License plate detection system with Hadoop

Due day : Friday, 2020/1/3 23:59

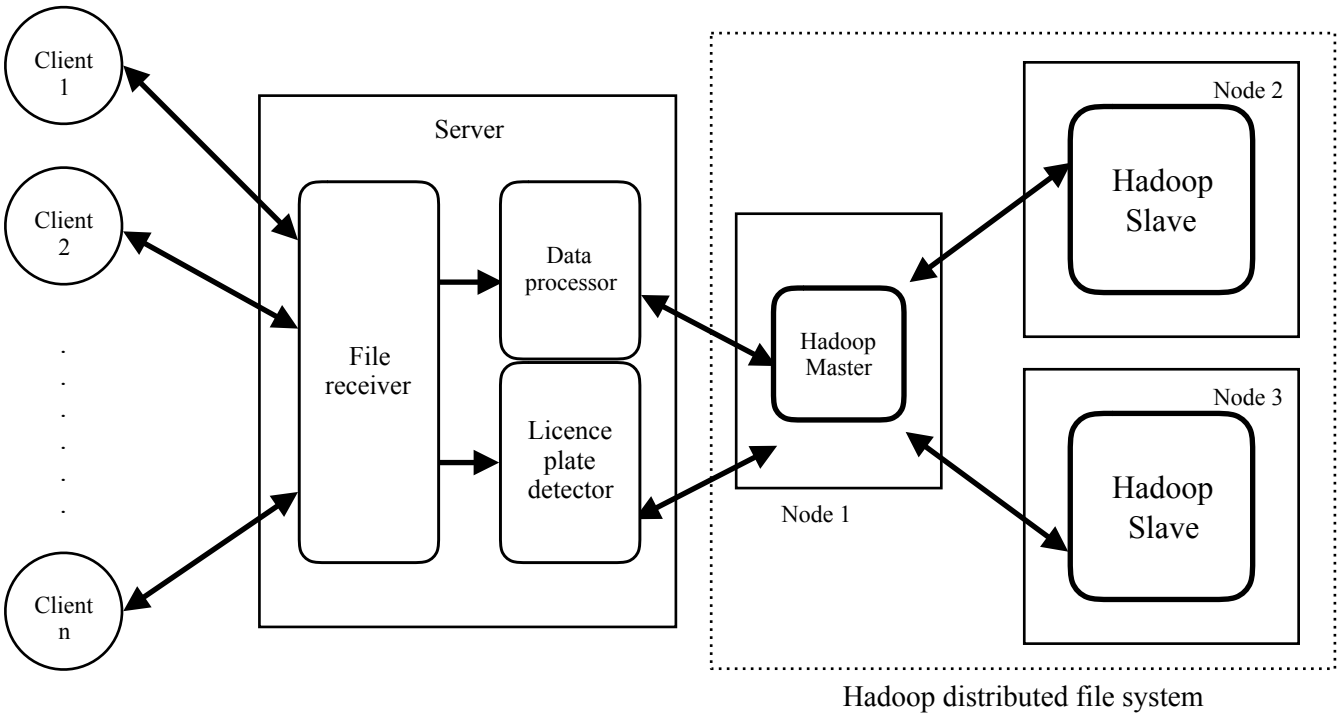
Overview

Apache Hadoop is a collection of open-source software utilities that facilitate using a network of many computers to solve problems involving massive amounts of data and computation.

In this homework, we are going to setup a Hadoop distributed file system with a real time server to handle the multiple data streaming.

Specification

- Components of server:
  - **File receiver**
    - Receive video files and names from multiple clients at the same time.
    - The maximum number of the clients is 5.
    - The size of the file is about 50 MB.
  - **Data processor**
    - Save the data to the HDFS while file receiver receiving the data.
  - **Licence plate detector**
    - Check if there is any license plate in every frame received from the clients.
    - Scan every frame from every file, if there is a license plate in this frame, record the number of this frame.
    - Each video will have a file to record the number of those frame with license plate.
    - The file name should be <video name>.txt and the format of the file will be provided in the attach file.
    - These files should also save in HDFS.
- Component of HDFS:
  - Your HDFS will have one name node(master) and two data node(slave).
  - The specification of the instance is limited. When launch the instances,
    - In step 2, please select the “Free tier eligible” one
      - Family : General purpose
      - Type : t2.micro
      - vCPUs : 1
      - Memory(GiB) : 1
      - Instance storage(GB) : EBS only
    - In step 4, please select
      - Size(GiB) : 30
      - Volume type : General Purpose SSD (gp2)



Grades

During the demo, you need to create 5 clients and send the camera videos to your server.

- Basic
  - If the accomplish all the requirements, you will get 50**%**.
- Efficiency
  - All of the students will be divided to five groups by the execution time.
  - The fastest **10** students will get **25%**.
  - 11th to 20th will get **20%**.
  - 21th to 30th will get **15%**.
  - 31th to 40th will get **10%**.
  - 41th to 50% will get **5%**.
- Accuracy
  - All of the students will be divided to five groups by the error rate.
  - The lowest **10** students will get **25%**.
  - 11th to 20th will get **20%**.
  - 21th to 30th will get **15%**.
  - 31th to 40th will get **10%**.
  - 41th to 50% will get **5%**.

P.S. if clients do not send the files at the same time, **you will not get any score**.

Note

- We have no limitation on the programming language.
- Server, clients and Hadoop distributed file system should setup on AWS instances.

• Server and Hadoop master node should run on different AWS instances.
• The server should be terminated after it finish all the works.
• During the demo, TA will use **our client** to send the video file.

File submission

Upload you source codes to new E3 platform directly. (Don't zip your files.)
TA would validate your source codes by cheating detection. Please finish the assignment by yourself.

Reference

Apache Hadoop

Hadoop cluster setup