

Deltares

Deltares Open Archive MongoDB

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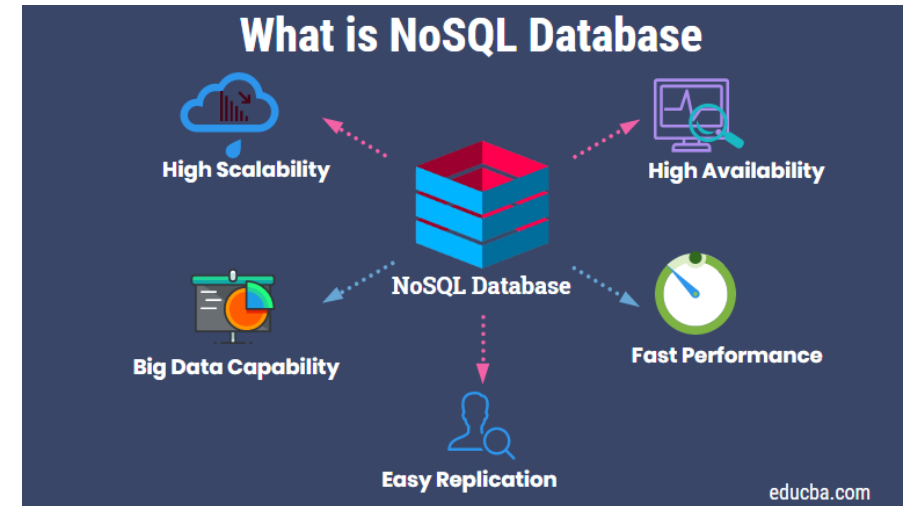
Andre Grijze (Deltares)

11/8/2021

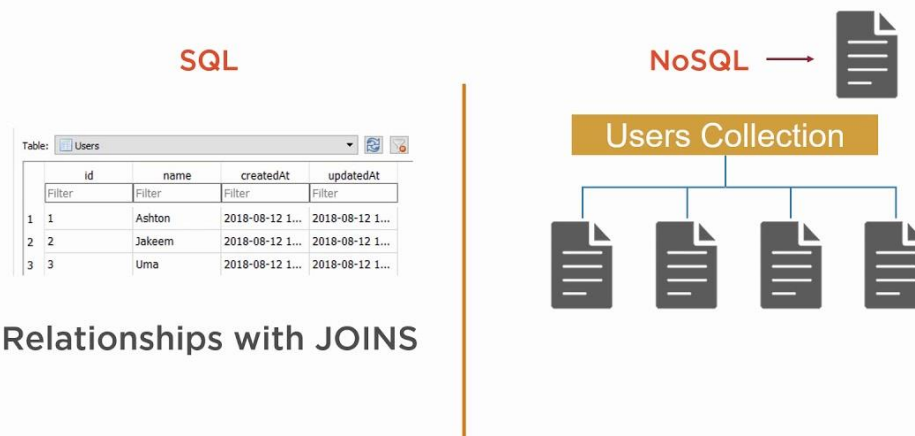
Why NoSQL?

Current Architecture Limitations

- Scalar data can only be retrieved through PI webservice
- Making updates or changes to the archive requires complex programming/scripting
- No data integrity enforcement (duplicates possible)
- Performance improvement needed for data warehousing/reporting
- Export configuration can be complicated

