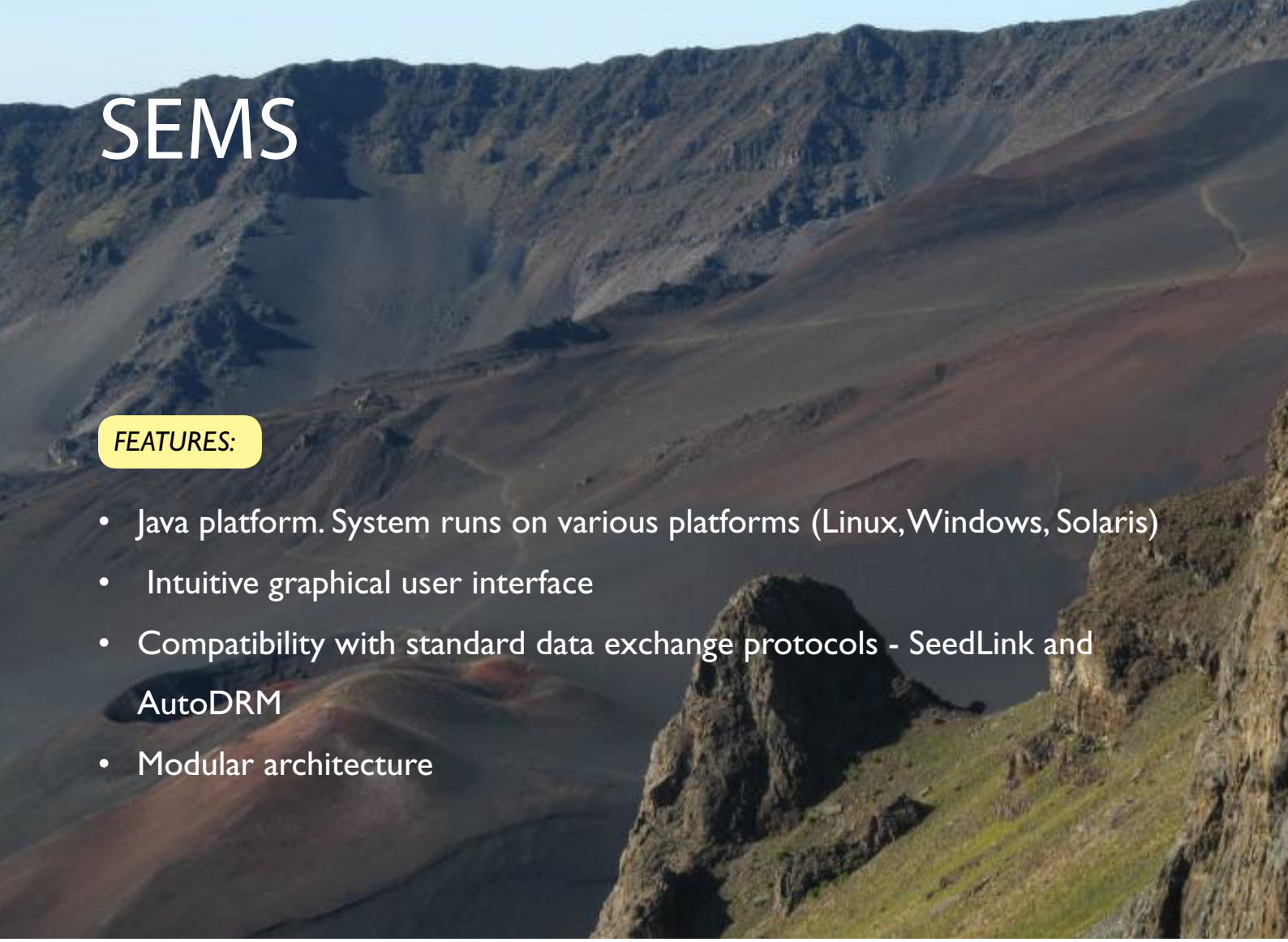
SEMS

Seismological Monitoring System

Seismic Data Acquisition, Archival, Analysis and Management of Seismic Networks



SEMS

FEATURES:

- Java platform. System runs on various platforms (Linux, Windows, Solaris)
- Intuitive graphical user interface
- Compatibility with standard data exchange protocols - SeedLink and AutoDRM
- Modular architecture

Seismological monitoring system is a package of products for data acquisition, archival and management of seismic networks.

System provides comfortable access to regular tasks in seismic network operation.

Seismological monitoring system consists from two main parts - station data acquisition system and central data acquisition system.

Station data acquisition system

Station data acquisition system is the first part of SEMS system working with measured data. It provides tools for data acquisition, processing, archiving and exchange. Graphical user interface, which can be accessed remotely, makes the use of system intuitive and straightforward. System runs on personal or industrial computers .

