

Azule- Earthquakes



Overview

- Supercomputer
- Software
- Seismometer
- Seismic Recorders
- Integration
- Predictive Modeling
- Technical Support



Summary

GBT is offering a complete solution for earthquake understanding from a research and predictive point of view.

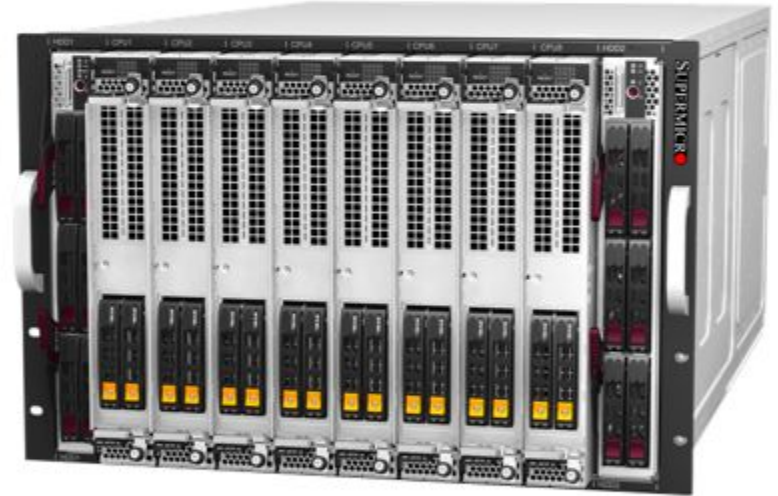
The Supercomputer will be equipped with AI and predictive modeling software, with preloaded models that help to compute Seismic data. The high computing power allows for the processing of large data sets with lightning speed results, particularly important to predictive functionality.

The seismometers and recorders will capture the seismic information in the field of choice, this information will then feedback into the computer for processing.

GBT will also offer technical support for both the hardware - questions on how specifically to install or use the machines or sensors/recorders, and the software - our specialized team will help with how to input data and create new models, work with any facet of the new software.

With new technology there can be a learning curve but we will make the process as seamless as possible by providing support for both high level and smaller scale problems.

Whole Solution Research and AI powered Predictive Lab

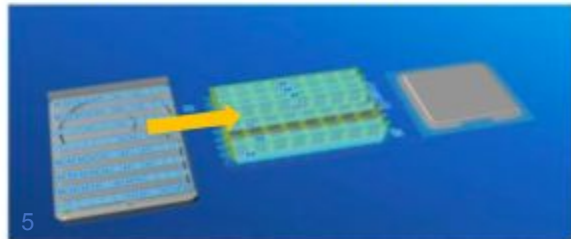


8-Way Advantages: In-Memory Computing & Shared Memory Pool

- **Storage computing:**
bottleneck on storage I/O

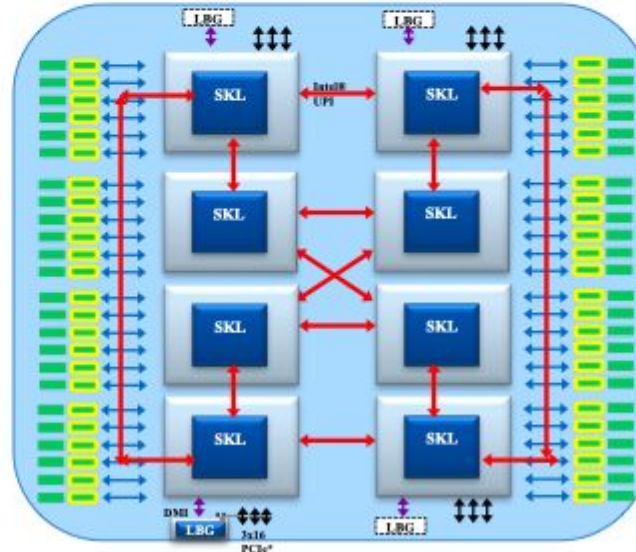


- **In-memory computing:**
large cache farm for faster data query



- **Larger memory pool:**
flexible to define more or stronger VMs

8S Configuration



Software Configuration with AI

- Installation of Open Source Software and Device drivers:
- Operating System: Ubuntu 16.04
- GPU Driver Version: 384.66
- CUDA Toolkit Version: CUDA 9.0.176
- NCCL Version: NCCL 2.2.1.4
- CuDNN Version: CuDNN7.0.5.15
- Open MPI Version: 3.0.0
- Mellanox OFED 4.2-1.2.0.0
- TensorFlow Version: 1.60
- Horovod Version: 0.12.0
- MXNetVersion: 1.2.0
- Torch 7
- OPEN NMT



