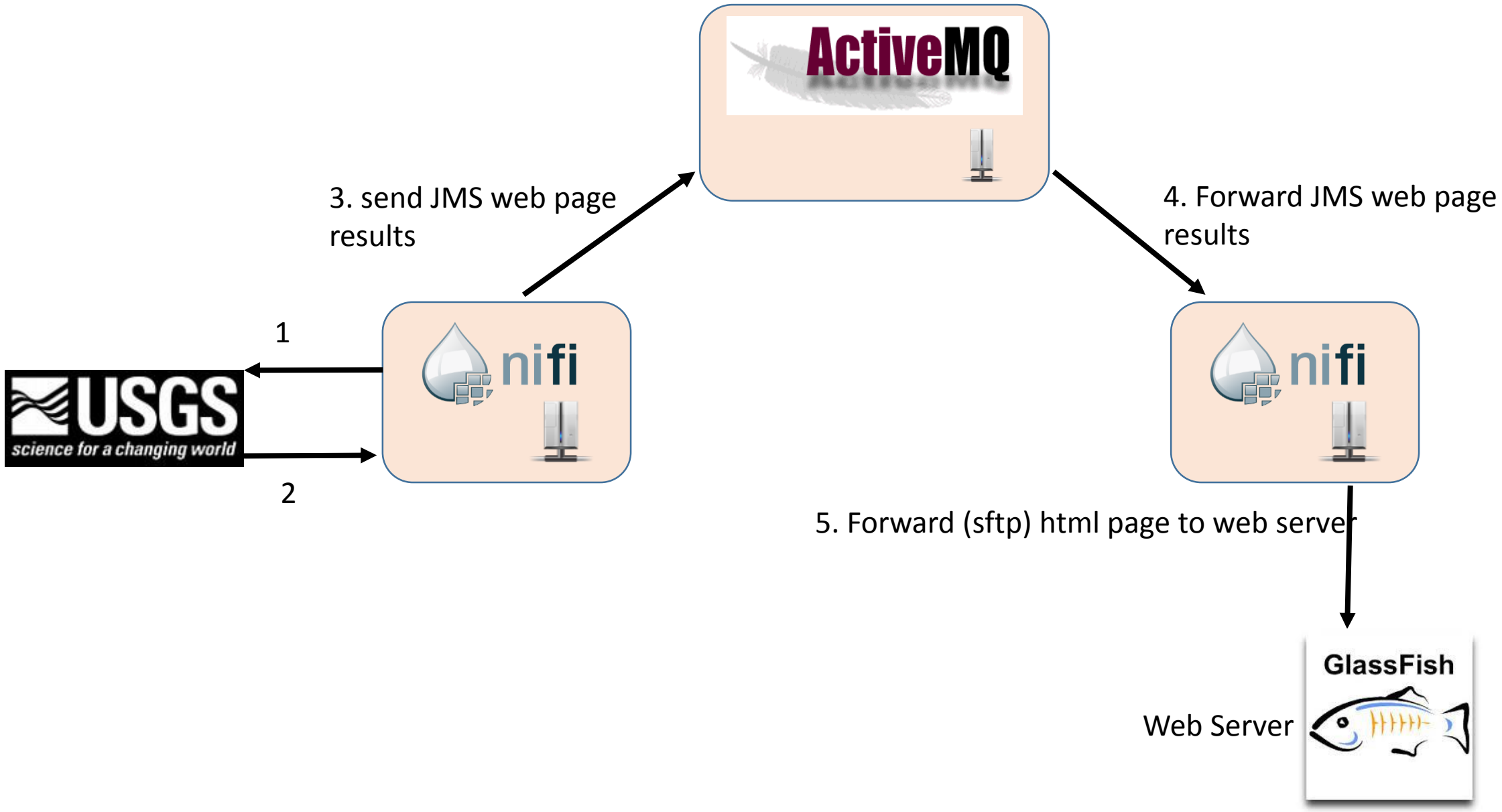
NiFi Proof of concept

QuakeReports is a dedicated data flow system designed to illustrate the powerful real time processing capabilities using the new Apache NiFi architecture. It functions as a transfer/translate data flow for earthquake data provided by theUSGS (in an xml formatted file). The NiFi processed results are ultimately routed to a web server for display.

The earthquake data manipulation and formatting is done through the applied use of various standard NiFi provided processors. This simple data flow design consists of several stages:

- Hourly query of the latest USGS provided earthquake xml formatted report
- Separate out each quake events listings into its own event
- Create a google map HTML entry for each event
- Merge all of the process events into a single HTML page for display
- Send this HTML file to a remote JMS topic for forwarding
- Receive the JMS topic message for final delivery to the web server
- Transfer (via sftp) the received html file to the final destination directory for display

