Installation_readme

1. Introduction:

1.1 Purpose:

The purpose of this installation guide is to describe in technical terms the steps necessary to install the “SmartDB” application and make it operational.

2. Prerequisites:

Installation of this application is supported on the following operating systems and versions:

- · Windows 8.1 and above
- · Raspbian Operating System
- · Virtual Image of Ubuntu Operating System

The following must be installed on the Host Machine prior to the installation of the application:

- Android
- VNC Viewer
- Putty
- Advanced IP Scanner
- Virtual Machine

The following must be installed on the Raspbian Operating System prior to the installation of the application:

- Pip3
  pip is a package management system used to install and manage software packages written in Python. Many packages can be found in the default source for packages and their dependencies — Python Package Index (PyPI).
  sudo apt-get -y install python3-pip
- Fs webcam
  fswebcam is the simplest and easiest way to have your webcam capture single frames, also programmatically at a specified timer interval.
  To install fswebcam simply run:
  sudo apt-get install fswebcam
- RPi.GPIO
  This package provides a class to control the GPIO on a Raspberry Pi.
  To install the RPi.GPIO package :
  sudo apt-get install rpi.gpio
- Time
  This module provides various time-related functions. It comes pre-installed with Python.
- Os
  The main purpose of the OS module is to interact with your operating system. It comes pre-installed with Python.
- Glob
  The glob module finds all the pathnames matching a specified pattern according to the rules used by the Unix shell, although results are returned in arbitrary order. It comes pre-installed with Python.

- Sys
  This module provides access to some variables used or maintained by the interpreter and to functions that interact strongly with the interpreter. It is always available.

- Pyrebase
  A simple python wrapper for the Firebase API. To install it use following command:
  sudo pip3 install pyrebase
- PyFCM
  Python client for FCM - Firebase Cloud Messaging (Android, iOS and Web). Firebase Cloud Messaging (FCM) is the new version of GCM. It inherits the reliable and scalable GCM infrastructure, plus new features. GCM users are strongly recommended to upgrade to FCM.
  Install using pip3:
  sudo pip3 install pyfcm
  OR
  sudo pip3 install git+https://github.com/olucurious/PyFCM.git

- Socket
  This module provides access to the BSD socket interface. It is available on all modern Unix systems, Windows, Mac OS X, BeOS, OS/2, and probably additional platforms. It is already installed.

The following must be installed on the Virtual Image of Ubuntu Operating System prior to the installation of the application:

- tensorflow
  TensorFlow™ is an open source software library for high performance numerical computation. Its flexible architecture allows easy deployment of computation across a variety of platforms (CPUs, GPUs, TPUs), and from desktops to clusters of servers to mobile and edge devices.
  To install it:
  sudo pip3 install tensorflow
- keras
  Keras is a high-level neural networks API, written in Python and capable of running on top of TensorFlow, CNTK, or Theano. It was developed with a focus on enabling fast experimentation.
  To install it:
  sudo pip3 install keras
- Scipy
  SciPy (pronounced “Sigh Pie”) is a Python-based ecosystem of open-source software for mathematics, science, and engineering. In particular, these are some of the core packages: Numpy, Scipy, Matplotlib, IPython, Sympy, pandas.
  To install it:
  sudo pip3 install --user scipy

- scikit-learn
  Scikit-learn (formerly scikits.learn) is a free software machine learning library for the Python programming language.[3] It features various classification, regression and

clustering algorithms including support vector machines, random forests, gradient boosting, k-means and DBSCAN, and is designed to interoperate with the Python numerical and scientific libraries NumPy and SciPy.
To install it:

sudo pip3 install scikit-learn

- opencv-python
  OpenCV (Open Source Computer Vision) is a library of programming functions mainly aimed at real-time computer vision.
  To install it:

  sudo pip3 install opencv-python
- h5py
  The h5py package is a Pythonic interface to the HDF5 binary data format.
  To install it:

  sudo pip3 install h5py
- matplotlib
  Matplotlib is a Python 2D plotting library which produces publication quality figures in a variety of hard copy formats and interactive environments across platforms.
  To install it:

  sudo pip3 install matplotlib
- socket
  This module provides access to the BSD socket interface. It is available on all modern Unix systems, Windows, Mac OS X, BeOS, OS/2, and probably additional platforms. It is already installed.

2. Product Installation:

- Open the link www.github.com/smartDBsavs/smartdb-project.
- Clone or download the repository.
- Set up the Raspberry Pi with Raspbian OS.
- Open the code given under SmartDb_pi_code/smartdb folder and copy all the files.
- Create one folder named smartdb in your home directory of raspberry pi.
- Now copy all of the code into smartdb folder.
- Go the downloaded folder.
- Go to the SmartDB_demo folder under the downloaded folder.
- Import the project on Android Studio.
- Create an virtual image of Ubuntu Operating System.
- Install all of the dependencies and prerequisites onto the ubuntu virtual machine.
- Open the Ubuntu folder under the downloaded repository and copy all of the code maintaining the same hierarchy into the virtual machine.

Configuring the firebase:

- Create your id at https://firebase.google.com/
- Click on Get Started.
- Create a project named same as that of Android application name.
- Give the required details along with the package name of your android application.
- Now firebase will provide you a json file and will ask you to put at some place in android project hierarchy.
- Firebase will also ask you to embed given lines of code into app and gradle file.
- Now you are done with firebase.

Running the system:

- Run bell.py from SmartDb_pi_code/smartdb folder on Raspberry Pi.
- Keep socket_server.py in running condition always on Virtual Machine.
- Run your android application on mobile phones.

Whenever any visitor arrives and presses the doorbell, the system works as expected.

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