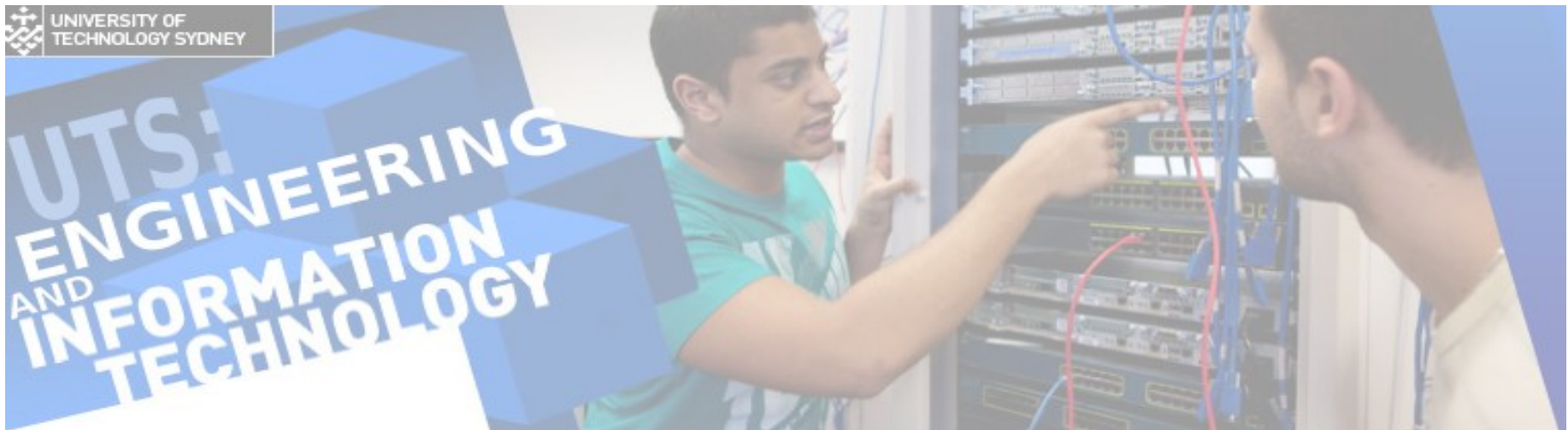


How OSS help UTS:FEIT to build a virtualized networking lab

By

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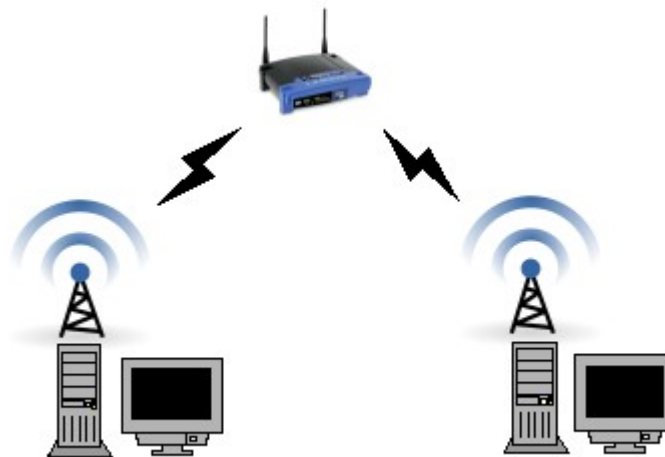
About us

