase reading.

- ID sc3-event-id create s-file and record waveform for this SC3 single event id.

The -man option is only valid for mode Request and Archives:

- man 0 (default: record all events, both automatic and manually processed)**
- man 1 record all automatically processed events only**
- man 2 record all manually processed events only**

3 INSTALLATION

Pre-requisites:

SEISAN installed according to SEISAN documentation.

SC3 installed according to SC3 documentation.

Package libmysqlclient-dev must be installed.

3.1 STEP-BY-STEP installation of SC2SEI

STEP 1:

It is assumed there is a user account in where SC2SEI can be installed. If not or you want to use a separate account, first create a user account with a username and directory name. An account **seismo** will be used throughout this manual, but any account name will work.

Username: **seismo**

Password: selected by the user.

Making this account will create a home directory: /home/seismo.

Log into this account to start the installation.

STEP 2:

Copy the distribution tar file into your /home/seismo directory and extract the distribution files:

gunzip sc2sei_v1.14.tar.gz

tar -xvf sc2sei_v1.14.tar

A new directory SC2SEI will be created with the subdirectories:

bin	executables
par	parameter files
slinktool	modified version of the SC3 slinktool
src	sc2sei source files and Makefile

STEP 3:

Change to the SC2SEI directory and type:

make clean

make all

make install

The sc2sei re-compiled executable is now stored in the SC2SEI/bin directory.

NB! Include the environment variable SC2SEIS_TOP, ARCHIVE_TOP and PATH:

bash:

export SC2SEI_TOP=/home/yourdir/SC2SEI

export ARCHIVE_TOP=/archive-directory

PATH=/home/yourdir/SC2SEI/bin:\$PATH

csh:

setenv SC2SEI_TOP /home/yourdir/SC2SEI

setenv ARCHIVE_TOP /archive-directory

set sc=(/home/yourdir/SC2SEI/bin)

set path=(\$path \$sc)

The SC3 environment setting SEISCOMP_ROOT must be set to the installation directory of the SC3 unless already set during the installation of SC3. Example:

export SEISCOMP_ROOT=/home/yourdir/seiscomp3

4 How SC2SEI works

SC3 is often operated with both local and remote stations and will thus, in addition to triggering on local events, also trigger on distant events which might not be of interest for the local monitoring. SC2SEI has therefore implemented a latitude-longitude and magnitude window within which the event must occur to be transferred to SEISAN. The magnitude is the one defined as *M* in SC3. SC3 must be running for SC2SEI to work. To ensure this, SC2SEI enters a loop checking if SC3 is active. When SC3 is active, SC2SEI will continue.

The program can work in four different modes:

- **Request mode:** The program is started to extract events in a given time interval *-begin* to *-end*. Events are extracted from the Seedlink segments. When all events from this time window have been extracted, the program exits.
- **Continuous mode:** The program runs continuously to extract events shortly after an event has been processed by SC3. An input parameter, *-time*, tells the program how far back in time it should start to look for events. When all events up until current time have been transferred, the program will continue checking for new events every minute. When events up to current time have been extracted, the next waveform extract is delayed 90 seconds (can be changed in parameter file), plus post event time to ensure data availability.
- **Archive mode:** The program is started to extract events from a given time interval *-begin* to *-end* and the *-arc* option directs the program to extract the events from the continuous SC3 archives. When all events from this time window have been extracted, the program exits. To use this mode the user must ensure that archives are generated by SC3 (module *slarchive* must be running).
- **Archive ID mode:** The program is started to extract one event specified by the option *-ID idnumber* where *idnumber* can be found in for example the SC3 *scolv* display. To use this mode the user must ensure that archives are generated by SC3 (module *slarchive* must be running).

All modes will record both s-file and waveform by default.

The user can add the option *-wav 0* on all four modes to record only the s-files.

The user can add the option *-allcmp 0* on all four modes to record only components with phase readings

In all modes, the main tasks performed by SC2SEI are:

- Checks if the magnitude is within the range specified in the parameter file.
- Checks if the location is within the area specified in the parameter file.
- A waveform file (MiniSeed format) with the detected event is extracted from the SC3 segments or archives and stored in the SEISAN database, the S-file is created with the corresponding link to the waveform file. The SC3 segments and archives are normally several days or weeks long. This is configured in SC3.

SC2SEI does not transfer all SC3 parameters. Currently the following are transferred:

origin time, hypocentre, magnitudes and corresponding amplitudes and periods (Ml, Mb and MB), number of stations used, residuals each p-phase reading, rms residual and all automatic p-phase readings.

As agency is not available in the SC3 bulletin, agency in the s-file is set to SC3.

In addition, the user must make his own SEISAN station and model file and the response files. The station and response files can be extracted from SC3 with an included utility while the model information must be provided by the user.

SC3 uses IASP91 model by default. SEISAN can also use IASP91, but then the distance indicator must be set to D.

SC2SEI command line arguments:

-time	n	hours to check back in time at startup. Note: <i>-time</i> cannot be used together with <i>-begin</i> and <i>-end</i> .
-arc	1	switch to extract data from archives
-u	username	username SC3 database
-p	password	password SC3 database
-hid	hostid	hostid database (default: localhost)
-sdbnam	SC3 database	SC3 database name (default: seiscomp3)
-begin	time1	format: "2012-01-28 10:30:00"
-end	time2	format: "2012-01-30 15:30:00"
-wav	1/0	1: record waveforms (default) and s-file. 0: do not record waveforms, only s-files
-allcmp	1/0	1: record all components specified in parameter-file (default) 0: record only components with phase readings.
-ID	event-id	create s-file and extract the waveform for this SC3 event id

- The username and password must always be present.
- The *-time n* option will extract data from the n hours back in time until current time and continue checking for new events every minute. Data extracted from the Seedlink segments. Not allowed with *-arc*, *-begin* and *-end*.
- The *-arc 1* option will extract data from *-begin* to *-end* from the SC3 continuous data archive. Not allowed with *-time*.
- The *-begin time1 -end time2* will extract events from time1 to time2 and exit. The format must be as shown above (as for SC3).
- The *-wav* controls if the waveform is extracted into the SEISAN data base or not. Default is 1. If the option 0 is selected, no waveforms are extracted and the corresponding s-file do not include the type 6 line that specifies the filename.
- The *-allcmp* controls which components that are extracted. Default is 1, which means that all components specified in the parameter-file are extracted. A 0 will extract only components with phase readings.
- If the *-arc 1* option is set, data are always extracted from the SC3 archives (normally big archives), otherwise from the SC3 segments (normally only some days storage).

Start *sc2sei*:

Request mode:

The command below will start *sc2sei*, look for events in the time window from *-begin* to *-end*, and it will log in to the database with the username *alfa* and password *beta*. Data is extracted from the Seedlink segment buffers. Then it will exit.

sc2sei -u alfa -p beta -begin "2012-01-28 10:30:00" -end "2012-01-30 15:30:00"

same as above, but only manually processed events:

sc2sei -man 2 -u alfa -p beta -begin "2012-01-28 10:30:00" -end "2012-01-30 15:30:00"

Continuous mode:

The command below will start *sc2sei*, look for events back in time 1 hour, extract data from Seedlink segment buffer, and it will log in to the database with the username *alfa* and password *beta*. Then continue checking for new events every minute.

sc2sei -time 1 -u alfa -p beta

Archive mode:

The command below will start *sc2sei*, look for events in the time window from *-begin* to *-end*, extract data from the SC3 continuous archives and exit.

sc2sei -arc 1 -u alfa -p beta -begin "2012-01-28 10:30:00" -end "2012-01-30 15:30:00"

same as above, but only automatically processed events:

sc2sei -man 1 -arc 1 -u alfa -p beta -begin "2012-01-28 10:30:00" -end "2012-01-30 15:30:00"

Archive ID mode:

The command below will start *sc2sei*, look for event id *gfz2015abcd*, extract data from the SC3 continuous archives and exit.

sc2sei -ID gfz2015abcd -u alfa -p beta

An example of continuous mode, no waveform recording:

sc2sei -time 1 -u alfa -p beta -wav 0

NB! *-time* cannot be used together with *-begin* and *-end*

4.1 Which mode to use and testing.

The user decides which mode to run the `sc2sei` depending on the tasks to be performed with the extracted data. Which mode that can be started will also depend on how the SC3 is configured. For example, if continuous archives are not generated, the *archive mode* and *archive ID mode* does not work. The time window of data to be extracted from the Seedlink segments (Request mode and Continuous mode) must be within the time window that are configured for the number of segments defined in SC3.

