For Raspberry PI On-Premise IoT / Apache Kafka / TML Deployments:

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Below are suggested configurations – some fields may differ or may not apply

Server environment:zookeeper.version=3.6.1--104dcb3e3fb464b30c5186d229e00af9f332524b, built on 04/21/2020 15:01 GMT
Server environment:java.version=1.8.0_144

1. **Install Java**

    a. **sudo apt-get update**
    b. **sudo apt install default-jdk**

2. **install TMUX: https://linuxhint.com/install-tmux-ubuntu/**

    a. **sudo apt update**
    b. **sudo apt-get install tmux**
    c. **pkill -f tmux (kills all tmux sessions)**
    d. **tmux a -t <session name>**

3. **Cpu monitoring:**

    a. **sudo apt update**
    b. **sudo apt install -y htop**

4. **Install MySQL:**

    a. **Sudo apt update**
    b. **Sudo apt upgrade**
    c. **sudo apt install mariadb-server**
    d. **sudo mysql_secure_installation**

5. **Install Python**

    a. **sudo apt-get install -y build-essential tk-dev libncurses5-dev libncursesw5-dev libreadline6-dev libdb5.3-dev libgdbm-dev libsqlite3-dev libssl-dev libbz2-dev libexpat1-dev liblzma-dev zlib1g-dev libffi-dev tar wget vim**
    b. **sudo mkdir Python**
    c. **sudo apt-get install libatlas-base-dev**
    d. **sudo chown pi:pi /home/pi/Python**
    e. **cd Python**
    f. **wget https://www.python.org/ftp/python/3.9.15/Python-3.9.15.tgz**
    g. **sudo tar -zxvf Python-3.9.15.tgz**
    h. **cd Python-3.9.15/**

i. ./configure --enable-optimizations
j. sudo make altinstall
k. confirm install:
    i. python -version
    ii. IF WANT TO REMOVE PYTHON:
        1. sudo apt-get clean
        2. sudo apt-get autoremove --purge
        3. sudo apt-get remove python3.9
        4. sudo apt-get autoremove

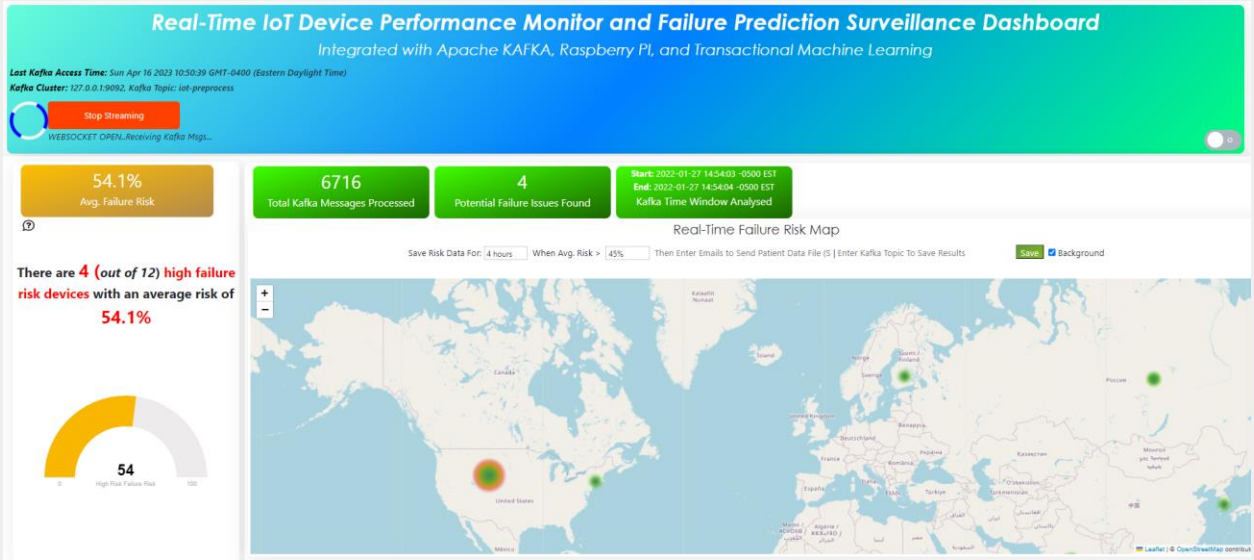
6. install MAADSTML python library
    a. pip install maadstml
    b. pip install requests
    c. pip install nest_asyncio
    d. pip install joblib
    e. pip install asyncio
7. Install TML Technologies for ARM chipset If using Pi 3+, for PI 4 using ARM64 binaries:
    a. Sudo mkdir viper
        i. Copy viper (arm or arm64 i.e. cp * /home/pi/viper)
    b. Sudo mkdir hpde
        i. Copy hpde (arm or arm64)
    c. Sudo mkdir viperviz
        i. Copy viperviz (arm or arm64)
    d. Copy viper-env-file from https://github.com/smaurice101/raspberrypi/tree/main/viper-env-file
        i. Replace viper.env file with one above
    e. IotSolution - copy all Python scripts from Github: https://drive.google.com/drive/folders/1wJEufLVtOzu8R-yYh6ybMASAaKkvMaTw?usp=sharing
        i. produce-iot-customdata.py
        ii. preprocess-iot-monitor-customdata.py
        iii. preprocess2-iot-monitor-customdata.py
        iv. Raw IoT Device Data: IoTData.zip and unzip data
        v. IoT Lat/Longs: downlaofdsntmlidmain.csv

8. Start Apache Kafka: ZOOKEEPER
    a. Download Zookeeper-Kafka and unzip
        i. https://drive.google.com/file/d/1yCyiAdSAQVC-ApD24BDwYU26WCnXW3vg/view?usp=share link
        ii.
    b. export KAFKA_HEAP_OPTS="-Xmx512M -Xms512M"
    c. Edit zookeeper/conf/zoo.cfg
        i.
```
tickTime=2000
initLimit=10
syncLimit=5
dataDir=/media/pi/sebusb/zookeeper # Don't put under
/tmp, it will be deleted.
clientPort=2181
```

```
    d. Cd to “zookeeper/kafka/bin”
    e. Enter:./zookeeper-server-start.sh
       ../config/zookeeper.properties <enter>

9. Start Kafka in another terminal
    a. Kill port: sudo kill -9 $(sudo lsof -t -i:3000)
    b. export KAFKA_HEAP_OPTS="-Xmx512M -Xms512M"
    c. ./kafka-server-start.sh ../config/server.properties
```

10. **VISUALIZATION URL: Make sure to change IP address to the one given to your Raspberry PI:**
    a. http://192.168.2.27:9005/iot-failure-seneca.html?topic=iot-preprocess2,iot-preprocess&offset=-1&groupid=&rollbackoffset=500&topictype=prediction&append=0&secure=0
    b. You should see a dashboard similar to this:



11. **Increase swap file**
    a. `sudo nano /etc/dphys-swapfile`
    b. `CONF_SWAPSIZE=2000`
    c. `sudo reboot`
    d. `free -m`