Data flow overview

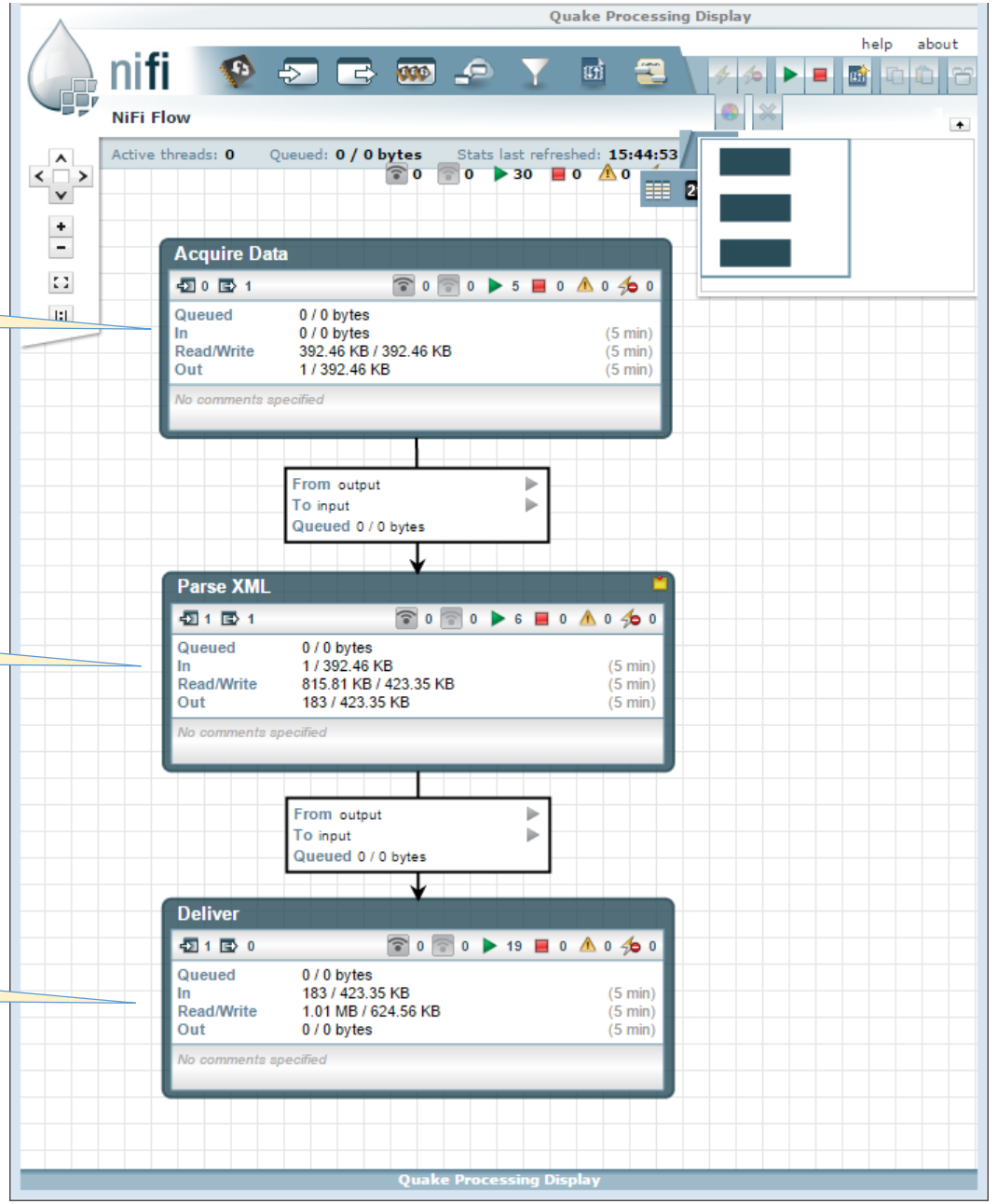


Quake NiFi flow overview

Get latest Quake data from USGS web site

Extract out each quake event info

Send the created html file to the ActiveMQ JMS server

