An AJAX Web Application for CO2 Sequestration Computations

COMP 670

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OVERVIEW

- Introduction
- AJAX Implementation
- Conclusion and Future Work

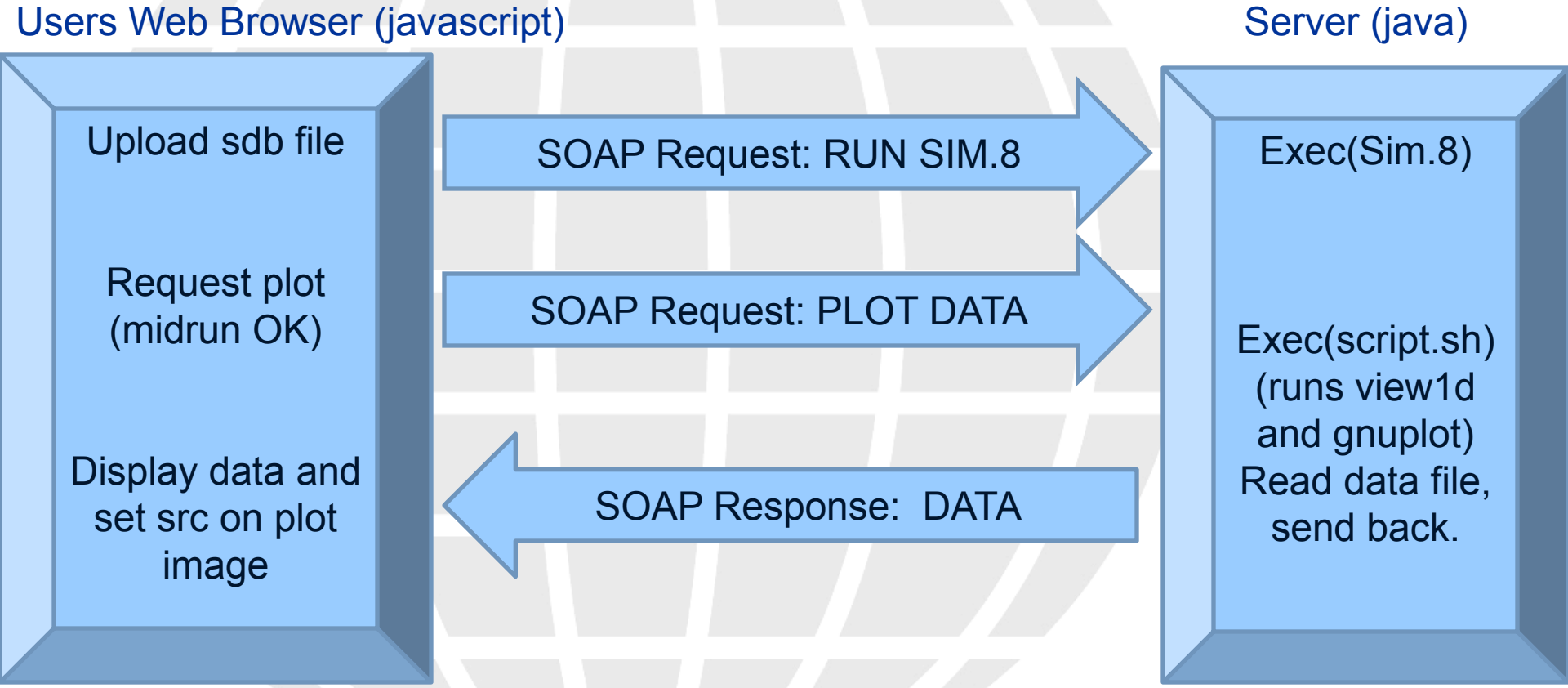
Introduction

- CO2 Sequestration
- Sim.8
- Need for easy-to-use GUI
- AJAX Advantages
  - Universal compatibility
  - Can run computations on large expensive machines from low-end devices (netbooks, iphones, etc)
  - Mobility

AJAX Implementation

- A work in progress
- Current task: plotting results
- Plan: Run UNIX script on server to parse output and generate plot, then reference plot image in browser
- Status: Works!