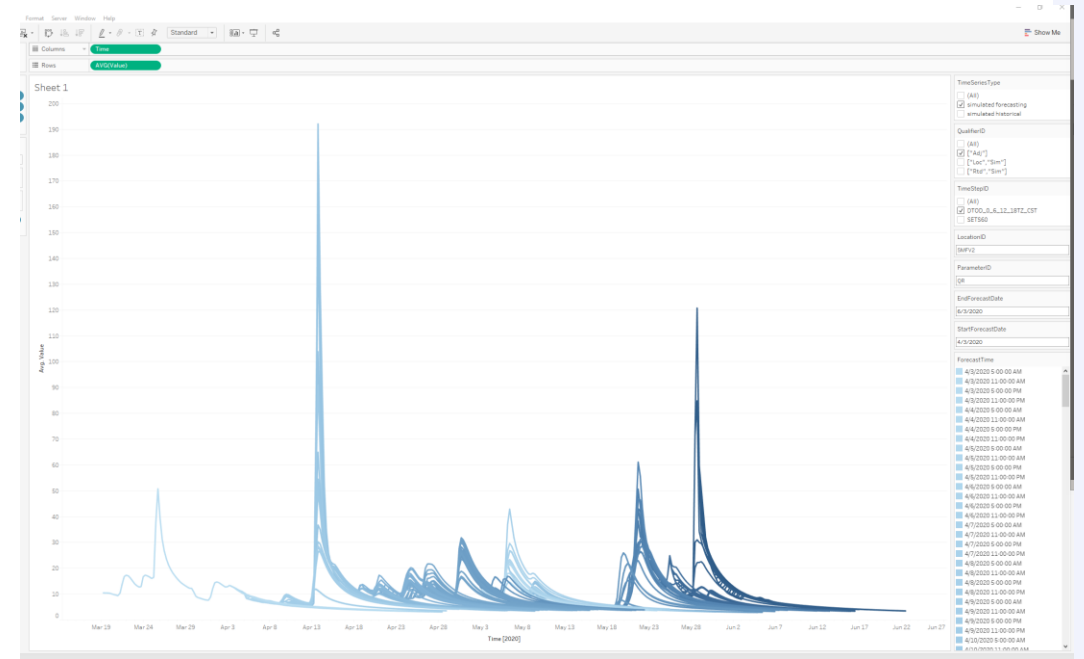


SQL vs NoSQL



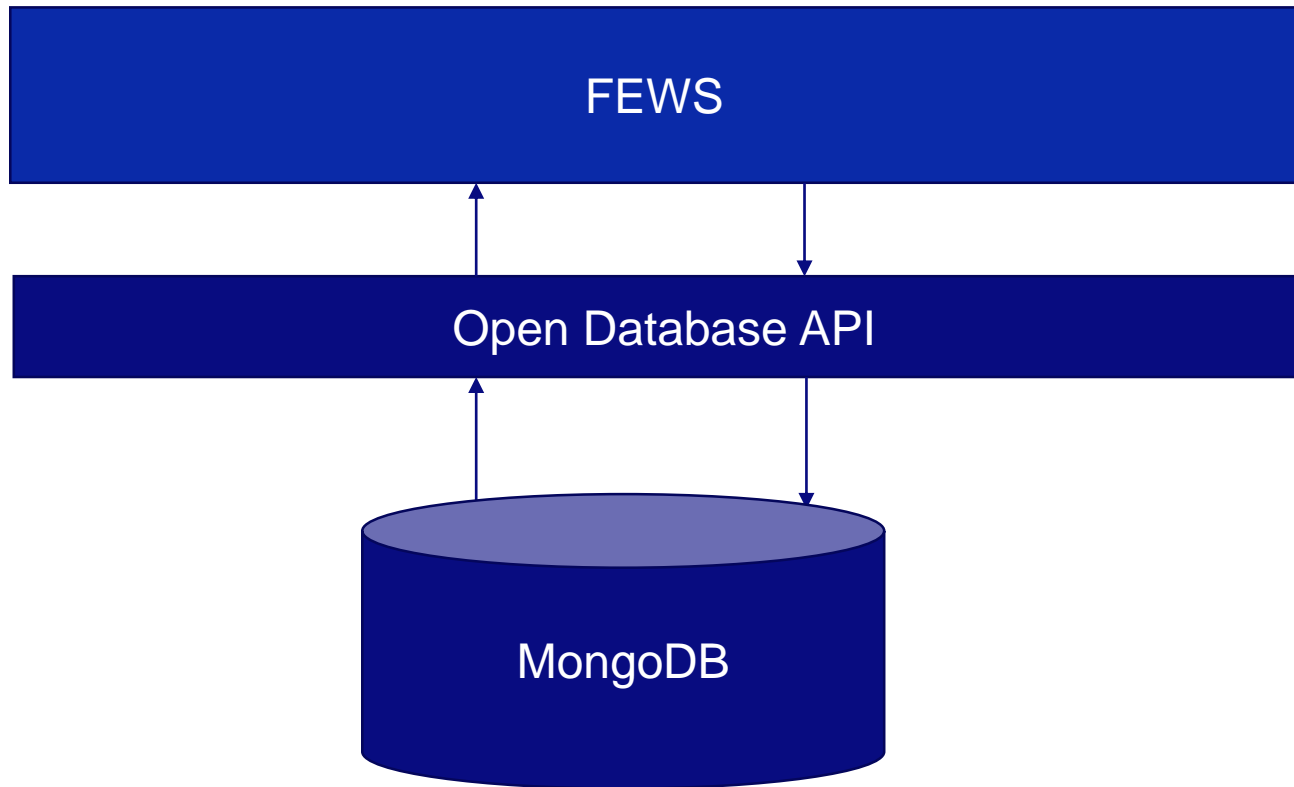
Advantages of NoSQL Archive Solution

- Data integrity assured by unique keys on entry
- Flexible query language allows for quick and easy data updates, data access, and in database analytics
- Data is available as soon as it is written to the database, eliminating the need for the harvester and index components.
- Scalar time series can be represented in an SQL format with the MongoDB BI connector and integrated directly into third party reporting tools like Tableau, SRRS, or PowerBI
- Improved speed and flexibility in retrieving data for the FEWS client
- Data can retrieved and edited directly through MongoDB



Integration MongoDB Deltares Open Archive

How to integrate MongoDB into the Deltares Open Archive?



Work Completed (2021.02 Release)

- Tool to migrate existing archive
- New archive catalogue interface
- Seamless integration for plot (external historical)
- Seamless integration for workflows (external historical)

Work to be Completed (2022.01 Release)

- Seamless integration for plots (simulated historical)
- Finalize seamless integration (simulated data)
- Documentation
- Additional Testing

Select data sets to download

area
 scalar

Time Series
 external historical

time series
 07-01-2019 06:00:00
 07-11-2019 06:00:00

- source
- All
 - Observed (Spillway Flow)
 - Observed (River Flow)
 - Observed (Total Flow)**
 - Observed (Runoff Inflow to Channel)
 - Observed (Plant Discharge)
 - Observed (Pond Discharge)
 - Observed (Sluice Flow)
 - Observed (Seepage Flow)
 - Observed (Other Spill Flow)