All modes will by default extract data into a SEISAN database called SC3___. If the user already uses this database name for other purposes and don't want data to be mixed or overwritten, the SEISAN database name must be changed in the `sc2sei` configuration file.

It is recommended that the user test the different actual options with a relatively small time interval, for example 2-5 days, before setting up a job to extract data for several months or years. This will give the user the possibility to check that the options works as wanted. This testing can be done in a few minutes while a long time interval can take hours.

It is also important to check the `sc2sei.par` file to verify that database name, magnitude limits and latitude, longitude are set to correct values.

4.2 Starting `sc2sei` as a cron job.

Cron jobs can be set up to run `sc2sei`. An example is shown below (edit the two files below to fit your installation):

`cron_restart.bash`

```
#!/bin/bash
#
MAILTO=""
PROCESS='sc2sei'
if ps ax | grep -v grep | grep $PROCESS > /dev/null
then
echo "SC2SEI running, EXIT"
exit
else
echo "$PROCESS is not running"
echo "start the process"
echo "Start $PROCESS !"
#echo "put in the start command here"
/home/yourdir/SC2SEI/par/start_sc2sei.bash &
fi
```

`start_sc2sei.bash`

```
#!/bin/bash
source /home/seisan-dir/COM/SEISAN.bash
export SEISCOMP_ROOT=/home/seiscomp3-dir/seiscomp3
export PATH=/home/seiscomp3-dir/seiscomp3/bin:$PATH
export LD_LIBRARY_PATH=/home/seiscomp3-dir/seiscomp3/lib:$LD_LIBRARY_PATH
export PYTHONPATH=/home/seiscomp3-dir/seiscomp3/lib/python:$PYTHONPATH
export MANPATH=/home/seiscomp3-dir/seiscomp3/share/man:$MANPATH
# Setup SC2SEI
export SC2SEI_TOP=/home/yourdir/SC2SEI
export ARCHIVE_TOP=/home/seiscomp3-dir/seiscomp3/var/lib/archive
PATH=/home/yourdir/SC2SEI/bin:$PATH
cd /home/yourdir
/home/yourdir/SC2SEI/bin/sc2sei -time 1 -u alfa -p beta &
```

Run `crontab -e` and add the following line to check every 2 minutes that `sc2sei` is running. If not running, it will be re-started.

```
* /2 * * * * /home/yourdir/SC2SEI/par/cron_restart.bash >/dev/null 2>&1
```

Edit the above to comply with your installation:

<code>yourdir:</code>	your account directory, for example <code>/home/seismo</code>
<code>seisandir:</code>	where SEISAN is installed, for example <code>/home/seismo</code>
<code>seiscomp3-dir:</code>	home directory for the SC3 installation, for example: <code>/home/sysop</code>

5 PARAMETER FILES

5.1 Overview of parameter files.

SC2SEI needs 2 parameter files as input:

sc2sei.par is used to configure sc2sei to look for events within a certain range of magnitude and geographical area.

It also specifies the name of the SEISAN database where the waveform and s-files are to be stored.

sc2sei.cfg is used for sc2seis to specify which station components are to be extracted from the Seiscomp3 archives.

5.2 sc2sei.par

This file is parameter file for SC2SEI.
Only the lines with recognized keyword under KEYWORD will be read.
The comments have no importance.
Columns Par 1-Par 2 start in columns 41,51.

All keywords in capital letters.

KEYWORD.....	Comments.....	Par 1.....	Par 2
DBASENAME	For SEISAN	SC3__	name of SEISAN database-----
PRE_EVENT	Pre-event (seconds)	60	pre-event in seconds-----
POST_EVENT	Post-event (seconds)	240	post-event in seconds-----
PROC_DELAY	Delay (seconds)	90	seconds to sleep to finish processing-----
MAG_MIN	Minimum magnitude	2.0	magnitude min-----
MAG_MAX	Maximum magnitude	9.0	magnitude max-----
LAT_MIN	Minimum latitude	-40.0	latitude min-----
LAT_MAX	Maximum latitude	-10.0	latitude max-----
LON_MIN	Minimum longitude	-80.0	longitude min-----
LON_MAX	Maximum longitude	-50.0	longitude max-----

DBASENAME	SEISAN database name (up to 5 letters)
PRE_EVENT	Number of seconds to record before the SC3 origin time.
POST_EVENT	Number of seconds to record after the origin time.
PROC_DELAY	Number of seconds to sleep to finish processing
MAG_MIN	Minimum magnitude.
MAG_MAX	Maximum magnitude.
LAT_MIN	Minimum latitude.
LAT_MAX	Maximum latitude.
LON_MIN	Minimum longitude.
LON_MAX	Maximum longitude.

5.3 sc2sei.cfg

The sc2sei.cfg file specifies which stations and components to be extracted from the SC3 archives. The format is column specific:

The top line RECORD CHILE1 is just a header.

NW Network name

STAT Station name

LOC Location (no location is specified as ..)

CMP Component

RECORD CHILE1

NW	STAT	LOC	CMP
CX	PB01	..	BHZ
CX	PB01	..	BHN
CX	PB01	..	BHE
CX	PB02	..	BHZ
CX	PB02	..	BHN
CX	PB02	..	BHE
CX	PB03	..	BHZ
CX	PB03	..	BHN
CX	PB03	..	BHE
CX	PB04	..	BHZ
CX	PB04	..	BHN
CX	PB04	..	BHE
CX	PB05	..	BHZ
CX	PB05	..	BHN
CX	PB05	..	BHE
CX	PB06	..	BHZ
CX	PB06	..	BHN
CX	PB06	..	BHE
CX	PB07	..	BHZ
CX	PB07	..	BHN
CX	PB07	..	BHE
CX	PB08	..	BHZ
CX	PB08	..	BHN
CX	PB08	..	BHE
CX	PB09	..	BHZ
CX	PB09	..	BHN
CX	PB09	..	BHE
CX	PB10	..	BHZ
CX	PB10	..	BHN
CX	PB10	..	BHE
CX	PB11	..	BHZ
CX	PB11	..	BHN
CX	PB11	..	BHE
CX	PB12	..	BHZ
CX	PB12	..	BHN
CX	PB12	..	BHE
CX	PB14	..	BHZ
CX	PB14	..	BHN
CX	PB14	..	BHE
CX	PB15	..	BHZ

CX	PB15	..	BHN
CX	PB15	..	BHE
CX	PB16	..	BHZ
CX	PB16	..	BHN
CX	PB16	..	BHE
CX	MNMCX	..	BHZ
CX	MNMCX	..	BHN
CX	MNMCX	..	BHE
CX	PATCX	..	BHZ
CX	PATCX	..	BHN
CX	PATCX	..	BHE
CX	PSGCX	..	BHZ
CX	PSGCX	..	BHN

6 Utilities stationhyp and crt_resp

6.1 stationhyp

This routine extracts the station name, latitude, longitude and elevation from the SC3 inventory database. The values are converted into SEISAN format and can be used directly in the STATION0.HYP file. It is recommended to run the routine from a working directory and then edit the STATION0.HYP file and include stations from the stationhyp.txt generated.

