A Google Cloud Technology based
Sensor Data Management System for KLEON

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KLEON

Korean Lake Ecological Observatory Network

An interdisciplinary collaboration network of limnologists, ecologists and computer scientists from universities and national research institutes.

Goal

To establish an ecological observatory network by sharing lake observation resources, managing observatory information, and supporting analysis tools.

Strategy

- Adopt and extend technologies already available in the GLEON community
- Develop new technologies by using innovative information technologies

Lake Observation

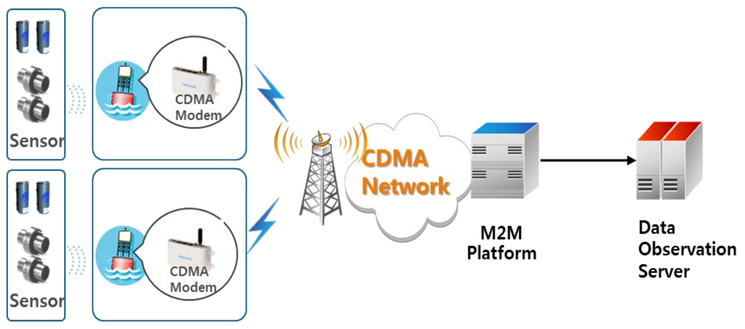
Environmental Sensor Network

Offer powerful distributed sensing capacity, real-time data visualization and analysis, and integration with adjacent networks and remote sensing data streams.

Communication

Use a commercial terminal device (MPT-800 CDMA/GPS Terminal from MELPER®) to provide the CDMA communication service and data logging service.

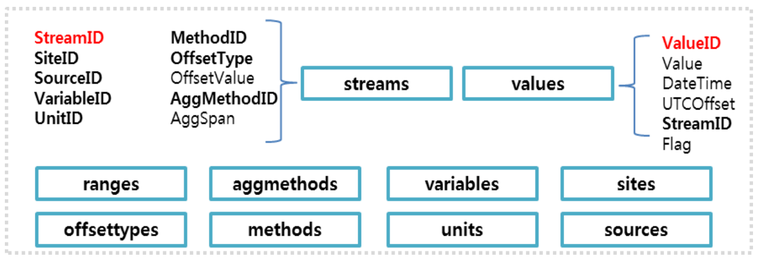
KLEON Sensor Network



Observation Data Management

Environmental Observation Data Model

- KLEON Data Model based on VEGA DM
- Observation-based data model for high-resolution time series data sampled at frequencies as high as a few seconds

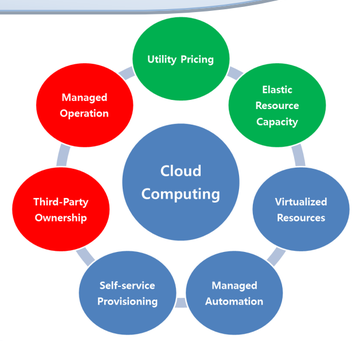


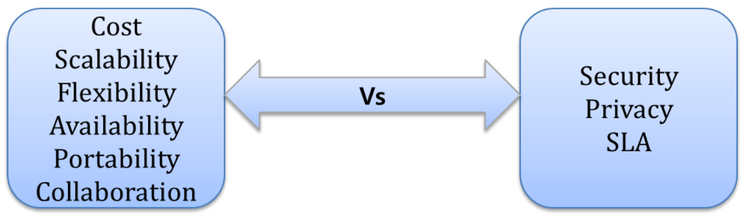
Challenges for Data Management

- Integrate large, multi-disciplinary Datasets
- Link Datasets to computational models
- Store increasing data volumes
- Develop tools and application
- Manage Data Infrastructure

Cloud Computing for Observation Data Management

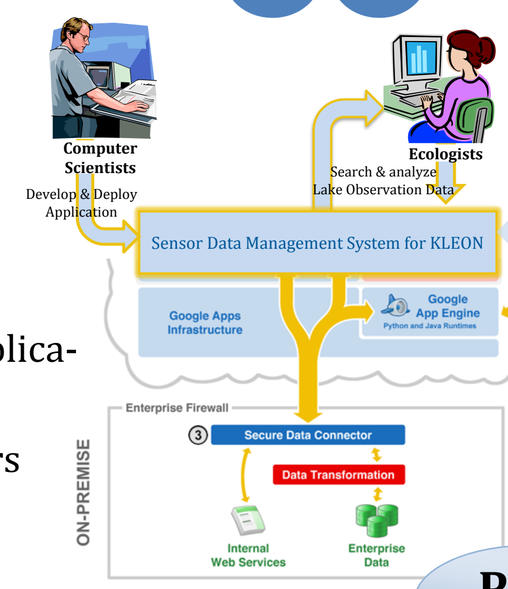
Cloud Computing provides computation, software applications, data access, data management and storage resources without requiring users to know the details of the computing infrastructure.