- UTS:FEIT <<http://feit.uts.edu.au>>
- The networking labs in UTS:FEIT



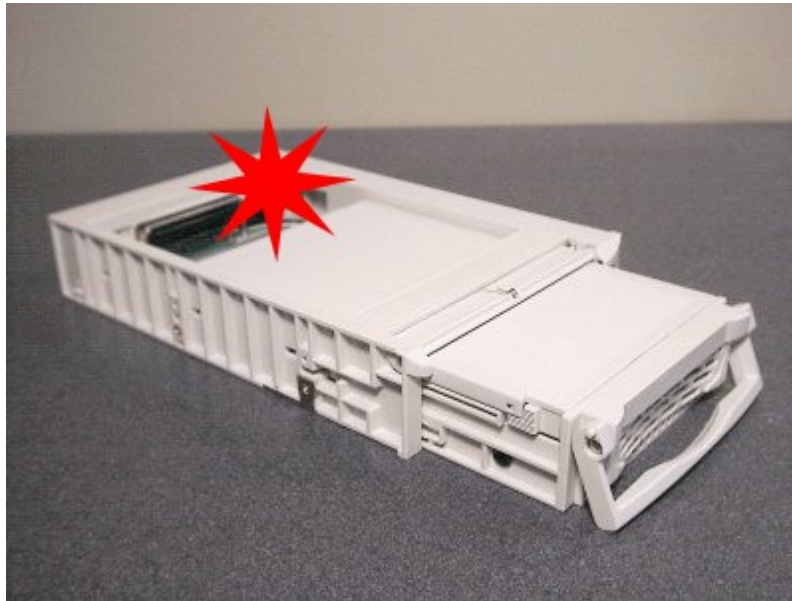
Requirement of networking labs

- Multiple OS  
- Student need full access to the OS
- OS need to be reset to pristine mode frequently
- Need to setup a wireless network environment



The limitation of previous setup

- Extra/non-standard hardware need
- not easy to change/add new image
- Frequent swapping of external hard drive / inserting LiveCD are error-prone

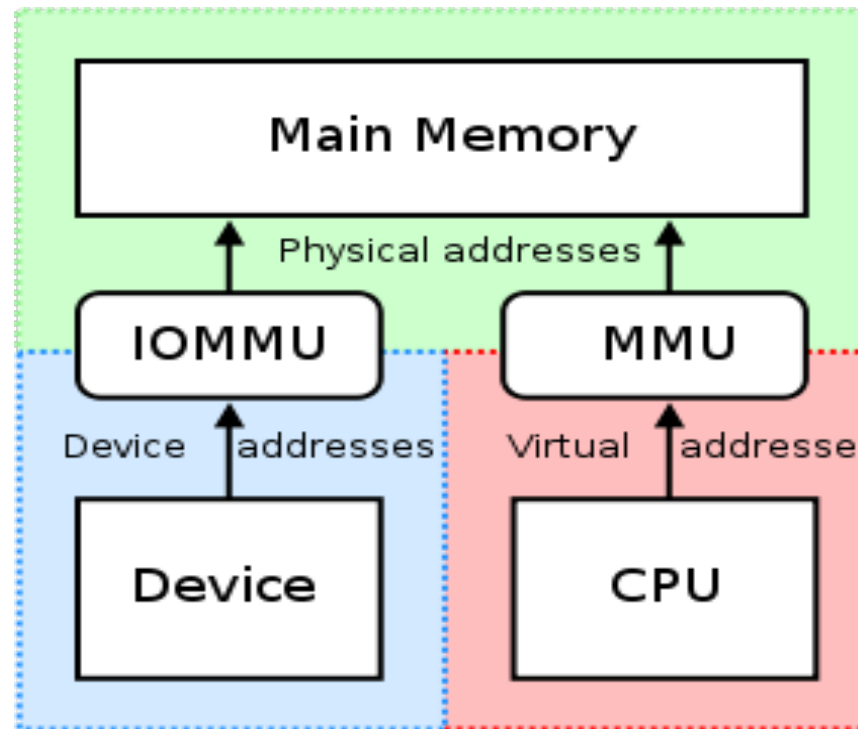


What virtualization can do ?

