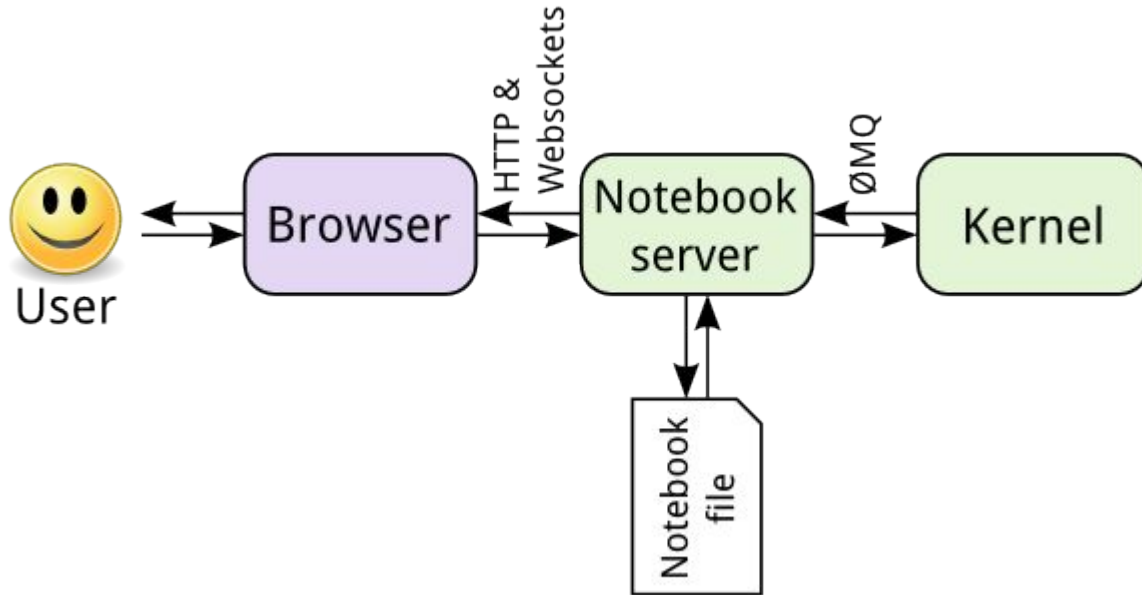# Jupyter Architecture

An overview
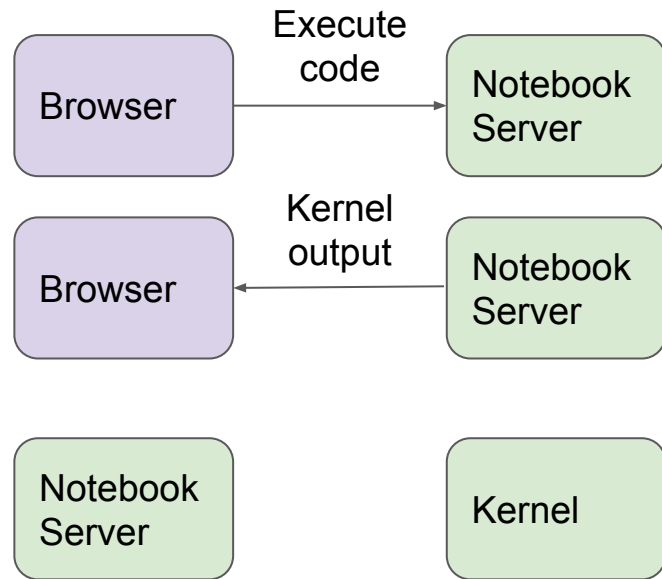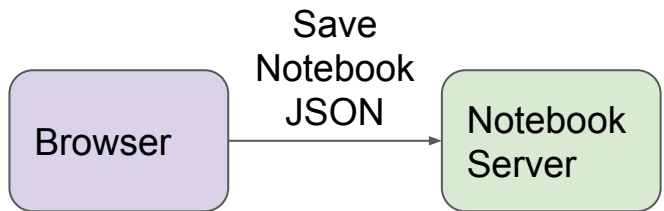
What is going on under the hood?

Browser

- You are viewing/editing a document
- Jupyter's Notebook frontend handles the following
  - User input
  - Rendering (Markdown, HTML, Javascript)
  - Sending changes to the Notebook Server
  - Sending code execute requests to the Notebook Server
- Communication happens using HTTP and Websockets
  - Websockets allow for a 2-way link between your browser and the server

Notebook Server

- Responsibilities
  - saves/loads notebook files
  - Spawns a kernel for you
  - Communicates with the kernel
    - uses the ZeroMQ (Message Queue) protocol

Execute
code

| Browser | → | Notebook Server |

Kernel
output

| Browser | ← | Notebook Server |

Save
Notebook
JSON

| Browser | → | Notebook Server |

| Notebook Server | | Kernel |

Kernels

Where user code execution happens

Separate process from the Notebook Server

Also handles other types of requests, like code completion

Browser

Execute cell code
JSON request

Notebook
Server

Execute cell code
ZeroMQ message

Kernel

Code
executes