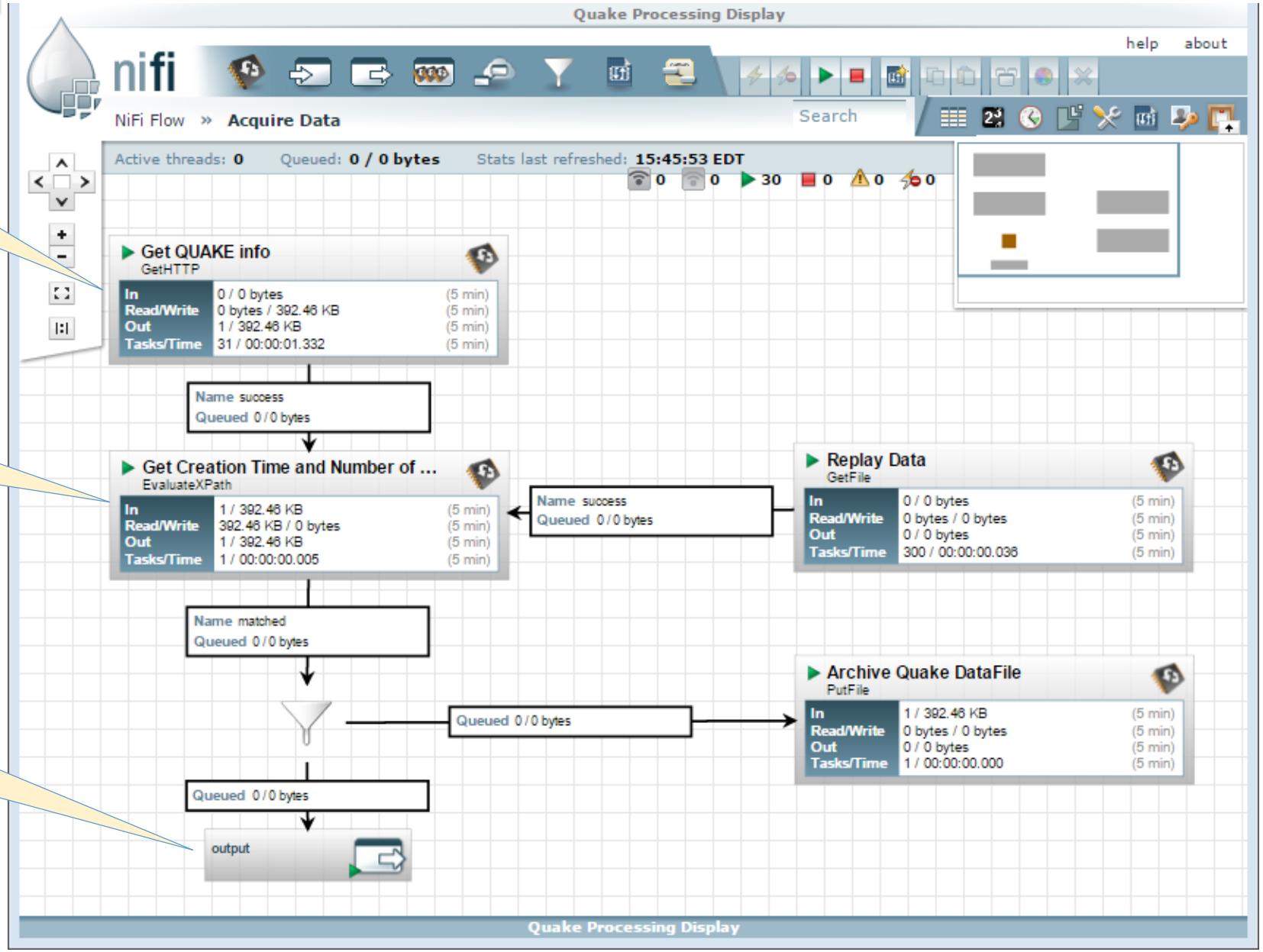


NiFi Acquire Data

Get latest USGS provided quake data once per hour

Extract the time the file was retrieved and the number of quake events in the xml file