6.2 crt_resp

This is a script stored in the SC2SEI directory that will use different routines from SC3 to produce response files that can be used directly in SEISAN.

It is recommended that you start the script from a working directory to check the files before transferring them to the CAL directory in SEISAN. Files can be checked with the SEISAN presp program.

Start the script from for example /home/seismo/TESTING

```
cd /home/seismo/TESTING
```

/home/seismo/SC2SEI/crt_resp alfa beta where alfa and beta is SC3 database username and password respectively.

The script will generate response files for all stations defined in the SC3 database.

```
RESP.CX.PB01..BHZ  
RESP.NU.ESPN..HHN  
etc.
```

7 Files in distribution

SC2SEI/Makefile	Makefile for all source codes
SC2SEI/crt_rest	script to create response files
SC2SEI/bin/sc2sei	executable of SC2SE
SC2SEI/bin/getwindow	executable of modified slinktool. Does not reconnect after timeout.
SC2SEI/bin/stationhyp	executable of routine to create SEISAN station file
SC2SEI/par/sc2sei.cfg	configuration file
SC2SEI/par/sc2sei.par	parameter file
SC2SEI/par/cron_restart.bash	cron file
SC2SEI/par/start_sc2sei.bash	file to start SC2SE from cron file
SC2SEI/slinktool/libslink	original seedlink library files needed for getwindow
SC2SEI/slinktool/src	source slinktool and getwindow
SC2SEI/src	source code for sc2sei
SC2SEI/src	source code for stationhyp
SC2SEI/src	mybulletin.py

8 REFERENCES

Havskov, J and L. Ottemøller (1999). SEISAN earthquake analysis software. *Seismological Research letters*, 70, 532-534. For current version see seisan.info.

Seiscomp3, Gempa, Potsdam, Germany. See www.seiscomp3.org

9 Console output examples

CONTINUOUS MODE

Start `sc2sei` in continuous mode and look for data 18 hours back in time

```
sc2sei -time 18 -u alfa -p beta
seedlink: not running.....wait.... SC3 not active, wait until started
seedlink: not running.....wait....
seedlink: not running.....wait....
seedlink: 3467 running, continue
code 7
Contin. mode: Extract from segments n hours back in time. Waveforms. All components.
SC2SEI: SEISCOMP_ROOT.....: /home/seismo/seiscomp3
SC2SEI: SEISAN_TOP.....: /home/seismo/snew
SC2SEI: SC2SEI.....: /home/seismo/SC2SEI
SC2SEI: ARCHIVE.....: /home/seismo/seiscomp3/var/lib/archive
SC2SEI: Read Parameters.....: /home/seismo/SC2SEI/par/sc2sei.par
SC2SEI: PRE_EVENT.....: 60 seconds
SC2SEI: POST_EVENT.....: 180 seconds
SC2SEI: PROC_DELAY.....: 90 seconds
SC2SEI: LAT_MIN.....: -40.00
SC2SEI: LAT_MAX.....: -4.00
SC2SEI: LON_MIN.....: -80.00
SC2SEI: LON_MAX.....: -50.00
SC2SEI: MAG_MIN.....: 2.00
SC2SEI: MAG_MAX.....: 9.00
SC2SEI: DBASENAME.....: SC3__
SC2SEI: WAVEDIR.....: /home/seismo/snew/WAV
***** Read sc2sei *****
SC2SEI: Read Config to MEM.....: /home/seismo/SC2SEI/par/sc2sei.cfg
number of lines in parameter file: 57
Mode: Continous
```

Check for event id in time interval

```
Setting start to 2015-10-28 19:41:37
Setting end to 2015-10-29 13:41:37
Extract ID: gfz2015vdqa after sleeping 90 seconds
```

Output from SC3 database

```
0 Event:
1   Public ID          gfz2015vdqa
2   Description
3     region name: Northern Chile
4 Origin:
5   Date              2015-10-28
6   Time              19:45:04.5 +/- 1.0 s
7   Latitude          -23.26 deg +/- 6 km
8   Longitude         -69.27 deg +/- 13 km
9   Depth             62 km +/- 11 km
10  Agency            AA
11  Mode               automatic
12  Status              NOT SET
13  Residual RMS       0.57 s
14  Azimuthal gap      215 deg
15
16 2 Network magnitudes:
17   MLv          5.06 +/- 0.20 12
18   M            5.06          12 preferred
19
20 14 Phase arrivals:
21   sta net cmp dist azi toang phase time res wt sta loca
22   PB15 CX BHZ 0.2 284 0.0 P 19:45:15.4 0.0 A 1.0 . PB15
23   PB06 CX BHZ 0.6 333 0.0 P 19:45:18.7 -0.5 A 1.0 . PB06
24   PB05 CX BHZ 1.0 295 0.0 P 19:45:22.2 -0.1 A 1.0 . PB05
25   PB10 CX BHZ 1.2 257 0.0 P 19:45:25.5 0.0 A 1.0 . PB10
26   PB04 CX BHZ 1.2 318 0.0 P 19:45:25.8 0.1 A 1.0 . PB04
27   PB03 CX BHZ 1.3 340 0.0 P 19:45:26.8 0.3 A 1.0 . PB03
28   PB07 CX BHZ 1.6 339 0.0 P 19:45:31.4 0.3 A 1.0 . PB07
29   PB14 CX BHZ 1.7 217 0.0 P 19:45:32.2 0.1 A 1.0 . PB14
30   PB02 CX BHZ 2.0 343 0.0 P 19:45:36.9 0.6 A 1.0 . PB02
31   PB01 CX BHZ 2.2 355 0.0 P 19:45:39.6 0.7 A 1.0 . PB01
```

```

32  HMBCX CX BHZ 3.0 349 0.0 P 19:45:49.7 -0.2 A 1.0 . HMBCX
33  PB08 CX BHZ 3.1 2 0.0 P 19:45:51.7 0.6 A 1.0 . PB08
34  PB11 CX BHZ 3.5 354 0.0 P 19:45:56.0 -0.5 A 1.0 . PB11
35  PSGCX CX BHZ 3.7 348 0.0 P 19:45:58.1 -1.6 A 1.0 . PSGCX
36
37 14 Station magnitudes:
38  sta net cmp dist azi type value res time amp per
39  PB15 CX BHZ 0.2 284 MLv 4.40 -0.66 2015-10-28 19:45:26.469 360.98
40  PB06 CX BHZ 0.6 333 MLv 4.92 -0.14 2015-10-28 19:45:31.419 118.315
41  PB05 CX BHZ 1.0 295 MLv 4.75 -0.31 2015-10-28 19:45:37.819 53.2659
42  PB10 CX BHZ 1.2 257 MLv 5.15 0.08 2015-10-28 19:45:47.149 94.0489
43  PB04 CX BHZ 1.2 318 MLv 4.91 -0.15 2015-10-28 19:45:49.519 53.0053
44  PB03 CX BHZ 1.3 340 MLv 4.90 -0.16 2015-10-28 19:45:49.269 48.6762
45  PB07 CX BHZ 1.6 339 MLv 4.90 -0.17 2015-10-28 19:46:04.569 30.7757
46  PB14 CX BHZ 1.7 217 MLv 5.41 0.35 2015-10-28 19:46:00.494 90.7636
47  PB02 CX BHZ 2.0 343 MLv 5.24 0.18 2015-10-28 19:46:11.919 41.615
48  PB01 CX BHZ 2.2 355 MLv 4.92 -0.14 2015-10-28 19:46:14.019 15.2115
49  HMBCX CX BHZ 3.0 349 MLv 5.35 0.28 2015-10-28 19:46:42.350 14.473
50  PB08 CX BHZ 3.1 2 MLv 5.00 -0.06 2015-10-28 19:46:17.419 5.84834
51  PB11 CX BHZ 3.5 354 MLv 5.40 0.34 2015-10-28 19:47:03.549 8.92896
52  PSGCX CX BHZ 3.7 348 MLv 5.33 0.27 2015-10-28 19:47:17.150 6.22662
53
SC2SEI:.fullpath and filename: /home/seismo/snew/WAV/SC3__/2015/10/2015-10-28-1944-04.SC3__
SC2SEI:.waveform directory...: /home/seismo/snew/WAV/SC3__/2015/10
buffer: 10-29-2015 13:43:07.
Extracting waveform data. Some components no data and program get timeout
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
0 gfz2015vdqa
1
2
3
4
5
6
7
8
9
New event
Extract ID: gfz2015vdri after sleeping 90 seconds
0 Event:
1 Public ID gfz2015vdri
2 Description
3 region name: Northern Chile
4 Origin:
5 Date 2015-10-28
6 Time 20:25:29.9 +/- 1.1 s
7 Latitude -22.62 deg +/- 5 km
8 Longitude -68.87 deg +/- 9 km
9 Depth 10 km
10 Agency AA
11 Mode automatic
12 Status NOT SET
13 Residual RMS 2.22 s
14 Azimuthal gap 229 deg
15
16 2 Network magnitudes:
17 MLv 2.70 +/- 0.34 10
18 M 2.70 10 preferred
19
20 14 Phase arrivals:
21 sta net cmp dist azi toang phase time res wt sta loca
22 PB06 CX BHZ 0.7 262 0.0 P 20:25:45.4 2.4 A 1.0 . PB06

