Nevada Seismological Lab
Antelope Users Group Meeting
San Diego, 2015

Mark Williams
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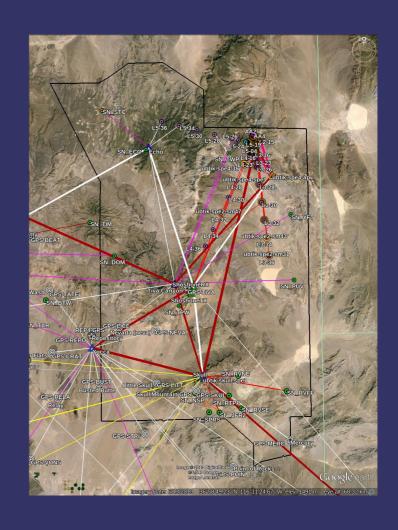Graham Kent, Ken Smith, Gabe Plank, Ryan Presser, David Slater, Kent Straley, John Torrisi

www.seismo.unr.edu
GitHub: NVSeismoLab

Nevada Seismological Laboratory
Mackay School of Earth Sciences and Engineering
University of Nevada, Reno

Overview

- Tier 1 Regional Seismic Network (ANSS)

- Data Center for Source Physics Experiment

- Wildfire monitoring initiative (AlertTahoe)

- Microseismic monitoring (mining)

- Climate monitoring (contributor)

Source Physics Experiment (SPE)

- Started in 2010 (continuous as of 2013)

- 4 explosion shots

- 350+ channels

- 500Hz geophones, 250Hz broadbands

- Reftek + various seismic sensors

- Smart24 + infrasound

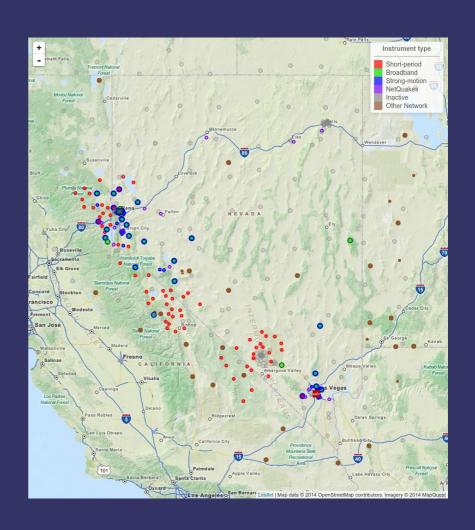- Microwave radio telemetry (Vegas → Reno)

SPE - Antelope

- Linux (5.2)

- 2 server + JBOD combos (Reno, Vegas)

- All data acquisition (rtp2orb, ew2orb)

- Data into DC at Reno, synced to DC in Vegas daily

- Also QC processing via SQLX

Regional Seismic Network (ANSS)

- 2014: 40,000 eqs

- ~200 channels, microwave, cell, analog

- Basalt, Reftek 130, Quanterra Q330, Nanometrics

- Reno/Tahoe/Mogul/Verdi, Mammoth/Walker Lane

- Expanding in Las Vegas, eastern Nevada

ANSS – Antelope Real-time

- Data Acquisition, Import and Export
- Solaris and Linux (5.2)
- SEEDLink is the future
- Export to ringserver via orb2ringserver
- 3 clients (Menlo, Golden, Caltech)
- Preferably move all imports to SEEDLink too

ANSS – Antelope Real-time

- Automatic Detections, Associations, Magnitudes

- Solaris & Linux (5.4)

- Current day – standalone dataset

- Manual re-location by analyst for big events

- Synced to archive at end-of-day

ANSS – Antelope Real-time

- Automated event processing

- Linux (4.11, 5.2)

- RTApps – service-based clients

- Verification, Web content, Messaging, Notifications

- Tweeting, QuakeML generation, Waveform image, PDL/USGS reporting added since last AUG meeting

ANSS – Antelope Archival

- Picking, location, magnitudes, focal mech, MT
- iMacs (5.2)
- 2 faculty, 1 staff, 6 undergrads
- Also sent to USGS via PDL
- Moving to Linux server (5.4)
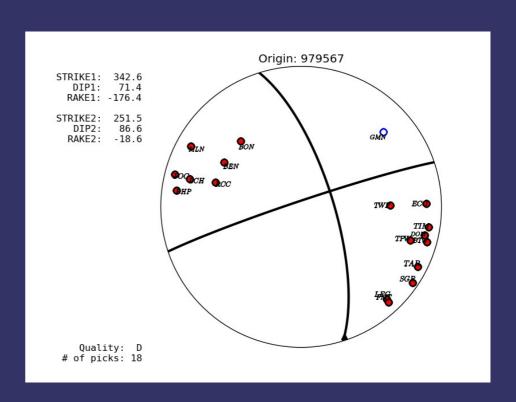
Projects involving Antelope

- Python DBAPI2 module for db interface

- HASH integration for focal mechs

- QuakeML output for reporting

- Salt formula for install/deployment/config

Development – Python API

- Cursor for DataScope (curds2)

- github.com/NVSeismoLab/curds2

- Python DBAPI2 standards compliant (AMAP)

- NULL and timestamp support

- Cursor, Row factories (OrderedDict rows)

- Backwards compatible! (5.2, 5.3)

- Dbptr and raw versions

Focal Mechanisms (HASH)

- Fork of Hardebeck & Shearer code (hashpy)

- github.com/markcwill/hashpy

- HASH subroutines (resyntaxed to f95)

- Callable from python module (f2py)

- Write hash_driver in python

- Antelope integration (CLI and dbloc2)

Event Reporting

- CSS → QuakeML schema converting classes

- Load data from db to obspy (XML serialization)

- Somewhat customized (pre-0.9.3 patch, MT's)

- Production submission system

- Is on GitHub (in common)

- Probably due for refactor in 2015

Administration & Deployment

- Salt Antelope formula (states and module)

- Resolve dependencies (packages, services, configuration)

- Configuration templates (pf files)

- Install Antelope via ISO/deb/rpm package

- Run updates, custom patches, etc automatically on multiple machines

Future Projects

- Hypoinverse integration (85% done)
- Web services (FDSN event implementation)
- New ORB client RTApps (visualization, detections, locations)
- Scaling – Messaging and/or remote db requests
- Expand cloud deployment, move web, exports to AWS
- Dockerize apps
- StationXML input/output (via obspy)
- QuakeML input (no use case right now)
- Next-gen of NSL's web picker interface (NEAT)