Output port to next group

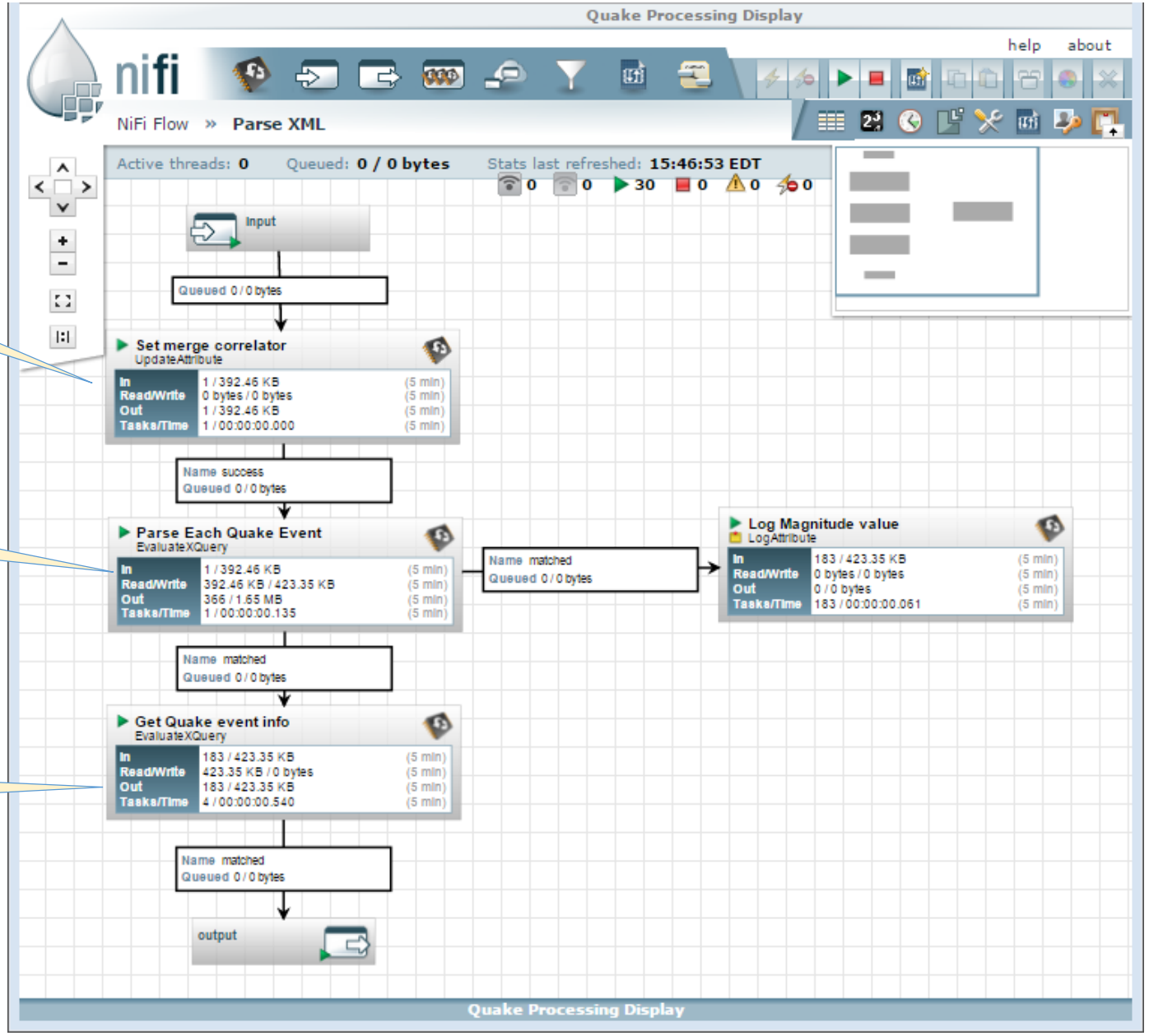


NiFi Parse Xml

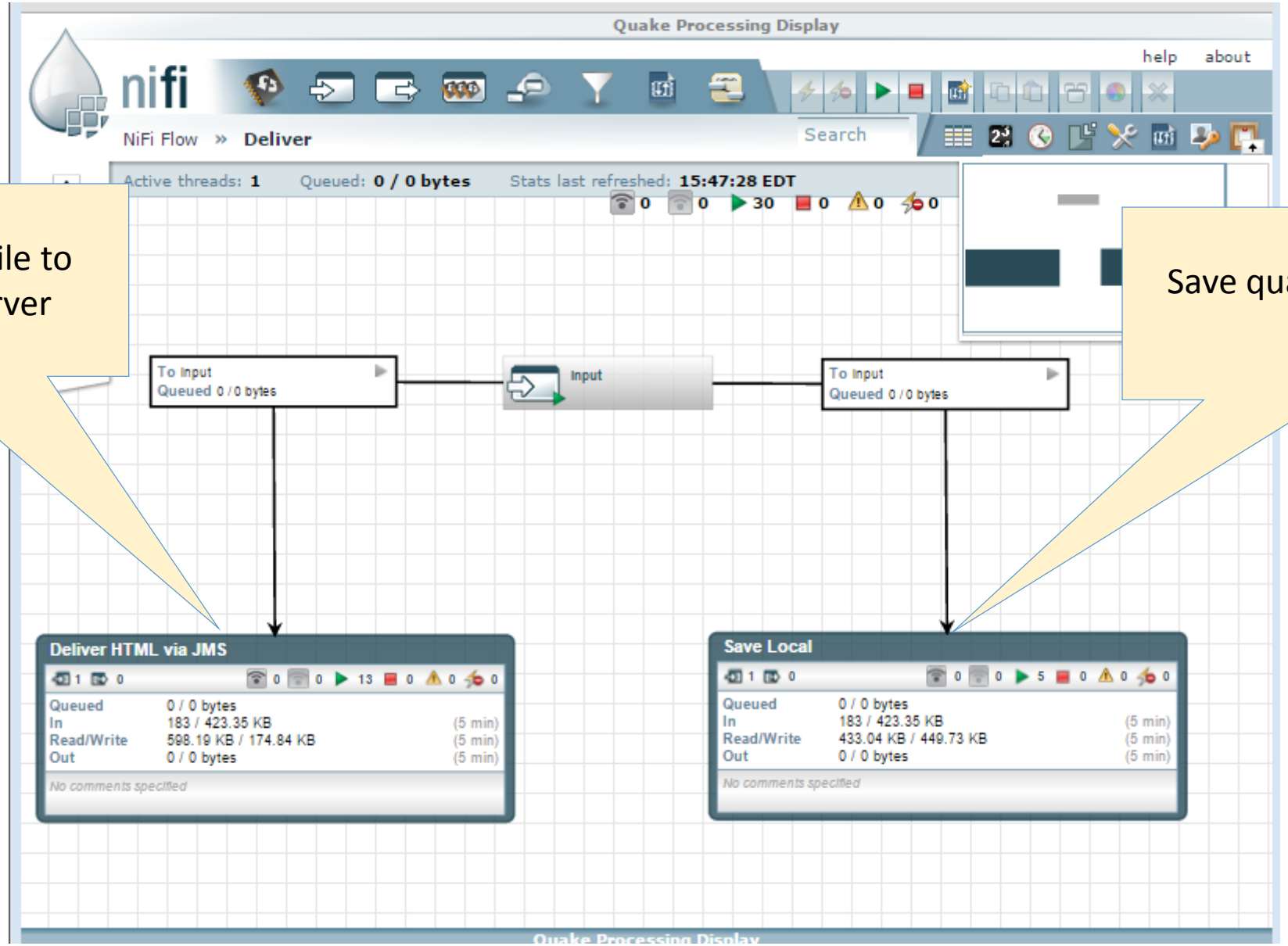
Create a variable to correlate all of the quake events to the same html page

Extract out each quake event from the summary xml file

Extract out info for this single quake event (ie. location, magnitude, time..)