```

```

23 PB15 CX BHZ 0.8 223 0.0 P 20:25:42.6 -3.1 A 1.0 . PB15
24 PB03 CX BHZ 1.0 305 0.0 P 20:25:46.2 -2.8 A 1.0 . PB03
25 PB04 CX BHZ 1.2 283 0.0 P 20:25:54.5 2.2 A 1.0 . PB04
26 PB05 CX BHZ 1.3 259 0.0 P 20:25:55.1 2.3 A 1.0 . PB05
27 PB07 CX BHZ 1.3 313 0.0 P 20:25:50.7 -2.7 A 1.0 . PB07
28 PB02 CX BHZ 1.6 324 0.0 P 20:25:57.8 -0.2 A 1.0 . PB02
29 PB01 CX BHZ 1.7 340 0.0 P 20:25:55.8 -3.1 A 1.0 . PB01
30 PB10 CX BHZ 1.8 240 0.0 P 20:26:08.2 7.6 AX 0.0 . PB10
31 PB14 CX BHZ 2.5 215 0.0 P 20:26:19.2 9.4 AX 0.0 . PB14
32 PB08 CX BHZ 2.5 354 0.0 P 20:26:12.1 1.8 A 1.0 . PB08
33 HMBCX CX BHZ 2.5 338 0.0 P 20:26:10.8 -0.0 A 1.0 . HMBCX
34 PB11 CX BHZ 3.0 345 0.0 P 20:26:18.5 1.9 A 1.0 . PB11
35 PSGCX CX BHZ 3.2 339 0.0 P 20:26:21.9 1.3 A 1.0 . PSGCX
36
37 12 Station magnitudes:
38 sta net cmp dist azi type value res time amp per
39 PB06 CX BHZ 0.7 262 MLv 1.92 -0.78 2015-10-28 20:26:06.769 0.113909
40 PB15 CX BHZ 0.8 223 MLv 2.42 -0.28 2015-10-28 20:26:24.019 0.29509
41 PB03 CX BHZ 1.0 305 MLv 2.08 -0.62 2015-10-28 20:26:20.269 0.106647
42 PB04 CX BHZ 1.2 283 MLv 2.77 0.07 2015-10-28 20:27:21.419 0.392509
43 PB05 CX BHZ 1.3 259 MLv 2.45 -0.25 2015-10-28 20:27:39.069 0.180837
44 PB07 CX BHZ 1.3 313 MLv 2.50 -0.20 2015-10-28 20:27:17.869 0.191774
45 PB02 CX BHZ 1.6 324 MLv 2.95 0.24 2015-10-28 20:27:24.469 0.356159
46 PB01 CX BHZ 1.7 340 MLv 2.52 -0.18 2015-10-28 20:27:37.819 0.122708
47 PB08 CX BHZ 2.5 354 MLv 2.79 0.09 2015-10-28 20:27:20.819 0.0804687
48 HMBCX CX BHZ 2.5 338 MLv 3.22 0.52 2015-10-28 20:27:56.699 0.206196
49 PB11 CX BHZ 3.0 345 MLv 3.32 0.61 2015-10-28 20:28:00.649 0.150248
50 PSGCX CX BHZ 3.2 339 MLv 3.32 0.62 2015-10-28 20:27:37.899 0.104494
51
SC2SEI::fullpath and filename: /home/seismo/snew/WAV/SC3___/2015/10/2015-10-28-2024-29.SC3___
SC2SEI::waveform directory...: /home/seismo/snew/WAV/SC3___/2015/10
buffer: 10-29-2015 13:45:12.
No data, timeout
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
0 gfz2015vdqa
1 gfz2015vdri
2
3
4
5
6
7
8
9
New event
Extract ID: gfz2015vdrv after sleeping 90 seconds
0 Event:
1 Public ID gfz2015vdrv
2 Description
3 region name: Northern Chile
4 Origin:
5 Date 2015-10-28
6 Time 20:39:32.7 +/- 0.5 s
7 Latitude -21.75 deg +/- 3 km
8 Longitude -69.33 deg +/- 6 km
9 Depth 10 km
10 Agency AA
11 Mode automatic
12 Status NOT SET
13 Residual RMS 2.60 s
14 Azimuthal gap 179 deg
15