Seismometer

Image:



Features:

- High dynamic range for portable and vault style installations
- Exceptionally low self-noise
- Small and lightweight
- Shock resistant housing
- Robust automatic mass unlock system

Application:

- Local and regional broadband networks
- Aftershock and portable deployments
- Earthquake early warning networks (EEW)

Seismic Recorder

Image:



Features:

- State-of-the-art ADC for BB/SP seismometers
- Small size and light weight
- Modular hardware and software
- IP communications over Ethernet and Asynchronous Serial
- Embedded/removable mass storage

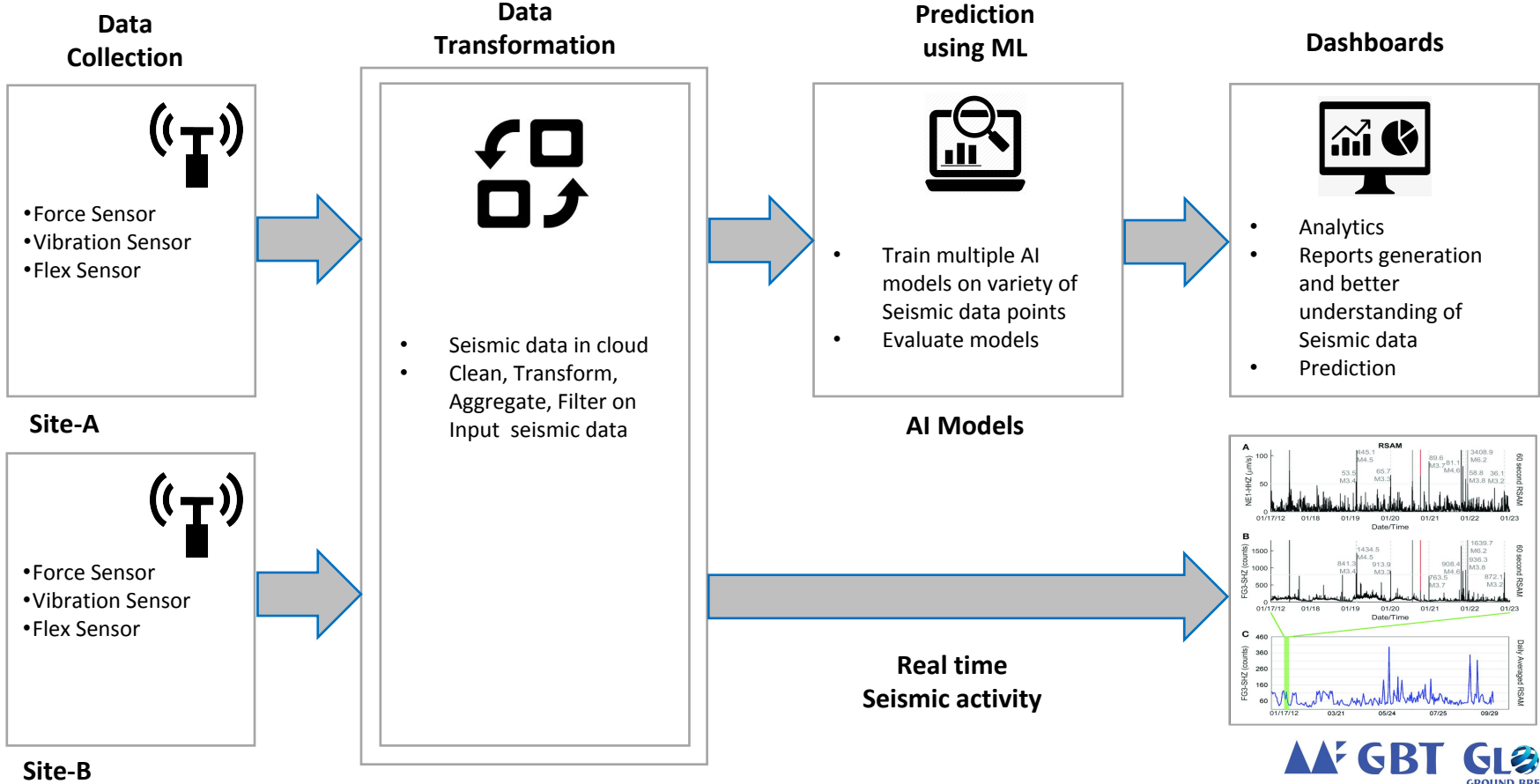
Application:

- Local and Regional Broadband
- Aftershock
- Active Source
- Micro-Zonation Survey
- Site Noise Survey
- Earthquake Early Warning
- Rapid Transportation