AJAX Implementation



Script File:

AJAX Implementation (Some) Details

```
#!/bin/bash
cd /opt/glassfish/domains/domain1/applications/j2ee-modules/rmc_Sim8/sdb/
BASENAME=`/bin/basename $1 .sdb`
FILE="OUTPUT/$BASENAME"
if [ ! -f $FILE.dout ]; then
    echo "file $BASENAME.dout not found in the OUTPUT directory"
    exit -1
fi
/usr/local/bin/view1d <<!
$FILE
0
1
$2
0
3
$3
0
-1
0
!
XFILE="xsp2.*d.t3.*dxy3.*dz3.*d.xgraph"
if [ -f $XFILE ]; then
    /bin/mv $XFILE ${FILE}_${2}_${3}.xgraph
else
    echo "file xsp2.*d.t3.*dxy3.*dz3.*d.xgraph not found"
    exit -2
fi
PLOTFILEIN=\"${FILE}_$2_$3.xgraph\"
PLOTFILEOUT=\"${FILE}_$2_$3.jpg\"
#PLOTFILE=\"OUTPUT/testdata\"
#PLOTFILE=\"OUTPUT/cs1d10_60_1.xgraph\"
/usr/bin/gnuplot <<!
set terminal jpeg
set output $PLOTFILEOUT
set size ratio .63662
plot $PLOTFILEIN title "Data" w lines
quit
!
```

Inside SOAP response function (javascript) for plot load

```
textbox = document.getElementById("ResultData");
textbox.innerHTML = returnData;
var imagesrc = 'http://co2seq.sdsu.edu/rmc_Sim8/sdb/OUTPUT/'+
               filename.substring(0, filename.length - 4)+
               '_'+parameter+'_'+timestep+'.jpg';
oThis.refreshImage("MainImage",imagesrc);
```

Many more options for gnuplot possible

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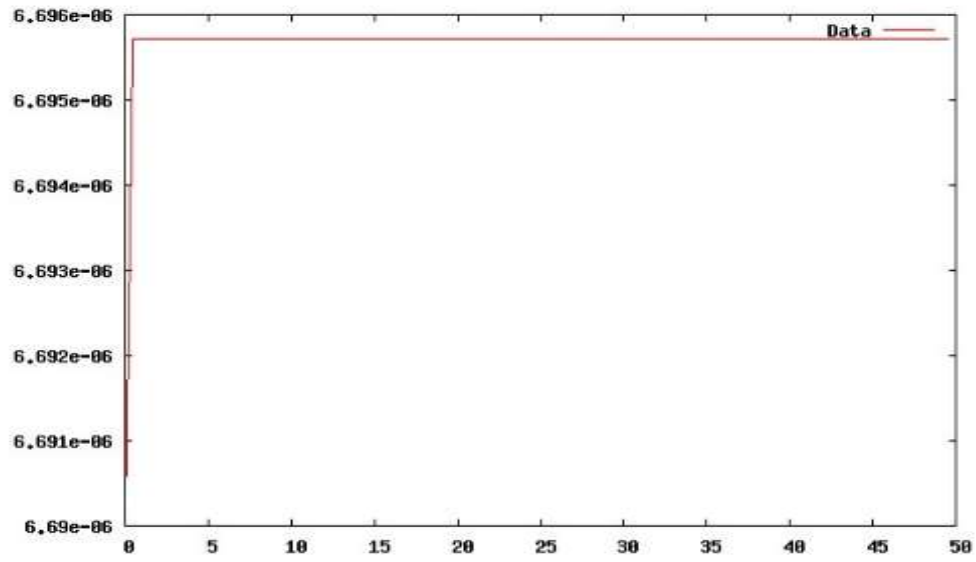
Sym.8

General Water-rock Interaction and Reactive-Transport Simulation

Upload .sdb file...

Desktop | Console | Constants | Mineral Kinetics | Equilibrium | Mineral Properties | Calculation | Results



" sp. 59 c h+ Molar : t 1, 0 my; ix 0, iy 1, iz 1 "
data from output file [OUTPUT/cs1d10]

[c h+ Molar]
0 6.69002e-06
0.5 6.69571e-06
1 6.69571e-06
1.5 6.69571e-06
2 6.69571e-06
2.5 6.69571e-06
3 6.69571e-06
3.5 6.69571e-06
4 6.69571e-06
4.5 6.69571e-06
5 6.69571e-06
5.5 6.69571e-06
6 6.69571e-06
6.5 6.69571e-06
7 6.69571e-06

Conclusion and Future Work

- Web interface works
- Development time versus benefits

- Lots more to implement (error checking, process termination, GUI parameters, better plots, load balancing on multiple machines, etc.)