Experiment No.: 05

Aim: To study and Install Raspberry Pi

Objective: To study Raspberry Pi

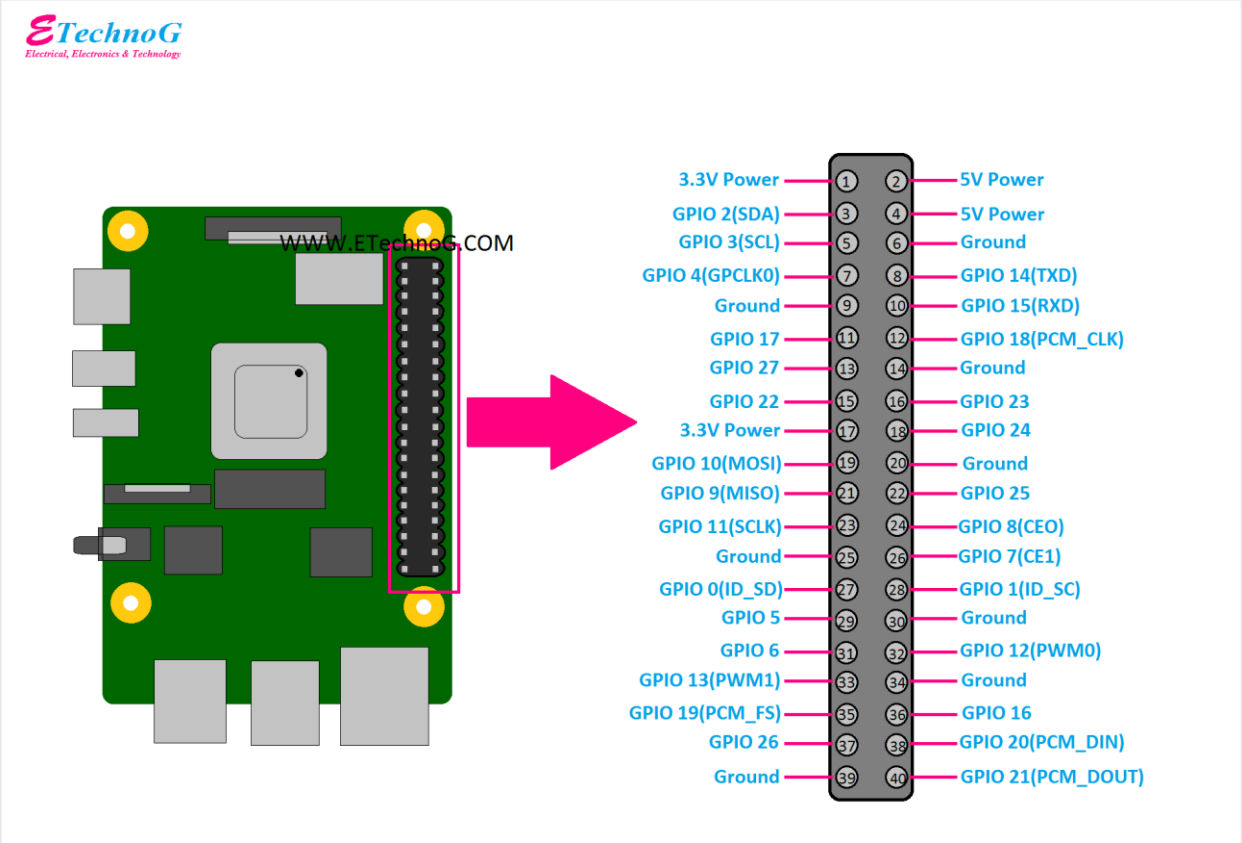
Outcome: Able to install Raspberry Pi and use it.

Theory:

The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games.

