

SCEC DATA CENTER OPERATIONS

Katrin Hafner and Robert W. Clayton

Seismological Laboratory
California Institute of Technology

1998 SCEC Annual Progress Report

January 15, 1999

Activities at the SCEC Data Center (SCEC_DC) during 1998 were primarily focused on moving the Data Center towards a new phase in its role as the primary on-line, and near "real time" archive of seismological data for Southern California. This effort included working closely with the TriNet development group at Caltech in developing a prototype database and archiving system to store parametric and waveform metadata from the new TriNet seismic network. In addition, a new mass storage system was purchased and installed to handle the increased data flow expected when the TriNet system is brought on-line. The SCEC_DC also continued in its outreach role to SCEC researchers and community, the public, and educational and government agencies, as evidenced by the rate of access via the WWW, "finger quake", and individual research accounts (which allow sorting and extracting of event driven data in various formats) (Figures 1A and 1B). A more detailed description of the Data Center's efforts this past year are outlined below:

1) The Data Center installed an ORACLE version 8.0.4 database to store seismic data generated by the prototype Trinet seismic system. This database has been receiving and archiving parametric data from the real-time system since October 1, 1998. The implementation of this database included developing a schema (currently V. 1.4.3) that is consistent between the U.S.G.S. Menlo Park, the Northern California Earthquake Data Center (NCEDC), and the Southern California real-time processing systems. The database system is currently set up so that the data center database receives data from the real-time database system via one-way data replication. This allows for quick access to the earthquake data, as well as provides a means to continuously archive parametric earthquake data should the data center be temporarily unavailable.

2) In conjunction with the implementation of the ORACLE database, the Data Center has implemented a waveform retrieval agent which reads waveform requests from the database, and retrieves the appropriate waveforms for an event from a waveform pool. The data are retrieved and archived in miniseed format. In addition, the retrieval agent then populates waveform tables in the ORACLE database with the pointers to the locations of these data in the archive, as well as their attributes. These tables are then used by waveform analysis programs developed for the seismic analysts by the USGS to retrieve and plot waveforms. These development efforts have also been coordinated with the NCEDC, which is already archiving continuous data, and is also in the process of implementing an ORACLE database. A figure illustrating the current configuration of the prototype Data Center database/waveform retrieval system is illustrated in Figure 2. These results were also presented at the Fall AGU meeting.

3) Installation of the new 5-Terrabyte DISC jukebox system was completed at the beginning of December. Currently recorded data from the Southern California Seismic Network is now being archived directly onto the new jukebox. Approximately, 1/3 of the data archived on the old 600 G-byte SONY jukebox systems has also been copied on to the new Jukebox. This includes the GPS data archive.

