

Geant4 Virtual Machine

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Distribution of Geant4 Virtual Machine

- <https://wiki.kek.jp/display/geant4/Geant4+Virtual+Machine>
- <https://wiki.kek.jp/x/4CVj>

Virtual Machine



vmware® || Parallels®

Ready for



Purpose of G4VM

- Geant4 pre-installed virtual machine
 - Download & Play
 - Available in VMware and Parallels
 - VirtualBox is "End of Service" because of insufficient graphic performance
 - Freely available under BSD 2-Clause License
 - First experience for novice users: used in hands-on sessions in tutorials
- What can be learned from VM
 - How to set the Geant4 running environment
 - Linux setup and software environment
 - Geant4 installation
 - How to use Geant4
 - Prebuilt Geant4 examples inside

Contents of G4VM

- OS: Ubuntu 22.04
 - x86_64 / Apple Silicon
- Geant4: 11.1.2
 - Installed in /opt/geant4/11.1.2
 - Pre-installed examples (Basic, extended/TestEM)
 - ~/work/basic/, ~/work/electromagnetic/
- Visualization tools: Qt, OpenGL
- Analysis tools:
 - Anaconda3 (2023.07-2)
 - > conda activate

System Requirements

- System resources
 - Vacant disk space: 30GB / memory : 8GB
 - VM resource:
 - 1CPU, 25 GB HD, 2 GB memory (initial)
- Software
 - ZIP (ZIP64) : zipped VM images
 - VMware
 - Workstation Player (Win/Linux) Product / Free
 - Workstation (Win/Linux) Product
 - Fusion Player (Mac) Free
 - Fusion (Mac) Product
 - Parallels Desktop
 - Parallels Desktop for Mac Product

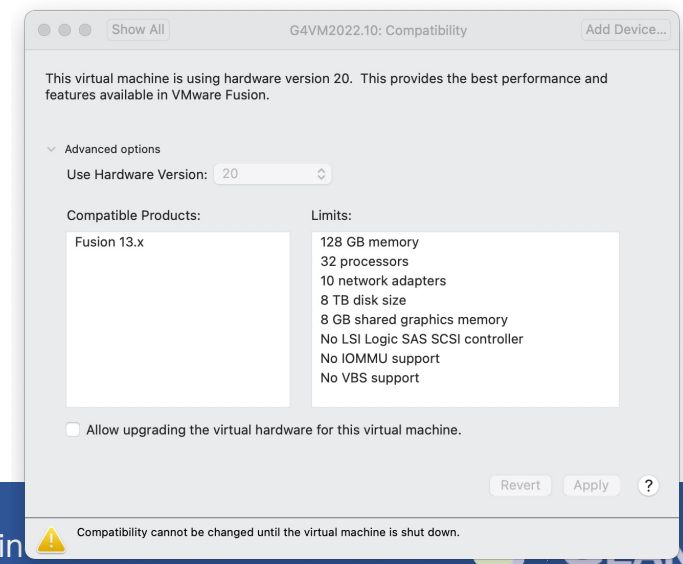
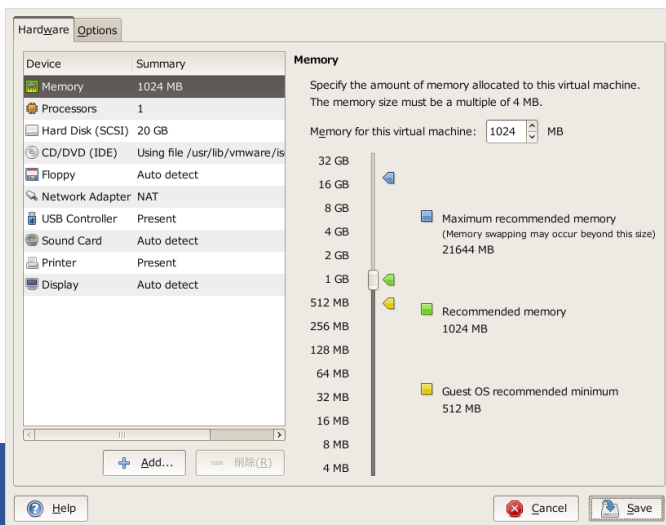
VM Machine Parameters

- You can change VM parameters via the control panel.

- Default settings
 - 1CPU, 1core
 - 2 GB memory
 - Disk: 25GB (extendable)
- Some parameters should be changed via an editor in VMware player.