- The main difference between them is: Arduino is a microcontroller board, while Raspberry Pi is a microprocessor based mini computer (SBC).
- The Microcontroller on the Arduino board contains the CPU, RAM and ROM. All the additional hardware on the Arduino Board is for power supply, programming and IO Connectivity. Raspberry Pi SBC has all features of a computer with a processor, memory, storage, graphics driver, connectors on the board.
- Raspberry Pi needs an Operating System to run. Arduino doesn't need any operating system. All you need is a binary of the compiled source code.
- Raspberry Pi comes with a fully functional operating system called Raspberry Pi OS (previously known as Raspbian OS). Although Pi can use different operating systems, Linux is preferred by Raspberry Pi Foundation. You can install Android, if you want. Arduino does not have any operating system. You just need a firmware instructing the Microcontroller what task to do.
- The clock speed of Arduino is 16 MHz while the clock speed of Raspberry Pi is around 1.2 GHz.

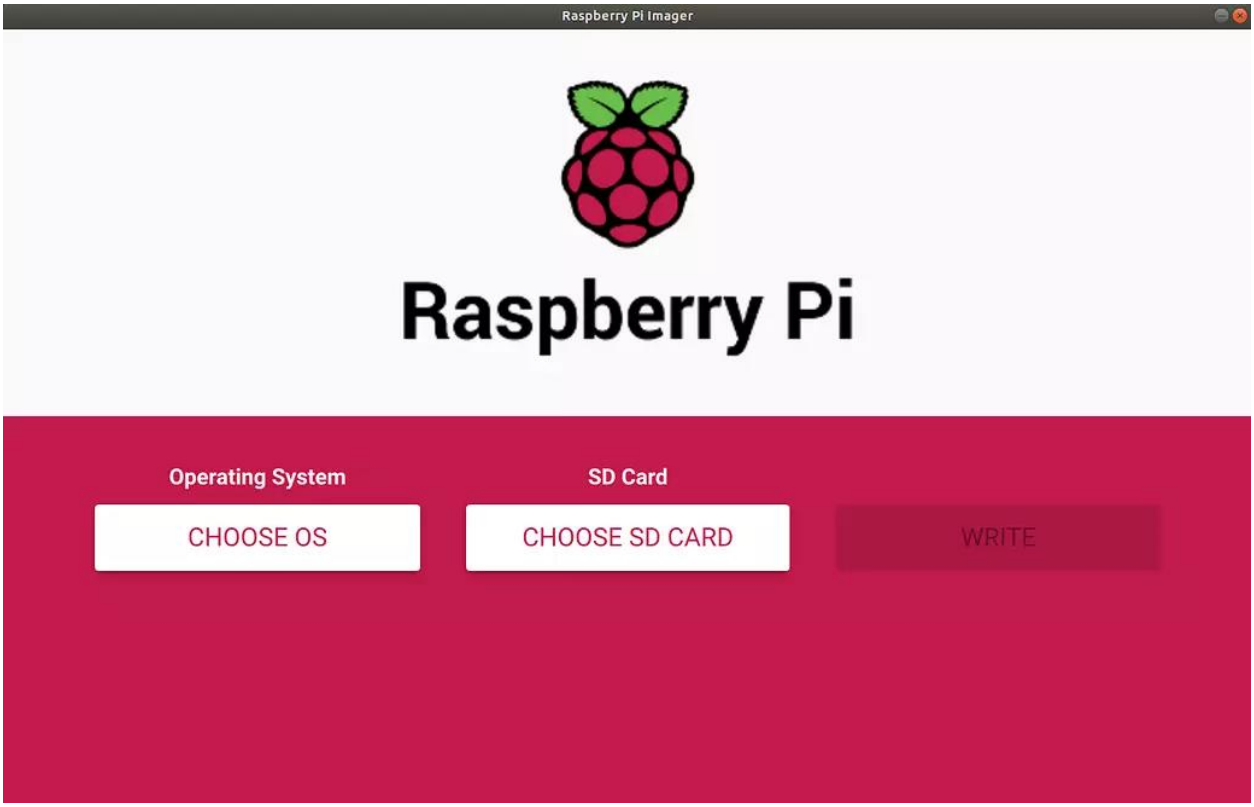
Pin diagram and Architecture:

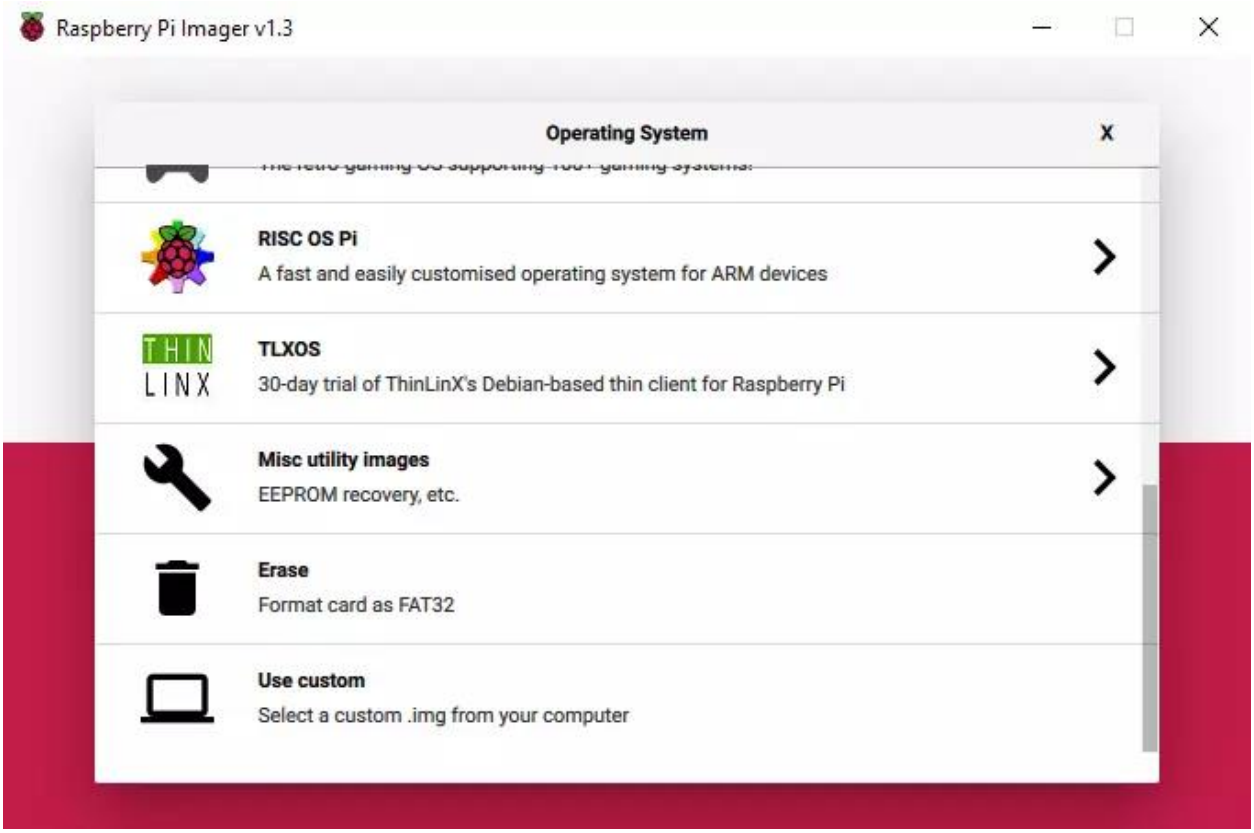