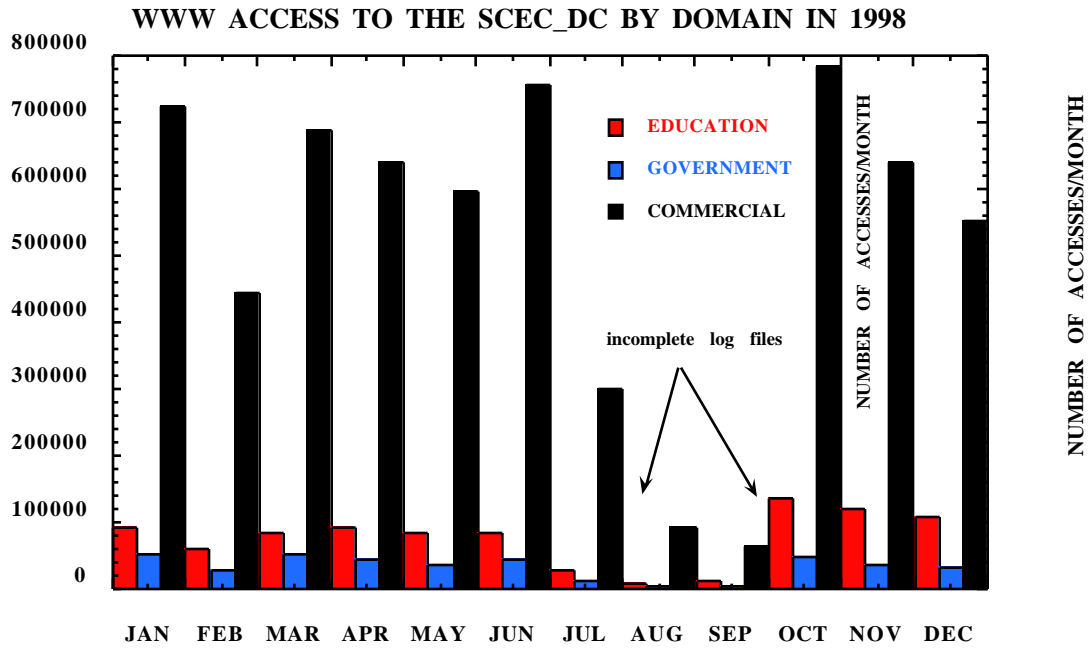


Figure 1A

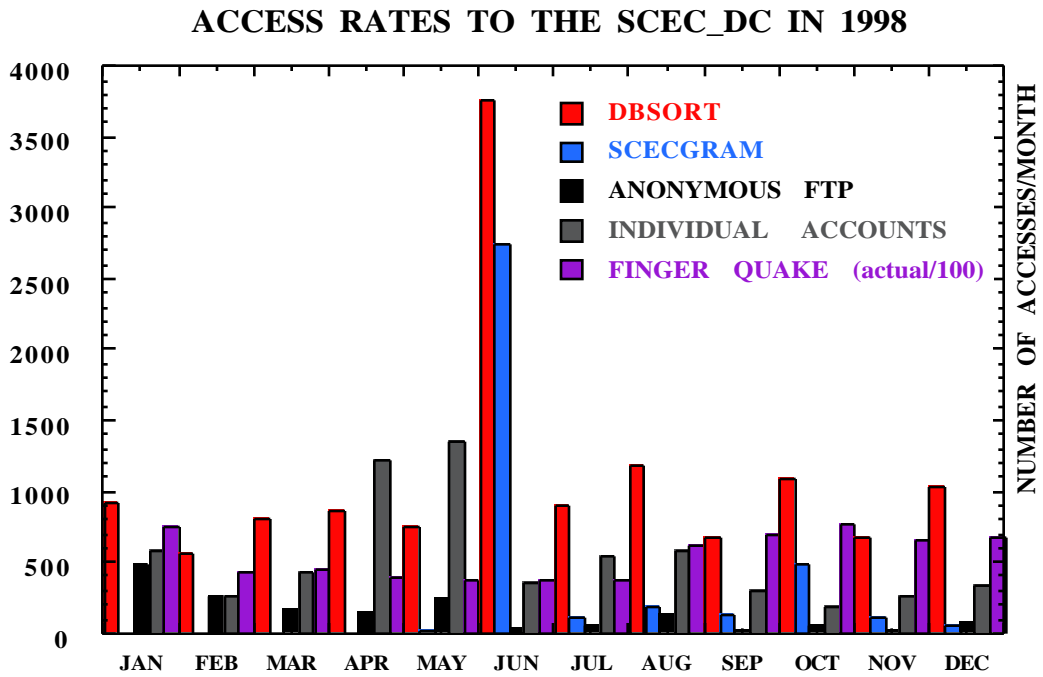


Figure 1B

SCEC DATA CENTER INTERACTIONS WITH TRINET

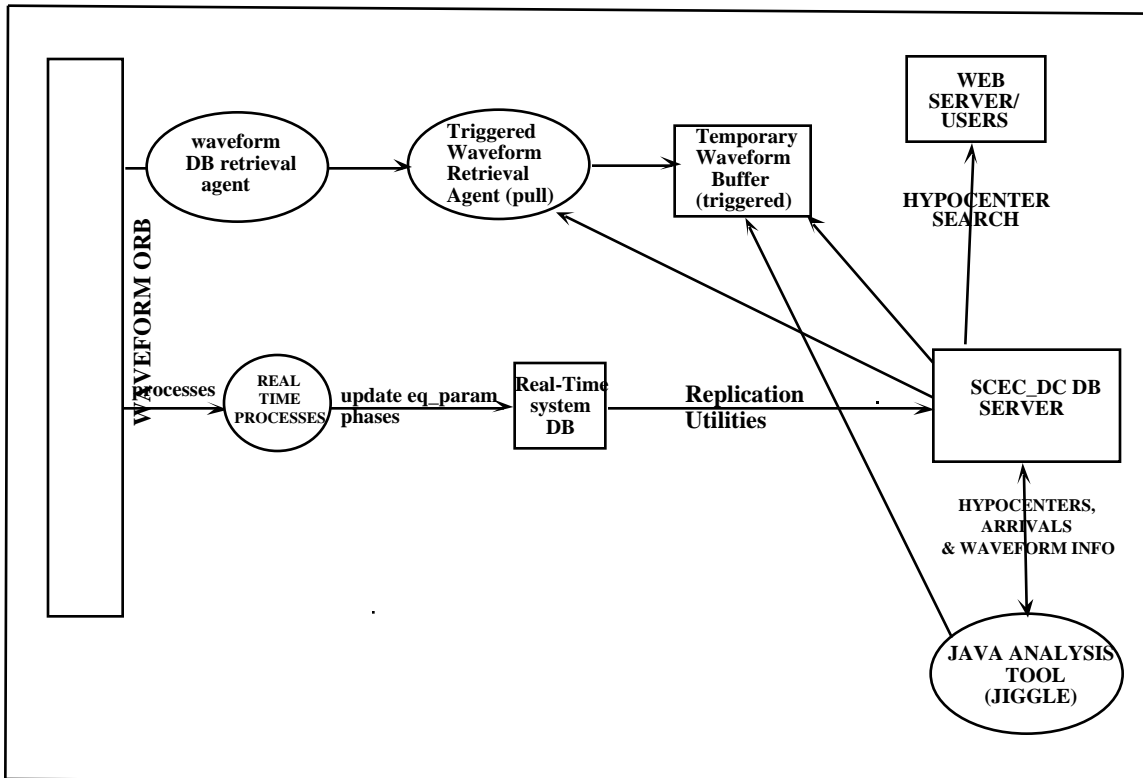


Figure 2

4) Processing of backlogged seismological data focused on copying 35 Gbytes of data for the time period of February 1979 through January of 1981 from old 9-track data tapes onto DAT tapes. Approximately 14 Gbytes of these data have been read from these DAT tapes, and converted to the conventional SCSN CUSP format of *.mem and *.grm files. These data have been archived on the Jukebox until the data can be re-analyzed by the seismic analysts. The data conversion is continuing at a rate of approximately 2 Gbytes/week, and should be completed by the end of March 1999. Approximately 1000 events from January and February of 1983 have also been relocated and processed. This effort will continue until all of the events through July of 1983 are completed.

5) Some of the Data Center's efforts continued to be focused on improving and adding to the existing WWW interfaces. A java applet that allows users to access the ORACLE database on the WWW was developed, and allows users to sort and retrieve parametric earthquake data recorded by the TriNet system. An interactive current seismicity map populated by the TriNet real-time system was also implemented (<http://terra10.gps.caltech.edu/recenteqs>). In