NiFi Deliver



Create html quake file to forward to JMS server

Save quake events to local device

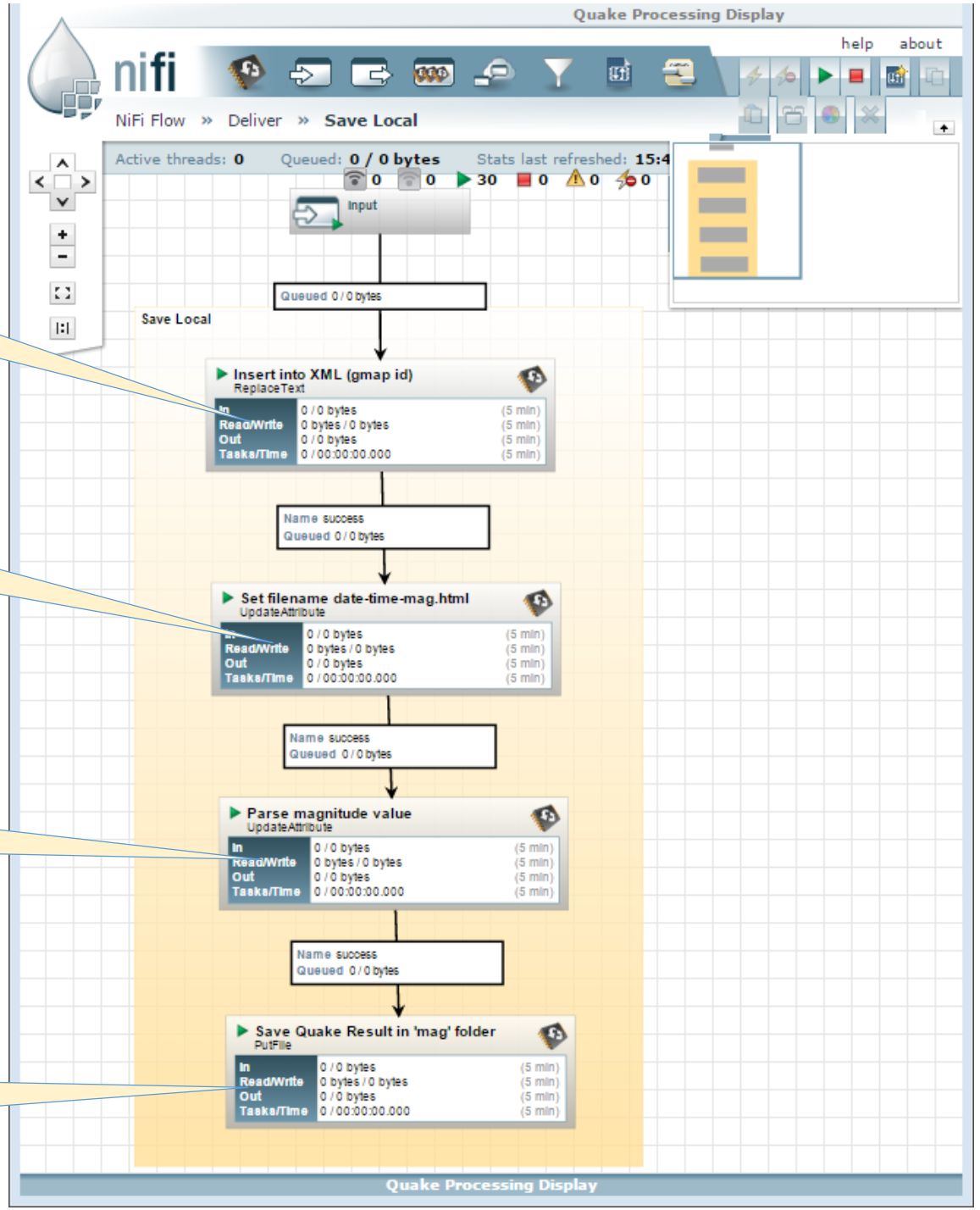
NiFi Deliver- Save Local

Create google map xml value from the extracted quake event data

Set filename of event based upon USGS id, magnitude, and magnitude

Get the magnitude of the quake event

Save local xml copy of quake event into folders based upon magnitude



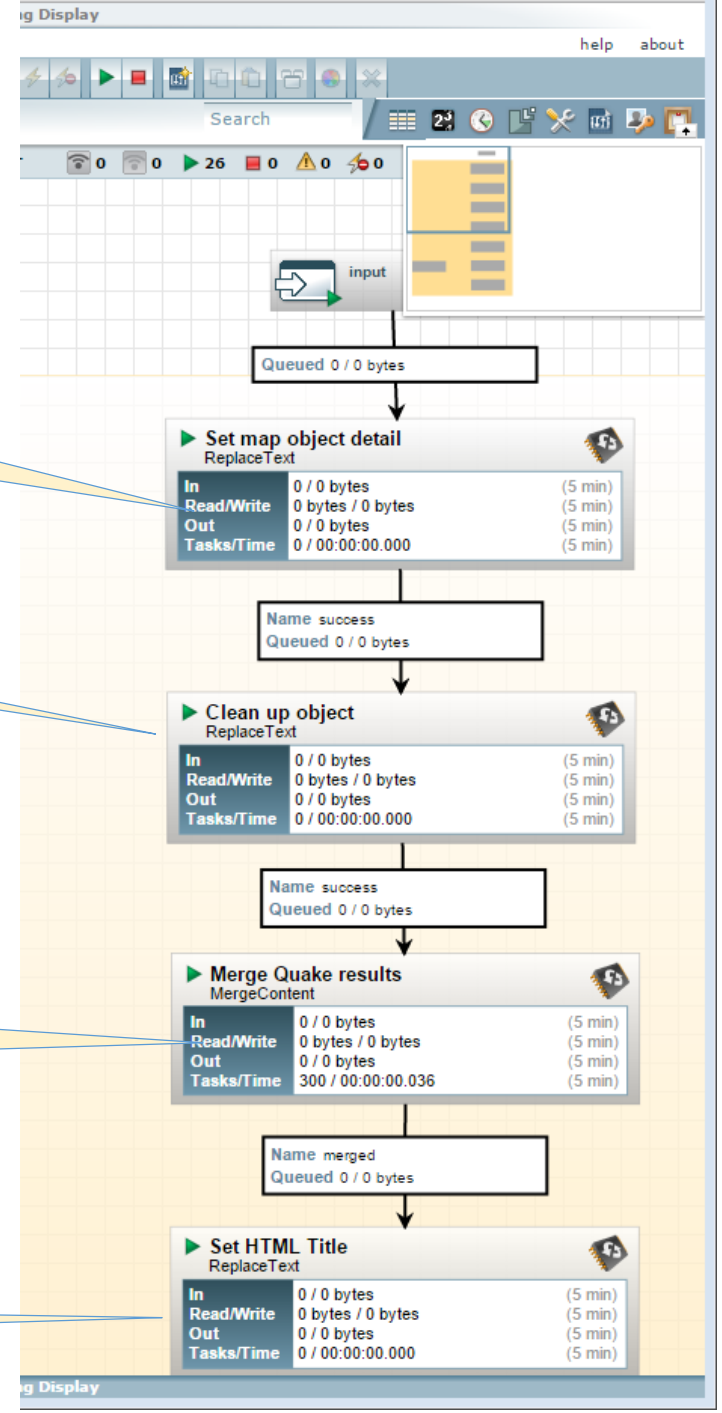
NiFi Deliver- HTML via JMS

Create google data item based upon quake event information

Remove extra characters

Collect all of the google map created quake events into one entry

Set the html page name



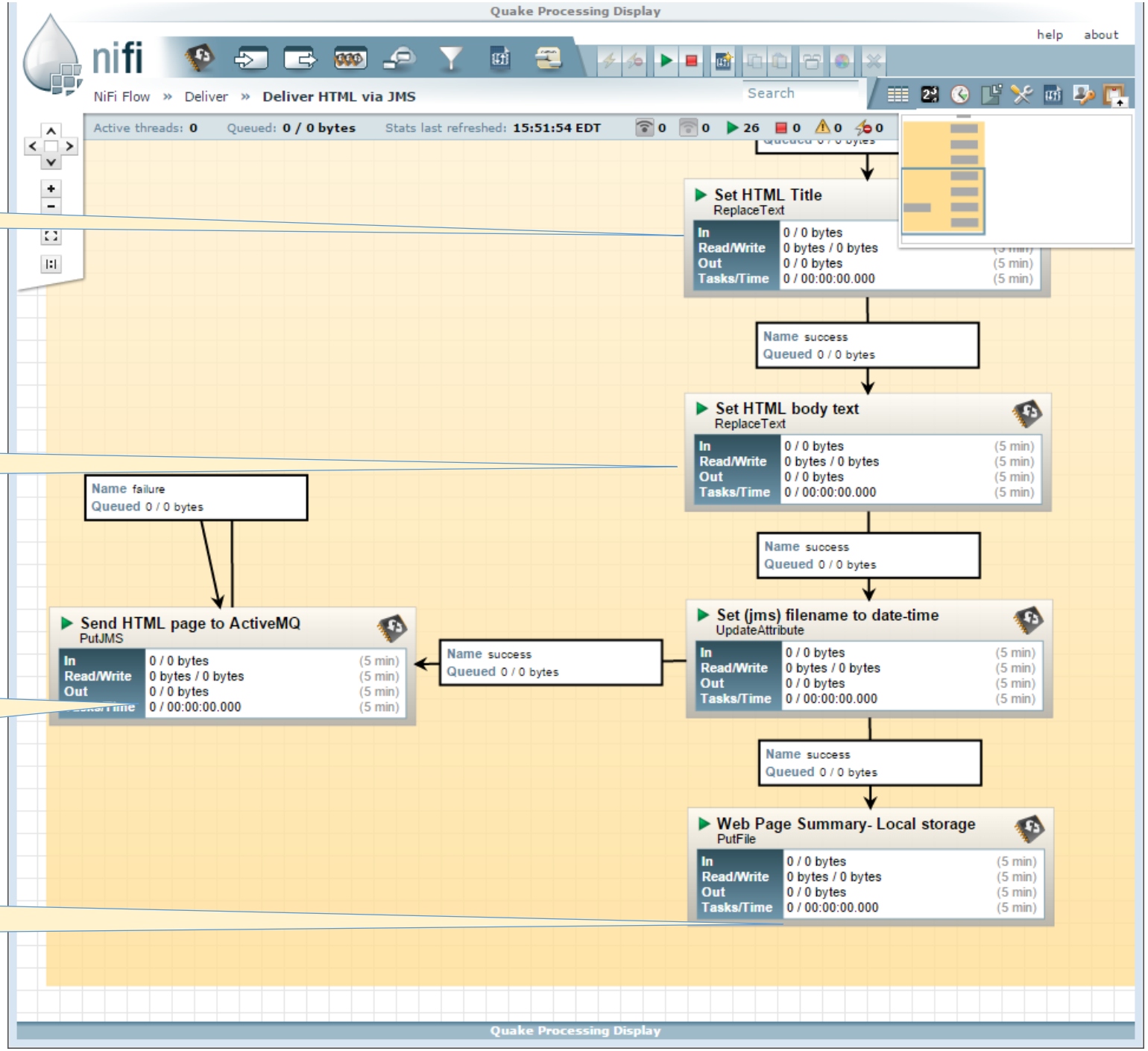
NiFi Deliver- HTML

Set the html page name

Set the html page body

Send html page to JMS topic

Local storage of created web page