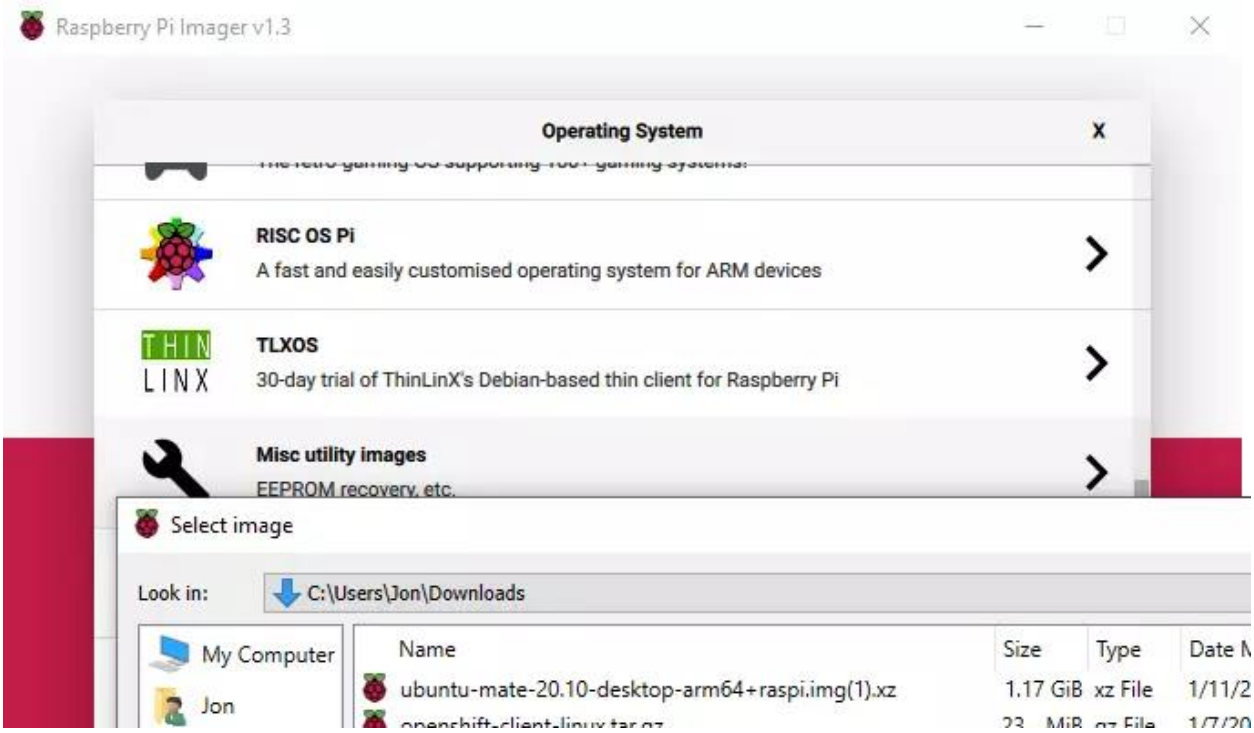
Example:

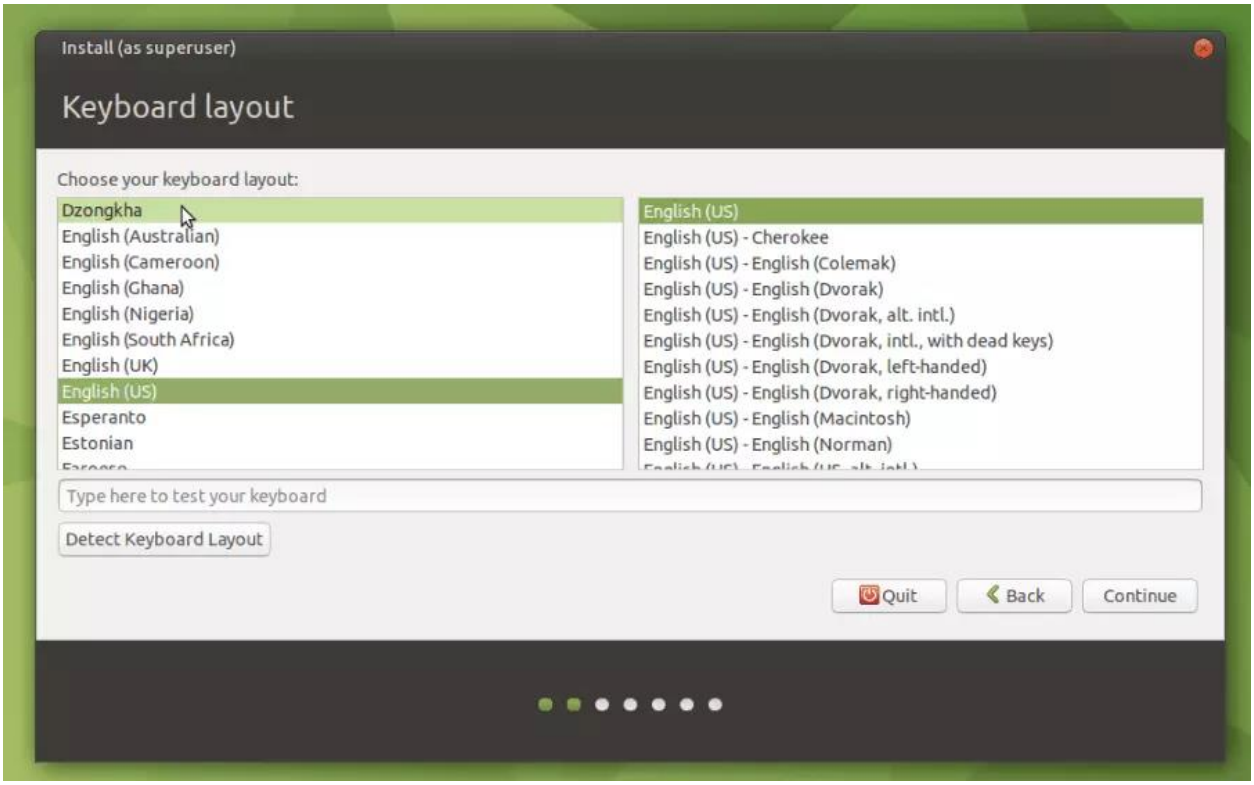
The applications of Raspberry Pi can be used as a game server as well. It is an excellent game server for Minecraft. If multiple Raspberry Pis are used, making one as a dedicated server, a great gaming experience can be achieved. Other multiplayer network games can be set up on the Raspberry Pi.