```

```

16 2 Network magnitudes:
17     MLv      2.35 +/- 0.32    9
18     M        2.35              9 preferred
19
20 12 Phase arrivals:
21     sta net cmp dist azi toang phase time res wt sta loca
22     PB03 CX BHZ 0.5 232 0.0 P 20:39:39.3 -3.8 A 1.0 . PB03
23     PB07 CX BHZ 0.5 272 0.0 P 20:39:40.5 -2.9 A 1.0 . PB07
24     PB02 CX BHZ 0.7 309 0.0 P 20:40:00.5 14.3 AX 0.0 . PB02
25     PB01 CX BHZ 0.7 348 0.0 P 20:39:45.4 -1.4 A 1.0 . PB01
26     PB04 CX BHZ 1.0 232 0.0 P 20:39:55.3 4.2 A 1.0 . PB04
27     PB06 CX BHZ 1.0 193 0.0 P 20:39:49.4 -2.2 A 1.0 . PB06
28     PB05 CX BHZ 1.4 216 0.0 P 20:39:59.9 2.5 A 1.0 . PB05
29     PB15 CX BHZ 1.5 185 0.0 P 20:39:56.5 -2.3 A 1.0 . PB15
30     HMBCX CX BHZ 1.6 340 0.0 P 20:40:01.7 1.6 A 1.0 . HMBCX
31     PB08 CX BHZ 1.6 6 0.0 P 20:40:00.5 -0.4 A 1.0 . PB08
32     PB10 CX BHZ 2.1 212 0.0 P 20:40:11.2 3.4 A 1.0 . PB10
33     PSGCX CX BHZ 2.3 341 0.0 P 20:40:11.3 1.1 A 1.0 . PSGCX
34
35 11 Station magnitudes:
36     sta net cmp dist azi type value res time amp per
37     PB03 CX BHZ 0.5 232 MLv 1.77 -0.58 2015-10-28 20:40:18.169 0.123352
38     PB07 CX BHZ 0.5 272 MLv 1.79 -0.56 2015-10-28 20:40:10.469 0.11343
39     PB01 CX BHZ 0.7 348 MLv 1.90 -0.44 2015-10-28 20:40:31.069 0.101531
40     PB04 CX BHZ 1.0 232 MLv 2.29 -0.06 2015-10-28 20:40:13.869 0.178882
41     PB06 CX BHZ 1.0 193 MLv 2.22 -0.13 2015-10-28 20:40:10.819 0.148672
42     PB05 CX BHZ 1.4 216 MLv 2.42 0.07 2015-10-28 20:40:47.869 0.142859
43     PB15 CX BHZ 1.5 185 MLv 2.85 0.51 2015-10-28 20:40:23.469 0.344542
44     HMBCX CX BHZ 1.6 340 MLv 2.56 0.21 2015-10-28 20:42:00.049 0.156161
45     PB08 CX BHZ 1.6 6 MLv 2.34 -0.00 2015-10-28 20:41:53.719 0.0887682
46     PB10 CX BHZ 2.1 212 MLv 2.89 0.55 2015-10-28 20:40:48.749 0.169133
47     PSGCX CX BHZ 2.3 341 MLv 2.72 0.38 2015-10-28 20:41:36.299 0.0913921
48
SC2SEI:.fullpath and filename: /home/seismo/snew/WAV/SC3___/2015/10/2015-10-28-2038-32.SC3___
SC2SEI:.waveform directory...: /home/seismo/snew/WAV/SC3___/2015/10
buffer: 10-29-2015 13:47:16.
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
0 gfz2015vdqa
1 gfz2015vdri
2 gfz2015vdrv
3
4
5
6
7
8
9
No more events in the interval 18 hours back in time, check for new events..
Setting start to 2015-10-29 13:43:50
Setting end to 2015-10-29 13:48:50
Setting start to 2015-10-29 13:44:50
Setting end to 2015-10-29 13:49:50
New event
Extract ID: gfz2015vezt after sleeping 90 seconds
0 Event:
1 Public ID gfz2015vezt
2 Description
3 region name: Northern Chile
4 Origin:
5 Date 2015-10-29
6 Time 13:48:45.9 +/- 0.5 s

```

[illegible]


```

TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
0 gfz2015vdqa
1 gfz2015vdri
2 gfz2015vdrv
3 gfz2015vezr
4
5
6
7
8
9

```

No data to extract, check every minute

Setting start to 2015-10-29 13:48:46

Setting end to 2015-10-29 13:53:46

REQUEST MODE

Extract events in given time interval from segments

```

rt>sc2sei -u sysop -p sysop -begin "2015-10-28 20:00:00" -end "2015-10-28 23:00:00"
seedlink: 6620 running, continue
code 27
Request mode: Extract from segments. Waveforms. All components.
SC2SEI: SEISCOMP_ROOT.....: /home/seismo/seiscomp3
SC2SEI: SEISAN_TOP.....: /home/seismo/snew
SC2SEI: SC2SEI.....: /home/seismo/SC2SEI
SC2SEI: ARCHIVE.....: /home/seismo/seiscomp3/var/lib/archive
SC2SEI: Read Parameters.....: /home/seismo/SC2SEI/par/sc2sei.par
SC2SEI: PRE_EVENT.....: 60 seconds
SC2SEI: POST_EVENT.....: 180 seconds
SC2SEI: PROC_DELAY.....: 90 seconds
SC2SEI: LAT_MIN.....: -40.00
SC2SEI: LAT_MAX.....: -4.00
SC2SEI: LON_MIN.....: -80.00
SC2SEI: LON_MAX.....: -50.00
SC2SEI: MAG_MIN.....: 2.00
SC2SEI: MAG_MAX.....: 9.00
SC2SEI: DBASENAME.....: SC3__
SC2SEI: WAVEDIR.....: /home/seismo/snew/WAV
***** Read sc2sei *****
SC2SEI: Read_Config_to_MEM.....: /home/seismo/SC2SEI/par/sc2sei.cfg
number of lines in parameter file: 57
Mode: Request
Setting start to 2015-10-28 20:00:00
Setting end to 2015-10-28 23:00:00
0 Event:
1 Public ID gfz2015vdri
2 Description
3 region name: Northern Chile
4 Origin:
5 Date 2015-10-28
6 Time 20:25:29.9 +/- 1.1 s
7 Latitude -22.62 deg +/- 5 km
8 Longitude -68.87 deg +/- 9 km
9 Depth 10 km
10 Agency AA
11 Mode automatic
12 Status NOT SET
13 Residual RMS 2.22 s
14 Azimuthal gap 229 deg
15
16 2 Network magnitudes:
17 MLv 2.70 +/- 0.34 10
18 M 2.70 10 preferred
19

```

```

20 14 Phase arrivals:
21 sta net cmp dist azi toang phase time res wt sta loca
22 PB06 CX BHZ 0.7 262 0.0 P 20:25:45.4 2.4 A 1.0 . PB06
23 PB15 CX BHZ 0.8 223 0.0 P 20:25:42.6 -3.1 A 1.0 . PB15
24 PB03 CX BHZ 1.0 305 0.0 P 20:25:46.2 -2.8 A 1.0 . PB03
25 PB04 CX BHZ 1.2 283 0.0 P 20:25:54.5 2.2 A 1.0 . PB04
26 PB05 CX BHZ 1.3 259 0.0 P 20:25:55.1 2.3 A 1.0 . PB05
27 PB07 CX BHZ 1.3 313 0.0 P 20:25:50.7 -2.7 A 1.0 . PB07
28 PB02 CX BHZ 1.6 324 0.0 P 20:25:57.8 -0.2 A 1.0 . PB02
29 PB01 CX BHZ 1.7 340 0.0 P 20:25:55.8 -3.1 A 1.0 . PB01
30 PB10 CX BHZ 1.8 240 0.0 P 20:26:08.2 7.6 AX 0.0 . PB10
31 PB14 CX BHZ 2.5 215 0.0 P 20:26:19.2 9.4 AX 0.0 . PB14
32 PB08 CX BHZ 2.5 354 0.0 P 20:26:12.1 1.8 A 1.0 . PB08
33 HMBCX CX BHZ 2.5 338 0.0 P 20:26:10.8 -0.0 A 1.0 . HMBCX
34 PB11 CX BHZ 3.0 345 0.0 P 20:26:18.5 1.9 A 1.0 . PB11
35 PSGCX CX BHZ 3.2 339 0.0 P 20:26:21.9 1.3 A 1.0 . PSGCX
36
37 12 Station magnitudes:
38 sta net cmp dist azi type value res time amp per
39 PB06 CX BHZ 0.7 262 MLv 1.92 -0.78 2015-10-28 20:26:06.769 0.113909
40 PB15 CX BHZ 0.8 223 MLv 2.42 -0.28 2015-10-28 20:26:24.019 0.29509
41 PB03 CX BHZ 1.0 305 MLv 2.08 -0.62 2015-10-28 20:26:20.269 0.106647
42 PB04 CX BHZ 1.2 283 MLv 2.77 0.07 2015-10-28 20:27:21.419 0.392509
43 PB05 CX BHZ 1.3 259 MLv 2.45 -0.25 2015-10-28 20:27:39.069 0.180837
44 PB07 CX BHZ 1.3 313 MLv 2.50 -0.20 2015-10-28 20:27:17.869 0.191774
45 PB02 CX BHZ 1.6 324 MLv 2.95 0.24 2015-10-28 20:27:24.469 0.356159
46 PB01 CX BHZ 1.7 340 MLv 2.52 -0.18 2015-10-28 20:27:37.819 0.122708
47 PB08 CX BHZ 2.5 354 MLv 2.79 0.09 2015-10-28 20:27:20.819 0.0804687
48 HMBCX CX BHZ 2.5 338 MLv 3.22 0.52 2015-10-28 20:27:56.699 0.206196
49 PB11 CX BHZ 3.0 345 MLv 3.32 0.61 2015-10-28 20:28:00.649 0.150248
50 PSGCX CX BHZ 3.2 339 MLv 3.32 0.62 2015-10-28 20:27:37.899 0.104494
51
SC2SEI::fullpath and filename: /home/seismo/snew/WAV/SC3___/2015/10/2015-10-28-2024-29.SC3___
SC2SEI::waveform directory...: /home/seismo/snew/WAV/SC3___/2015/10
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
0 Event:
1 Public ID gfz2015vdrv
2 Description
3 region name: Northern Chile
4 Origin:
5 Date 2015-10-28
6 Time 20:39:32.7 +/- 0.5 s
7 Latitude -21.75 deg +/- 3 km
8 Longitude -69.33 deg +/- 6 km
9 Depth 10 km
10 Agency AA
11 Mode automatic
12 Status NOT SET
13 Residual RMS 2.60 s
14 Azimuthal gap 179 deg
15
16 2 Network magnitudes:
17 MLv 2.35 +/- 0.32 9
18 M 2.35 9 preferred
19
20 12 Phase arrivals:
21 sta net cmp dist azi toang phase time res wt sta loca
22 PB03 CX BHZ 0.5 232 0.0 P 20:39:39.3 -3.8 A 1.0 . PB03
23 PB07 CX BHZ 0.5 272 0.0 P 20:39:40.5 -2.9 A 1.0 . PB07
24 PB02 CX BHZ 0.7 309 0.0 P 20:40:00.5 14.3 AX 0.0 . PB02
25 PB01 CX BHZ 0.7 348 0.0 P 20:39:45.4 -1.4 A 1.0 . PB01
26 PB04 CX BHZ 1.0 232 0.0 P 20:39:55.3 4.2 A 1.0 . PB04