 - Observed (Water Temperature Replicate)
 - Observed (Wind Speed)
 - Observed (Net flow)
 - Observed (Water Temperature Test Point)
 - Observed (Pump Flow)
 - Observed (Spillway, Sluice, and Other Flow,
 - Observed (Canal Flow)
 - Observed (Turbine Flow)
 - Observed (Reservoir Inflow)
 - Observed (Time, Hours)
 - Observed (Tailwater)
 - Observed (Depth Over Structure)
 - Observed (Water Temperature Delta T)
 - Observed (Wind Direction)
 - Observed (Water Temperature)
 - Observed (Water Temperature)
 - Observed (Station Health)
 - Observed (Headwater)
 - Observed (Storage)
 - Observed (Water Temperature TROC)
 - Observed (Relative Humidity)
 - Observed (Precipitation, Incremental)
 - Observed (Chattanooga Statistics)
 - Observed (River Stage)
 - Observed (Pumps in Operation)
 - Observed (Tributary System Flood Storage)
 - Observed (Air Pressure)
 - Observed (Precipitation, Accumulated)
 - Observed (Cooling Tower Status)
 - Observed (Hydrothermal Gate Settings)
 - Observed (Total Sky Cover)
 - Observed (Air Temperature)
 - Observed (Dewpoint Temperature)
 - Observed (Other Spill Flow)
 - Observed (Total Flow)
 - Observed (Incremental Cost)
 - Observed (Spill Flow)
 - Observed (Gate Settings)
 - Observed (Power, Station Service)
 - Observed (Pump Status)
 - Observed (Turbine Flow)
 - Observed (Load)
 - Observed (Power, Station Service)
 - Observed (Storage)
 - Observed (Total Spill Sluice and Other Flow)
 - Observed (Water Temperature)
 - Observed (Gate Position)

Time Step

All
 0:00 6:00 12:00 18:00 CST
 0:00 CST
 hour

parameters

All
 Total Flow (QT)

module instance id

All
 ImportBrookfieldObserved
 ImportCorps
 Preprocess_QT

Questions?