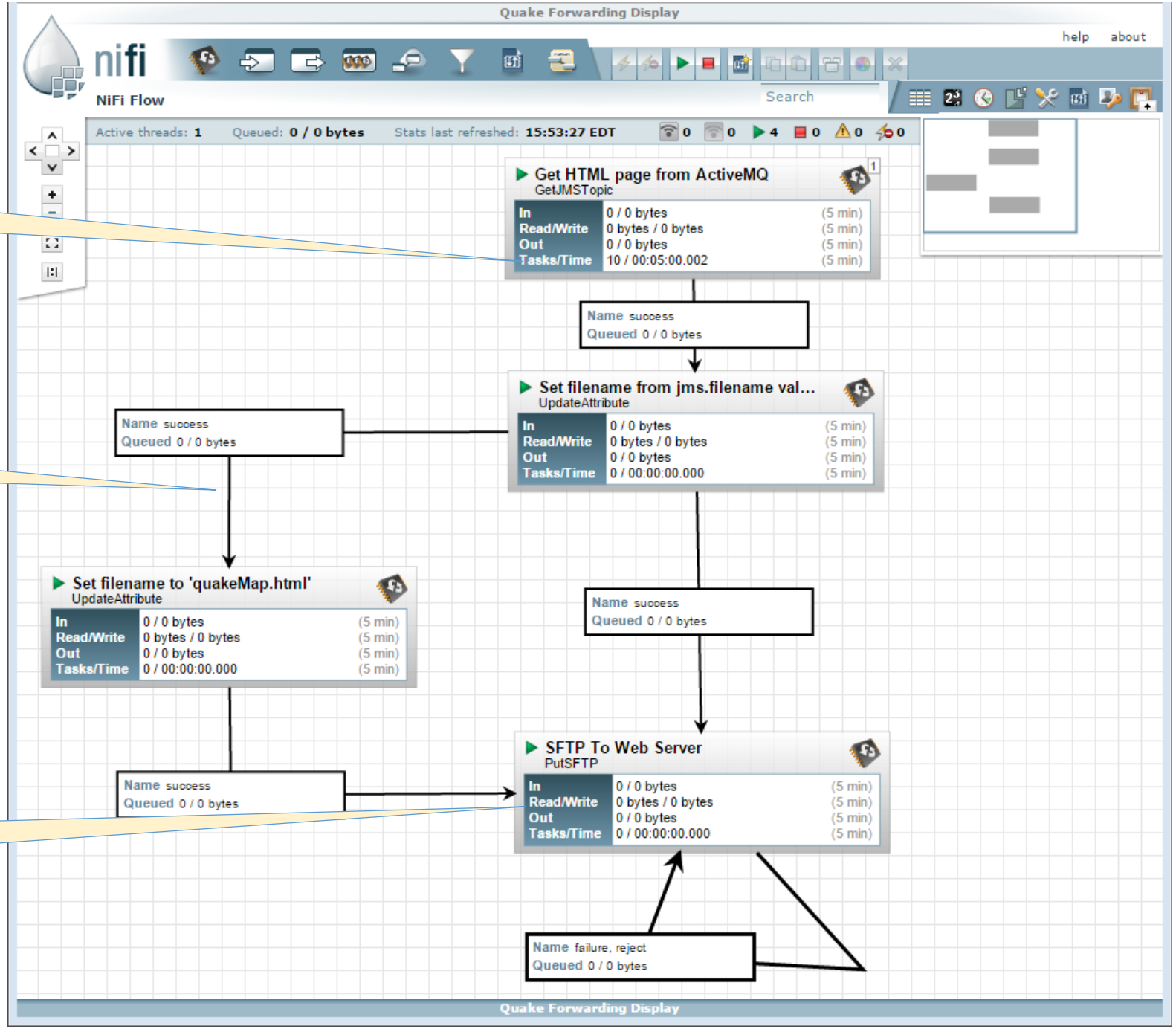


NiFi Receive

Receive html page to JMS topic

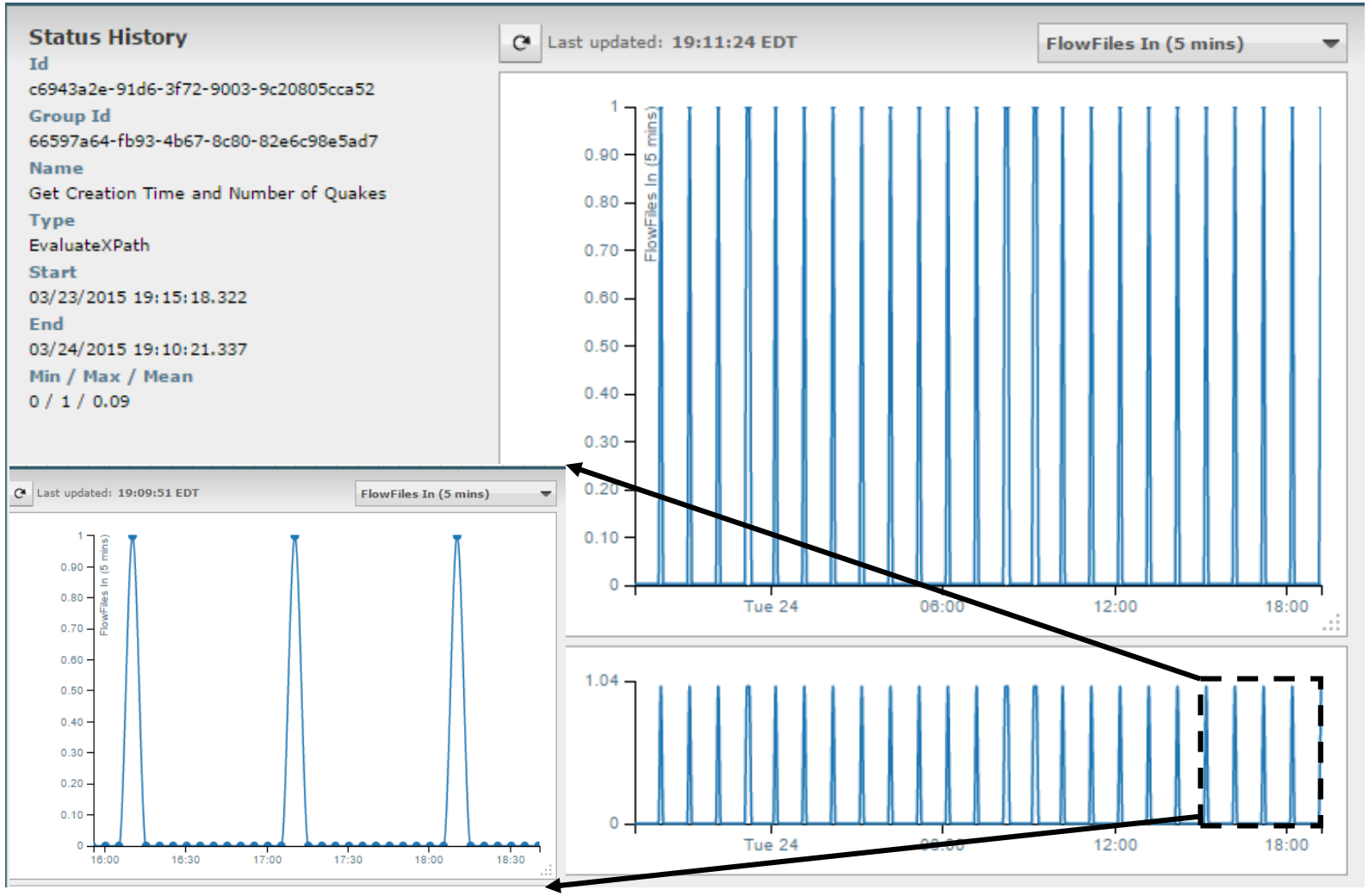
Set html filename

sftp file to web server for display



NiFi status history example

Every NiFi processor provides historic status displays



Initial USGS provided XML data


```
▼<q:quakeml xmlns="http://quakeml.org/xmlns/bed/1.2" xmlns:catalog="http://anss.org/xmlns/catalog/0.1" xmlns:q="http://quakeml.org/xmlns/qua
  ▼<eventParameters publicID="quakeml:earthquake.usgs.gov/earthquakes/feed/v1.0/summary/all_hour.quakeml">
    ▼<event catalog:datasource="nc" catalog:eventsource="nc" catalog:eventid="72429125" publicID="quakeml:earthquake.usgs.gov/earthquakes/fee
      ▼<description>
          <type>earthquake name</type>
          <text>6km WNW of Cobb, California</text>
