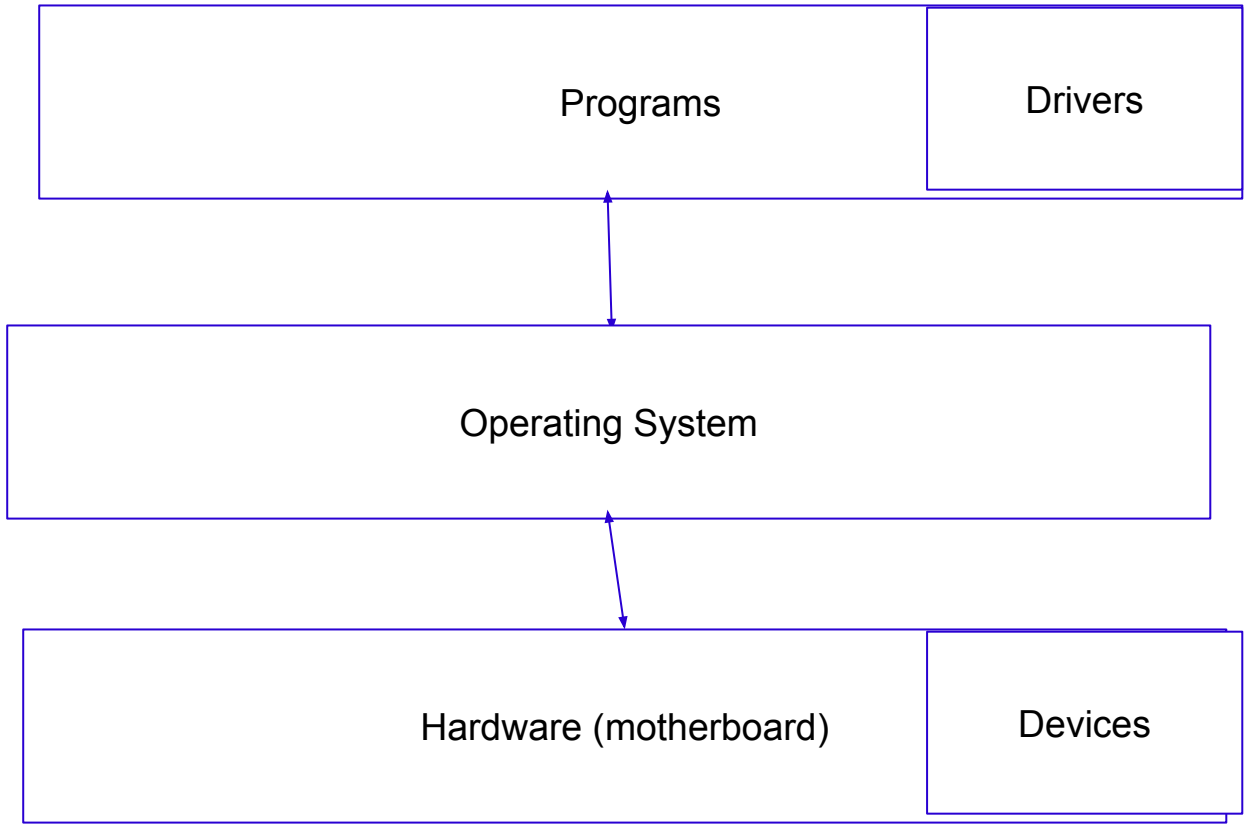
Docker

What does an OS do?