```

```

27 PB06 CX BHZ 1.0 193 0.0 P 20:39:49.4 -2.2 A 1.0 . PB06
28 PB05 CX BHZ 1.4 216 0.0 P 20:39:59.9 2.5 A 1.0 . PB05
29 PB15 CX BHZ 1.5 185 0.0 P 20:39:56.5 -2.3 A 1.0 . PB15
30 HMBCX CX BHZ 1.6 340 0.0 P 20:40:01.7 1.6 A 1.0 . HMBCX
31 PB08 CX BHZ 1.6 6 0.0 P 20:40:00.5 -0.4 A 1.0 . PB08
32 PB10 CX BHZ 2.1 212 0.0 P 20:40:11.2 3.4 A 1.0 . PB10
33 PSGCX CX BHZ 2.3 341 0.0 P 20:40:11.3 1.1 A 1.0 . PSGCX
34
35 11 Station magnitudes:
36 sta net cmp dist azi type value res time amp per
37 PB03 CX BHZ 0.5 232 MLv 1.77 -0.58 2015-10-28 20:40:18.169 0.123352
38 PB07 CX BHZ 0.5 272 MLv 1.79 -0.56 2015-10-28 20:40:10.469 0.11343
39 PB01 CX BHZ 0.7 348 MLv 1.90 -0.44 2015-10-28 20:40:31.069 0.101531
40 PB04 CX BHZ 1.0 232 MLv 2.29 -0.06 2015-10-28 20:40:13.869 0.178882
41 PB06 CX BHZ 1.0 193 MLv 2.22 -0.13 2015-10-28 20:40:10.819 0.148672
42 PB05 CX BHZ 1.4 216 MLv 2.42 0.07 2015-10-28 20:40:47.869 0.142859
43 PB15 CX BHZ 1.5 185 MLv 2.85 0.51 2015-10-28 20:40:23.469 0.344542
44 HMBCX CX BHZ 1.6 340 MLv 2.56 0.21 2015-10-28 20:42:00.049 0.156161
45 PB08 CX BHZ 1.6 6 MLv 2.34 -0.00 2015-10-28 20:41:53.719 0.0887682
46 PB10 CX BHZ 2.1 212 MLv 2.89 0.55 2015-10-28 20:40:48.749 0.169133
47 PSGCX CX BHZ 2.3 341 MLv 2.72 0.38 2015-10-28 20:41:36.299 0.0913921
48
SC2SEI:.fullpath and filename: /home/seismo/snew/WAV/SC3___/2015/10/2015-10-28-2038-32.SC3___
SC2SEI:.waveform directory...: /home/seismo/snew/WAV/SC3___/2015/10
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel
TUMOD Timeout. No data for 1 second, try next channel

```

Above 2 events were extracted from time interval.

Below 2 s-files generated

```

2015 1028 2025 29.9 R -22.620 -68.870 10.0 SC3 14 2.2 2.7LSC3 1
GAP=229 1.10 5.0 9.0 E
2015-10-28-2024-29.SC3___ 6
ACTION:NEW 15-10-28 20:25 OP:SEIS STATUS: ID:20151028202529 I
Northern Chile 3
STAT SP IPHASW D HRMM SECON CODA AMPLIT PERI AZIMU VELO AIN AR TRES W DIS CAZ7
PB06 BZ IP A 2025 45.4 113.9 2.40 77 262
PB15 BZ IP A 2025 42.6 -3.10 88 223
PB03 BZ IP A 2025 46.2 -2.80 111 305
PB04 BZ IP A 2025 54.5 2.20 133 283
PB05 BZ IP A 2025 55.1 2.30 144 259
PB07 BZ IP A 2025 50.7 -2.70 144 313
PB02 BZ IP A 2025 57.8 -0.20 177 324
PB01 BZ IP A 2025 55.8 -3.10 189 340
PB10 BZ IP A 2026 8.2 7.60 200 240
PB14 BZ IP A 2026 19.2 9.40 278 215
PB08 BZ IP A 2026 12.1 1.80 278 354
HMBCXBZ IP A 2026 10.8 -0.00 278 338
PB11 BZ IP A 2026 18.5 1.90 333 345
PSGCXBZ IP A 2026 21.9 1.30 355 339
PB06 BZ IAML 2026 6.7 113.9 77 262
PB15 BZ IAML 2026 24.0 295.1 88 223
PB03 BZ IAML 2026 20.2 106.6 111 305
PB04 BZ IAML 2027 21.4 392.5 133 283
PB05 BZ IAML 2027 39.0 180.8 144 259
PB07 BZ IAML 2027 17.8 191.8 144 313
PB02 BZ IAML 2027 24.4 356.2 177 324
PB01 BZ IAML 2027 37.8 122.7 189 340
PB08 BZ IAML 2027 20.8 80.5 278 354
HMBCXBZ IAML 2027 56.6 206.2 278 338
PB11 BZ IAML 2028 0.6 150.2 333 345
PSGCXBZ IAML 2027 37.8 104.5 355 339