Data acquisition module provides reliable acknowledged protocol for communication with AD converter. It supports various data formats (GSE, SEED, ASCII).

Data processing module includes filtering and triggering. System supports application of user defined FIR filters. Trigger algorithm uses hierarchical tree of elementary trigger algorithms, which enables precise trigger setting.

System is ready for data exchange using SeedLink and AutoDRM services. It supports different communication media-telephone lines, GSM modems, internet, HF transmission.

Configuration module makes it easy to configure any part of the system.

Data Acquisition Center

Central acquisition system receives data from SEMS seismic stations. Using SeedLink and AutoDRM services, it is capable of receiving data from external sources as well as providing data to different users.

Central acquisition system provides tools for state-of-health monitoring of stations connected to the system. It is possible to configure remote stations using special service messages or direct access to their user interface.

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Configuration Tools

System provides graphical users interface to the configuration tasks.

With this tool the following attributes can be configured:

- station parameters (network, name, id, coordinates)
- channel parameters (name, type of sensor, gain, amplification, filter)
- serial lines and their parameters
- converters (communication parameters, channel assignments, sampling frequence)
- remote access (type, rights)
- GPS (communication, GPS parameters - provided sentences)
- trigger parameters
- recording parameters (continuous and/or triggered recording, record length, data format)
- data exchange parameters (shared data, client rights, communication parameters)
- users and user rights

Configuration utilities support autodetection of AD converters (Wave24) and GPS receivers (Garmin, SiRF, FastTrax)

System provides network-wide repository of configurations and tools for synchronizing the repository.

Repository tools provide also possibility to configure stations remotely using special configuration messages - you can perform the configuration actions over the repository and then upload it to particular station.

Data Exchange Tools

System uses proprietary acknowledged protocol for data exchange (real-time as well as off-line) and supports also standard protocols/services - SeedLink, AutoDRM.

Access to the data can be precisely configured and monitored. Configuration of access can be done on per-client basis - only allowed client can obtain data. Monitoring facilies enable to monitor data flow for particulars clients and allow to take actions if the client does not behave properly (disconnect client, restrict access) directly from the monitoring window.

Data Inspection Tool

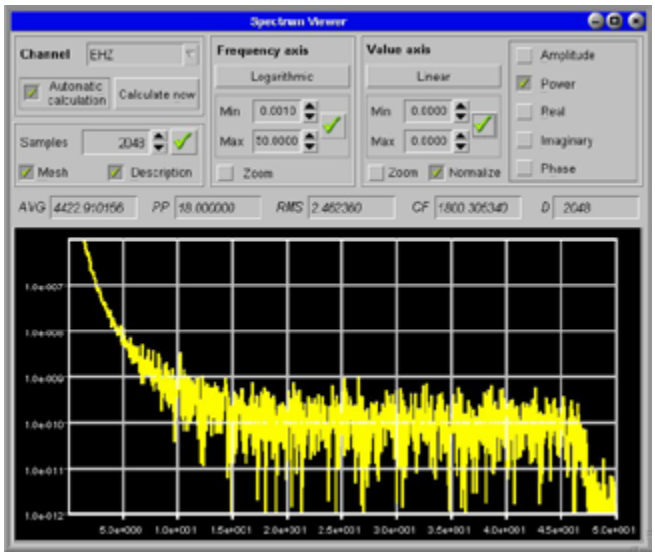
System provides tools for monitoring of different data and data products. It provides tools for monitoring waveform data in real-time as well as in off-line modes. There is spectrum viewer which can work in real-time as well providing necessary feedback on signal properties. Trigger tree can inspected thoroughly from the trigger viewer.

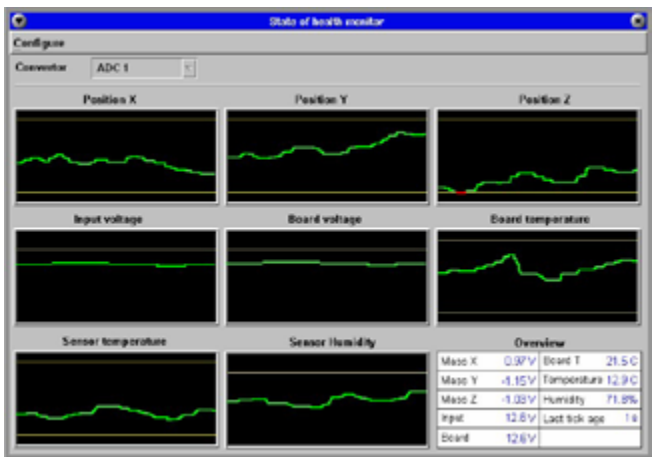
Monitoring of particular conditions can be started from the viewer. It is also possible to reset the condition from the main window of the viewer. The other tool enables to monitor GPS status - number of satellites, fix types, transmitted messages.