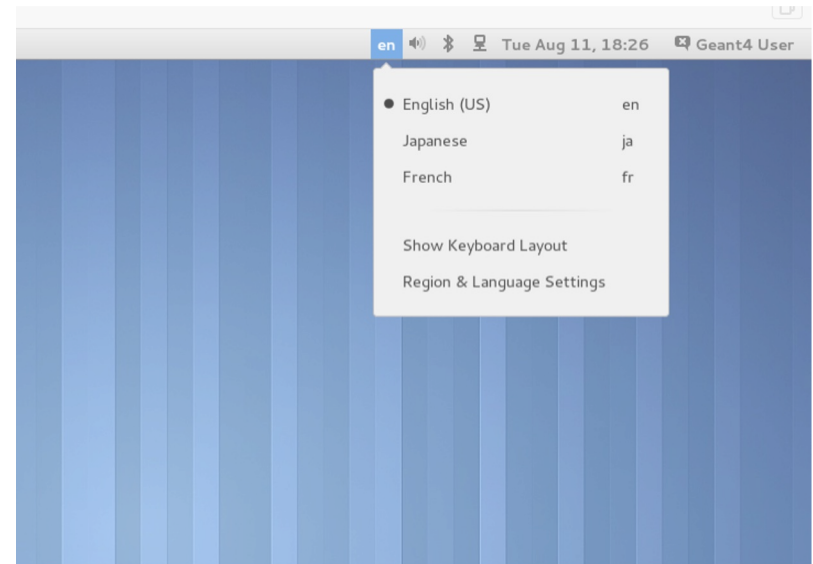


- You may need to downgrade the hardware compatibility of VMware for an old version of VMware.



VM Machine

- User Information
 - User name: g4user / Password: g4user
 - Autologin is set.
 - Admin: root / !!g4vm
- Keyboard Layouts
 - English 101 Keyboard by default
 - You can change the keyboard type (English/Japanese).
- System updates:
 - > sudo apt update
 - > sudo apt upgrade
 - > sudo apt install “package”
 - > sudo snap refresh



User Environment

- Shells
 - bash (default)
 - (t)osh
 - zsh
- Necessary environment variables are already defined.
 - `> printenv | grep GEANT4` : Location of data file
- Editors:
 - VS Code, vim, gedit
- Rust tools
 - `exa (ls)`
 - `bat (less)` : `less -p` (行表示なし)

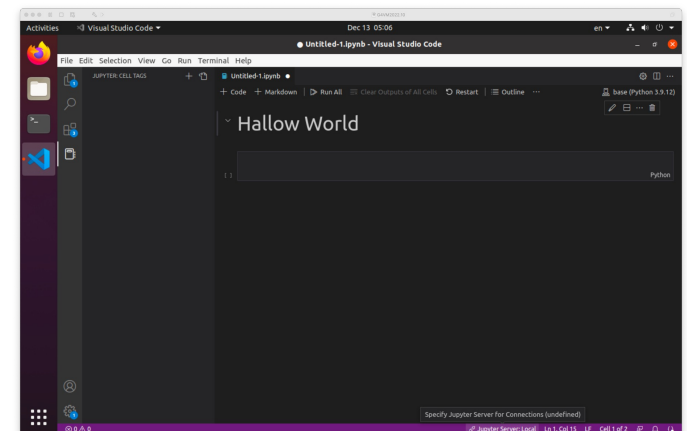
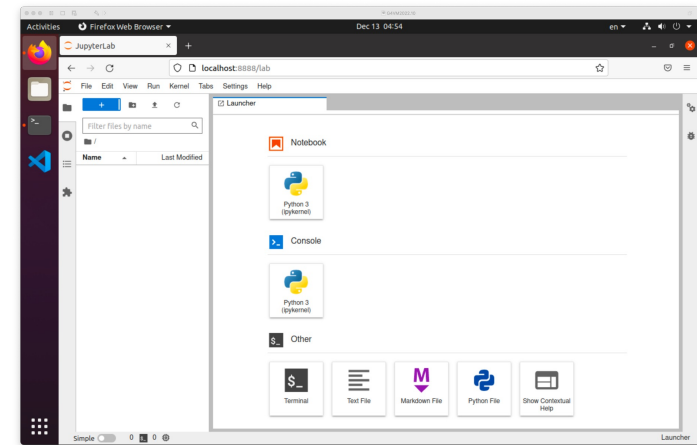


Geant4 Examples

- Basic examples
 - B1-B5
 - Location: /home/g4user/work/basic/
 - Basic examples demonstrating Geant4 basic features
 - In case of a malfunction with Qt visualization,
 - Export G4FORCE_RUN_MANAGER_TYPE=Serial
 - Run in a single-thread mode
- TestEM extended examples
 - TestEm1-18
 - Location: /home/g4user/work/electromagnetic
 - Examples of testing Geant4 EM physics
 - Including analysis with histograms

Python / Anaconda

- Ready for Anaconda3
 - Activate before use
 - > conda activate
 - Remind of bad compatibility between Anaconda Qt and system Qt.
- Jupyter-lab
 - In your terminal,
 - > jupyter-lab
 - Jupyter is launched in your browser.
 - Quit with Ctr-C in the terminal
- Run Jupyter on VS Code
 - Open a *.ipynb file
 - Use command pallet (Ctrl-Shift-p)
 - Set Python kernel to Anaconda3



Summary

- Geant4 Pre-installed virtual machine is freely available.
- Providing Geant4 user experiences:
 - Demonstrating
 - how to make a Linux environment
 - how to build a Geant4 running environment
- Purposes:
 - The first step of using Geant4
 - Easy way to use Geant4 development environment
 - Please don't use it for production purposes.