        </description>
      ▼<origin catalog:datasource="nc" catalog:dataid="nc72429125" catalog:eventsource="nc" catalog:eventid="72429125"
        publicID="quakeml:earthquake.usgs.gov/realtime/product/origin/nc72429125/nc/1429147921570/product.xml">
        ▼<time>
            <value>2015-04-16T01:30:27.220Z</value>
          </time>
        ▼<longitude>
            <value>-122.7993317</value>
          </longitude>
        ▼<latitude>
            <value>38.8359985</value>
          </latitude>
        ▼<depth>
            <value>2500</value>
            <uncertainty>720</uncertainty>
          </depth>
        ▼<originUncertainty>
            <horizontalUncertainty>420</horizontalUncertainty>
            <preferredDescription>horizontal uncertainty</preferredDescription>
          </originUncertainty>
        ▼<quality>
            <usedPhaseCount>8</usedPhaseCount>
            <usedStationCount>9</usedStationCount>
            <standardError>0.01</standardError>
            <azimuthalGap>114</azimuthalGap>
            <minimumDistance>0.00742</minimumDistance>
          </quality>
          <evaluationMode>automatic</evaluationMode>
        ▼<creationInfo>
            <agencyID>NC</agencyID>
            <creationTime>2015-04-16T01:32:01.570Z</creationTime>
            <version>0</version>
          </creationInfo>
        </origin>
      ▼<magnitude catalog:datasource="nc" catalog:dataid="nc72429125" catalog:eventsource="nc" catalog:eventid="72429125"
        publicID="quakeml:earthquake.usgs.gov/realtime/product/origin/nc72429125/nc/1429147921570/product.xml#magnitude">
```

Final processed web page results