Web Mapping Application for Operative Fire and Water Services

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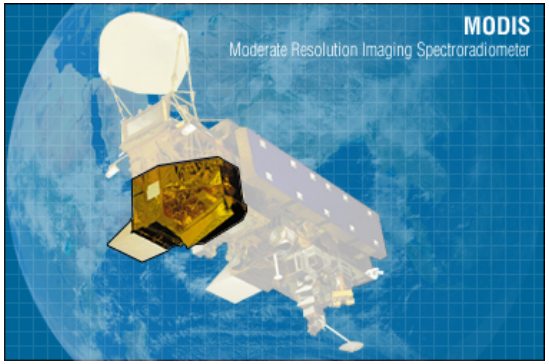
Definitions

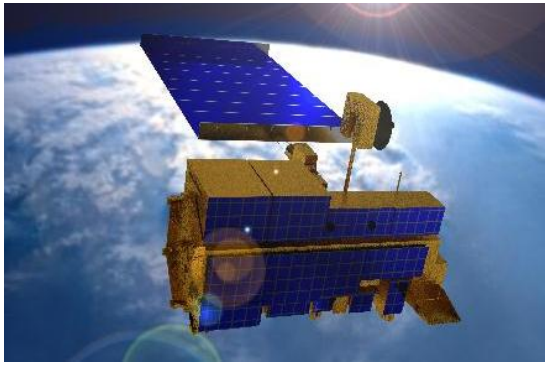
MODIS

- MODIS is a sensor carried on both the Terra and Aqua satellites.
- It allows to obtain images in the morning (Terra) and in the afternoon (Aqua) for any distinct location.
- Its data spatial resolution are between 250 meters to 1 kilometer.



Source: *http://aqua.nasa.gov*

MODIS-Aqua



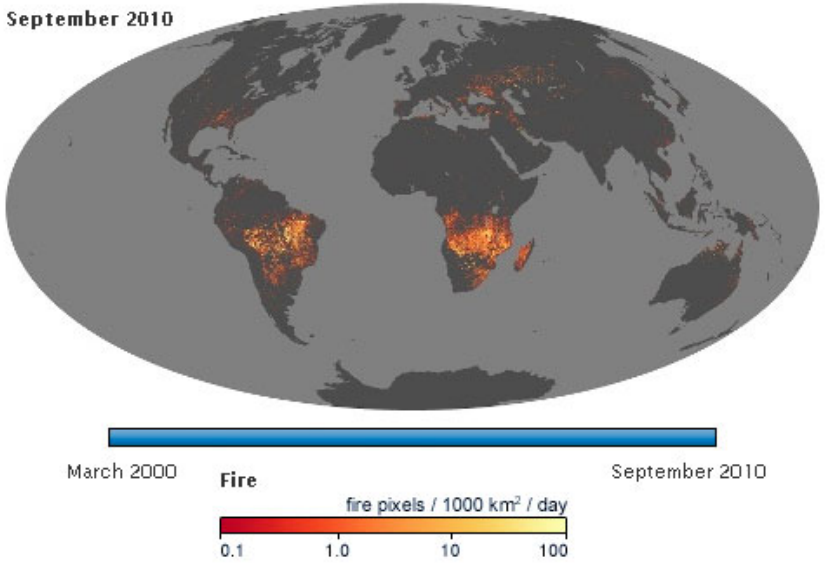
Source: *http://terra.nasa.gov*

MODIS-Terra

Introduction

Motivation

- Fire is an important ecosystem process affecting land cover change
- MODIS Sensor increases the ability to monitor fires from space
- Archive/Catalog connector has to be built.