```

```

2015 1028 2039 32.7 R -21.750 -69.330 10.0 SC3 12 2.6 2.3LSC3 1
GAP=179 0.50 3.0 6.0 E
2015-10-28-2038-32.SC3 6
ACTION:NEW 15-10-28 20:39 OP:SEIS STATUS: ID:20151028203932 I
Northern Chile 3
STAT SP IPHASW D HRMM SECON CODA AMPLIT PERI AZIMU VELO AIN AR TRES W DIS CAZ7
PB03 BZ IP A 2039 39.3 -3.80 55 232
PB07 BZ IP A 2039 40.5 -2.90 55 272
PB02 BZ IP A 2040 0.5 14.30 77 309
PB01 BZ IP A 2039 45.4 -1.40 77 348
PB04 BZ IP A 2039 55.3 4.20 111 232
PB06 BZ IP A 2039 49.4 -2.20 111 193
PB05 BZ IP A 2039 59.9 2.50 155 216
PB15 BZ IP A 2039 56.5 -2.30 166 185
HMBCXBZ IP A 2040 1.7 1.60 177 340
PB08 BZ IP A 2040 0.5 -0.40 177 6
PB10 BZ IP A 2040 11.2 3.40 233 212
PSGCXBZ IP A 2040 11.3 1.10 255 341
PB03 BZ IAML 2040 18.1 123.4 55 232
PB07 BZ IAML 2040 10.4 113.4 55 272
PB01 BZ IAML 2040 31.0 101.5 77 348
PB04 BZ IAML 2040 13.8 178.9 111 232
PB06 BZ IAML 2040 10.8 148.7 111 193
PB05 BZ IAML 2040 47.8 142.9 155 216
PB15 BZ IAML 2040 23.4 344.5 166 185
HMBCXBZ IAML 2042 0.0 156.2 177 340
PB08 BZ IAML 2041 53.7 88.8 177 6
PB10 BZ IAML 2040 48.7 169.1 233 212
PSGCXBZ IAML 2041 36.2 91.4 255 341

```

ID MODE

Extract event-id gfz2015uukb from archive

```
sc2sei -u sysop -p sysop -ID gfz2015uukb
```

```
seedlink: 6620 running, continue
```

```
code 131
```

```
ID mode: Extract event ID gfz2015uukb from archives. Waveform. All components.
```

```
SC2SEI: SEISCOMP_ROOT.....: /home/seismo/seiscomp3
```

```
SC2SEI: SEISAN_TOP.....: /home/seismo/snew
```

```
SC2SEI: SC2SEI.....: /home/seismo/SC2SEI
```

```
SC2SEI: ARCHIVE.....: /home/seismo/seiscomp3/var/lib/archive
```

```
SC2SEI: Read_Parameters.....: /home/seismo/SC2SEI/par/sc2sei.par
```

```
SC2SEI: PRE_EVENT.....: 60 seconds
```

```
SC2SEI: POST_EVENT.....: 180 seconds
```

```
SC2SEI: PROC_DELAY.....: 90 seconds
```

```
SC2SEI: LAT_MIN.....: -40.00
```

```
SC2SEI: LAT_MAX.....: -4.00
```

```
SC2SEI: LON_MIN.....: -80.00
```

```
SC2SEI: LON_MAX.....: -50.00
```

```
SC2SEI: MAG_MIN.....: 2.00
```

```
SC2SEI: MAG_MAX.....: 9.00
```

```
SC2SEI: DBASENAME.....: SC3
```

```
SC2SEI: WAVEDIR.....: /home/seismo/snew/WAV
```

```
***** Read sc2sei *****
```

```
SC2SEI: Read_Config_to_MEM.....: /home/seismo/SC2SEI/par/sc2sei.cfg
```

```
number of lines in parameter file: 57
```

```
Mode: ID request
```

```
0 Event:
```

```
1 Public ID gfz2015uukb
```

```
2 Description
```

```
3 region name: Off Coast of Northern Chile
```

```
4 Origin:
```

```
5 Date 2015-10-23
```

```
6 Time 18:33:31.5 +/- 2.4 s
```

```
7 Latitude -26.60 deg +/- 19 km
```

```
8 Longitude -71.80 deg +/- 18 km
```

```
9 Depth 10 km
```

```
10 Agency AA
```

```
11 Mode automatic
```

```
12 Status NOT SET
```

```
13 Residual RMS 0.76 s
```

```
14 Azimuthal gap 340 deg
```

```

15
16 5 Network magnitudes:
17   MLv      5.06 +/- 0.14  10
18   mB       5.12          2
19   Mw (mB)  4.48          2
20   mb       4.81 +/- 0.28  6
21   M        4.97          10 preferred
22
23 12 Phase arrivals:
24   sta net cmp dist azi toang phase time res wt sta loca
25   PB14 CX BHZ 2.3 33 0.0 P 18:34:09.0 -0.9 A 1.0 . PB14
26   PB10 CX BHZ 3.3 20 0.0 P 18:34:22.9 0.1 A 1.0 . PB10
27   PB15 CX BHZ 4.0 32 0.0 P 18:34:34.0 1.3 A 1.0 . PB15
28   PB06 CX BHZ 4.4 28 0.0 P 18:34:37.4 -0.6 A 1.0 . PB06
29   PB04 CX BHZ 4.5 20 0.0 P 18:34:39.9 0.0 A 1.0 . PB04
30   PB03 CX BHZ 4.9 23 0.0 P 18:34:44.9 -0.3 A 1.0 . PB03
31   PB07 CX BHZ 5.2 20 0.0 P 18:34:48.4 -0.4 A 1.0 . PB07
32   PB02 CX BHZ 5.6 19 0.0 P 18:34:53.7 -0.3 A 1.0 . PB02
33   PB01 CX BHZ 5.9 21 0.0 P 18:34:58.8 -0.5 A 1.0 . PB01
34   HMBCX CX BHZ 6.6 16 0.0 P 18:35:09.0 1.3 A 1.0 . HMBCX
35   PB08 CX BHZ 6.9 21 0.0 P 18:35:13.5 1.1 A 1.0 . PB08
36   PSGCX CX BHZ 7.2 13 0.0 P 18:35:15.3 -0.7 A 1.0 . PSGCX
37
38 20 Station magnitudes:
39   sta net cmp dist azi type value res time amp per
40   PB14 CX BHZ 2.3 33 MLv 5.14 0.08 2015-10-23 18:34:26.795 21.9576
41   PB10 CX BHZ 3.3 20 MLv 4.53 -0.53 2015-10-23 18:35:00.250 1.60612
42   PB15 CX BHZ 4.0 32 MLv 5.65 0.59 2015-10-23 18:35:22.269 11.1773
43   PB06 CX BHZ 4.4 28 MLv 5.08 0.02 2015-10-23 18:35:30.269 2.42735
44   PB04 CX BHZ 4.5 20 MLv 5.03 -0.03 2015-10-23 18:35:39.669 1.99724
45   PB03 CX BHZ 4.9 23 MLv 5.10 0.04 2015-10-23 18:35:46.869 1.85902
46   PB07 CX BHZ 5.2 20 MLv 5.24 0.18 2015-10-23 18:35:57.319 2.207
47   PB07 CX BHZ 5.2 20 mB 5.07 -0.06 2015-10-23 18:35:38.219 1691.18
48   PB07 CX BHZ 5.2 20 mb 5.09 0.28 2015-10-23 18:35:09.169 148.86 0.72
49   PB02 CX BHZ 5.6 19 MLv 5.18 0.12 2015-10-23 18:36:24.619 1.56288
50   PB02 CX BHZ 5.6 19 mB 5.18 0.06 2015-10-23 18:35:52.719 1991.59
51   PB02 CX BHZ 5.6 19 mb 5.05 0.24 2015-10-23 18:35:18.319 84.7969 0.50
52   PB01 CX BHZ 5.9 21 MLv 4.84 -0.21 2015-10-23 18:36:21.669 0.573598
53   PB01 CX BHZ 5.9 21 mb 4.62 -0.18 2015-10-23 18:35:22.419 30.9372 0.54
54   HMBCX CX BHZ 6.6 16 MLv 5.12 0.06 2015-10-23 18:36:44.699 0.762258
55   HMBCX CX BHZ 6.6 16 mb 5.01 0.21 2015-10-23 18:35:37.150 61.9356 0.49
56   PB08 CX BHZ 6.9 21 MLv 5.07 0.01 2015-10-23 18:36:51.919 0.54982
57   PB08 CX BHZ 6.9 21 mb 4.60 -0.20 2015-10-23 18:35:38.169 26.0943 0.56
58   PSGCX CX BHZ 7.2 13 MLv 4.69 -0.37 2015-10-23 18:37:04.549 0.197526
59   PSGCX CX BHZ 7.2 13 mb 4.27 -0.54 2015-10-23 18:35:16.850 11.9064 0.57
60
SC2SEI::fullpath and filename: /home/seismo/snew/WAV/SC3___/2015/10/2015-10-23-1832-31.SC3___
SC2SEI::waveform directory...: /home/seismo/snew/WAV/SC3___/2015/10
scart -dsvE -l scartinput.txt /home/seismo/seiscomp3/var/lib/archive >
/home/seismo/snew/WAV/SC3___/2015/10/2015-10-23-1832-31.SC3___