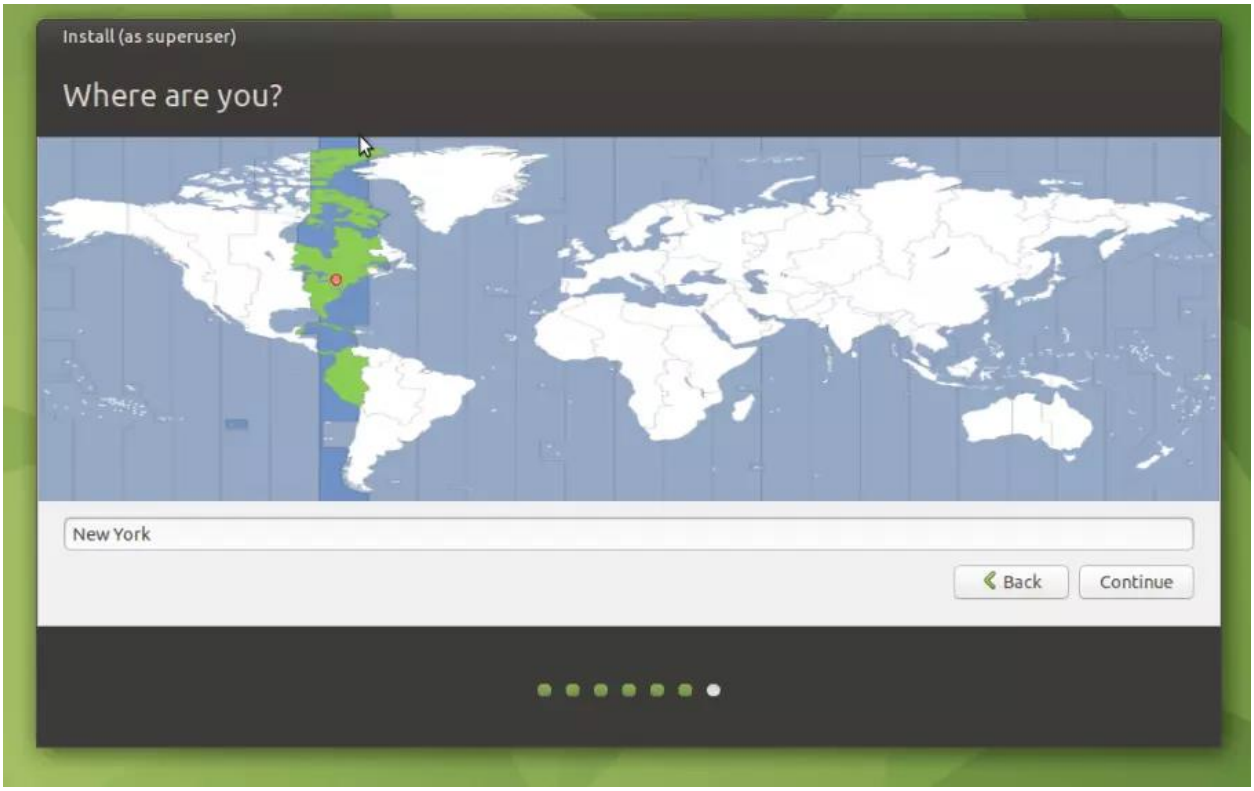
OutPut:

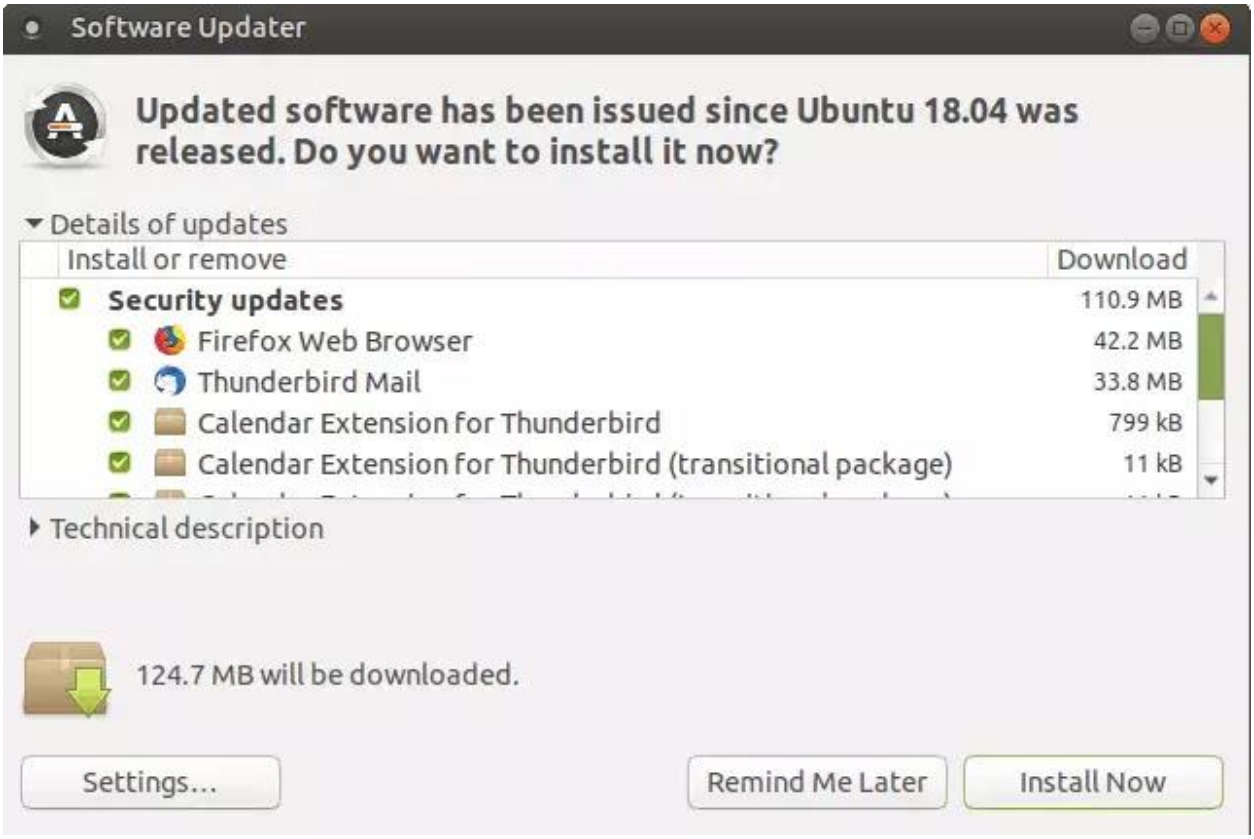

Raspberry Pi Imager
Raspberry Pi
Operating System
CHOOSE OS
SD Card
CHOOSE SD CARD
WRITE