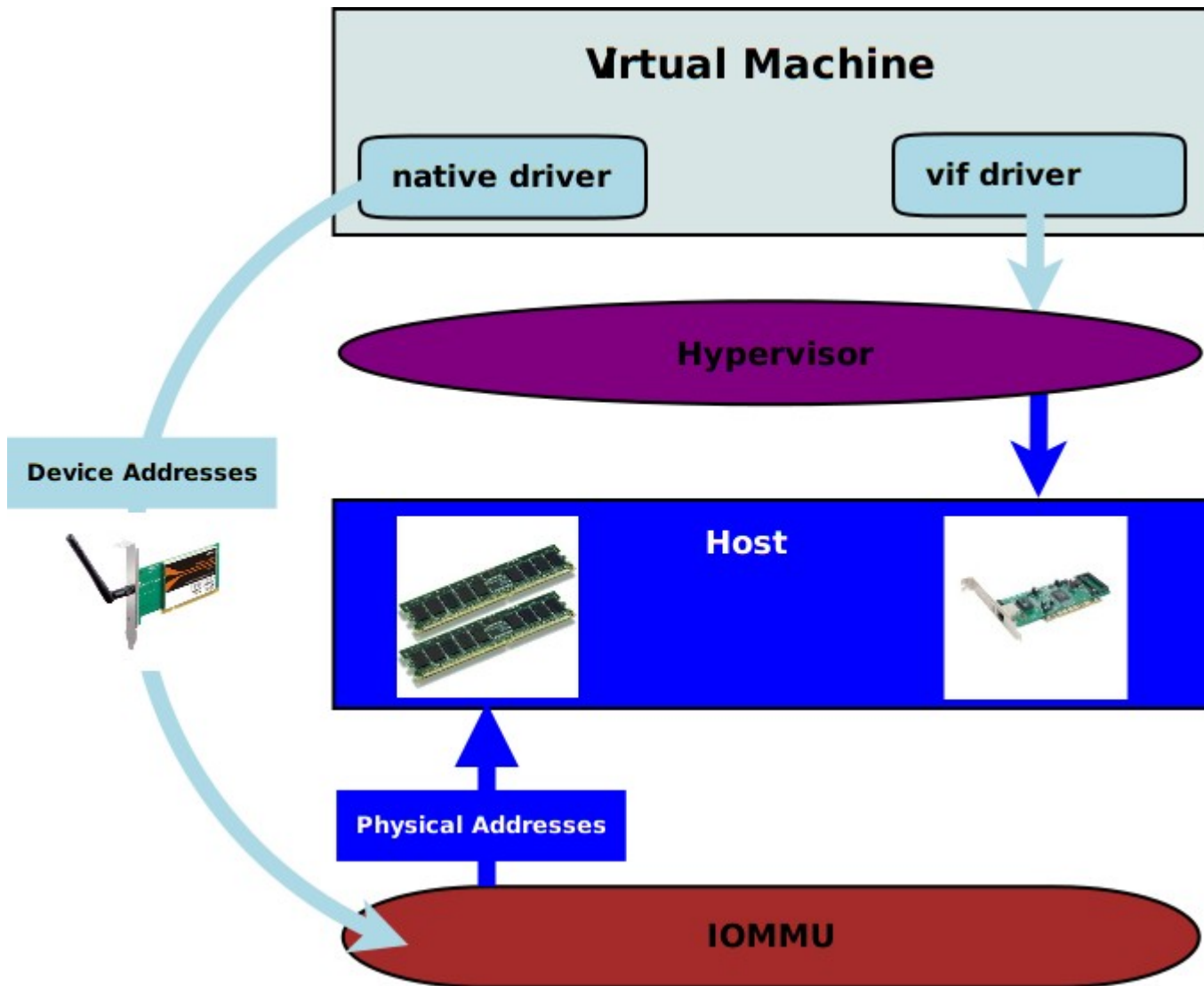
- Provide a clean/immutable lab environment in which user have full privilege on their running VM
- Provide a easy way to switch from different OSs on demand
- Better management over networking labs
- However, no usable emulated wireless device available atm

PCI-Passthrough via IOMMU

- I/O virtualization technology to provide exclusive & secure access to the passthroughed PCI device to a specific VM



PCI-Passthrough -continued



Xen hypervisor with GNU/Linux

- Widely used & proved open source virtualization technology, have a very active community
- Provide better PCI-passthrough support for shared IRQ device
- Combined with GNU/Linux and QEMU it provides a solid and versatile virtualization platform