Maintenance Tools

There is a set of maintenance tools included in the system. System enables to monitor state-of-health parameters. There is detailed logging implemented in the system and user-friendly protocol viewer makes it easy to inspect protocols according to date or task.

System provides also sensor maintenance tools (calibration, periode switching, autozero, lock - unlock) - this tools cooperate with WaveEXT extension module and depends also on the sensor capabilities. State-of-healt and sensor maintenance tools provide also command line interface for the low-speed lines.





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Additional Tools

Additonal tools are included to the system for special tasks - there are record inspection tools (for inspection of data record structure) and format converters (GSE, SEED, ASCII)

Analysis Software Package

Analysis central is a separate module of Seismological Monitoring System sharing data with data acquisition module.

This approach makes it possible to process data as soon as they enter data acquisition central and perform analysis in near real-time mode.

P-phase picking and automatic location run in real-time mode providing early alerts on detected events.

The central is equipped with software modules for manual data processing.

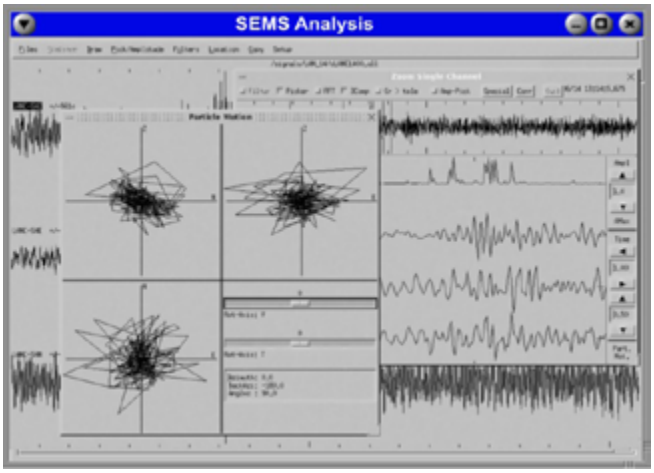
The basic features include:

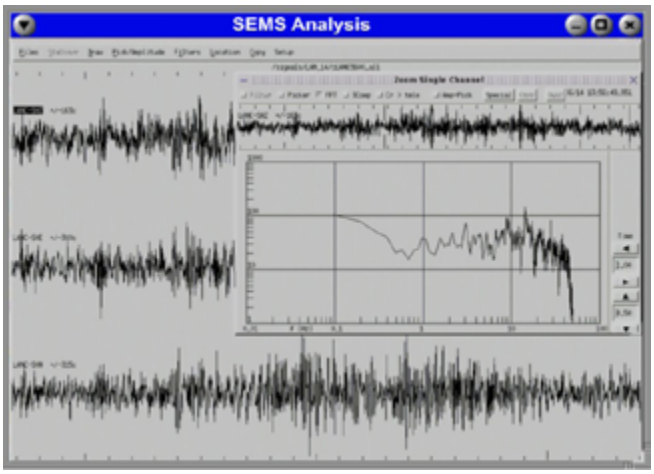
- multichannel display
- single channel zoom
- spectral analysis
- filtering and simulation filtering
- P-phase picker
- polarization analysis
- off-line data download using AutoDRM
- location module

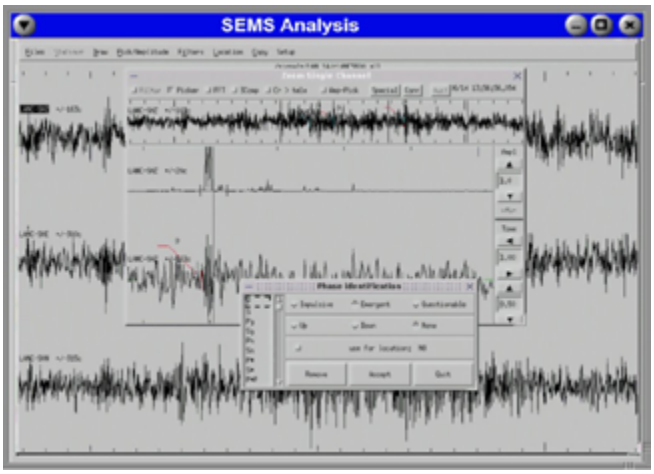
The module cooperates with database, which is a part of the module.

Database is used for storage of station data (transfer functions, coordinates etc) as well as processed events.

Automatic processing produces event entries to the database which can be used later as a starting point for manual analysis.







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