```

s-file generated

```

2015 1023 1833 31.5 R -26.600 -71.800 10.0 SC3 12 0.8 5.0LSC3 4.8bSC3 5.1BSC31
GAP=340 2.40 19.0 18.0 E
2015-10-23-1832-31.SC3___ 6
ACTION:NEW 15-10-23 18:33 OP:SEIS STATUS: ID:20151023183331 I
Off Coast of Northern Chile 3
STAT SP IPHASW D HRMM SECON CODA AMPLIT PERI AZIMU VELO AIN AR TRES W DIS CAZ7
PB14 BZ IP A 1834 9.0 -0.90 255 33
PB10 BZ IP A 1834 22.9 0.10 366 20
PB15 BZ IP A 1834 34.0 1.30 444 32
PB06 BZ IP A 1834 37.4 -0.60 489 28
PB04 BZ IP A 1834 39.9 0.00 500 20
PB03 BZ IP A 1834 44.9 -0.30 544 23
PB07 BZ IP A 1834 48.4 -0.40 578 20
PB02 BZ IP A 1834 53.7 -0.30 622 19
PB01 BZ IP A 1834 58.8 -0.50 656 21
HMBCXBZ IP A 1835 9.0 1.30 733 16
PB08 BZ IP A 1835 13.5 1.10 767 21
PSGCXBZ IP A 1835 15.3 -0.70 800 13
PB14 BZ IAML 1834 26.7 21957.6 255 33
PB10 BZ IAML 1835 0.2 1606.1 366 20
PB15 BZ IAML 1835 22.2 11177.3 444 32
PB06 BZ IAML 1835 30.2 2427.4 489 28
PB04 BZ IAML 1835 39.6 1997.2 500 20

```

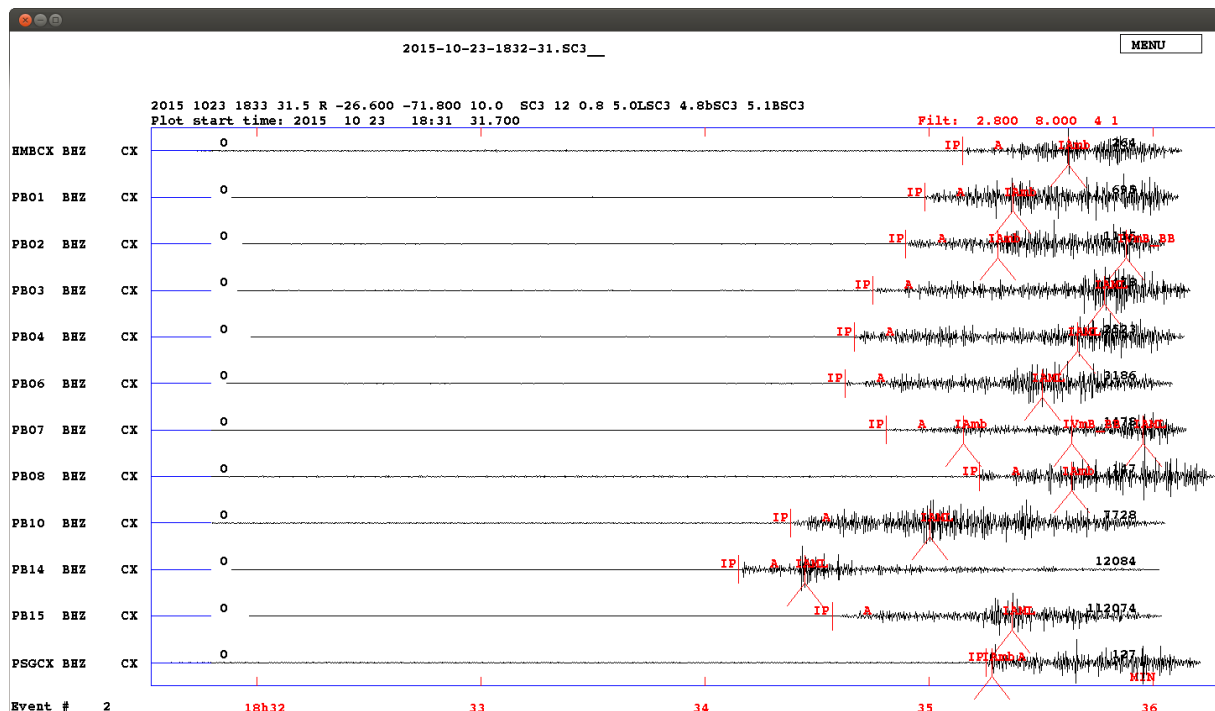
PB03 BZ	IAML	1835	46.8	1859.0	544	23
PB07 BZ	IAML	1835	57.3	2207.0	578	20
PB07 BZ	IVmB_BB	1835	38.2	1691.2	578	20
PB07 BZ	IAmb	1835	9.1	148.9	578	20
PB02 BZ	IAML	1836	24.6	1562.9	622	19
PB02 BZ	IVmB_BB	1835	52.7	1991.6	622	19
PB02 BZ	IAmb	1835	18.3	84.8	622	19
PB01 BZ	IAML	1836	21.6	573.6	656	21
PB01 BZ	IAmb	1835	22.4	30.9	656	21
HMBCXBZ	IAML	1836	44.6	762.3	733	16
HMBCXBZ	IAmb	1835	37.1	61.9	733	16
PB08 BZ	IAML	1836	51.9	549.8	767	21
PB08 BZ	IAmb	1835	38.1	26.1	767	21
PSGCXBZ	IAML	1837	4.5	197.5	800	13
PSGCXBZ	IAmb	1835	16.8	11.9	800	13

ID MODE components with phases only

```
sc2sei -u sysop -p sysop -ID gfz2015uukb -allcmp 0
```

The command above produces a waveform containing only components with phase readings. The figure below shows the extracted waveform.

The figure also show the effect of a too short POST-EVENT. The magnitude of the event is 5.1 and the POST-EVENT should be at least twice the length.



ARCHIVE MODE many events example:

This command will extract events for a time interval of almost a month, a total of 107 events. Each event have 55 components configured and the extracted waveform is around 5 minutes long. Total time to extract all events was around 4 minutes on a standard laptop computer.

```
sc2sei -u sysop -p sysop -begin "2015-10-01 00:00:00" -end "2015-10-29 23:00:00" -arc 1
```