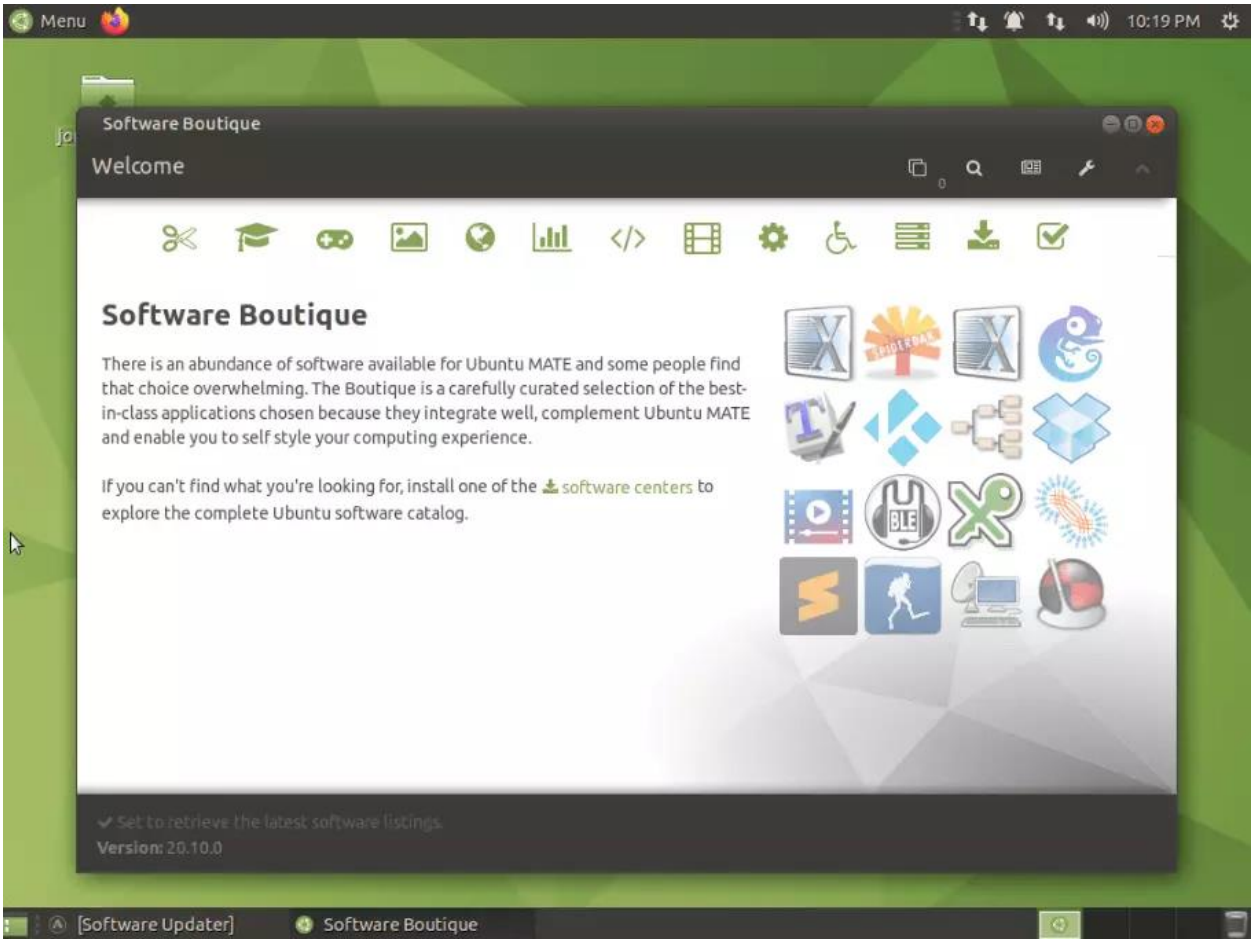

Raspberry Pi Imager v1.3
Operating System
X
RISC OS Pi
A fast and easily customised operating system for ARM devices
THIN LINX
TLXOS
30-day trial of ThinLinX's Debian-based thin client for Raspberry Pi
Misc utility images
EEPROM recovery, etc.
Erase
Format card as FAT32
Use custom
Select a custom .img from your computer


Raspberry Pi Imager v1.3
Operating System
RISC OS Pi
A fast and easily customised operating system for ARM devices
THIN LINX
TLXOS
30-day trial of ThinLinX's Debian-based thin client for Raspberry Pi
Misc utility images
EEPROM recovery, etc.
Select image
Look in:
C:\Users\Jon\Downloads
My Computer
Jon
Name
Size
Type
ubuntu-mate-20.10-desktop-arm64+raspi.img(1).xz
1.17 GiB
xz File


Install (as superuser)
Keyboard layout
Choose your keyboard layout:
Dzongkha
English (Australian)
English (Cameroon)
English (Ghana)
English (Nigeria)
English (South Africa)
English (UK)
English (US)
Esperanto
Estonian
English (US)
English (US) - Cherokee
English (US) - English (Colemak)
English (US) - English (Dvorak)
English (US) - English (Dvorak, alt. intl.)
English (US) - English (Dvorak, intl., with dead keys)
English (US) - English (Dvorak, left-handed)
English (US) - English (Dvorak, right-handed)
English (US) - English (Macintosh)
English (US) - English (Norman)
Type here to test your keyboard
Detect Keyboard Layout
Quit
Back
Continue


Install (as superuser)
Where are you?
New York
Back
Continue


Software Updater
Updated software has been issued since Ubuntu 18.04 was released. Do you want to install it now?
Details of updates
Install or remove
Download
Security updates
110.9 MB
Firefox Web Browser
42.2 MB
Thunderbird Mail
33.8 MB
Calendar Extension for Thunderbird
799 kB
Calendar Extension for Thunderbird (transitional package)
11 kB
Technical description
124.7 MB will be downloaded.
Settings...
Remind Me Later
Install Now


Menu
10:19 PM
Software Boutique
Welcome
Software Boutique
There is an abundance of software available for Ubuntu MATE and some people find that choice overwhelming. The Boutique is a carefully curated selection of the best-in-class applications chosen because they integrate well, complement Ubuntu MATE and enable you to self style your computing experience.
If you can't find what you're looking for, install one of the software centers to explore the complete Ubuntu software catalog.
Set to retrieve the latest software listings
Version: 20.10.0
[Software Updater]
Software Boutique