

Antelope databases

a few thoughts

Seismological Service Nikolaus Horn nikolaus.horn@geosphere.at

				🔀 dbhelp	:css3.0				
	css3.0								
Center for Seismic Studies S									
Timestamp field: Modifications from origi	Iddate								
and instrument.rsptyp JNUT values corrected 2) offdate added to prin 3) endtime added to prin 3) endtime added to prin 3) arid and erange values exp 7) added vfredit relation 2) added vfredit relation 2) changed the primary key 00) added calibration an 11) changed primary key 12) changed primary key 13) changed primary key 13) changed primary key	ey in sitechan to chanid, in sensor to force joins h sensor table. in moment and centryd tab	type and unit: ich it occurs ich it occurs ing. ting and added le to orid. pe, sta, orid , offdate) atrix	5						
	und stgrid tables to accom Histopar			achanaux	adoption	affiliation	alarmcache	alarmcomm	alarms
anetsta	arrival	arrival2	arrival_tshift	assoc	b051	b059	balerlist	balerproc	beam
calib_request	calibration	calplot	calresult	calwf	centryd	changed	chanperf	cluster	comm
db_log									
ub_log	deployment	detection	detev	digitizer	discriminant	dlacq	dicalwf	dichannel	dicmd_cal
dlevent	deployment disensor	detection	detev	digitizer dmcfiles	discriminant dmcseed	dlacq dmcwf	dicalwf emodel	dlchannel ems98	dicmd_cal event
-									
dlevent	disensor	dlsite	dmcbull	dmcfiles	dmcseed	dmcwf	emodel	ems98	event
dlevent evin fo	disensor evissues	disite evt_channel	dmcbull evt_record	dmcfiles extension	dmcseed filehash	dmcwf fkgrid	emodel fplane	ems98 gap	event gps
dlevent evinfo gregion	disensor evissues gridscor	disite evt_channel gridstat	dmcbull evt_record gsnspec	dmcfiles extension hashsum	dmcseed filehash hypocentroid	dmcwf fkgrid idp	emodel fplane idp_assoc	ems98 gap instrument	event gps iptable
dlevent evinfo gregion lastid	disensor evissues gridscor latency	dlsite evt_channel gridstat macrosrc	dmcbull evt_record gsnspec mapassoc	dmcfiles extension hashsum mapstock	dmcseed filehash hypocentroid massoc	dmcwf fkgrid idp matrix_definition	emodel fplane idp_assoc mcitation	ems98 gap instrument mdp	event gps iptable meffects
dlevent evinfo gregion lastid meval	dlsensor evissues gridscor latency mmap	disite evt_channel gridstat macrosrc moment	dmcbull evt_record gsnspec mapassoc mpicture	dmcfiles extension hashsum mapstock mreport	dmcseed filehash hypocentroid massoc mreport_work	dmcwf fkgrid idp matrix_definition mt	emodel fplane idp_assoc mcitation netmag	ems98 gap instrument mdp netmw	event gps iptable meffects netperf
dlevent evinfo gregion lastid meval network	disensor evissues gridscor latency mmap nominalresp	dlsite evt_channel gridstat macrosrc moment origerr	dmcbull evt_record gsnspec mapassoc mpicture origin	dmcfiles extension hashsum mapstock mreport origin2	dmcseed filehash hypocentroid massoc mreport_work origqual	dmcwf fkgrid idp matrix_definition mt pdistance	emodel fplane idp_assoc mcitation netmag pmelruns	ems98 gap instrument mdp netmw predarr	event gps iptable meffects netperf predmech
dlevent evinfo gregion lastid meval network pregion	dikensor evissues gridscor latency mmap nominalresp q330_calibration_weblog	dlsite evt_channel gridstat macrosrc moment origerr q330comm	dmcbull evt_record gsnspec mapassoc mpicture origin q730b	dmcfiles extension hashsum mapstock mreport origin2 qctests	dmcseed filehash hypocentroid massoc mreport_work origqual qgrid	dmcwf fkgrid idp matrix_definition mt pdistance ratechange	emodel fplane idp_assoc mcitation netmag pmelruns remark	ems98 gap instrument mdp netmw predarr replayed	event gps iptable meffects netperf predmech retransmit
dlevent evinfo gregion lastid meval network pregion rrdcache	dikensor evissues gridscor latency mmap nominalresp q330_calibration_weblog rrdgraph	disite evt_channel gridstat macrosrc moment origerr q330comm rsyncbaler	dmcbull evt_record gsnspec mapassoc mpicture origin q730b schanloc	dmcfiles extension hashsum mapstock mreport origin2 qctests schwaz	dmcseed filehash hypocentroid massoc mreport_work origqual qgrid seismometer	dmcwf fkgrid idp matrix_definition mt pdistance ratechange sensor	emodel fplane idp_assoc mcitation netmag pmelruns remark sensorcal	ems98 gap instrument mdp netmw predarr replayed sensormodel	event gps iptable meffects netperf predmech retransmit site
dlevent evinfo gregion lastid meval network pregion rrdcache sitechan	disensor evissues gridscor latency mmap nominalresp q330_calibration_weblog rrdgraph sitephotos	disite evt_channel gridstat macrosrc moment origerr q330comm rsyncbaler snetsta	dmcbull evt_record gsnspec mapassoc mpicture origin q730b schanloc specdisc	dmcfiles extension hashsum mapstock mreport origin2 qctests schwaz sregion	dmcseed filehash hypocentroid massoc mreport_work origqual qgrid seismometer stabaler	dmcwf fkgrid idp matrix_definition mt pdistance ratechange sensor stage	emodel fplane idp_assoc mcitation netmag pmelruns remark sensorcal stamag	ems98 gap instrument mdp netmw predarr replayed sensormodel stamw	event gps iptable meffects netperf predmech retransmit site stanotes