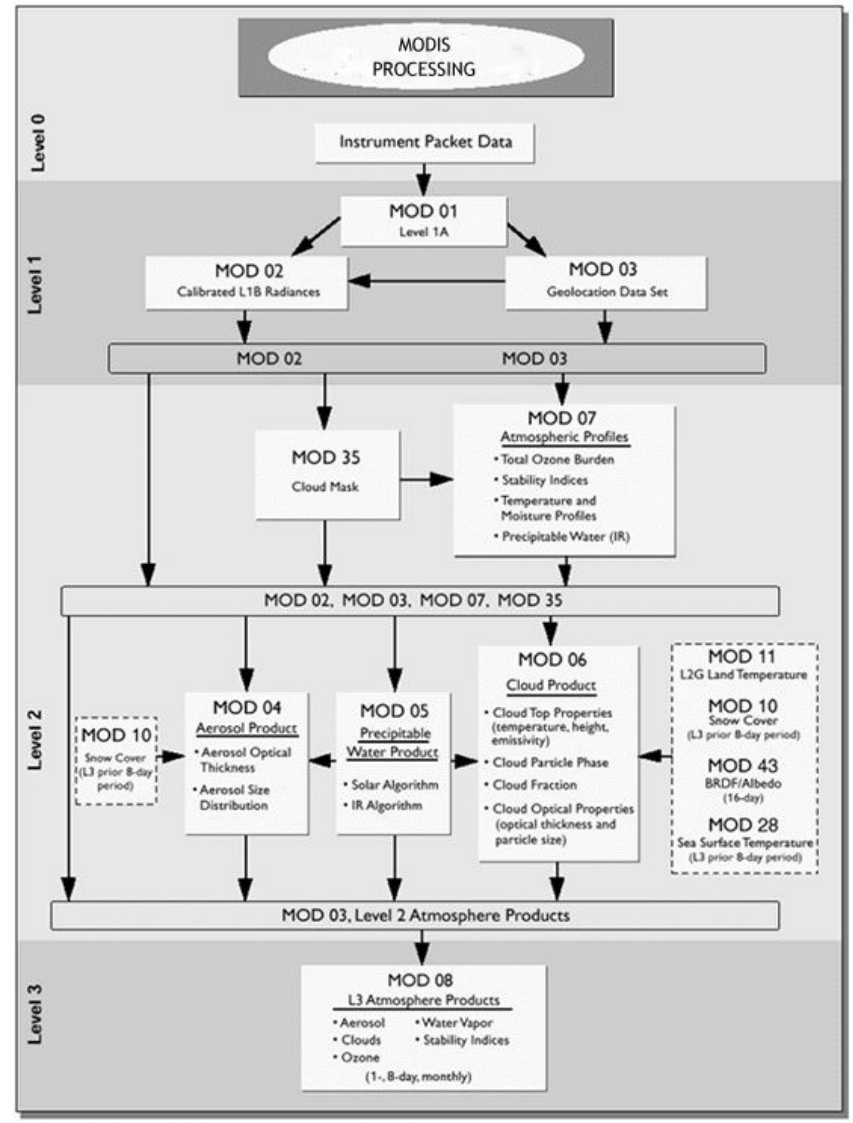
NASA Models

Source: *http://www.nasa.gov/topics/earth/features/fiery-past_*

Monthly Global Fire Activity

MODIS Data Products

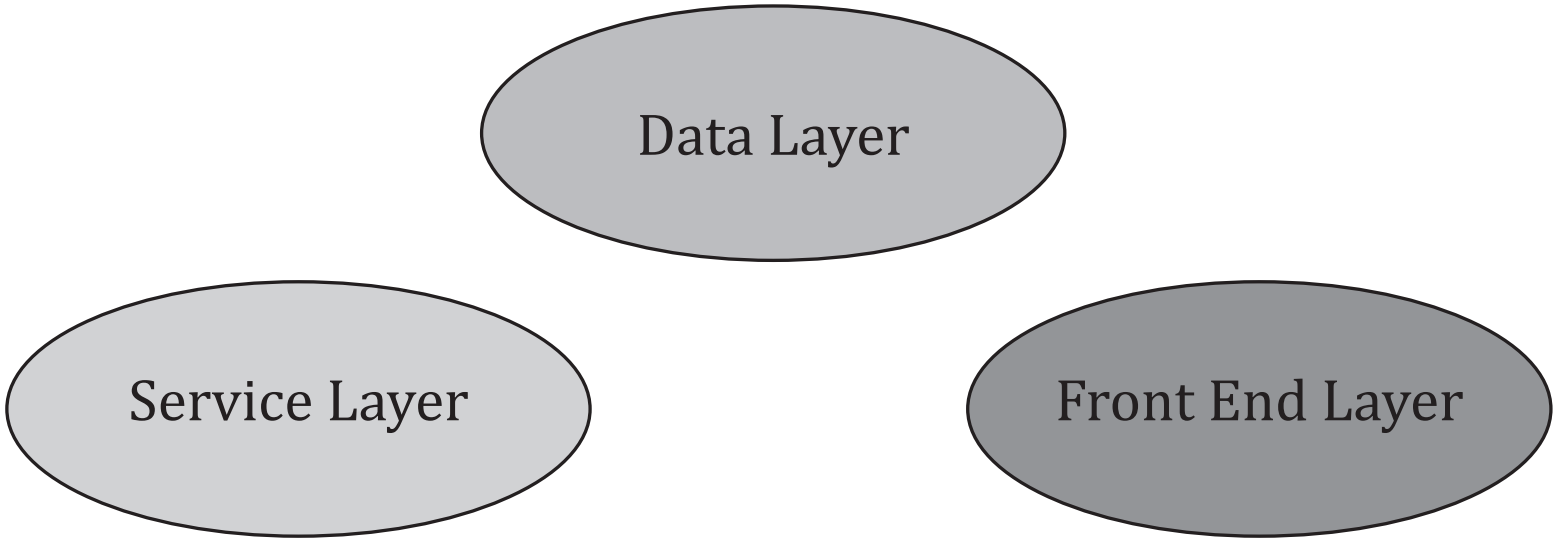
- There are 44 MODIS data sets divided into 4 levels.
- MODIS data products are like a biological food web.
- Calibration and Geolocation.