conjunction with the SCEC Outreach Group, the SCEC_DC has continued its participation in the development of the seismicity module "Investigating Earthquakes through Regional Seismicity". Many of the products and data to be used in exercises by the students utilize data from the SCEC_DC database. Version 1.0 of the module were presented at the annual SCEC meeting, as well as the Fall meeting of AGU. In addition, the data center has upgraded its internet connection during the last year.

The slowest portion of the link between the Data Center webserver and the outside world now transmits requests at 100 Mb/sec. This could be easily upgraded further if traffic warrants it.

The on-line SCEC_DC archive has increased to 530 Gbytes of SCSN data, 12 Gbytes of GPS data, 25 Gbytes of triggered broadband data, and 9 Gbytes of portable instrument data from the Joshua Tree, Landers and Northridge earthquake sequences . Waveform data are still extracted primarily via individual user accounts (“scecgram” program - Figure 1B).

PUBLICATIONS

Hafner, K., Rajeshuni, S. and Small, P., 1998, Oracle Database Interactions between TriNet and the SCEC Data Center (SCEC_DC), (abstract), Fall 1998 AGU meeting)

Marquis, J. Hafner, K, and Hauksson E., 1998, Investigating Earthquakes through Regional Seismicity: <http://www.scecdc.scec.org/Module/module.html>, (abstract) Fall 1998 AGU meeting