How all of these been glued up

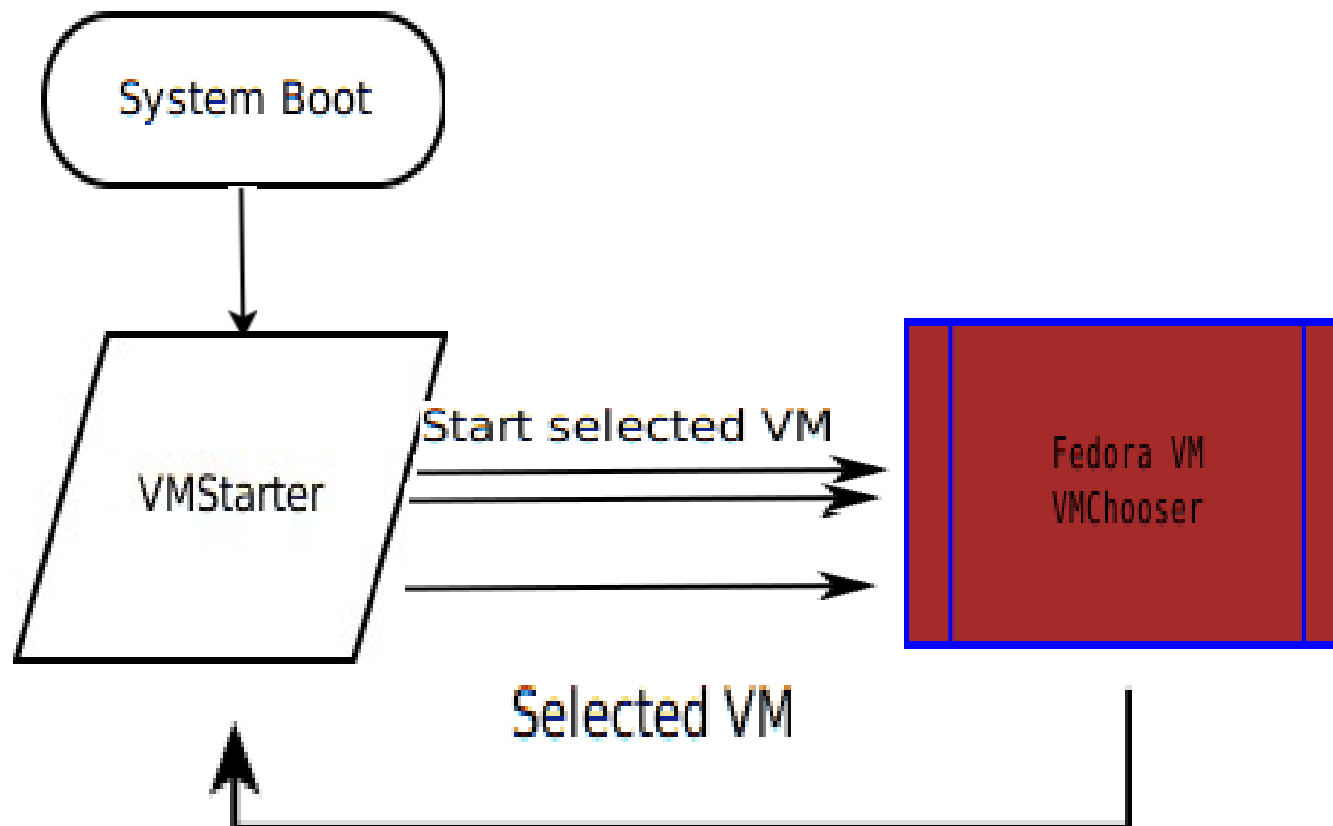
- We created a GUI application called vmchooser for user authentication & VM selection

Source rpms: [<ftp://ftp.it.uts.edu.au/fcit/fedora/17/SRPMS/>](ftp://ftp.it.uts.edu.au/fcit/fedora/17/SRPMS/)

- On host boot, an auto-login user will run vmchooser then pass user selection back to the host for VM handling
- QEMU COW snapshot is used to save/restore each user's session

User feedback and improvement

- Students are not happy with VNC Viewer
- VGA-Passthrough is good, but how do we authenticate user and let them choose a VM ?



XEN + SPICE, another option

- SPICE protocol is supported since Xen 4.2
- Better GUI than VNC
- Remote access via HTML5 capable browser

Why Open source

- OSS has been widely used in UTS:FEIT
- Cost effective
- Flexible, highly customizable
- Unified package management and centralized configuration tool
- Meet the special need in our networking labs