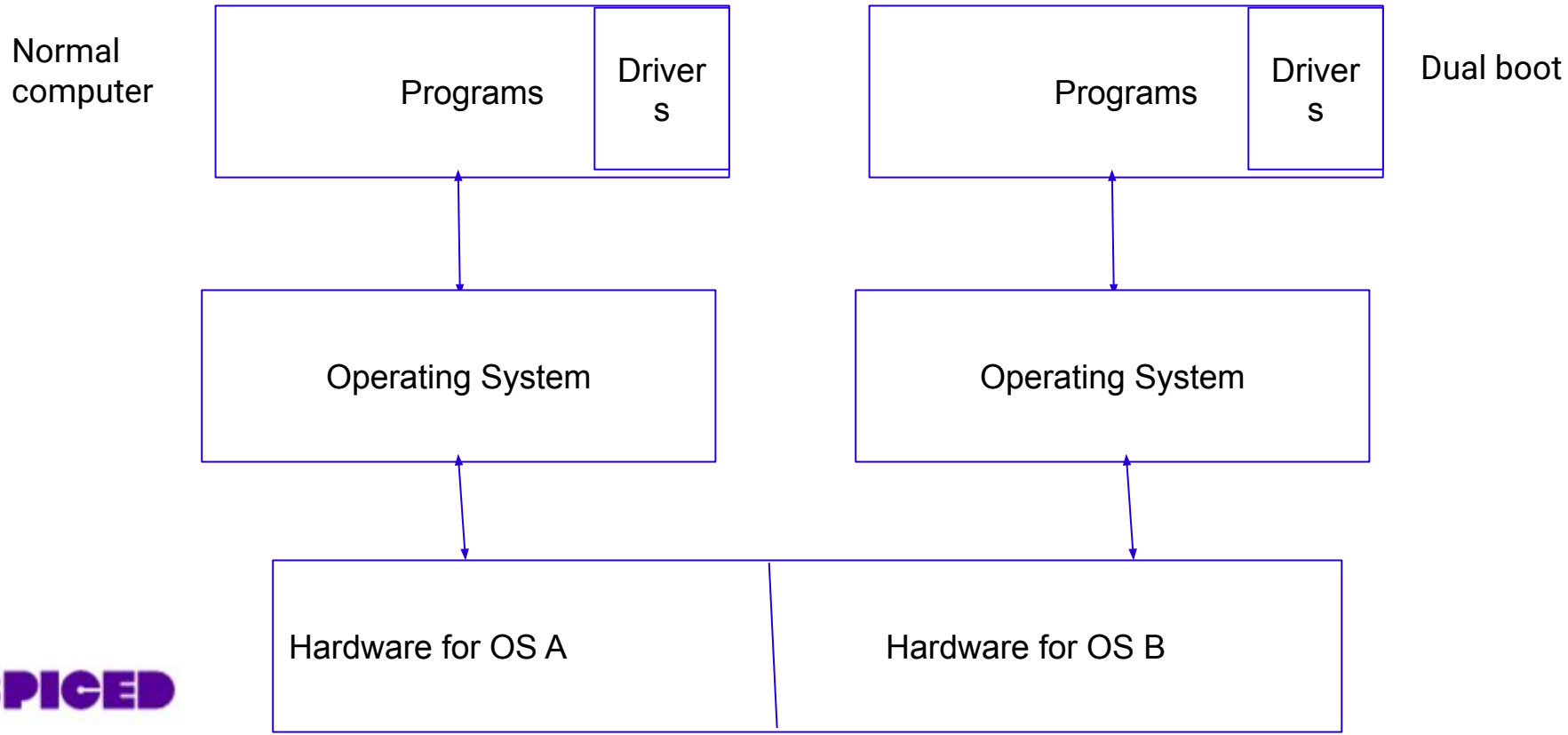
- Organises and manages all the input and output from all the programs
- Makes sure that the most important run when they’re supposed to, etc.
- Speaks to the hardware directly
- Allows users to interact with programs / Interact with the computer via the shell or GUIs