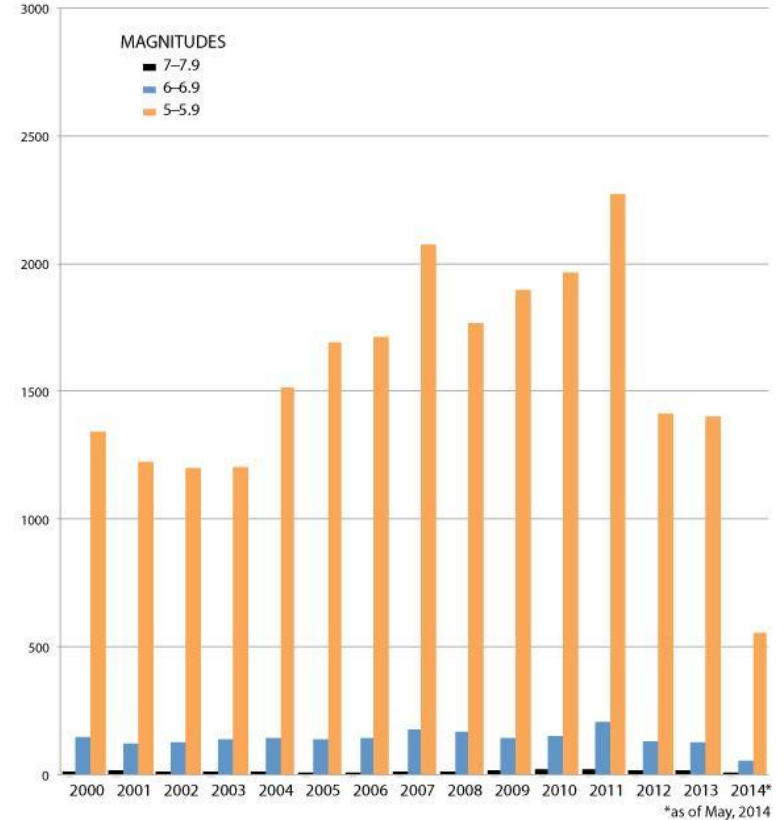
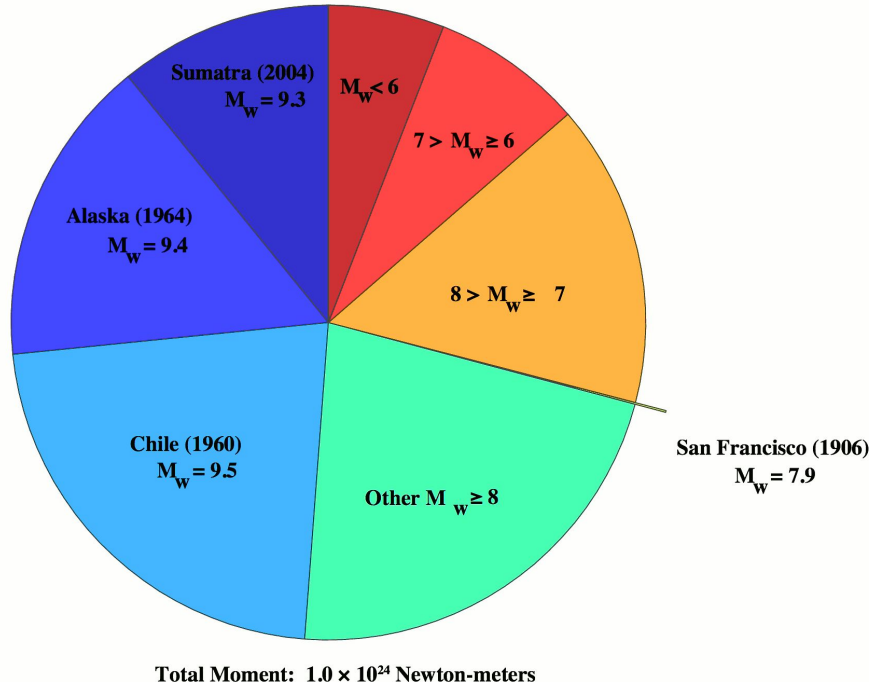
Earthquake Sensors

- Flex, Acceleration sensor
- Vibration sensor
- Force Sensor
- Moisture/ Light/ Wind
- Soil air

Earthquake Application Workflow



Seismic Activity Sample Dashboard



Support Components

Support components include the following:

- **ML Models:** Creating new ML models and Training ML models based on updated parameters and seismic data collected from the system
- **Data transformation:** Build custom rules to reduce noise, clean and filter input data
- **Analytics:** Use BI tools for data analysis and to create or update dashboard as per new needs

ML Model Development Workflow