Google App Engine

- Cloud computing technology
- A platform for developing and hosting web applications in Google-managed data centers
- Virtualizes applications across multiple servers

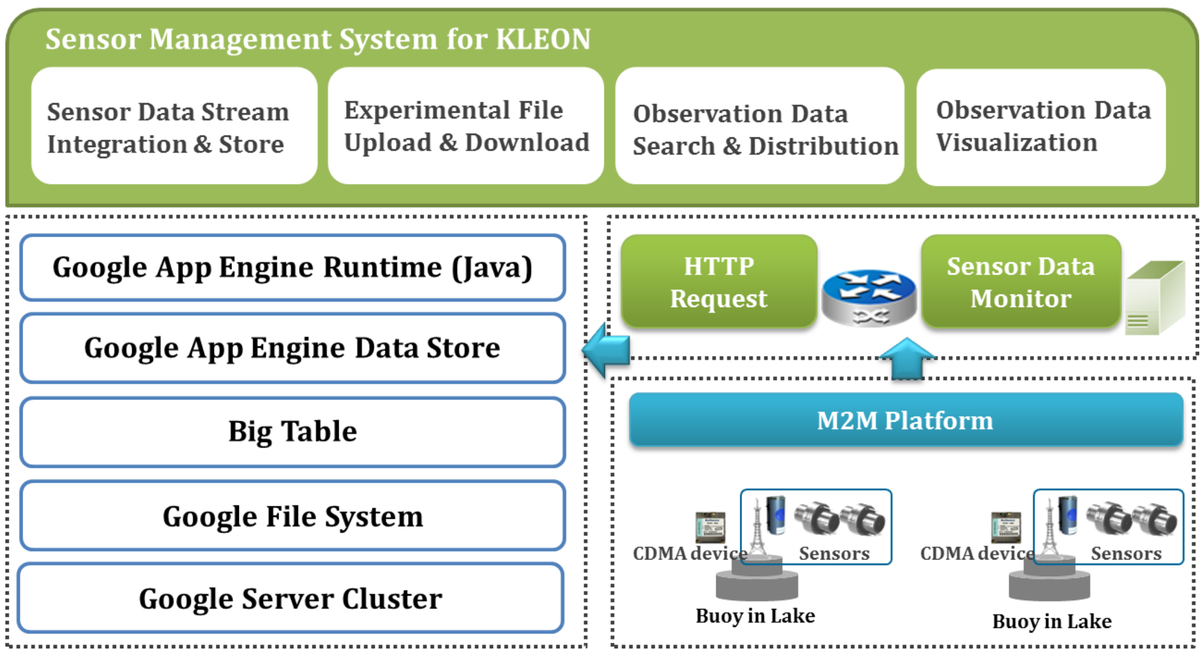


Benefits for KLEON

- Easy to build
  Computer Scientists develop application that runs reliably under heavy load and with large amounts of data
- Easy to scale
  Application automatic scaling as traffic and data storage needs grow
- Easy to maintain
  Limnologist no need to manage Data Infrastructure
- Ease to access
  any where in the world
- Pay as use
  Free with a quota, provide billing model

System Design

- Observation Data distributed by Data Turbine
- Observation data stored into GAE Application by Web Service in KLEON data model
- In Data Store KLEON data model Mapping in JDO



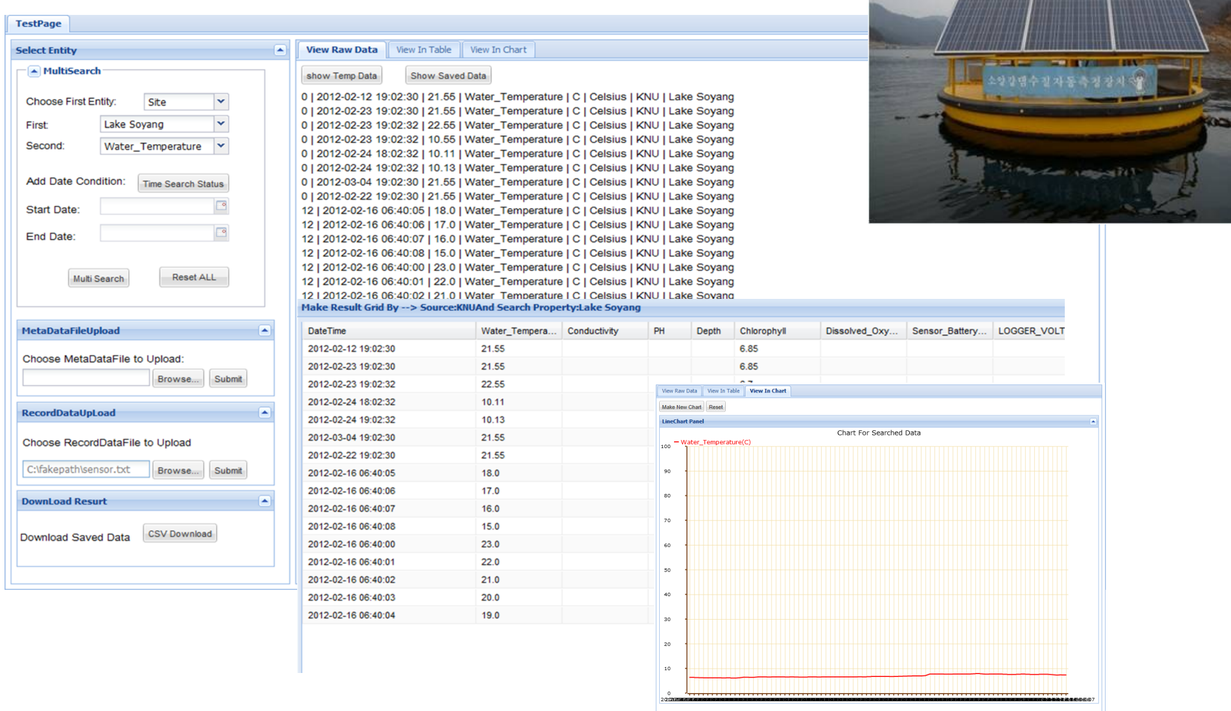
Prototype for Lake Soyang

Lake Soyang

- Chuncheon City, Kangwon-do, South Korea

Prototype Application

- http://gaebasedkleon.appspot.com



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