Normal computer



SPICED

Dual boot



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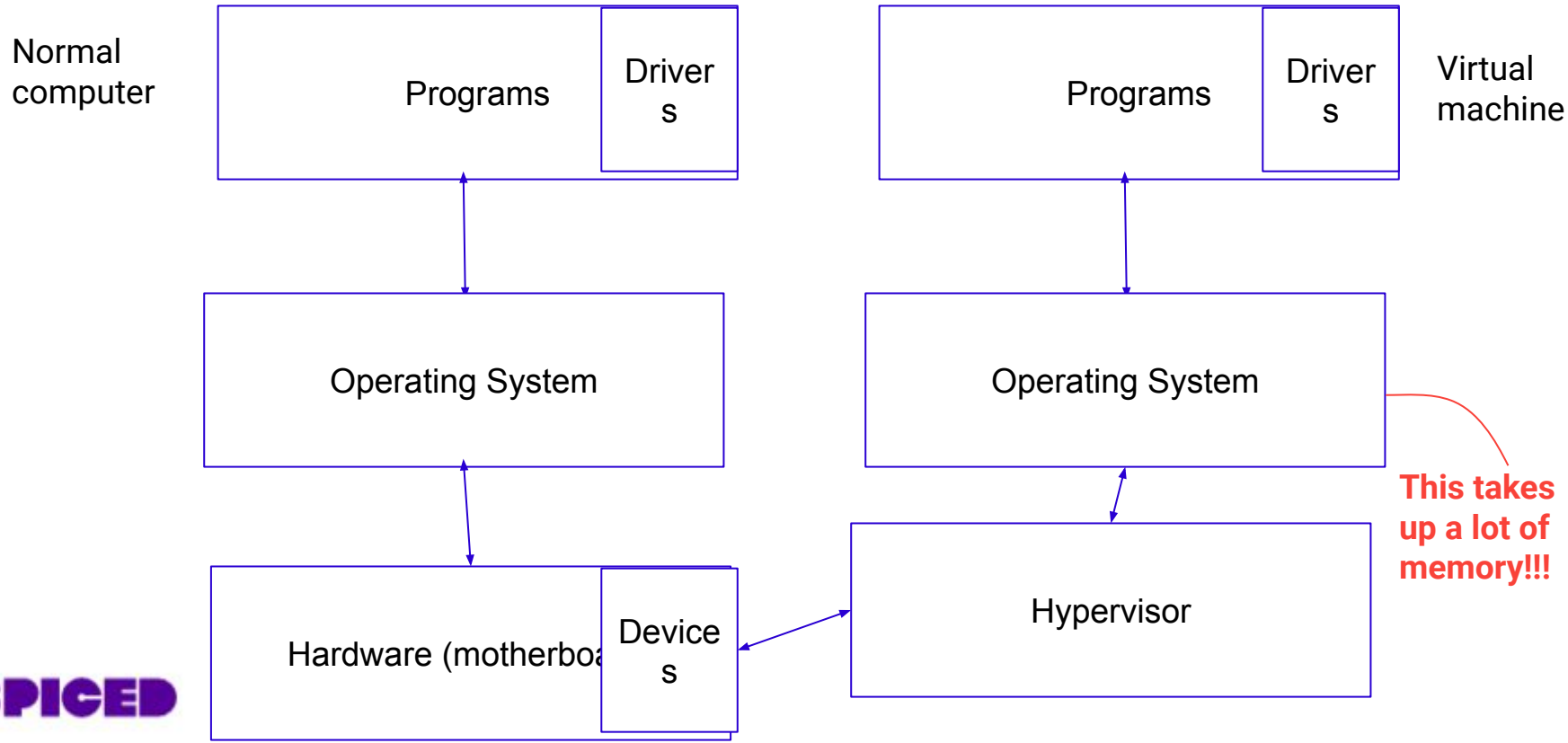
virtual machine