Source: *http://modis-atmos.gsfc.nasa.gov/products_flow.html*

MODIS Data Work Flow

Design



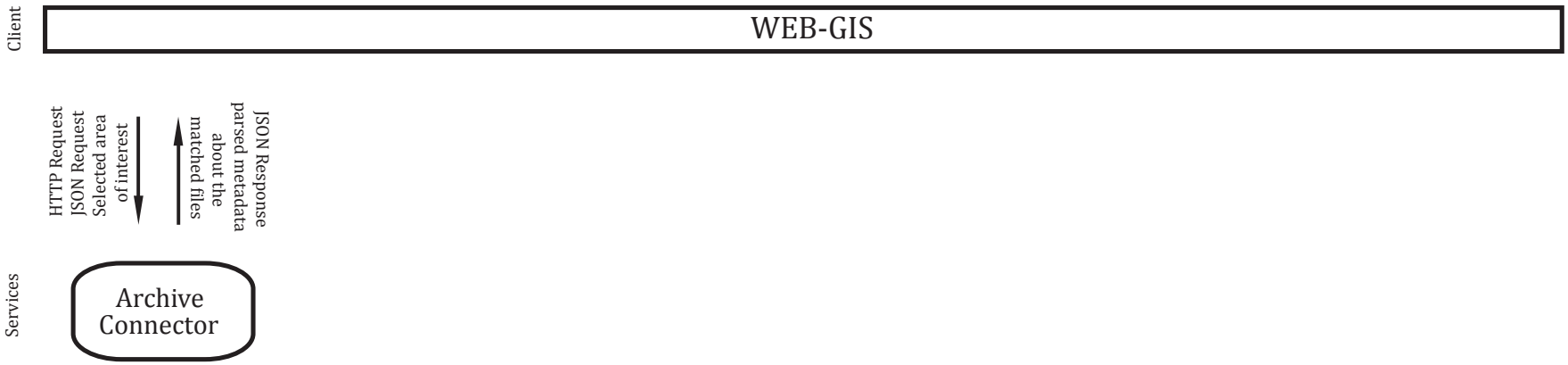
System Workflow

System Workflow

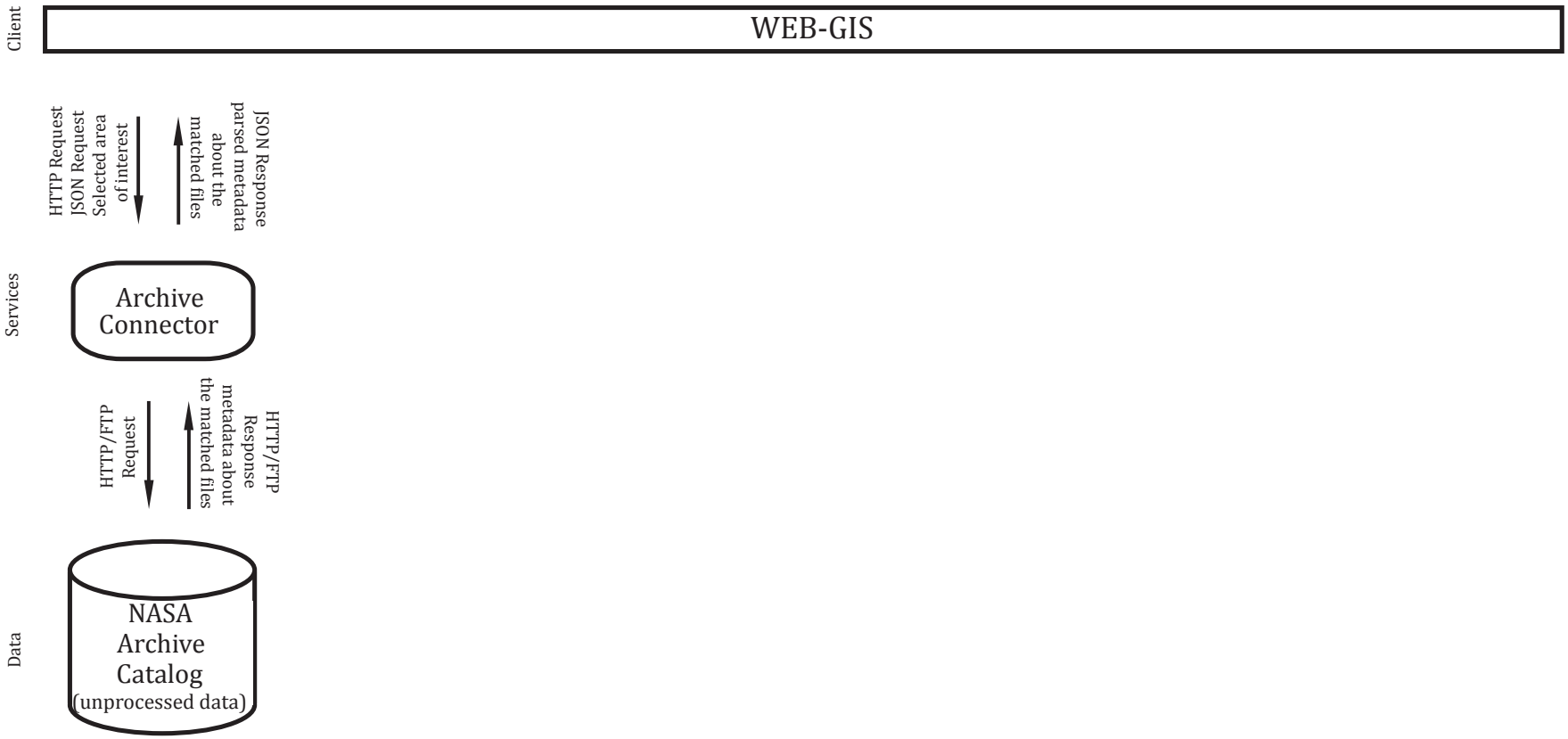
Client

WEB-GIS

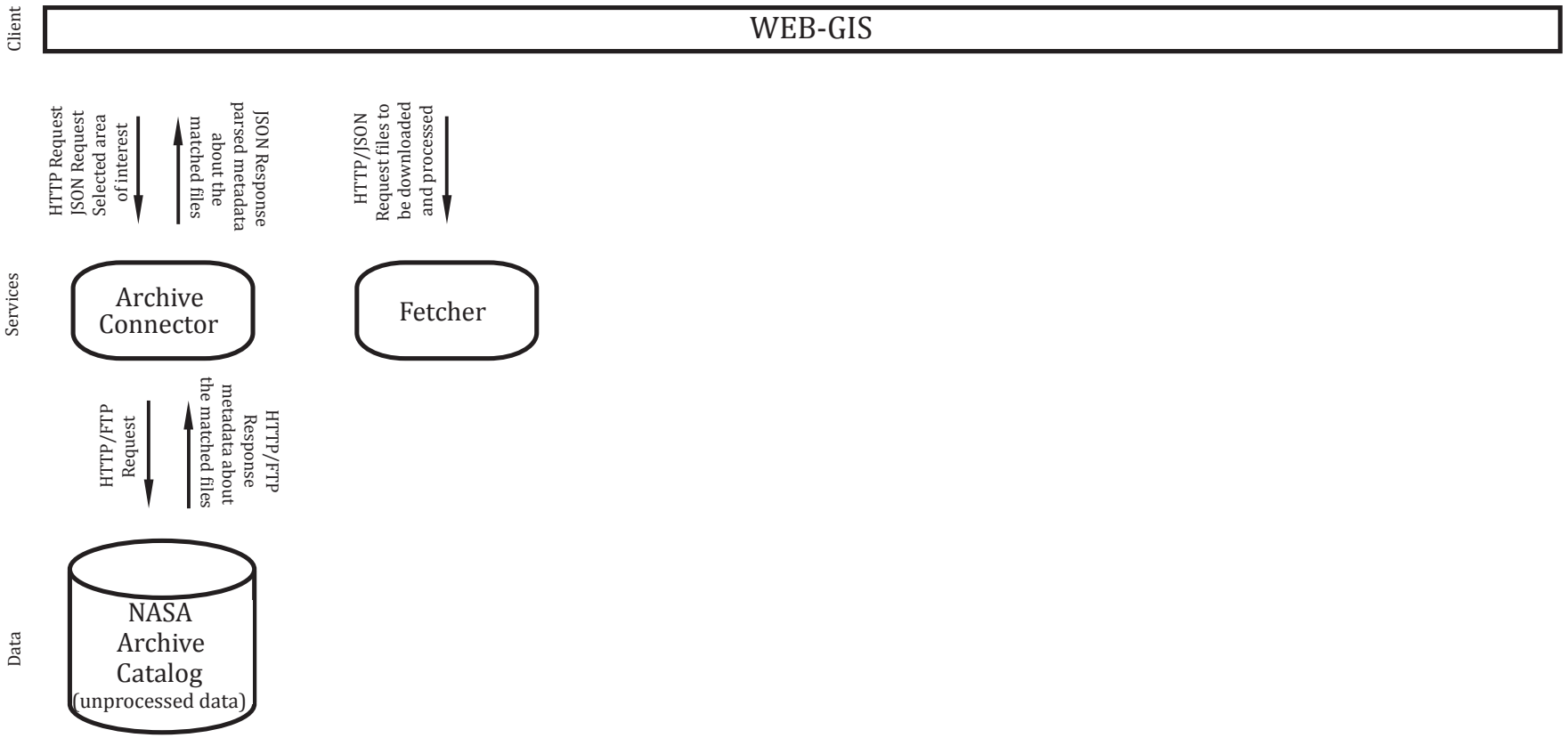
System Workflow