June 5, 2023

schema basics



schema is made up of

- attributes
 - name, type, format
 - units, range, null, description, detail optional
- relations
 - name, fields
 - primary, alternate, foreign keys optional
 - defines, separator, description, detail optional

rules for schema definition unclear what are the rules for Units, Range,...?

definitions possible in files at various locations \$ANTELOPE/data/schemas/<schemaname> \$ANTELOPE/data/schemas/<schemaname>.ext/* \$ANTELOPE/contrib/data/schemas/<schemaname> \$ANTELOPE/contrib/data/schemas/schemaname.ext/* \$SCHEMA_DIR/<schemaname> \$SCHEMA_DIR/<schemaname>.ext/*

```
Attribute tmeas

Time (17)

Format ("%17.5f")

Null ("-99999999999900")

Units ("Seconds")

Description ("epoch time")

Detail {

Epoch time of a discrete measurement

made on waveform data

}
```

same attribute can be defined multiple times requires **identical** formatting previously defined attributes can be used how to avoid duplicated definitions ?

error messages sometimes misleading meaningless definitions possible

schema verification



new utility check_schema

iterate over all files that make up the schema

- check attributes
 - null reasonable
 - field sizes make sense
 - type corresponds with formatting and null value
 - ...
- check if attribute definitions identical

if no serious problems so far

- iterate over all relation
 - check if keys make sense
- iterate over all attributes
 - check null values
 - check if attribute is used in any relation







etype in origin – should be in event mb, ml, ms in origin confusing

event info missing – would be nice to have evname/evmag/evurl/evtype various flavours exist in contributed tables

event.evname too short

preferred "magnitude" missing

no clear "order" of magnitudes

site/sitechan/sensor/instrument

- note really intuitive
- ondate::offdate ⇔ time::endtime
- sta/chan ⇔ chanid

wfid

• what is it good for?

• • • • x origin											
Data on event location and size											
Information descri particular event i				origin f	or a						
Rrimary key: time lat lon depth ndef nass											
Alternate key:	orid										
Defines id:	orid										
Foreign keys: evid commid grn srn											
Record Size (bytes): 238											
lat	lon	depth	time	orid	evid	jdate	nass	ndef	ndp	grn	
srn	etype	review	depdp	dtype	mb	mbid	ms	msid	ml	mlid	
algorithm	auth	commid	Iddate								
Dismiss										Quit	

calibration

- wfdisc.calib
- calibration.calib
- seismometer.calib
- instrument.ncalib



evinfo – event info missing in event

- etype
- levname / sevname
- puburl / privurl
- magnitude / magtype / magid

meffects - macroseismic effects

- heard, felt \rightarrow lights, liquefaction
- specify uncertainites

origqual - origin quality

- mindist/maxdist
- azgap/azgap2
- nsta_def
- nsta $\overline{3}$ 0/nsta125 \rightarrow nsta300

pregion/pdist - cache geographical search results

- join keys: id/id_name
- allows for different types (e.g. city/province)

filehash/hashsum - checkums

- hash
- method
- length

evissues – event issues

- issue
- source of problem
- time checked/fixed
- open/closed

staproblem – site problems

- sta time::endtime
- class
- description

meval/massoc/mdp/mmap/mreport – macroseimic stuff

- multiple evaluations possible
- holds raw felt reports to evaluations



extension - generic table for "whatever"

- join on key (key value)
- numeric value / unit
- string

evt_record/evt_channel- triggered waveforms

- time::endtime triggertime
- filename
- channelwise statistics (min/max/...)

Problems

- extensions generally poorly documented
- avoid collision of fieldnames
- each problem a new table \rightarrow so many tables



questions?

000	🔀 origin										
Data on event loca Information desc particular event	ribing a	derived or		origin f	or a						
Primary key:	time lat lon depth ndef nass										
Alternate key:	orid										
Defines id:	orid										
Foreign keys:	evid com	mid grn srn									
Record Size (bytes	: 238										
lat	lon	depth	time	orid	evid	jdate	nass	ndef	ndp	grn	
srn	etype	review	depdp	dtype	mb	mbid	ms	msid	mi	mlid	
algorithm	auth	commid	Iddate								
			Disr	niss						Quit	





Seismological Service Nikolaus Horn nikolaus.horn@geosphere.at