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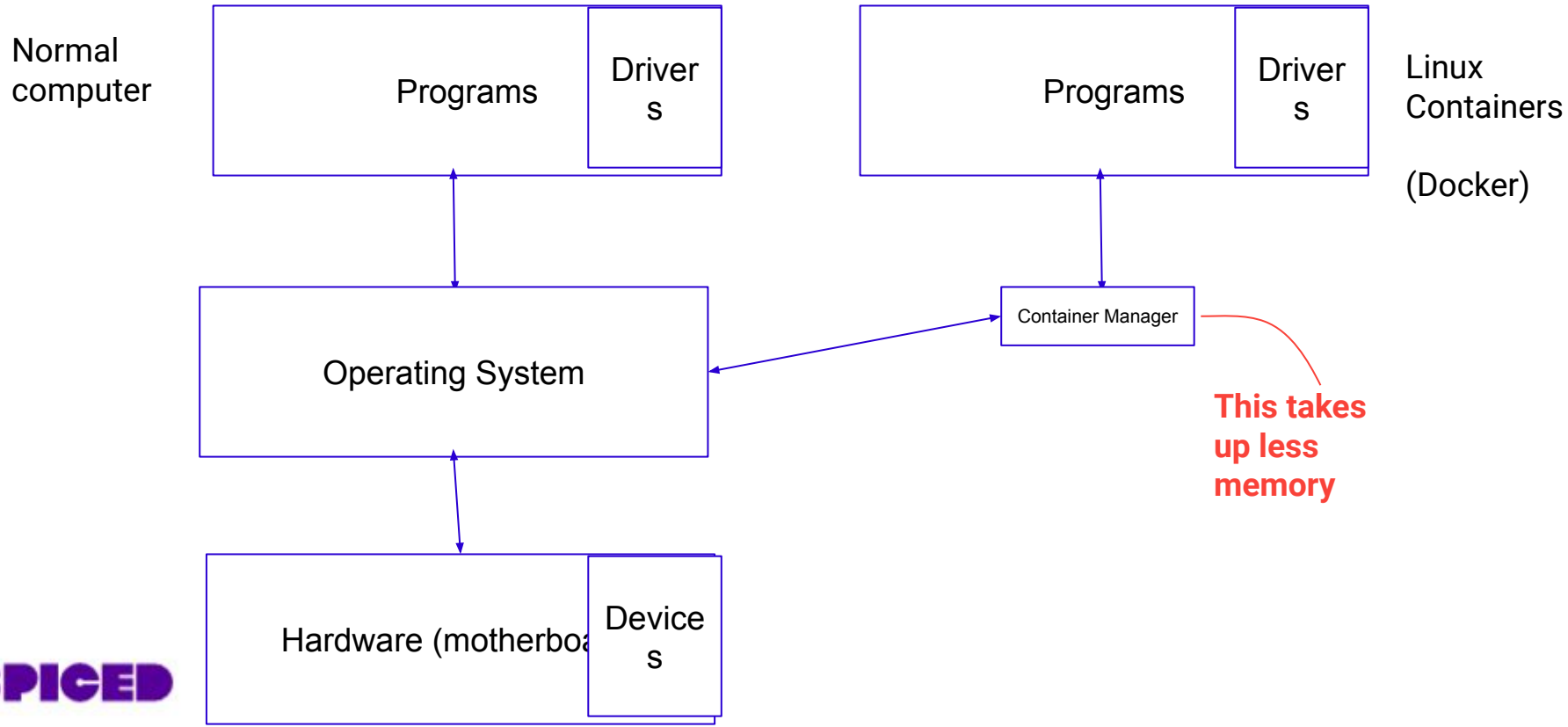
Docker container



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Containers vs VMs

- Virtual machines are big and slow, but SAFE!!! (e.g i can run a VM and inject viruses and test viruses)
- Docker containers are fast and small but less safe (DO NOT DO the above on your docker containers)
- This is what affects speed considerations… if you only use left of the list u r FAST, if u have to use right of the list u r SLOW
    - CPU>Cache(Ram in your CPU)>RAM>Swap RAM>Disk>Network

In summary - docker is great cos...

- Portable :
  - I can take a container and host it on ANY computer in the world - that computer only needs to have docker on it...
- Scalable:
  - If i build a website and in the first 1m there's 1 user, and then i go viral , suddenly i have 1m users, and my postgres db is in docker, i can create 1m postgres dbs to handle all the new data
- Easier and cheaper - all cloud services use VMs / containers

Docker - COMMANDS

What can we do with Docker?

Run a prebuilt container - (NO CODE REQUIRED)

- Docker run image_name container_name
  - -d - keeps the container running
  - -it means we can interact with the container
  - --name is the name of the container
- Investigate what we have - images and containers
  - Docker ps -a - LIST ALL CONTAINERS
  - Docker images - LIST ALL IMAGES
- Go inside the container
  - Docker exec -it container_name first_command
    - -it - makes the container interactive
    - Container_name - specifies the container
    - First_command - make ur code run

Write our own containers - CODE REQUIRED

- We need 4 things:
  - A folder for the below 3 things (colime_docker)
  - DOCKERFILE - a docker instruction manual
  - Requirements.txt - list of software required to run our code
  - App.py - our own python code
- Go to the folder you just created (cd colime_docker)
- BUILD the image
  - Docker build -t image_name .
    - DON'T FORGET THE . !!
- RUN the container
  - Docker run -it -v local/path:/app/ image_name optional_container_name

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Docker

Objectives with Docker this week

- One container for hosting our tweet scraping (get_tweets)
- One container that stores stuff in postgres (postgres)
- One container that stores stuff in mongodb (mongo)
- Maybe some others! (websites, slackbots, whatever you wanna build)
- How do they talk to each other? DOCKER-COMPOSE