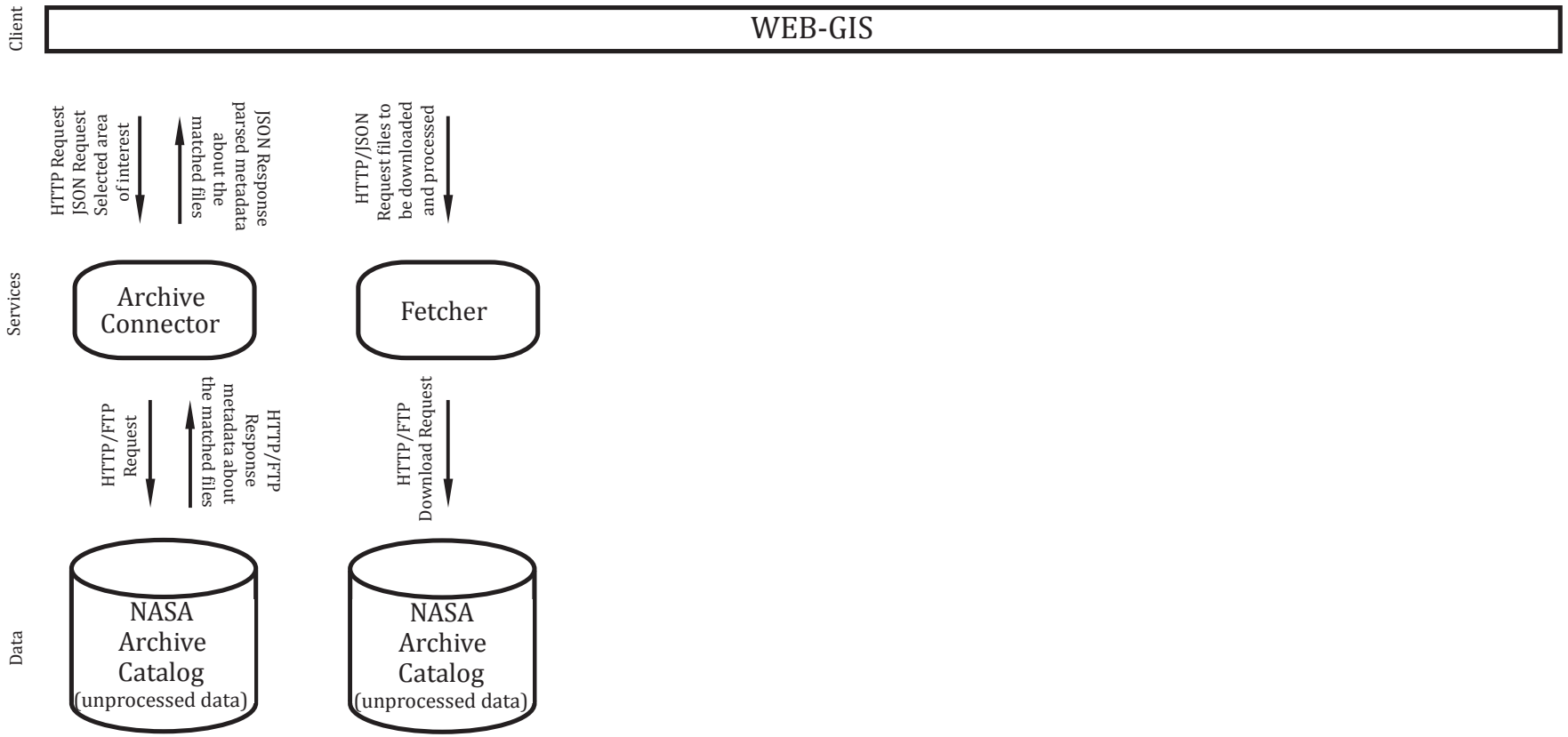
System Workflow



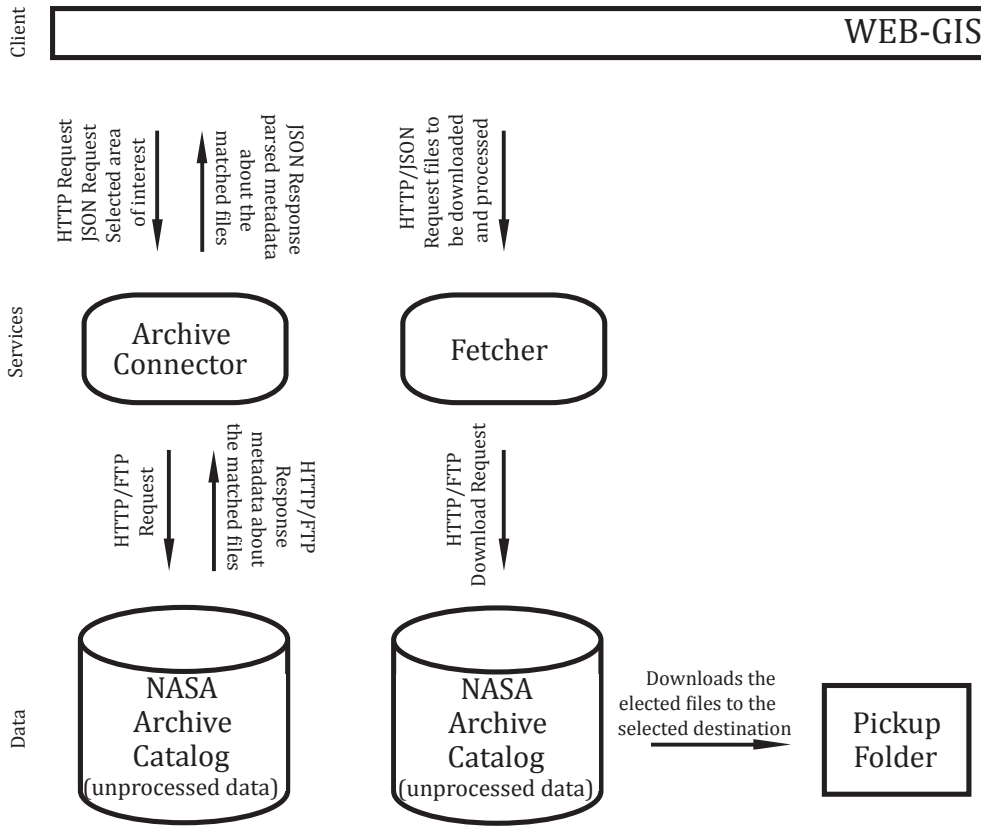
System Workflow



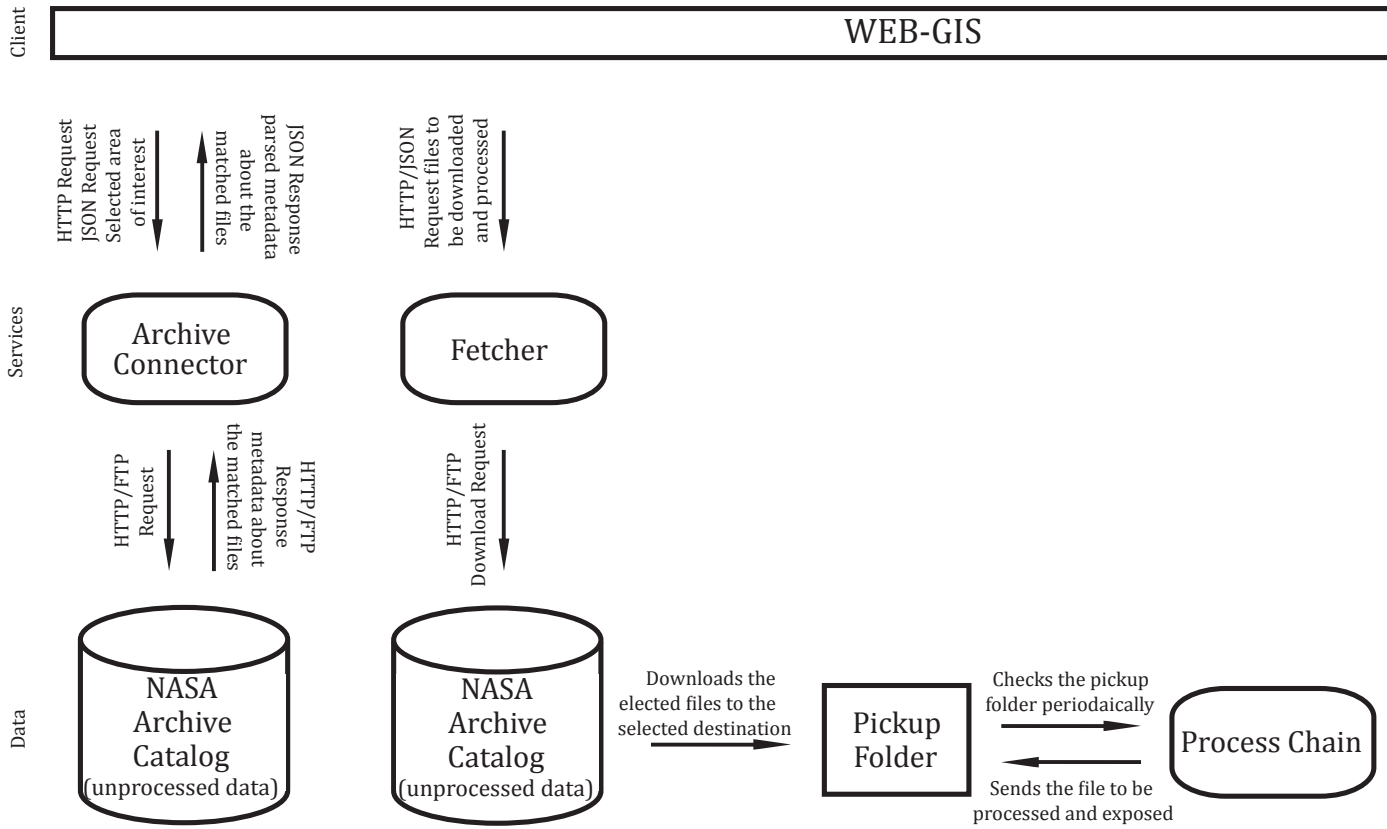
System Workflow



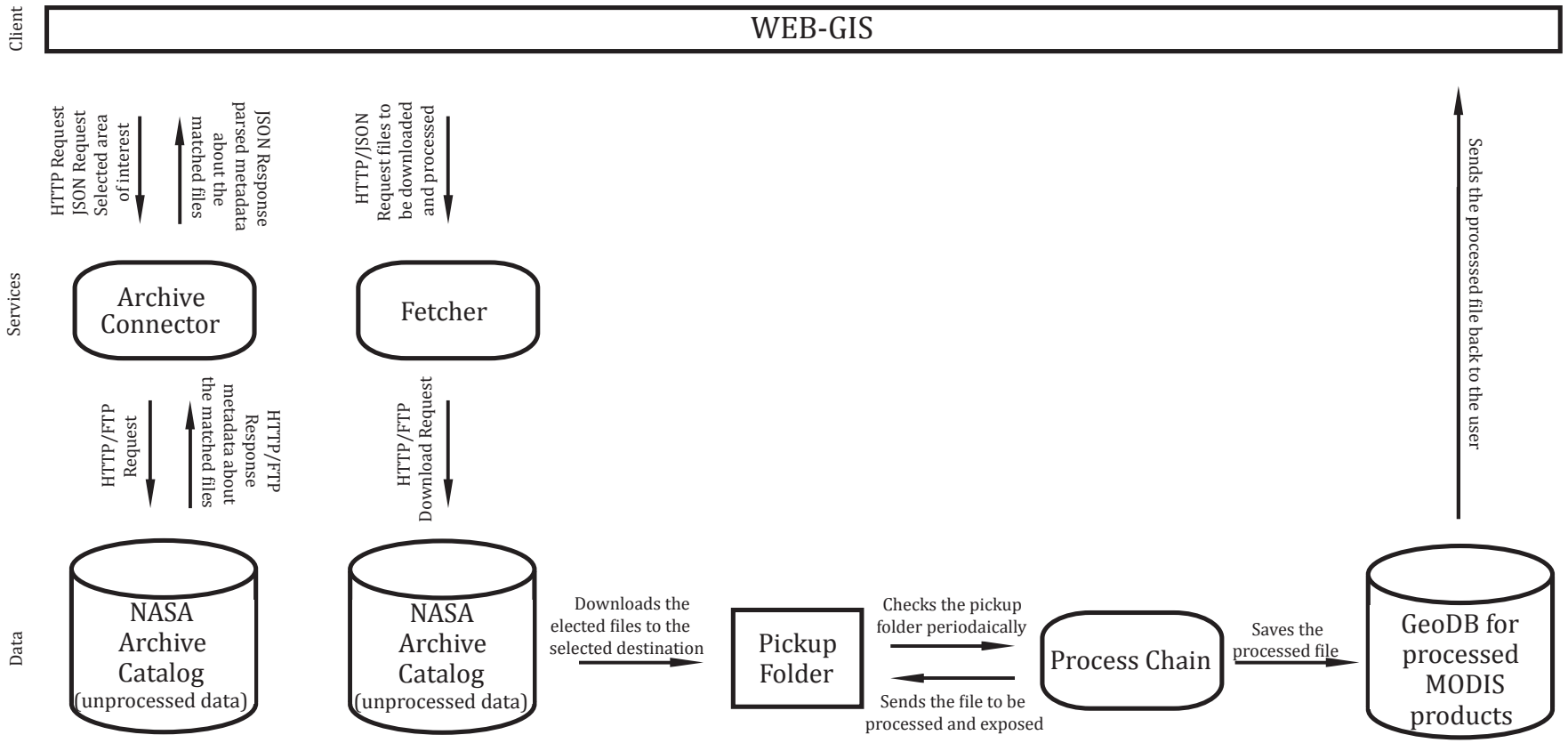
System Workflow



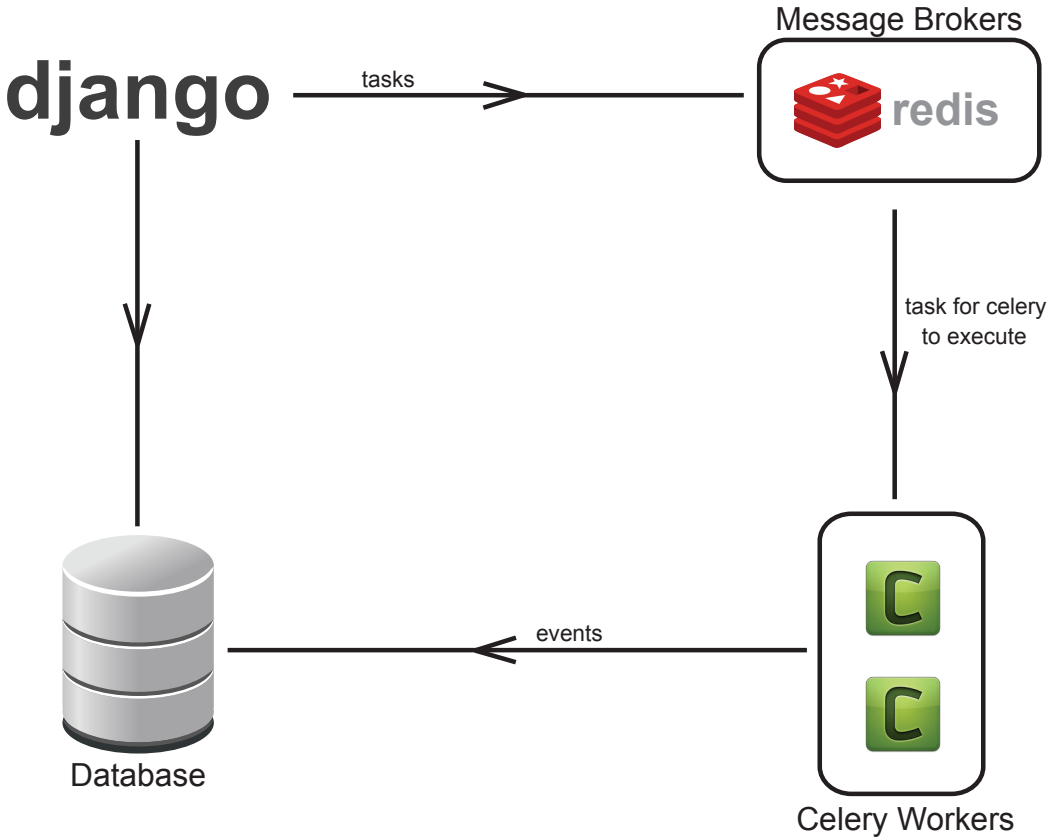
System Workflow



System Workflow



Fetching Process



Source: *http://www.celeryproject.org/*

Celery Architecture

Conclusion

Results

- Web-based modules for the retrieval, processing and exposing of satellite-based crisis information to the process chain is built.
- Archive Connector maps the user input parameters to NASA-MODIS Data Archive.
- Fetcher module uses the Distributed Task Queue allowing the download process for multiple files to be executed asynchronously.

Limitations and Future Work

Limitations

- MODIS is an optical sensor and not a passive-microwave one.
- Cloud coverage leads to an average annual global unmapped area of 43%.
- The MODIS active fire product will only detect fires that are burning at the time of satellite overpass.

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Future Work

- HDF files is to be distributed across many machines in a cluster or cloud, which will result in a faster processing of the files.
- The tool should be able to fetch/retrieve HDF files from multiple archives depending on the availablity of the archive servers.

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